

National Sustainable Development Strategy

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Ministry of Environment Government of Pakistan

By

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List of Acronyms and Abbreviations

ABCD	Activity Based Capacity Development Program
AIDS	Acquired Immune Deficiency Syndrome
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CEO	Chief Executive Officer
CFC	Chloro Fluro Carbon
CGE	Computable General Equilibrium
CITES	Convention on International in Endangered Species
CMS	Convention on Migratory Species
CNG	Compressed Natural Gas
CSR	Corporate Social Responsibility
dB	Decible
DFID	Department of International Development- UK
EAI	Environment Area Initiatives
E& CP	Economic and Common Policies
EU	European Union
EGs	Environment Goods
EIA	Environment Impact Assessment
ERNP	Environment Rehabilitation in NWFP and Punjab Project
EPA	Environment Protection Act
EFR	Environment Fiscal Reform
EPPs	Environmentally Preferable Products
ERRA	Earthquake Relief and Rehabilitation Authority
EQS	Environment Quality Standards
FTA	Free Trade Agreement
FY	Fiscal Year
FAO	Food and Agriculture Organization (UN)
FDI	Foreign Direct Investment
GoP	Government of Pakistan
GHG	Green House Gases
GEF	Global Environment Facility
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GMOs	Genetically Modified Organisms
GST	General Sales Tax
HEC	Higher Education Commission
HFCs	Hydro Fluoro Carbons
HIV	Human Immunodeficiency Virus
HS	Harmonized commodity Description
ICTSD	International Centre for Trade and Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
ISO	International Organization for Standardization
IUCN	International Union of Conservation Nature
JFM	Joint Forest Management
KM	Knowledge Management
LEAP	Long rang Energy Alternative Planning
LEAD	Leadership for Environment and Development
mm	Mili Meter
MAF	Million Acre Feet
MoE	Ministry of Education
MAGICC	Model for Assessment of Greenhouse gas Induced Climate Change

MDGs	Millennium Development Goals
MDP	Measure for Domestic Product
MEAs	Multilateral Environmental Agreements
MoSW&SE	Ministry of Social Welfare and Special Education
MACP	Mountain Areas Conservation Project
MTDF	Medium Term Development Framework
NAFTA	North Atlantic Free Trade Agreement
NCS	National Conservation Strategy
NEP	National Environment Policy
NEQS	National Environment Quality Standards
NSDS	National Sustainable Development Strategy
NCHD	National Commission for Human Development
NIO	National Institute of Oceanography
NMVOCs	Non-Mathane Volatile Organic Compounds
NWFP	North West Frontier Province
NAVTEC	National Vocational and Technical Education Commission, Pakistan
ODS	Ozone Depleting Substances
PM	Particular Matter
PAMP	Protected Area Management Project
PCAP	Pakistan Clean Air Program
PEPA	Pakistan Environment Protection Agency
PFCs	Per Fluoro Carbons
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PKR	Pakistani Rupees
PPP	Public Private Partnership
PPM	Part Per Million
PPMs	Process and Production Methods
PWP	Pakistan Wetlands Project
PMD	Pakistan Meteorology Department
PSDP	Public Sector Development Program
PRSP	Poverty Reduction Strategy Papers
PRSPs	Pakistan Rural Support Programs
PSO	Pakistan State Oil
R&D	Research and Development
RNR	Renewable Natural Resources
SMART	Self Monitoring and Reporting
SD	Sustainable Development Policy Institute
SAICM	Strategic Approach to International Chemical Management
SAFTA	South Asian countries bilateral Free trade Agreement
SDPI	Sustainable Development
TDS	Total Dissolved Solids
VETS	Vehicular Emission Testing Services
WHO	World Health Organization
WWF	World Wide Fund
WTO	World Trade Organization
wef	With Effective From
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNRISD	United Nations Research Institute for Social Development

National Sustainable Development Strategy¹

Preface

National Sustainable Development Strategy is the synthesis of the policy response by the government, groups and individuals to make Globalization work for the development of Pakistani people, so that they can live in harmony with each other as a community, in a healthy environment, in such a way that the future generations live equally well or better. Similar Strategy documents have been produced by many other countries, since the exercise of encouraging member countries to develop their National Sustainable Development Strategies was started by UNEP.

The Ministry of Environment, government of Pakistan, expressed its commitment to the UN process of developing individual country's National Sustainable Development Strategies, by signing a contract. The task for coordinating Pakistan's National Sustainable Development Strategy was entrusted to the Sustainable Development Policy Institute, Islamabad. An inception workshop was held in January 2006 to get the inputs from the civil society and other stakeholders. A draft was initially proposed towards the middle of 2008. But as 2008 progressed, a deep economic crisis engulfed Pakistani society. Unsustainable fiscal and trade deficits accompanied by food shortages, sky-rocketing petroleum prices and consequent high inflation and pressure on Pakistani Rupee, impacted all the aspects of Pakistan's economy and society. Where these multiple crises warranted a review of major economic and social policies by the government, it also necessitated the revision of the earlier proposed NSDS Draft. Pakistan is now under an IMF Programme, which has brought Pakistan back from the brink of a default. The sustainability concerns are now being given high priority. We strongly hope that the NSDS being proposed here would complement the national effort to put Pakistan on the path of sustainable development.

NSDS process has been envisioned as a coordinated, participatory, and continuous process of analysis, debate, capacity-strengthening, planning, and investment that integrates the economic, social and environmental objectives of society and brokes sustainable trade-offs where required. NSDS aims at defining and creating strategic interdependencies between the three pillars of Sustainable Development in the light of an analysis of the national situation. Pakistan has been pursuing different policies to protect Environment in Pakistan. One is also observing a growing interest in Climate Policy issues too. But when, the Draft NSDS was presented for debate during the 11th Sustainable Development Conference, held in Islamabad from 1st to 3rd December 2008, the most important concern voiced in that hotly debated session was the over-riding pre-occupation of the participants with the social issues i.e., in-equality, poverty, governance and their implications for any Strategy for the protection of Environment and improvement in Climate Change. In a country beset by deep seated poverty, which has worsened during 2008, and continuously increasing in-equality, the 'talk' of a focus on Climate Policy appeared to many as anachronistic. In the Pakistani context, the emergence of a Shared Vision of sustainable development is predicated upon a successful integration of the complementarities of the economic, social and environmental pillars. NSDS re-affirms the importance of systems approach for any sustainable Development strategy to succeed with a special attention for the creation of policy symbiosis and need of superior structures, which motivate, plan and implement. The report in hand has proposed the creation of such a 'superior structure' in the form of a Commission for Sustainable Development in Pakistan and hope that this Commission would be able to motivate, plan and implement the Sustainable Development Strategies, with an active participation of all the stakeholders with a stake in a prosperous future for all in Pakistani State.

¹ SDPI thanks Dr. Safdar A. Sohail, DG Pakistan Institute of Trade and Development for overall editing and contributing the Chapters, 1, 2, 4 & 6, Shakeel Ramay of SDPI for the work on the Chapters 3 & 5 and Dr. Abid Sulehri, ED SDPI for reviewing the Draft NSDS.

Supported by suitable policies of socio-economic development, it is hoped that the proposed strategies would not only harness peace and social justice but would also leave a better Natural Resource base and eco-system for the coming generation of Pakistanis.

Pakistan is loosing very heavily due to ineffective policies for the protection of Environment as shown in the Table below.

Environmental Damages	Annual Damage Cost in PKR
Inadequate Water Supply, Sanitation & Hygiene	112 Billion
Agricultural Soil Degradation	70 Billion
Indoor Pollution	67 Billion
Urban Air Pollution	60 Billion
Cost of Lead Exposure	45 Billion
Rangeland Degradation & Deforestation	7 Billion
Total	249 Billion

Source: Pakistan Strategic Country Environmental Assessment Report by World Bank, 2006.

Over the past 20 years, an extraordinary number of international environmental agreements have been concluded. More than 200 multilateral environmental agreements are known to exist. Some of these are global treaties, open to any country. The number of bilateral agreements is unknown, but is thought to be well in excess of a thousand. The result is an international structure for environmental management that was not premeditated, and that reflects the extraordinary diversity of issues and interests involved. Pakistan also is a signatory of the most of the relevant MEAs. But signing MEAs is helping us very little, as shown above. We realize that the sustainable development is a multidimensional phenomenon, including sustainable production and sustainable consumption. The recent global meltdown has alerted different stakeholders and decision makers to the dangers of irresponsible consumption and has created a genuine desire among the people to see the State as well as international institutions to protect and promote the 'public good' from the excesses of the market. NSDS aims at achieving sustainable development by addressing the sources of environmental degradation and negative climate change i.e., Production, instead of half-heartedly initiating some programs to reduce certain pollution levels. The evolving global climate Policy would force sooner than later the individual countries to revamp their traditional production in line with globally agreed 'clean production, be it manufacturing or agriculture. In practice, this means a new economics, one that environmental economist Herman Daly describes as "a subtle and complex economics of maintenance, qualitative improvements, sharing, frugality, and adaptation to natural limits. It is an economics of better, not bigger." Pakistan, which is badly hit by the Climate Change, like other countries need to take a long term view and mobilise sufficient resources for the greening of the economy to ward off any potential threat to its international trade in the short run and harm to the sustainability concerns in the long run. We hope that with sufficient donor support, presence of a strong political will and involvement of strategic groups, the proposed measures would put Pakistan on track to Sustainable Development.

The NSDS realizes the importance of developing the institutional capacity to manage the environmental effects of the past and present development practices in Pakistan. Though, we have not treated 'institutions' as formally a fourth pillar of sustainable development but in Pakistan's context, institutional in-efficiencies have the potential any brilliant strategy. NSDS has proposed many institutional changes in the environment and climate protection infrastructure of the country, with a hope that the leaders entrusted with the relevant institutions would rise to the occasion and start a new chapter in the implementation of the NSDS.

NSDS aims to produce a community of knowledge and has tried to benefit from the knowledge of communities in its formulation process. Though NSDS has extensively used the secondary sources, but through consultative process, the views and inputs of all the major groups have been factored in. It is expected that in the implementation phase of the NSDS, this participatory approach would continue to guide the implementers.

The ongoing global crisis and the resultant stress on the state structures and social fabric have created space once again when nations are obliged to ask very basic questions about their past and future of a system and polity. This is the time when the sustainability of past development experiences in Pakistan, relevance of the current governance infrastructure and the pertinence of the domineering patterns of behaviour of Pakistanis need to be critically analysed with a view to provide alternatives. NSDS based on an extensive academic work, analysing Pakistan's and global development experiences and extensive consultations is being proposed with an aim to provide a holistic comment and suggestions to help the government and civil society improve its development strategies and practices.

Strategic Objectives of NSDS

- Adoption of a suitable vision of Sustainable Development by Government, industry and civil society
- Adding on PRSP II and Vision 2030, define and underscore the Policy Space and significance of Environment and Climate Change Policy
- Propose an Sustainable Development Strategy, providing legal, institutional, financial and technological responses

Principle components of NSDS

- Strategies for sustainable production and consumption in conformity with climate change concerns
- Mainstreaming Environment and Climate Change Policy in national development planning, building upon Environmental Policy 2005
- Financing of Environment and Climate Change Policy
- Upholding national interest in Trade & Multilateral environmental agreements
- Mitigation, adaptation, financing and technology transferring prioritizing options for Pakistan

NSDS has not ignored the traditional Environmental Policy issues which are well known and on which a lot of work is under way, such as Energy, water, agriculture, pollution, adaptation and mitigation of global warming, Biodiversity, forest management etc.

The country's population is predominantly rural and dependent on agricultural lands, rangelands and forests. Natural resources and their sustainable management are therefore central to economic growth and people's livelihoods. The NSDS has created an opportunity for mainstreaming environment in all sectors and themes that target poverty reduction, thus maximizing the benefits of interventions and eliminating or minimizing the adverse impacts of the initiatives and interventions. The environment is a cross-cutting issue; the solution to the environmental problems lies beyond the restricted jurisdiction of environmental agencies. Environmental governance, therefore, needs to be integrated into economic decision-making at all levels, especially in the Planning Division, government of Pakistan.

However, we realise that our efforts of strategic policy making have been obstructed by lack of awareness, information on several critical issues and limited data coverage. Enhancing information and data base in key environmental sectors and dissemination of environmental information should, therefore, be a high policy priority and NSDS gives due importance to the creation of knowledge.

The Fourth report of the Intergovernmental Panel on Climate Change (IPCC)² suggested that South Asia is one of the world's regions more at risk from climate change in terms of adverse impacts to the poor. The socio-economic costs of climate change-related impacts can be significant for Pakistan, and also have the potential to severely reverse the progress made by the country on development and poverty alleviation. Significant investments in infrastructure development are needed to enhance Pakistan's competitiveness, but investments are also crucial to improve environmental quality and

2 "Climate Change 2007", Fourth IPCC Assessment Report.

achieve progress in terms of environmental health. In the long-term, the sustainability of infrastructure investments and their influence on development and economic growth will be a function of the extent to which their associated environmental impacts are evaluated and, if necessary, mitigated. NSDS is proposing that the practice of Integrated Assessment be made an integral part of the overall national planning process, and has proposed an institutional framework to guarantee coordination between agencies to:

- (i) develop and put in place such process given the specific context of the country; and
- (ii) ensure that the process is consistently carried out. We hope that NSDS and other sustainable development strategies, it aims to leverage, would be able to inaugurate a new era of people friendly development practice without any harm to the natural and human capital of present and future generations.

While formulating NSDS a large number of organizations and individuals contributed, whose contributions are sincerely appreciated.

Chapter 1

Sustainable Development in Pakistan: Affirming a Shared Vision

Sustainable development is commonly understood to be a set of multi-dimensional principles and practices created in response to the recognition of threats to the planet's ability to support life associated with present forms of development and economic behaviour (UNCED, 1987). Sustainable development encompasses both environmental and human systems, it involves factors in three key dimensions i.e., environmental, social and economic. Though these three key elements operate in an interdependent fashion, sustainable development – the approach we have taken while developing NSDS for Pakistan – focuses on how the first dimension, the Environment is impacted by activity connected with the other two dimensions.

Sustainability can be interpreted in terms of maintenance of different forms of capital to ensure that the levels of future consumption are at least, as high as that of the present generation. This is usually done by using investment data, aligning investment with the consumption path. But sometimes past estimates of investments cannot be used to predict future investment levels, as in a country like Pakistan, which is beset with high security threats and vulnerability due to which it would be very hard to predict the investment levels for future.

The concept of sustainable development as such is not new in Pakistan. As Pakistan has been an active member of the diplomatic efforts on Environment, from Stockholm onwards, the sustainability concerns, usually conceived as the harmful impact of human activity on the environment, have also been frequently voiced. Pakistan, as a member of United Nations, has remained actively involved in the global initiatives on various matters including environment, climate change and other initiatives linked with Sustainable Development. Pakistan was one of the core member states who took lead in the first historical conference on “Human Environment” held in Stockholm in 1972.

As a follow up to the emerging environmental concerns, government of Pakistan established an Environment Cell in the Presidential Affairs Division in Late 1972. The Environment Cell was expanded and given the status of a “full fledged Division” housed in the Ministry of Housing and Works in 1980s. With the expansion of the Environmental canvas at the global level and increasing commitments at the national level, the government of Pakistan raised the status of the Environment Division to a fully fledged Ministry of Environment in 1991.

Pakistan was one of the first countries in the world which prepared a National Conservation Strategy. This document was a comprehensive response to the emerging environmental issues confronting Pakistan at the national level as well as for meeting its international commitments being a Party to various Environmental Conventions and Protocols. Pakistan not only presented this document at the second Earth Summit held in Rio-de-Janeiro in 1992 but also being the leader of the group of ‘G-77 and China’, led the discussions and negotiations on Agenda 21 as well as Rio Conventions (UNFCCC, UNCBD, UNCCD) at the formative stage to protect and safeguard the interest of the developing countries.

The Government of Pakistan realizing the gaps due to expansion of the environmental canvas drafted a comprehensive and permanent legislation on environment replacing Environmental Protection Ordinance³, 1983 with the Pakistan Environmental Protection Act⁴, 1997. The National

3 Ordinance is a law enacted by President of Pakistan.

4 Act is a law passed by the parliament.

Environmental Quality Standards [NEQS] were approved in 1993 for liquid, solids, and gaseous emissions. NEQS were reviewed and revised in late 1990s in consultation with the industry, environmental experts and other stakeholders to facilitate implementation of these standards in Pakistan.

However, a critical evaluation of the outcomes of these initiatives in themselves and the circumstantial evidence that Pakistan has experienced severe environmental degradation during the last two decades and is faring very badly on different indices related to Sustainable Development, make it abundantly clear that there have been and are serious gaps and weaknesses displayed by all the major stakeholders – government, industry, civil society, donors – in advancing the Sustainable Development agenda in Pakistan.

When we tried to gauge public opinion about the reasons of environmental degradation and threats to Sustainable Development in Pakistan, the resounding response was that the Environmental Policy becomes irrelevant to Sustainable Development, if the policies for social and economic development in Pakistan continue to work at odds with the objectives of Sustainable Development.

Social Policy is defined variously in different contexts. Most commonly understood, it is a group of policies which ‘aim’ to contribute towards the social development of the community and well being of the individual citizens. In reality, the end of all the policies in a country – be these the economic policies, policies to promote better governance, Health and Education or targeted social support policies and programs – is the realization of the twin objectives of social development and citizens’ well being,. It is impossible to think of social development, especially in the generational context, if the economic development policies are not contributing towards the social ends. However, the social policies could also be understood as a group of policies with shorter transmission to the ‘perceived well being of citizens and social development of certain groups. If we compare the channels of transmissions, the impact of targeted social support policies would be direct whereas, the impact of economic policies would be indirect through employment generation, more public spending etc. However, as the success of any social support policy would depend largely on the governance effectiveness, this indirect impact would be as crucial as the ‘social policies’ which are supposed to directly impact on the well being of individuals and groups. This precisely is the reason that any notion of sustainable development needs to factor in the policies interdependencies.

The negative perception of financing constraints and poor implementation of Social Policy in Pakistan is such a chronic and omnipresent sentiment, that any fresh policy thinking receives a sceptical response. People view policy making process as a futile exercise and to some extent rightly so because the new policies either do not get proper funding, or they fail implementation and above all most often they are not even ‘socially relevant’. The weak outcomes of the policies, meant to bring social development in Pakistan over the last few decades, have produced a ‘trust deficit’ among ordinary Pakistanis, which verges on to cynicism.⁵ In these circumstances, the social pillar of Sustainable Development in case of Pakistan becomes central, as it would be in case of any other developing country, struggling with wide spread poverty and galloping in-equality.

The failure of the socio-economic policies in fact has accentuated the ‘social vulnerabilities’ to a critical level which has resulted in a significant *voire* dangerous degradation of social fabric in Pakistan. The destitution is on the rise in Pakistan, necessitating the ‘social safety’ programs such as recently announced Benazir Income Support Programme. The social vulnerabilities are now increasingly manifesting themselves through higher levels of petty and serious crime. The presence of extremism in the society can also, to an extent, be understood as a manifestation of social chaos, unleashed by the continuing failure and underperformance of different social policies. The

5 The First Draft of the NSDS was presented to a select gathering of academia, civil society, development sector representatives and media during the 11th Sustainable Development Conference held in December 2008 for discussion. The dominant theme/feedback of an otherwise hotly debated debate was that it was ineluctable that the government makes its policies of socio-economic development more productive in order to make NSDS succeed.

expenditure that the government is supporting to mitigate the effects of these past failures keeps on rising in the shape of law and order expenditure and direct social support programs. The fiscal space at the disposal of government is already very limited in the wake of recent economic turmoil. The government is not able to allocate enough funds to Education and Health policies which have a direct bearing on the Sustainable Development policies.

In hindsight, one could say that the government would have been better placed if it had taken effective measures to reduce the unbridled exploitation of natural resources in Pakistan and checked those production and trade practices, which harm the environment and long term sustainability of the communities. The policy makers perhaps did not understand the potential negative impacts of production, trade, energy and livelihood practices and policies for the future generations and allocated less political will and funds for mitigation and adaptation. Or they could not forcefully explain and convince the powerful lobbies benefitting from the prevalent exploitation practices. As a result, the problems of economic vulnerability and insecurity have become so omnipresent in Pakistan, that the proposals to renew the Environment Policy and have a Climate Change Policy appear vacuous to the popular sentiment.

The opinion and decision makers in Pakistan appear oblivious to the fact that the direct and indirect negative impacts of the continuation of un-sustainable policies and practices is transferred disproportionately to the ones who are poor and vulnerable already. That is why, it is important that the proposed NSDS gives sufficient importance to the awareness and interest creation in crucial social groups. Unless the government and other strategic groups have a clearer understanding of Sustainable Development issues in Pakistan, they would not be able to judiciously allocate the scarce resources of policy development, funding and implementation equally for mitigation, adaptation and for undertaking a structural change in the socio-economic development policies. These measures are mandatory in order to ensure that the future generations lead their life in a better physical and social environment.

The social environment in Pakistan is becoming increasingly suffocating and is creating different kinds of stress and responses. Our physical environment is also suffocating. But as its effects are rather invisible and indirect and slow to appear, people continue to give insufficient attention to it. Quality of Environment is a public good, disregard to which could be very expensive and lethal for the well being, even existence of Pakistan. But as the impacts of environmental degradation are variable among different strata of the society and in different regions and areas, one does not see the emergence of a coherent social movement and mobilisation to affect a change in Pakistan. This is a classical case of a 'public good' which concerns the short and long of every aspect of life, touching each and every citizen. But this very characteristic makes it unwieldy as it does not often get a critical mass of popular sentiment. NSDS aims at establishing that the Quality of Environment is a *public good*; and for its protection and improvement, the State needs to own it. As the Quality of Environment is a public good of the order of national security, there is a need to re-affirm that it is the State which is its repository. Governments could and should own it too but often the governments might be restrained due to a variety of reasons. To protect and promote the Quality of Environment as a fundamental Right for the present as well as future generation of Pakistanis, all the organs of State need to play their part, including the judiciary, media, political parties, cultural institutions, national security systems etc.

When it is proven that the vested interest continues to be bigger than a certain 'public good', there is an urgent need to reinforce the State's responsibility. The state of Environment in Pakistan avers that our country is becoming a country of deficits. A State is as good as its institutions and state of its 'endowments'. We are depleting our natural resource base, destroying our human capital and habitat and society. The net effect is the weakness of the State to the extent that we feel our State was under severe stress. The people of Pakistan must play a collective role in addressing the root causes of 'impoverishment' of environmental resources and they should exert pressure on the governments to take action against the polluters and reckless exploiters of Pakistan's natural resources.

The crucial importance of the socio-economic development policies of the government and donors for sustainable development in Pakistan notwithstanding, the development and implementation of sound Environment and Climate Policy should not be relegated to the back burner. Environment and Climate Policy makes an integral part of the socio-economic development policies in Pakistan and needs to be undertaken along with the policies aimed at reducing poverty and inequality. In order to make the Environment and Climate Policy relevant to the 'Policy history' of the country, it is important to contextualise and situate the environment and Climate Policy among the general public policy context in Pakistan.

Pakistan's economic policies have always aimed at modernizing the economy. Modernization is one aspect of Globalization, which has both endogenous as well as exogenous components. The endogenous component of modernization of the economy is fuelled by technological changes; while exogenously, it is fuelled by government's policy decisions, such as trade and investment liberalization policies. The governments actually play an important part as far as the pace and direction of production is concerned. Though the Pakistani government at one time pursued 'import substitution' policies, yet, the country's economy has been the most free market economy in the region and integrated to the international market. Pakistan undertook Trade Liberalization in the wake of the structural Reforms from mid 80's onwards. In other words, Pakistan embraced Globalization, wholeheartedly, which aims at transforming the production processes and markets access gradually in such a way that it starts demonstrating a more "international" characteristics than national.

The government of Pakistan has promoted the globalization of Pakistani economy with the objective of increasing the growth so that more and more people could partake in the prosperity brought in the country. But though liberalization is a broader process than economic growth, it is only one of the contributors to growth, while population, natural resource endowments, technology and cultural traditions are other important drivers of growth (Jones 1998). Moreover, growth could also impact negatively resulting in resource depletion or harming the environment. For a long time, Pakistan has followed a strategy termed as 'pure growth-man-ship' with the hope of eventual 'trickle down'. The latter has not taken place as expected as evidenced by the presence of poverty and inequality. The government in its policies focussed too much on capital-driven growth, practically disregarding the fact that there were different types of 'capitals' that sustain the human wellbeing – including natural and human i.e., socio-cultural capital. As a result, this pattern of growth has impoverished the future generations of Pakistan and therefore the 'state of Pakistan'.

The state of affairs in Pakistan, as delineated above amply demonstrates that the development notions put in practice in Pakistan till date were lopsided. The international experience convincingly recommends that the development effort needs to give due importance to 'environmental; as well 'social' dimensions in order to be sustainable.

The global push for sustainable development is also impacting economies like Pakistan in the form of a 'concern' of our major import markets. Though sustainability risks have not been sanctioned as mandatory compliances for international trade, so that they do not become non-tariff barriers, there is a growing realization that trade is a major source these days of economic, environmental and social changes. A growing number of developing countries look to trade and investment as a central part of their strategies for development, and trade considerations are increasingly important in shaping economic. Therefore Trade could not remain entirely disconnected from the sustainability concerns in production and transportation, be it the carbon emitted during production or the sub-soil water pollution.

We feel there is an urgent need to revisit sustainable Development discourse in the Pakistani context. The current situation is that of an oscillation between 'environment centred SD' and 'SD as an equivalent to Social Justice'. Whereas the government stands close to 'environment centred' SD but the people attach greater importance to the social justice aspects of sustainability. The documents such as PRSP and Vision 2030 indicate confusing symptoms and causes and blame the poor more than the political economy of Production and Consumption in Pakistan for non sustainable development.

These documents do not attempt to fix responsibility of ‘accrued losses’ up till now. As a result, these documents end up in vague solutions to ‘deficits. In closed door parlance, we take the ‘environmental’ centred view and give the ‘ownership’ and responsibility to the Ministry of Environment. Whereas, in general discussions, we tend to take a maximalist view and we feel like bringing in all the sustainability issues from social justice to sub-soil water pollution. In our opinion, there is a need to be aware of the importance of macro policies, as enablers, and as necessary conditions of success; nonetheless, the Environmental and Climate Change Policies have to be the centre pieces of Sustainable Development policies of Pakistan. For effective implementation of the Environment and Climate policy, there is a need to spell out clearly the linkages between Environment & Climate Policy and the Economic and Social policies in the context of Pakistan.

Pakistan is becoming a country of deficits. A State is as good as its institutions and state of its ‘endowments’. Pakistanis are depleting their natural resource base, destroying human capital and habitat and society. The net effect is the weakness of the state to an extent that the state seems to be crumbling. There is certainly a need to address the root causes of ‘impoverishment’ of environmental resources. Government, business and civil society need to join hands to fill these gaps and address these issues through collective efforts.

Chapter 2

Mainstreaming Sustainable Development in Production and Trade

2.1 Need of a New Policy Mix

Pakistan continued to suffer the 4F crisis – food, fuel (energy), fiscal and frontier (security situation) – during the year 2008. We have recently witnessed serious macroeconomic instability, increasing the vulnerability of a large number of citizens and sapping investor confidence, both domestic and foreign with the fear that the growth rates would nose-dive in the coming months and years. The current crisis reflects both adverse short-term impacts caused due to an unprecedented increase in global oil and food prices and the deep-seated structural economic weaknesses that have resulted in bursts of stop-go cyclical growth in Pakistan marked by fragile budgets, loss of international competitiveness and fragmented social protection.

The results of Pakistan's development experience have been rather mixed. Pakistan is a developing country, stuck in a group of those countries which could graduate to the middle income countries as far as the Per capita is concerned. But, in its efforts to achieve this average Per capita, the number of poor has swollen to 60 millions, in-equality has increased and the social fabric of the society and environment have eroded to the extent that Pakistan appears to be heading for an uncertain and for many a bleak future. The theory and practice of development in Pakistan calls for a serious review to assess what worked and what did not to avoid further harm in future. The National Sustainable Development Strategy aims at underscoring these imbalances and make short, medium and long term suggestions to make Pakistan's development experience more sustainable for present and future generations.

In the traditional policy mix, with fiscal and monetary policies would be in the driving seats, accompanied with Trade and Investment Policy. The Washington Consensus that continues to inform Pakistan's economic policy making mainly focuses on economic growth and does not emphasize on rational distribution of benefits of economic growth among the masses. This social injustice does not only lead to a weak social fabric also brings natural resources under tremendous exploitative pressure. Hence social policies should be deployed by the government to reduce critical vulnerabilities. The Environment Policy, of Pakistan was formed as a more as a result of international developments, also can be categorised as a policy deployed to mitigate the traditional development practices in Pakistan which have left a trail of rather irresponsible exploitation of natural resource without much respect to Pakistan's eco-system or aspirations of future generations. The Policy focus of National Sustainable Development Strategy is that:

- The notion of Sustainable Development is a qualitative improvement on the traditional development strategies practised in Pakistan.
- There is an urgent need to establish a new balance between State and the Market Economy in such a way that the National Sustainable Development Strategy has the Environment and Climate Change Policy at the centre of State's public good agenda, supported by suitable social and economic policies
- The traditional Environmental agenda is subsumed largely in Climate Change dominated Green Agenda, which has changed the policy landscape in Pakistan once for all

2.2 Promoting Sustainable Production in Pakistan

2.2.1 *Beginning of the Beginning*

The Pakistan economy and market is urgently required to give a big push to the mainstreaming of the principles of sustainable development in Production, Trade and Consumption products. Though comprehensive and extensive Sustainability Analyses/reports regarding principle production sectors in Pakistan do not exist, except in a few sectors such as leather industry etc., our cursory analysis suggests that our principle production sectors are beset with all the five Strategic Deficits, which are as follows:

- Awareness Deficit
- Policy Deficit
- Organizational Management Deficit
- Implementation Deficit:
[Implementation Capacity Deficit, Participation Deficit, Monitoring Effectiveness Deficit, Coordination Deficit, Technology Deficit, Transparency Deficit, Capacity deficit to confront vested interest]
- Financing Deficit

Internationally, the following sets of principles are used while formulating and practicing environmental measures or policy at the national level:

- Species and habitat conservation measures (Biodiversity)
- Restriction on certain goods and practices
- Environmental taxes and charges
- Negotiate voluntary agreements
- Deposit and refund, or take back schemes

In case of Pakistan, until recently, only the first two measures have been put into practice in some sectors.⁶ However, Pakistan has made National Environment Quality Standards, which could potentially be of a great relevance to environment-trade interface in case of traded goods.⁷ Gradually, Pakistan has started having many environmental standards along the life cycles of different products, from extracting through raw material, processing, manufacturing, packaging, transport, trade, sale, use and disposal.

The principle Standards in vogue in Pakistan are as follows:

Environment Quality Standards: These Standards, seeking to describe the state of environment, stipulate the concentration of certain substances either in the form of solid, liquid or gases in the soil, water and air, and also establish the critical loads, a level of deposition of pollutants, below which some elements of the environment are not damaged. EQS in Pakistan can further be classified as follows:

Emission Standards: describe the amount of pollutants of certain substances that can be emitted by a facility. These are dynamic standards, requiring the use of latest or best technology. The emission standards can have a significant impact on the production process, as it could be cheaper to avoid producing pollutants rather than capturing them at the end of production process, creating solid waste or waste stream that must in turn be managed.

Product Standards: specify certain characteristics that are deemed necessary to avoid environmental harm from the use or disposal of products. For example, the use of lead in household paints in Pakistan has been banned because some of that toxic heavy metal is likely to reach the environment

6 For details, see Pakistan Environment Protection Act

7 For details, see NEQS

and pose a hazard. Similarly, chlorofluorocarbons have been banned from use in aerosols because they destroy the stratospheric ozone layer. Product standards are frequently used to protect human health.

Standards based on Processes and Production Methods (PPMs): specify how products are to be produced and what kinds of impact they may have on the environment. Standards based on process and production methods can take on significance in international trade, which they might be completely lacking at the domestic level. Applied to traded goods, the PPMs have been accused by many developing countries of amounting to regulating the activities in the country of production.

Performance Standards: require certain actions, such as environmental assessment, which are expected to improve environmental management. Like PPM-based Standards they focus on process, but not on the process of actual production. Environmental Management Standards, for example, dictate a structure of firm management that is conducive to adequately addressing environmental concerns, spelling out reporting standards, mandating an objective of continuous improvement and so on.

It is possible to combine all of these measurements and standards when analyzing the full impact of a single product—to consider all the environmental impacts of a product’s production, use and disposal, and to combine them in a single Life Cycle Analysis (LCA). In Pakistan, most of these Standards are not mandatory. Even the voluntary adoption of these Standards is rather rare as most of the sectors are not even aware of the presence or the importance of these Standards. Though there are some success stories of effective imposition of bans such as the ban on Lead in paints but more often than not, the mandatory Standards are seldom imposed strictly, especially for the products produced for the local market.

LCAs are a very useful tool to identify opportunities to reduce environmental impacts, or to compare the environmental impacts of otherwise “like” products as LCAs by definition look at a large number of categories of environmental impacts—for example, water and energy use, and release of various pollutants to calculate an overall measure of environmental impact.

2.2.2 Introduction of SMART

The Government of Pakistan recently launched a programme called “SMART” (Self Monitoring and Reporting Tool) to monitor release of effluents and emissions from the Industries initially with 50 industrial Units later expanding to 200 and 400 Industrial Units all across the country under phase-I program.

Based on the experiences learnt in phase-I, Govt. of Pakistan is planning to launch SMART-I program to cover the entire industrial sector.

2.3 Trades and Environment

Pakistan has pursued Trade Liberalization as a principle policy choice. Trade liberalization, we now know, has opportunities and risks. International trade and investment promote economic growth and competition. In doing so, they might contribute directly to poverty reduction and enhance long term development opportunities in developing countries. They also stimulate technology development and diffusion, and promote the structural changes necessary to make more efficient use of natural resources and environmental resources. This benefits the consumer through lower prices, greater product diversity, and increase in purchasing power of their wages. The increasing economic activity of trade and investment liberalization, however, will place additional pressure on environment, either in the form of pollution or depletion of environmental resources. In the countries, where environmental policies are very weak and poorly enforced, these pressures could lead to a reduced

environmental quality for a long time to come, negatively affecting the socio-economic welfare of the country.

The international evidence suggests that if trade and investment are combined with strong regulatory frameworks to protect the environment, they lead to both beneficial effects on environmental as well as socioeconomic conditions of the country. But somehow, this lesson has not sunk deep within us. We still are in the ‘compliance mode’ as far as the adaptation is concerned.

Foreign direct Investment is usually divided in three parts:

1. Resource seeking
2. Market seeking
3. Export oriented

In all the three, more so, in case of the export oriented investment, the investment flows would go less to the countries with weak environmental standards, due to buyer’s and/or international requirements. Environmental costs will also affect quality of infrastructure, access to inputs, wages cost, labour productivity, size and growth of potential markets when considering investors account.

Pakistan can actually avail maximum benefits from the positive linkages between trade and goals of sustainable growth, environmental protection and social development, if our national policy response

2.3.1 Multilateral Environmental Agreements

After the enforcement of WTO trade regime, the developed country importers/buyers are free to invoke and enforce strict compliance of MEA’s to the exporting countries desiring to enter into their markets.

Pakistan has signed a number of “Multilateral Environmental Agreements” [MEAs] as shown below.

S. No	Particulars of MEAs	Date of Signing	Date of Ratification
1	RAMSAR Convention on Wetlands	1971	January, 1987
2	Convention on Migratory Species (CMS)	1971	December, 1987
3	Convention on International Trade in Endangered Species (CITES)	1973	April, 1976
4	Convention on the Law of Seas	December 1982	February 1997
5	Basel Convention on the Control of Transboundary Movements of Hazardous Waste	May 1992	October, 1994
6	Montreal Protocol on Substances that Deplete the Ozone Layer	January 1989	December 1992
7	Vienna Convention on Substances that Deplete the Ozone Layer. London Amendments on Substances that Deplete the Ozone Layer. Copenhagen Amendments on Substances that Deplete the Ozone Layer	August 1992 June 1994	December, 1992 December, 1994
8	United Nations Framework Convention on Climate Change (UNFCCC)	June, 1992	February 1992
9	Kyoto Protocol to UNFCCC	December, 1997	January, 2005
10	Convention on Biological Diversity (CBD)	June, 1992	June, 1994
11	United Nations Convention to Combat Desertification (UNCCD)	October, 1994	February, 1997
12	Stockholm Convention on Persistent Organic Pollution (POPs)	December, 2001	Not yet ratified
13	Rotterdam Convention on Prior Informed Consent (PIC)	1999	Date to be confirmed
14	Cartagena Protocol on Bio-safety to the CBD	June 2001	Not yet ratified

The government did take a few positive steps to turn the industry more environment friendly. The duty on the importation of environmental abatement equipments and machineries has been reduced to

help compliance of National Environmental Quality Standards and ISO 14000. The Government also provides 50% contribution in the processing fee, to the industries applying for ISO 14000 certification.

The lifting of trade barriers for providing level playing field to the WTO member parties serves as a strong driver and pushes the industries towards compliance of the provisions of the Multilateral Environmental Agreements such as in the import and export of hazardous waste under Basel Convention, endangered species under CITES, GMO's under Cartagena Protocol and Import of CFC gases as well as phasing out of ODS under Montreal Protocol. Pakistan is usually rated as a country which has implemented WTO Agreements and rules in letter and spirit. This fact was noted by the Secretariat report on Pakistan's third Trade Policy Review, held in January 2008 in Geneva.

MEA's by their very nature and purpose are focused to an to an specific environmental issue such as; Global warming and sea level rise under climate change convention on UNFCCC focuses on stabilization of Greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous atmospheric (manmade) interference with the climate system.

All these conventions and protocols either contain obligatory or voluntary provisions for compliance by the member country parties. Such provisions call for development of policy framework for respective MEA's dealing with specific Environmental issues at the international, national and local levels. Pakistan has a mixed record as far promoting these MEAs are concerned. It did move effectively in banning the restricted products and has failed largely when it comes to voluntary approaches. In the recent past, several projects and initiatives have been launched in response to enforcement of MEA's which include launching of GEF funded projects in Pakistan in the areas of UNFCCC, UNCBD and UNCCD, the total funding exceeds 40 million US \$, where as some CDM are also in the pipeline.

2.3.2 Linkage between Trade and Environment

The international community, for the moment, prefers the voluntary approach as far as the compliance of those issues created as a result of the interface of Trade and environment. It needs to be realized that the voluntary approaches actually put huge responsibilities on the industry, government and the society at large. In many cases, the voluntary approaches have not worked very well. In Pakistan also, though the Leather industry has show significant improvement in controlling environmental pollution, but the improvement in this sector are only partially attributable to voluntary approaches. As Pakistan continues to resist any linkage between trade and environment at WTO, there is a need to design and implement voluntary approaches much more seriously and effectively. Pakistan also needs to give a much better chance to the market forces in service of the 'public good'.

2.3.3 New Imperatives linking Environment with Trade

Under the emerging trading mechanisms, the global market is being divided into blocks of trading partners such as NAFTA (North Atlantic Free Trade Agreement) between North America and Mexico, SAFTA among South Asian Countries, EU, and ASEAN etc. Most of these Agreements as well as Bilateral Investment Treaties have clauses on environmental compliances. This is becoming another mechanism of enforcement of environmental standards, as the undertakings given by a signing country to one trading partner have to be given to any other WTO member country. Though the developing countries such as Pakistan try to avoid having environmental clauses, it might not be possible in case of an FTA with European Union or USA. Pakistan needs to prepare for such an eventuality otherwise, it can start losing market access due to environmental/climate change non-compliances.

2.4 Manufacturing and Sustainable Development:

Manufacturing can promote sustainable development by creating opportunities for economic growth and for social development e.g., boosting employment for peoples in multiple sectors, or the environment, through more efficient use of environmental resources. But Manufacturing can also have a range of negative environmental, health, and social impacts. Environmental impacts include those measured by air, water, or land pollution associated with the enterprises producing traded products. There could also be natural resource effects associated with changes in the demand for the use of natural resources, leading to either higher or lower resource depletion or environmental degradation, depending on the scale and resource-efficiency of enterprises. Manufacturing, however, is not the root cause of environmental problems as such.

2.4.1 Local Manufacturing versus Imports/Outsourcing

The environmental problems are actually created due to market and intervention failures. Market failure occurs when markets do not properly value and allocate environmental assets, leading to such prices of goods and services, which do not reflect full environmental costs. The divergence of the apparent costs of an activity from its total cost is reflected in the loss of clean air and water and degradation of environmental resources, e.g. the depletion of ozone layer and degradation of sub-soil water. Intervention failure occurs when government interventions fail to correct, create and/or further exacerbate market failures, e.g. subsidies and trade barriers leading to over exploitation of natural resources and lack of enforcement. For example, production and export subsidies and other trade barriers can potentially worsen environmental conditions by distorting resource values, input cost and market prices. The proponents of Trade Liberalization argue that the pressure on the local natural resources could be reduced by allowing more imports. But in the short term, this ‘trade off’ done for the long term environmental welfare of all, could have serious negative impacts as the sectors competing with ‘cheaper’ imports, could witness a worse resource exploitation. In order to compete with imported shoes, the tanners could pay their labour less and might not install effluent treatment plant. The removal of trade barriers therefore can have positive and negative environmental effects. The positive effects of trade liberalization on the environment are improvements of the allocation of resources, the promotion of economic growth and of general welfare with implementation of effective environmental policies. The negative impacts of trade liberalization on the environment generally relate to the expansion of trade in context of market and other intervention failures.

But the final impact of trade liberalization would depend on the particular situation obtaining in a country. The North has successfully re-located the dirty manufacturing in South, where environmental damage might be borne due to the trade off with local employment generation. But eventually, the local environment may suffer irreparable damage. Having exported ‘dirty manufacturing’ to the South, North now is suggesting stricter measures on the trading of dirty goods. In the wake of recent Financial Crisis and ensuing Recession in most of the Northern economies, there is a renewed focus on Localism and Greenism, which might witness the revival of green manufacturing in North on the strength of huge Green Stimuli. In the medium term, the best option for a country like Pakistan is to plan for greening for mainstreaming its national sustainable development agenda.

2.4.2 Setting an indigenous Agenda for Green Production: Clarifying the major dimensions in Pakistani context

In Pakistan, the awareness of the environmental effects of manufacturing is rather limited. Manufacturing has many different kinds of environmental effects such as *Scale Effects*; associated with overall level of economic activity, *Structural Effects*; associated with changes in pattern of economic activity, *Product Effects*; associated with trade in specific product, *Technology Effects*; the way products are made, depending on technology used and *Regulatory Effects*; are the legal and policy effects of the design and implementation of environmental regulations and other measures like voluntary approaches. Pakistan needs to undertake Product Cycle Analyses to study these effects and

gradually develop an integrated assessment of Pakistan's industry. We have tried to provide an initial assessment of Pakistan's industry on the above six indicators so that our SD starts responding to the challenge of SD in Pakistan's industry more effectively.

Scale Effect: The industry in any country, especially operating in a competitive national and international market, continuously tries to expand the level of economic activities, efficiency, producing more goods within the given set of natural resources, machinery and technology. This economic expansion and efficiency creates wealth which may have positive or negative effects on the environment and for sustainable development. The environment may benefit from this wealth in two ways. First, increased efficiency can directly benefit the environment, through the efficient use of resources--efficient firms' need fewer natural resources input and thus produce less polluting waste. Second, increased efficiency benefits the environment indirectly by making people wealthier, creating a demand for strong environmental protection.

The increased economic activity, however, can also have negative environmental effects. More economic activity means more environmental damages, like increased extraction of raw materials and/or harvesting non-renewable resources would create more pollution and waste.

In case of Pakistan the *bilan* is rather mixed. We never had any quantifiable red lines in terms of natural resource utilization, be it land quality, forest coverage, mineral resource extraction, fish catch, pumping of ground water etc. As in Pakistan, we have believed in the *laisse faire* and trickle down, an incessant exploitation of all resources has become an in-alienable democratic right, exercised by those sections of the society who possess more factors of production in the prevailing political economy of Pakistan. As a result, we have started having scarcities and shortages, be it water, natural gas, forest resources. But as the whole process is not 'managed' in the favour of public good, the negative effects of these scarcities are distributed un-evenly to the dis-possessed.

Structural Effect: The manufacturing in Pakistan is mainly resource based. Over a period of time, the country has developed a comparative advantage in Textiles, leather, food grains, fisheries, minerals, cement, chemicals, fertilizers etc. Most of these industries have either a direct polluting effect or a resource depleting effect. In the developed countries the industries which have higher pollution intensity, or may require a greater use of the country's natural resources have either closed down or have been re-located to the developing countries. It is therefore utmost necessary to find ways and means to overcome the structural constraints of production in Pakistan and develop comparative advantage in those sectors of the economy, which are less polluting and resource intensive.

Regulatory Effects: An internationally integrated economy and its industry operate within the international trade regimes, which stipulate such regulatory reforms which may have an impact on environmental regulations and standards. Pakistan has signed many MEAs, which explicitly include measures to improve environmental standards. Pakistan is strengthening the regulatory framework of environmental standards but the effectiveness of the same in case of local market in particular leaves a lot to be desired.

Product Effects: Many products have an impact on the environment or development. Some of the products traded may be environmentally friendly, while others may be hazardous to the environment. Overall product effects therefore can be positive or negative, depending on the nature of the products traded as well as their volume. The Product Effects have recently gained prominence as a result of discussions on Carbon Trading, which has brought the Production under a big international focus. In Pakistan, there are many product groups, whose manufacturing results in direct emissions of GHG and/or they use a lot of fossil fuel for their production. The Clean Development Mechanism has not yet taken off in Pakistan; therefore, the possible negative Product effects have not gained much prominence in SD Strategies focusing on Manufacturing.

Technology Effects: Technology plays an important part in the production of a product. A technology may be harmful or friendly to the environment. There is a positive technological effect when a trade

policy allows the flow of environmentally friendly technologies, and a negative effect when it prompts the transfer of harmful technologies. In Pakistan, many of the industries are using environmentally inefficient energy solutions or are using those outdated technologies which harm the environment and climate directly.

With the expanding world trading system, the national economies are increasingly integrated in a global economic structure where all the necessary elements such as inputs, innovation, management, saving for investments form an integrated whole, around the globe, through Information and Communication Technology to produce final goods and services.

As a result of large scale manufacturing and ever-increasing international trade due to global supply chains, the world faces immense environmental changes. In the last 50 years humans distorted the world's ecosystem more rapidly than at any period in human history and 60 percent of the world natural resources have been degraded unsustainably. The emission of carbon dioxide, which has increased four times, has led to catastrophic climate changes impacting various aspects of life, with disproportionately bigger effects on poor and marginalised. The latest Report by UNFCCC has created a strong case for revisiting the existing interface between Environmental protection policies and production practices and strengthens positive linkages, if the production practices continue to be unsustainable.

2.4.3 Environmental Protection Policy for Industries in Pakistan

2.4.3.1 Classification of Industrial Units and Environmental Management Regime.

The industrial units in Pakistan are classified according to the international norms as follows:

	Category	Reporting Period	Priority Parameters
For Liquid Effluent	A (Most Hazardous)	Monthly Basis	Effluent flow, Temperature, PH ,TSS, (Schedule III, Table A)
	B (Moderately Hazardous)	Quarterly Basis	(Schedule IV, Table A)
	C (Least Hazardous)	Biannual Basis	(Schedule V)

Categorization of Industry (Liquid Effluents)

Category A: Monthly

- 21 Sectors/Sub-sectors: Metal finishing and electroplating, Fertilizers, Pulp & Paper, Pesticide formulation, Leather tanning, etc.

Category B: Quarterly

- 13 Sectors: Glass manufacturing, Sugar, Detergent, Oil & Gas explorations, etc.

Category C: Biannually

- Pharmaceutical (formulation), Marble crushing, Cement

Categorization of Industry (Gaseous Emissions)

Category A: Monthly

- 11 Sectors: Cement, Iron & Steel, Nitrogenous Fertilizers, Petroleum Refining, Pulp & Paper, Thermal Power Plants etc.

Category B: Quarterly

- 7 Sectors: Sugar, Textile, Metal Finishing & Electroplating etc.

In the international ranking, Pakistan is not considered a great polluter, neither in terms of GHG nor in terms of environmental harm, if compared with our neighbours. However, the potential losses in the Pakistani are non-negligible. According to a recent World Bank study, Pakistan incurs around Rs. 250 billion annually in terms of environmental losses, which is bigger than the total PSDP for the year 2008-9.

2.4.3.2 Pakistan Environmental Protection Act, 1997:

The government has introduced two major laws to reduce the environmental damage caused by the industry. Pakistan Environmental Protection Act, 1997 is an Act to provide for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development:

Non compliance of this Act may results in

- Financial penalties
- Clean-up Costs
- Compensation Costs
- Loss of License
- Restriction of activities

Major Functions of Pakistan Environmental Protection Agency

- To Administer and Implement the Pakistan Environmental Protection Act, 1997;
- To take all the necessary measures for Implementation of National Environmental Policies approved by the Pakistan Environmental Protection Council;
- To prepare, revise and establish the National Environmental Quality Standards with the Approval of Pakistan Environmental Protection Council

Major Programs/Projects under EPAs

- Self-monitoring and Reporting Program (SMART)
- Vehicular Emission Testing Services (VETS)
- Activity Based Capacity Development Program for All EPAs (ABCD)
- Management of Hazardous Substances And Wastes
- Introduction of Cleaner Production Techniques

2.4.3.3 Pollution Control Act

The Section 11 is the basic provisions relating to pollution control of Pakistan's Pollution Control Act, which prohibits discharge or emission of any effluent or waste or air pollutant or noise in excess of the NEQS, or the established ambient standards for air, water or land. However, there is a consensus among the observers of the environmental standards in the industry that the Pollution Control Act has largely failed to stem the environmental degradation, as evidenced by the industrial pollution levels in different Pakistani industries.

Industrial Pollution Levels

	BOD (µg/m3)	COD (µg/m3)	TSS (µg/m3)	TDS (µg/m3)
Chemical	1400-9800	2300-18640	950	38000
Tanneries	800-1680	1020-2367	298	9104
Textile	800-8500	1610-16500	1900	9680
Sugar	100-1100	200-1896	2850	17300
Fertilizer	400-610	860-1650	9720	-
Oil And Ghee	460-1470	1260-3280	576	15462
NEQs	80	150	150	3500

Source: Study by SINDH EPA

2.4.4 Recommendations

2.4.4.1 Blending Voluntary and Mandatory Approaches

Pakistan has been pursuing a predominantly voluntary compliance approach to promote the acceptance of environmental standards in the industry. Though, there is a need to introduce mandatory requirements and market based interventions, the willing participation by the industry in making these measures a success, remains central. The Industry needs to realize that eventually it makes a good business sense to green their production, even in case of sale in the local market. An empirical study carried out in 2008 with the help of Asian Development Bank confirmed the common perception about the industry that it is ambivalent on the impact and linkages of Production and Environmental Standards on Pakistan's foreign trade.⁸ The 'official' insistence by Pakistan on de-linking environment from trade and the disconnect between the official positions and practices has actually resulted in a lack of preparedness for 'Greening' even as a buyer's compliance or as a condition in our much desired FTA with EU. Pakistan needs to define its indigenous policy and prepare the country to new climate friendly practices in production and trading, in such a way that Adaptation becomes an engine of growth.

The ultimate objective of an effective introduction of environmental Standards is to persuade and sometime force producers, traders and consumers to respond to the environmental impact of the economic decisions they take. Pakistan needs a huge awareness leap, especially by the producers for local market, importers and consumers, who must understand and internalize the external environmental costs in their decision-making. The exporters are relatively better aware of these aspects.

The relative failure of the voluntary approach in Pakistan has created a serious 'policy deficit'. The time has come now to seriously consider using market-based instruments such as taxes, charges, tradable permits or subsidies to achieve the sustainability targets in each of the principle production sectors in Pakistan.

The advantage of such instruments is that they are generally more economically efficient. It is important to recognize, that all of these measures, both regulatory and market based, can result in positive structural economic change as environmentally desirable activities are favoured and environmentally undesirable ones disadvantaged. Gradually, on the basis of the polluter pays, we can add another source of financing for sustainable development in Pakistan, in addition to the Government, Philanthropy and Donors.

2.4.4.2 Polluter Pays to Pakistani Consumers

Pakistan does favour 'polluter pays' principle at the international level in case of climate change, but a disregard to this principle in the domestic market has resulted in an unenviable and untenable situation in which the environmental damage continues unabated but the resources at the disposal of government for the mitigation and adaptation are virtually un-matched to the challenge. Where the government needs to mobilize national and international financing for reversing the environmental degradation, the government priority No. 1 should be the prevention of further production of 'dirty' products either out-rightly, in a graduated manner and making the producer pay the full cost of the environmental damage.

The government of Pakistan has recently rationalised the tax regime and has introduced uniform rates of general sales tax on almost all the products produced locally and imported. There is however the policy of exempting those products from GST either entirely or partially, which are of great relevance to public good, public health and poverty such as edible oil, medicine etc. The policy of differential GST needs to be extended to include the possibility of higher GST on 'dirty' products. According to the Pakistani law, GST basically belongs to the provincial governments. As a sizeable production

8 Study carried out in the context of a campaign to promote positive linkages between the International quality standards and Trade Competitiveness of Pakistan, courtesy PRMP of Punjab Government.

activity in Pakistan takes place in clusters, it should be possible to let more of the GST proceeds to the area/cluster, which is producing the relevant products. Some of the available funds could also be used to help the industry adapt with the help of green technologies.

2.4.4.3 Industry-wide Sustainable Development Strategy

- Emphasize Sustainable Development concerns as a Public Good, not merely a Corporate Social Responsibility
- Strengthening Environmental laws in such a way that the emphasis to shift from a hesitant Compliance of international obligations to the protection of local consumers.
- Revaluation of Pakistan Standards and re-mediation with international demands, if Pakistan has introduced unreasonably stringent Standards.⁹
- Strengthening of Consumer Protection laws, bringing all ‘public goods’ related complaints about environment, safety, health hazards under the rubric of ‘injury by direct or passive consumption.’
- Adoption of a roadmap for voluntary implementation of high priority Sectoral Approaches
- Adoption of a roadmap for an energy efficient and environment friendly production, especially for priority sectors
- Adoption of a roadmap to ‘resource efficient’ production, especially for the priority sectors, setting quantifiable utilization targets after scientifically mapping all the strategic natural resources of Pakistan
- Addressing the technological capability issues
- Addressing the research capability issues, specially the capacity of ‘deployment’ of the technologies.
- Procure more Financing for Technology
- Mobilise Consumers for protecting environment
- Undertake initiatives to enhance the capacity to effectively utilize the funds.¹⁰

2.4.4.4 Choosing High Priority Sectors for Action

Pakistan has a fairly large production base. Therefore, it would be important to choose the priority sectors. Some of the candidates for the prioritization could be:

- Pesticides
- Chemicals, especially in Textiles and Food
- Packaging industry
- Cooling appliances
- Iron and steel products

For each of these sectors, **Strategic Action Plans** is proposed with the following principle elements:

1. Establishment of an Sustainable Development Management Company for each sector on the principles of Public Private Partnership
2. Awareness campaign
3. Creation of a sector specific Adaptation Fund
4. Set targets for the industry in five to 20 years context
5. Gradual introduction of green GST
6. Strengthening the green audit capacity
7. Fund technology transfer in pilot/model units in sufficient number
8. Reward the champions
9. Undertake Technical and Management capacity building programs
10. Strengthen sector-wise Green Accountability, with an active involvement of elected representatives, consumer rights groups, judicial system and civil society

⁹ Effluent Standards could not be same for Hungary and Pakistan

¹⁰ Pakistan's record of getting and utilization of CDM Projects under Kyoto Protocol has been dismal

2.4.4.5 Leveraging Regional and International Cooperation

The government should play a proactive role to ensure protection of regional and global environment and cooperate with the international community in promotion of sustainable Development, with the help of the steps/initiatives such as:

- a. Effectively participate in regional and international fora to foster cooperation for protection of environment and natural resources.
- b. Ensure effective implementation of all bilateral, regional and international multilateral environmental agreements, protocols and conventions to which Pakistan is a party, in line with national trade and industrial policies.
- c. Develop and implement national strategies and action plans for each of the major Multilateral Environmental Agreements.

2.5 Production and Trade Under the Evolving International Climate Change Policy

2.5.1 Understanding the Context

Climate Change is in the process of emerging as a new idiom of ‘development’ in the world. Each passing day seems to bring increased urgency to the task at hand. For a number of years, it was assumed that 550 parts per million (ppm) of CO₂ in the atmosphere represented an acceptable target for the stabilization of emissions. But that would likely represent a global average temperature increase of about 3°C, which the IPCC indicates would be very dangerous in terms of species loss, sea level rise and the increased possibility of the occurrence of non-linear events. The EU has therefore concluded that any concentration that results in an average temperature rise of more than 2°C is dangerous. That translates to a concentration in the atmosphere of 450 ppm.

Although it is obvious that climate change is a global challenge, it is not obvious at first blush why trade policy-makers should concern themselves with that challenge, the aims of trade being, after all, economic growth rather than stemming the Climate Change? The answer is that trade policy is not only about economic growth. The Ministerial Declaration that launched the Doha Agenda “strongly reaffirmed” WTO Members’ commitment to the objective of sustainable development. And it argued that the goals of the multilateral trading system, and actions for the protection of the environment and the promotion of sustainable development, “can and must be mutually supportive.”

Also, many of the solutions under discussion to resolve the problem of climate change are expected to impact heavily on trade and investment flows and can result in fundamental economic restructuring of the world’s systems of energy production, transportation, manufacturing, resource extraction and harvesting etc. Once the primacy of climate change objectives is established, it would be but logical to invoke or amend trade measures, whether we like it or not. The trade policy community is in fact already actively discussing how to initiate such measures which are positive for both climate change and trade objectives.

The trade and climate change agenda is, much like the broader trade and environment agenda, a rough assortment of issues with different dynamics and different types of solutions. Therefore, where there are a number of potential synergies between the trade and climate change regimes, there are a number of potential conflicts as well. And there are some entirely new concepts that we simply need to explore more deeply, to understand better how they might result in synergies or conflicts and for whom?

2.5.2 Principle Issues

The United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in Bali on 8–9 December 2007 underscored the need to marry environmental, economic and development dimensions. They set out to achieve two things. The first was to secure the agreement of

the participants that there is merit in convening Trade Ministers to discuss issues at the interface between trade, climate change and energy policy. In the event that this were achieved, they hoped the meeting would identify a number of specific ways in which the trade and climate change communities might support one another's aims and that might serve as useful inputs to the Bali Action Plan negotiations over the coming two years. Despite the real differences that exist between the North and South on some issues—particularly relating to how to broaden the list of environmental goods that might enjoy preferential status—there was a consensus on the need to pursue “mutually supportive linkages between climate change, international trade and development.” In this context, Ministers called for additional analysis and for the exchange of information between climate change and trade officials.

After Bali 2008, a seemingly full plate of has appeared on which the trade community can contribute to its own objectives and also to those of the climate change community. The road ahead does not seem to be smooth. First of all there is a need for greater clarity on benefits and pitfalls. Equally important would be the mechanism through which the ‘clear potential for good’ would be realised through the complex ground reality of trade & climate change negotiations, which includes an ailing round of multilateral trade talks, an advanced and but very complex process of climate negotiations, diverse national interests, and a convoluted institutional mix of jurisdictions and responsibilities. Already it is clear that the world community has to tread very clearly, with a better understanding of the implications of the various policy options on the issues such as border carbon adjustment being suggested by the North. Many developing countries are also weighing new initiatives. Many developing countries, like Pakistan, could have significant comparative advantage at producing organic foods for export, but it's not likely that their proposals to have these listed as environmental goods will finally be accepted. However, the discussions are converging mainly on the key issues involved in the six large thematic areas such as the Trade Liberalization of Environmental Goods, Border carbon adjustment, Embodied carbon in traded goods, Intellectual property right, clean energy investment and Standards and labelling. The discussions and negotiations on these thematic areas are at different stages. At the moment, in case of Pakistan, the issue of Trade Liberalization of Environmental Goods is the most relevant as well as the anticipated impact of climate change negotiations and developments on Pakistan's Export Competitiveness. National Sustainable Development Strategy of Pakistan would be incomplete without integrating these aspects of Climate Change conundrum as these are expected to deeply impact on the prospects of sustainable development in Pakistan.

2.5.3 Liberalization of Environmental Goods

International Trade can be an important channel for the diffusion of such goods, which can mitigate climate change. Lowering trade barriers for such products would bring their prices closer to world market, making them more affordable to consumers (industry and households) thereby reducing overall climate mitigation costs. Lowering tariffs on climate mitigation goods can also contribute to UNFCCC technology transfer mandates by facilitating access to these goods. A 2007 World Bank study, *International Trade and Climate Change*, points to the potential for liberalization in the area of low-carbon goods to lead to real increases in trade flows. According to Bank estimates, the removal of tariffs for four basic clean energy technologies (wind, solar, clean coal and efficient lighting) in 18 developing countries with high greenhouse gas emissions would result in trade gains of up to seven per cent. The removal of both tariffs and non-tariff barriers could boost trade by as much as 13 per cent. The net effect would, however, vary across technologies and across countries, depending on existing barriers and the import elasticity's of demand.

Trade is an important channel for the diffusion of many climate mitigation technologies and goods. Few countries have the domestic capacities or know-how to produce all that they need. This is particularly true for developing countries, and although building domestic capacities may be their long-term goal, trade liberalization can provide rapid access to key technologies. Trade liberalization—whether locked in through negotiations at the WTO or elsewhere, or undertaken

autonomously—can also lower the costs of environmental goods by allowing consumers (industries or households) to purchase them at world market prices.

It is believed that, with appropriate supportive measures, trade liberalization of climate technologies can also contribute towards fulfilling the technology transfer mandates of UNFCCC. Similarly, trade liberalization can complement negotiations within the WTO Working Group on Trade and Transfer of Technology, which is mandated to “examine the relationship between trade and transfer of technology, and of any possible recommendations on steps that might be taken within the mandate of the WTO to increase flows of technology to developing countries.”

But is it that simple? Trade barriers can be lowered autonomously. More importantly, countries can engage in multilateral, regional or bilateral trade negotiations to lower barriers with binding commitments. Trade liberalization is only one of a range of factors—some others being gross domestic product (GDP), foreign direct investment (FDI), environmental regulatory frameworks and technical assistance—that affect actual trade and diffusion of climate mitigation goods. Fiscal incentives, investment frameworks and intellectual property-related costs also determine access to, and affordability of, climate mitigation technologies. At the same time, many developing countries actually legitimate objectives such as safeguarding sensitive industries and building domestic capacity, which may discourage them from pursuing all-out liberalization in climate mitigation goods. The negotiations on the liberalization of environmental goods and services (including climate mitigation goods) within the WTO Doha Round face some specific challenges also. Definitional issues related to environmental goods remain unresolved. Complexities also exist with regard to their classification for customs purposes, making selective liberalization of climate-friendly goods challenging. The modalities of liberalization also remain contentious.

2.5.3.1 Environmental Goods [EGS] Negotiations in Doha

Paragraph 31(iii) of the Doha mandate, agreed by all WTO Members in 2001, calls for a reduction or, as appropriate, elimination of tariffs and non-tariff barriers on environmental goods and services. This mandate offers a good opportunity to put climate-friendly goods and services on a fast track to liberalization, although, as the negotiations to date have shown, this is not a simple proposition.

These trade negotiations in the WTO are expected to result in binding, predictable market access, as well as greater market expansion due to the scale of participation. In regional trade agreements usually the aim is liberalization of all goods and services; these more ambitious EGs may also be included in future WTO negotiations to get benefit of liberalization.

For the moment, the focus of negotiations at WTO is primarily on goods, but surely, climate-related services are also important from a mitigation perspective.

2.5.3.2 Issue of Product Coverage

The absence of a universally accepted definition of environmental goods (EGs) has slowed down negotiations on product coverage. Two broad categories of EGs have featured in the WTO discussions so far:

Traditional Environmental Goods, with the main purpose of addressing or remedying an environmental problem (e.g., carbon capture and storage technologies); and

Environmentally Preferable Products (EPPS); which include any product with certain environmental benefits arising either during the production, use or disposal stage relative to a substitute or “like” product,

Introducing an additional layer of complexity, products can be environmentally preferable, either due to improvements in embedded technology (e.g., more energy efficient variants of the same good, such as a car) or as compared to a different product (such as solar cookers versus wood-burning stoves).

In terms of classification, categories and sub-categories of goods are assigned a code within the Harmonized Commodity Description and Coding System (HS), allowing countries to track trade volumes and tariff levels. The more digits included in a code, the more specific the description of the good is. At the WTO, countries have HS numbers for products only up to the six-digit level. This makes it difficult to clearly identify EGs, including climate mitigation goods, at the six-digit level. They are often lumped together with other goods that are unrelated to the environment or climate mitigation.

“Processes and production methods (PPMs)” relativity and evolving technology:

Most WTO Members have not accorded “environmental goods” status to otherwise “like” products that have been produced using methods friendlier to the environment. This is due to the difficulty of distinguishing such products within the HS system and challenges of harmonizing standards and labelling, as well as due to systemic concerns and fears with regard to other non-product-related standards making their way into the WTO system as a basis for differentiated treatment. Even for products, where the environmental benefits do not depend on PPMs, many are only relatively eco-friendly. Hybrid cars, which can be compared to electric cars, provide one example. Moreover, technological change could make existing “relatively friendly” EGs obsolete tomorrow. How should trade negotiations respond to these challenges? Once lowered, bound tariffs cannot be raised again for obsolete products. At the very least, newer products that emerge should automatically benefit from trade benefits accorded to the obsolete one. If relatively clean goods are accorded preferences, should we distinguish based on national level baselines, or some internationally set baseline? Predominant methods of production differ dramatically across countries. Some experts, including Mytelka (2007), argue that only “*truly clean*” technologies should benefit from EG liberalization—as opposed to “relatively cleaner” products, but then we are left with the challenge of defining truly clean—particularly challenging, as one takes a longer term perspective.

The dual-use problem; the dual use problem is one of most important challenges facing EGs negotiators. It arises from the fact that most product categories proposed by WTO Members as EGs for rapid liberalization include, at the HS-6 digit level, other products that also have non-environmental uses. In other cases, a specific ex-out product, such as a pipe, may intrinsically be dual-use and used for environmental and non-environmental purposes. Pipes, for instance, are used as components of sewage treatment plants as well as for transporting oil and gas.

Most developing countries are hesitant to liberalize bound tariffs on dual-use products such as valves and pumps due to concerns about the impact of such overarching liberalization on their established domestic industries. Proponents of these liberalization efforts argue that the environmental benefits would be limited if liberalization was confined only to a handful of products used solely for environmental purposes.

The distribution question; A big challenge for the EGs negotiations is to include products of export interest to developing countries. The perception is that EGs—being capital- and technology-intensive—are of export interest only to developed countries and a few middle-income developing economies. But some, such as Hamwey (2005), see significant export opportunities for developing countries in a large number of lower-tech environmental goods, such as parts and components. However, these also happen to be the “dual-use” products with which most developing countries have concerns.

Undoubtedly, many developing countries such as China and India have emerged as leading producers in clean energy sectors such as wind and solar energy, and Brazil is a world leader in bio-fuel manufacturing equipment. According to the World Bank (2007), exports of clean energy products such as efficient lighting are growing rapidly from many developing countries. Analysis by Dr. Veena Jha (2008) reveals that China and Mexico were among the top 10 exporters in various categories of EGs relevant to climate change mitigation discussed in the WTO. On the other hand, interest in the inclusion of agricultural products by Latin American countries, and particularly ethanol by Brazil, has met with some degree of resistance by traditional developed-country EGs proponents.

2.5.3.3 Issues of Modalities

Approaches to liberalization; In addition to issues of product coverage, the question of how to approach the liberalization exercise has been another big stumbling block to progress in the Doha Round negotiations on EGS. For many developing countries, this issue needs to be resolved before the talks can progress to product coverage. Fundamentally, many developing countries are unwilling to commit to bound liberalization on lists that comprise mostly dual-use products. Some have therefore proposed their own alternative approaches to liberalization.

The list approach is favoured by the so-called “Friends of Environmental Goods,” comprising Canada, the European Union, Japan, Korea, New Zealand, Norway, Chinese Taipei, Switzerland and the United States. The approach essentially consists of identifying and submitting lists of what Members regard as environmental goods of interest for accelerated and permanent liberalization by reducing or eliminating bound tariffs.

India’s project approach proposes liberalizing any good or service intended for a specific environmental project as approved by a Designated National Authority for CDM project activities and based on criteria developed by the WTO’s Committee on Trade and Environment. Such liberalization would be temporary, lasting for the duration of the project, and domestic implementation of the criteria would be subject to WTO Dispute Settlement.

The integrated approach proposed by Argentina resembles the project approach but with further identification of goods used in various approved projects. Both approaches were driven by concerns of ensuring “environmental end-use” of products that are mainly dual-use.

A fourth approach—the request offer approach—has been proposed by Brazil whereby countries would request specific liberalization commitments from each other on products of interest to them and extend tariff cuts they deem appropriate equally to all WTO Members. Some Members have informally proposed combining various approaches, depending on whether the good in question was single or dual-use. For the time being however, there appears to be no resolution on which approach or combination of approaches to follow.

The World Bank report (2007) has proposed accelerated liberalization of products, technologies and services used in CDM projects. According to the report, such liberalization could reduce equipment costs and contribute to lowering transaction costs for potential investors as long as they were complemented by certain measures, such as supportive local regulatory measures.

Technology transfer and special treatment of developing countries, during the course of negotiations, many countries, including China, have stressed the need to facilitate technology transfer. Canada, among others, has stressed technology transfer as occurring through aid, private investment, technical assistance, partnerships between research organizations and small companies, and trade in environmental technologies themselves. Others, such as Cuba, prefer a differentiated treatment for developing countries, including transfer of technologies on favourable and preferential terms with related know-how and necessary training. From Pakistan’s perspective, the lack of adequate attention to technology transfer remains one of the main complaints with regard to the “list” approach. Technology is actually at the heart of climate change tractations. But a consensus is necessary to facilitate easier flow of Technology from North to South without compromising the legitimate interests of southern countries.

Duty Draws Back Scheme

Rob Howse and Petrus van Bork for instance, in a paper undertaken for ICTSD (Howse, 2002), have proposed a duty-drawback scheme for products which are intended for an environmental end-use. Under this scheme, the duty collected at the border for “dual-use” products is refunded based on an application by the final purchaser certifying an environmental end-use for the product. The critics have, however, pointed out to the administrative burden imposed by such a process as well as the possibility of corruption and diversion of products meant for environmental end-users to other uses.

Environmental Area Initiative

Cottier and Baracol-Pinhão (forthcoming) advocate an environmental area initiative (EAI) approach, organizing EGS negotiations on the basis of a prior identification of specific sustainable development target areas and goals. Adopting such goals and targets would partly draw from commitments to the UN MDGs and obligations under existing MEAs. Cottier and Baracol-Pinhão advocate the selection of environmental goods by using environmental services as a starting point. Goods are to be liberalized if one or the other of these conditions is met: (a) the good is essential to the delivery of the said services, or (b) it is a good or cluster of goods that is common to more than one type of environmental service.

Stillwell (2008) advocates a similar approach of starting by identifying environmental activities and categories as proposed by a number of WTO Members and then deciding on product coverage on the basis of a number of criteria such as (i) contribution to the fulfilment of environmental priorities; (ii) direct use in addressing environmental problems; (iii) direct environmental benefit arising from their use; (iv) not having significant other non-environmental uses; and (v) offering export opportunities for developing countries.

“Friends” or “Climate Friendly”

Climate-relevant proposals, from a climate mitigation perspective, the EGs negotiations have seen proposals from Qatar, the “Friends,” and, more recently, from the United States and EU, which have included “climate-friendly” goods. Early on in the negotiations, Qatar proposed liberalizing natural gas-fired generation systems and advanced gas generation systems, citing a reference to its benefits under the UNFCCC. Qatar also referred to the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports, which recommended increased use of natural gas over other fossil fuels as a way to reduce greenhouse gas emissions.

The “Friends” proposed a list of 153 products, which included categories such as renewable energy products, solid waste management, and heat and energy management products. On 30 November 2007, the United States and EU proposed accelerated liberalization of goods and services relevant to climate change mitigation, including zero tariffs by 2013 for 43 products that were identified by the World Bank from the “Friends” 153-product list as being relevant to climate change mitigation. There were to be longer phase-in periods for liberalization by developing countries and participation was made optional for least-developed countries. The list of 43 goods included a wide variety of products such as solar collectors and system controllers, wind-turbine parts and components, stoves, grates and cookers, and hydrogen fuel cells.

2.5.3.4 Trade liberalization of low-carbon goods

Low carbon goods are in a way an extension of the EGs but the definitional issues in this case are also complex. Normally a definition of low carbon would take into account the full life-cycle of a good i.e., how much carbon was emitted in the good’s production, endues and disposal, relative to the baseline case.

Like goods could be defined as environmentally friendly by any of at least three criteria:

- By method of production: a good could be considered low-carbon because of the low amount of carbon emitted during its production process. This definition, however, gets into the difficulties associated with PPM-based discrimination.
- By its end-use as consumer goods: a hybrid car might be considered low-carbon, since it emits fewer GHGs in use than do other sorts of cars. This, however, is a relative judgment, and would need to be adjusted over time—something the WTO would find difficult to do.
- By its end-use as intermediate goods: a windmill turbine might be considered low-carbon, in that it is destined to contribute to energy generation in a manner that emits fewer GHGs than other methods. This sort of narrow definition would result in a list of goods in which, with only a few exceptions, developed countries have the overwhelming comparative advantage (though this picture is quickly changing).

The negotiations on the liberalisation of low carbon goods are at a very initial stage and many reservations are being voiced, further slowing down the progress on low carbon goods liberalization. Some of these reservations are:

- The volume of trade in the goods involved is small relative to overall trade flows, and the amount of GHG emissions reduced as a result of even an ambitious outcome may in the end be correspondingly small.
- Tariffs on many of these goods are already low, on average, particularly on industrial goods in developed countries, and will be getting lower as liberalization of trade in general is successful.
- The liberalization in low carbon goods will not succeed in those countries that have very poor investment climates for such goods, whether because of regulatory barriers, generally poor investment conditions or lack of regulatory drivers.
- Non-tariff barriers to trade in such goods are generally held to be more significant than tariff barriers, but there are few efforts or proposals to deal with anything but the latter.
- By itself, liberalization may even have environmentally negative results, if it encourages increased production of such goods in countries where GHG intensity of production is quite high.

2.5.4 Climate Change and Competitiveness Issues for Pakistan

As negotiations accelerate in the lead-up to the Copenhagen meeting in December 2009 and beyond, trade-related issues have emerged as major elements of the discussions and trade-offs. There is a growing belief that the design of an effective climate change regime will imperatively include the use of trade policy tools. What specific tools constitute the first best options and whether these tools need to be incorporated into a global climate change regime and if so, how best to go about it, are questions that the relevant policy communities are navigating these days. They also need to consider whether there are other ways in which trade policy and existing regimes can be made supportive of climate change mitigation and adaptation efforts. By focusing on competitiveness issues, which are at the centre of the current climate change and trade discussion, the developing countries are showing their apprehensions that by taking on climate change commitments, they might put their industries – at least the energy and carbon-intensive ones – at a disadvantage on the international marketplace.

2.5.4.1 Competitiveness in a carbon constrained world

International competitiveness and trade have always been a consideration underlying multilateral negotiations to address climate change. Only recently has the debate become open and politicized, however. Topics such as the potential relocation of carbon-intensive industries and carbon leakage, carbon barriers at the border, carbon embodied in traded consumer goods, as well as the climate change impacts of transporting agricultural and industrial products around the globe have landed in the already overflowing briefcases of climate change negotiators.

It is clear that climate change mitigation comes at a cost. What exactly the cost is, and how it will be distributed within countries and sectors under different policy scenarios is less clear. The international distribution of that cost is, of course, at the centre of the climate change negotiations. Complicating the matter is the economic integration of countries in an open global economy, including through supply chains that are increasingly spread across countries.

2.5.4.2 Leakage and competitiveness – economic, social and environmental dimensions

Countries set to take on stringent mitigation obligations worry that this may affect the international competitiveness of their energy- and carbon intensive industries. Although concerns include loss of competitive advantages both in domestic and international markets, the debate mostly centres on the economic and social implications of the real or perceived relocation of industries to countries without such obligations. In addition, such relocation may lead to higher overall carbon emissions from the same production of the same volume of goods in countries with less efficient processes. This would be the environmental angle of carbon leakage: the same amount of production, increased amounts of related pollution.

While the picture is not yet very clear, the issues have become highly political. Some dispute that significant carbon leakage is taking place, pointing, among others, to the fact that developed countries still are producing most of their energy-intensive steel and cement products domestically. Trade can actually lead to greater production efficiencies, including lower overall greenhouse gas emissions.

2.5.4.3 Can border adjustments be justified?

While firms in carbon-constrained economies already are responding by turning to increasingly specialized high-value products in sectors such as steel, they are also among the main demanders for legislation instituting carbon-related “competitiveness provisions” in the form of mandatory carbon offsetting allowances on imports, or border tax adjustments.

Such border measures are highly controversial, as they are seen as ‘sticks’ rather than ‘carrots’ to encourage an inclusive approach to deal with the problem. Their legality under the WTO is anything but straightforward.

2.5.4.4 What role for sectoral agreements

In this context, there is renewed interest in global sectoral agreements – covering energy-intensive and heavily trade-exposed industries such as steel, aluminium, pulp and paper, cement and agro-chemicals – since these potentially could help address some of the international competitiveness issues. Under an approach proposed by Japan in the G-8 context, energy-intensive sectors would be set benchmarks related to best available technologies, taking on climate change commitments that would be added up at the national level. For developing countries, these commitments would be of a voluntary nature.

Sectoral agreements offer no clear-cut solutions, however. Developing countries have cautioned that these might open the back door to new standards and obligations, which would hinder or complicate developing country industrial development and exports.

Indeed, referring to the principle of “common but differentiated responsibilities,” developing countries have said that competitiveness issues with a potential to affect their development prospects have no legal ground in the UNFCCC context.

2.5.4.5 Embodied Carbon in Trade

There is now firm evidence of the atmosphere’s limited capacity to absorb certain types of the gases generated by anthropogenic activity. Such activity has traditionally failed to account for the use of the atmosphere or inputs that affect it. If policy is to deal with climate change effectively, internalization of such costs is an imperative. In this context estimating and addressing carbon emissions related to internationally traded goods becomes a priority area of attention.

Indeed, defining responsibility for action with respect to their mitigation is anything but straightforward: should emissions be accounted for only at the source of production, or rather following the full life cycle of goods or services, with emissions attributed at points of production, transportation, consumption and disposal? If so, the question arises as to how to distribute the attribution of emissions to countries involved in today’s complex geography of international production and trade networks and flows.

Several recent studies show that around one quarter of Chinese carbon emissions can be directly attributed to the production of goods that are exported – many to consumers in developed countries that no longer are engaged in such manufacture.

Therefore, in this specific case, consumer countries have been accused of ‘carbon laundering’ their economies by outsourcing polluting industries to producing countries. Critics stress the need for consumer countries, particularly developed countries, to take strong first steps to tackle climate change in order to address their responsibilities both with regard to their historic emissions and their current emissions, taking into account the embodied carbon in their imports. Some producing and exporting countries have, in fact, hinted at the need to redefine emissions reduction responsibilities since part of their emissions are directly related to consumption in other, mostly developed countries.

2.5.4.6 Carbon accounting and labelling

Carbon inventories are centred on countries and managed by states. Perhaps one day each traded good will be accompanied by its own carbon passport, allowing the transfer of carbon responsibilities across borders. However, initial life cycle analyses of traded goods from a carbon perspective have demonstrated just how complex this process would be – and how costly. Some embryonic carbon labelling schemes based on life cycle analyses have been set up by the private sector, covering just a few products. These have mainly been agricultural goods, since they tend to be less processed than industrial goods and thus simpler to analyze. In addition, some global companies have started using carbon foot-printing to identify carbon hotspots in their supply chains and target these for mitigation action. Recently the Wall Mart CEO announced in China that their company would shortly restrict its imports to green products only.

The role of voluntary carbon labelling schemes is likely to grow in the future, providing consumers with the option of decreasing their personal carbon footprints. There are, however, risks associated with such schemes, if they are not well designed. The first experiment with a crude form of labelling – airplane stickers in supermarkets to indicate fresh produce that had been air-freighted –ended up hurting some of the poorest and most vulnerable countries. These developing countries had managed to capture high value niche markets in developed countries by air freighting fresh produce during the northern winter. The stickers singled out just one part of the carbon footprint, namely transport, ignoring other parts of the process. Overall, the exporters operating in warmer climates often produced products with lower carbon emissions as compared to their counterparts in developed countries, which produce out-of season vegetables in a highly mechanized fashion in greenhouses using large amounts of carbon-intensive fertilizer input. Under a differently designed scheme, the small developing-country producers may have been the ones to benefit.

2.5.5 *Sources or Constraints of Green Competitiveness*

2.5.5.1 Intellectual property and innovation

In the climate change negotiations, intellectual property issues have become a bone of contention. Intellectual property rights have long been a tool to promote innovation and the dissemination of new ideas and inventions. Nevertheless, in some cases the excessive scope or level of protection of intellectual property rights in fact provides a disincentive for further research and development, as well as an obstacle to access to the protected knowledge by the broader public. Therefore, a balance will need to be achieved between patents and access to climate-related technologies.

Intellectual property is not necessarily the bottleneck for the present generation of technologies. This may change as new technologies are developed, and a better understanding is also needed on a sector by sector and technology by technology basis. Under the Montreal Protocol, the technology funds included money to pay for the necessary licensing fees. There are suggestions that countries should be able to issue compulsory licenses for climate change technologies - meaning they would be able to unilaterally make decisions to allow their companies to copy technologies without following normal procedures for patented goods. The intellectual property discussion can also be used as a stalling tactic within the negotiations by countries that do not wish to see a successful outcome.

The issue is of particular relevance to some of the most technologically advanced developed countries, which are seeking to re-engineer their economies into the low-carbon era, putting most of their R&D into eco-innovation. They are hoping to increasingly base their economies on these sectors, having already made the move from natural resource intensive sectors and industries into services and cutting edge technologies.

There is also increasing realization that – both within and beyond the intellectual property system – existing innovation structures and activities can and should be enhanced. Initiatives include an international “distributed innovation” model and strategy for climate technology.

2.5.5.2 Energy at the centre

Climate change policy aims to set countries onto a path towards an efficient, low-carbon energy future. Energy efficiency is one of the most cost-effective areas of intervention to address energy use. Clean energy and new and renewable forms of energy are costly. No new source of energy has ever been developed without significant government support; the same will be true for new and renewable forms of energy. Technology transfer and diffusion will also require policy intervention. Meanwhile, existing subsidies supporting fossil fuels still need to be phased out, in accordance with the Kyoto Protocol objective of progressive reduction or phasing out of market imperfections and subsidies in all greenhouse gas emitting sectors. Current WTO rules set out the parameters for subsidies that affect trade, as well as for standards and labelling. Some have called for efforts at the WTO to phase out harmful energy subsidies, along the lines of the current negotiations targeting subsidies in the fisheries sector that lead to overexploitation of fish stocks globally. In order to develop a comprehensive and coherent strategy at the interface between trade and energy – spanning trade in energy itself, in energy-related technologies, energy subsidies, standards, labelling, technology transfer and innovation – the crafting of policies or even a new legal instrument may be necessary. The negotiations towards a post-2012 climate regime and beyond could provide an avenue for such efforts. Following a successful outcome, the results might need to be accommodated for within the WTO and regional trade agreements.

2.5.5.3 Carbon, land-use, land-use change and trade

Agriculture and forestry cumulatively account for over 30 percent of global carbon emissions. Global agricultural trade and rules governing this trade affect carbon management globally, as changes in land use patterns have major impacts on the carbon balance. If land is converted from forest to agricultural land, carbon is released. Deforestation contributes approximately 18 percent of global carbon emissions. Agriculture also binds carbon in crops and soil, and certain practices do more than others to sequester carbon. For achieving long-term climate objectives, the Intergovernmental Panel on Climate Change (IPCC) reports indicate that agricultural mitigation options are found to be more cost competitive compared to non-agricultural options.

2.5.5.4 Agriculture trade in a changing climate

Global shifts in cropping patterns are expected to result from the eventual Doha agreement that will bring down tariffs, phase out export subsidies, and reform and decrease internal agricultural support programs. The overhaul of agricultural subsidies provides an opportunity to promote genuinely sustainable agricultural production and practices.

While there are few agricultural subsidy programs focusing on carbon sequestration specifically, these may become more prominent in the future. Current subsidy reform, with the emphasis shifting towards decoupled payments and extensification, may also naturally lead developed countries towards practices that support carbon sequestration.

Policy-makers also need to provide adequate attention to the needs of smallholder farmers and rural communities, especially in the developing world. In addition to the evident imperative to ensure the food security of these poor communities, which may be among the most vulnerable to the negative effects of climate change, governments also need to take into account the fact that these producers may also hold some of the keys to a solution.

Not only do small farmers frequently practice more sustainable traditional agricultural practices such as crop rotation and mixed cropping, leaving land lying fallow, and the use of low levels of artificial chemical inputs such as fertilizers, they are often also the custodians of agricultural biodiversity, selecting and sharing seeds of plant varieties that are particularly well suited to local conditions. In the context of a changing global climate, this storehouse of biodiversity could be critical in developing the varieties that are needed to adapt to a changing world environment. Global trade negotiations will need to integrate this as a major background factor.

2.5.6 Recommendations

2.5.6.1 Making Trade Liberalization work for Development

The trade policy formulators in Pakistan need to realise that the Environmental Goods' liberalization can address climate mitigation efforts in a broader sustainable development context. Though the trade liberalization by itself may not be sufficient and Pakistan would need a whole host of complementary measures—regulatory, capacity building, financial and technology-related— to transform the liberalization of EGs into an economic opportunity as well realize the sustainable development goals. Easier availability EGs, coupled with better enforcement of environmental regulations (shown by environmental performance indices) would help Pakistan attract many bilaterally funded “environmental” projects, especially CDM.

In case of CDMs, Pakistan should take the route of autonomous liberalization for benefitting from the spill-over of CDMs.

Pakistan needs to open up to the opportunities being offered by the expected increase in the flow of EGs. Ministry of commerce, government of Pakistan needs to take the lead in developing both the offensive and defensive approaches regarding EGs and ensure domestic preparedness for the impending liberalization of EGs.

One of the principle reasons that Pakistan benefitted little from CDM is that the implications and subtleties in undertaking CDMs were not fully understood by the Ministry of environment, which is the Authority. This Authority should be shifted to Ministry of Commerce.

The product categories such as renewable energy and heat and energy management appear at the moment sensitive to tariffs and long-term dynamic comparative advantage (until 2015) in these products lies with developed countries (for renewable energy) and with middle-income developing countries (for heat and energy management products). It is essential that Pakistan takes an offensive approach on the liberalization of EGs and build up its own productive and technological capacities to the extent that it starts exporting more than importing, like India, Mexico, China, Brazil.

Ministry of Commerce should consider reducing the tariffs drastically, if possible to zero, on Climate Friendly products. But Pakistan should be more cautious on the trade liberalization of low carbon products.

Engineering Development Board, Ministry of Industries should establish a Fund, with the cooperation of Ministry of Science and Technology and international donors, for developing indigenous technologies for local use as well as for exports. Sizeable funding would be available to finance the importation of EG goods and services. Pakistan can position itself as a producer of clean technologies and services by initiating strategic climate friendly Trade Policy initiatives to realise the twin objectives of promoting sustainable production and increasing exports.

2.5.6.2 Carbon Labelling Scheme

Carbon labelling schemes provide opportunities as well as challenges for a country like Pakistan. Any future carbon schemes would need to balance the need for accurate and useful data with the need to be simple, transparent, and involve sufficiently low transaction costs to include small countries and players.

Among developing countries there is widespread suspicion regarding private sector labelling schemes in particular, as they feel they are not represented and their voice is not heard in their development. While such private sector schemes can hurt their export interest, the countries have little room to manoeuvre given that the international trade rules governing standards and technical regulations, namely the WTO Agreement on Technical Barriers to Trade, essentially binds Member countries, not private organizations.

This discussion also applies to trade-related aspects of the more established labelling schemes focusing on energy efficiency, as well as voluntary or mandatory standards in this area. These schemes provide opportunities for positive product differentiation and market opportunities. On the other hand, many producers are concerned that labelling and standards become barriers to market access. They see the rise in such ‘non-tariff barriers’ as potential obstacles to market entry and as a vehicle for green protectionism. Where Pakistan should try to promote greener production, the government should start planning for an effective response to carbon labelling as a buyer’s compliance. The Ministry of Commerce should initiate programs for spreading awareness of carbon labelling issues and for building the capacity of remediation of Pakistani companies. The Ministry of Commerce should also start incentivising Green Labelling in some Pilot Industries.

2.5.6.3 Developing a Climate Friendly Trade Policy for Pakistan

Countries need resources to strengthen their resilience and to adapt to climate change. There is a strong push for adaptation funding from the main polluters to developing countries suffering the consequences of climate change. NSDS would like to assert that the trade-led economic growth would help increase the resilience of Pakistan’s economy. In the coming years, the agenda of ‘Aid for Trade’ would be directed more towards the adaptation. Government of Pakistan needs to develop an Adaptation Plan for each of the Priority Production Sector.

But Trade led growth can have positive and negative economic, environmental and social effects. These effects vary across individuals, households, regions and ecosystems; across companies and across industries. And they vary with the types of trade and trade policies in question. Integrated assessment evaluates these impacts at a national level, capturing different aspects of these impacts in a single study. As Integrated Assessment has quickly become one of the most valuable tools available for policy-makers concerned with achieving environmental, economic and social progress, the Ministry of Commerce should initiate a few Pilot Integrated assessment as it would provide the ministry of commerce and other policymakers with a full picture of the changes that might arise from trade policy reforms suggested above. With the help of Integrated Assessment Tool, the Governments would be able to explore the interactions between trade, environment and development policies. NSDS has suggested elsewhere for the start of Industry specific Action Plans. An Integrated Assessment of the target sector would provide the basis for the design and application of “packages” of sector specific policies that together are supportive of sustainable development. This would also serve as the basis for a strengthened, informed position in trade-related negotiations. As the flexibility of integrated assessment methodologies allows governments and research institutions to select their aims, and then determine how they wish to respond to the environmental, economic and social effects of trade and trade policies, the NSDS proposes UNEP to finance Integrated assessments to be carried out by the policy research institutes of high risk sectors.

Pakistan has largely failed till date in designing environmental and other policies that maximize the net development gains from trade. One of the principle reasons for this has been the multidisciplinary nature of any policy linking trade and development through greenism, which is predicated for its success on the cooperation between the relevant ministries and on their mutual understanding of tools and policy objectives in the trade and environment sectors. This type of cooperation needs the capacity for policy integration, facilitating the identification of “win-win” situations in which trade liberalization can benefit the environment and development. Ministry of Commerce needs to lead from the front and make it its declared Trade Policy Objective to strengthen the linkages between trade and environment in the service of sustainable development for future generations and come up with clear economic and scientific rationales for the design and implementation of such policy reforms in a manner that takes into account environmental and developmental objectives. The Ministry should undertake sufficient funds for research to develop a solid Climate friendly Trade Policy the soonest possible.

Ministry of Commerce should be willingness to provide guidance on how to maximize the policy relevance of a Climate friendly Trade Policy, outlining a range of potential policy responses, from the macro-economic to the micro-economic, and including environmental and social policy changes. This

would require the Ministry of Commerce to develop and implement a robust communication strategy centred at the preparedness of the Ministry of Commerce and the Industry. The Ministry should also be willing to modify trade agreements under negotiation, or of trade-related policies.

The Ministry should undertake an assessment of the climate friendliness of its trade policies and agreements and should seek to build capacity to do such an analysis. The Ministry of Commerce should also seek to enhance its capacity to design and implement such trade policies, which help the government and industry in realising the goals of sustainable development to the benefit of all Pakistanis.

Chapter 3

Saving Environment in Pakistan

Challenges and Policy Response

3.1 General

Environmental degradation in Pakistan is a well-documented and known fact. Pakistan is the most urbanized country in South Asia, with an estimated 38 percent of its population living in cities. Rapid urbanization and the expansion of industry and transport have led to a rapid decline in the quality of air in all major cities in Pakistan, where levels of fine particulate matter (PM10) of up to 6-7 times WHO guidelines have been measured. About 16.28 million Pakistanis (40 percent of total urban population) are under risk of air pollution, which is costing Rs. 25.7 billion every year on account of health merely by not complying with the WHO Ambient Air Quality Standards.¹¹ Urban air pollution, of which mobile sources are the most significant, is estimated to cause around 22,700 premature deaths per year. The number of vehicles in Pakistan has increased tenfold in the past twenty years, where the fastest growth has been in two-stroke delivery vehicles and diesel trucks and buses. Vehicular emissions are particularly detrimental to human health because pollutants are emitted at ground level. Pakistan's consumption of petroleum products is growing at an annual rate of about 6 percent, almost half of which is consumed by the transport sector. The high content of sulphur in diesel (0.5-1 percent) and furnace oil (1-3.5 percent) is a major contributor to air pollution. Industrial activities are another important source of air pollution in urban areas, both from large-scale facilities (e.g. cement, fertilizers, sugar, steel and power plants) and from small to medium scale industries using waste fuels (e.g. brick kilns, steels works and plastic moulding). Industrial emissions are further compounded by the widespread use of small diesel electric generators in commercial and residential areas in response to the poor reliability of electricity. Combustion of municipal waste is another significant contributor to air pollution. Almost 48,000 tonnes of solid waste are generated every day across the country, most of which is either dumped in low-lying areas or burnt. Open burning of waste is also the largest source of dioxins and furans to the environment.

Industrial development has been associated with some of Pakistan's most significant environmental challenges, which are expected to intensify in the future. In addition to industry's contribution to air pollution, it is estimated that industrial wastewater accounts for as high as 30 percent of total wastewater generated. Currently, there is relatively modest investment in environmentally sound technologies despite strong evidence pointing at the significant health and economic benefits that would result from the employment of cleaner production methods. Pakistan's industrial sector appears to be oblivious to Green opportunities, which can be benefitted from by developing strategic actions that can reduce the costs of environmental degradation while simultaneously contributing to enhance the country's competitiveness, such as the adoption of practices to foster energy efficiency, quality control, Corporate Social Responsibility, and compliance of environmental and social standards of export markets.

The rate of deforestation in Pakistan is high. Although forests cover a relatively small proportion of land area in Pakistan, they remain a vital source of direct benefits including fuel-wood, livelihood and government revenue. Forests also provide several indirect services such as watershed protection, soil conservation, carbon sequestration and biodiversity habitat. A major immediate cause of forest loss in Pakistani context is the over exploitation for subsistence and commercial purpose. Much of the rural population relies on forest resources, while the high timber value gives perverse incentives to harvest

11 GoP, Planning Commission, 'MTDF 2005-2010' (May 2005).

in an unsustainable manner. The opportunity cost associated with forests loss can be large considering a wide range of benefits and services they provide.

Pakistan government however is not totally unaware of the problems of environmental degradation and has been taking diverse actions to further prevent the degradation. Pakistan's institutional environmental framework has evolved since the adoption of the Pakistan Environmental Protection Ordinance in 1983. Currently, the **National Environmental Policy (NEP) of 2005** constitutes the Government's overarching strategy for achieving the goals of sustainable development. **However, NEP implementation and enforcement of environmental regulations has been slow, as evidenced by the worsening environmental conditions.**

The Pakistan Environment Protection Act [EPA] of 1997 transferred environmental management powers to provincial governments. While major environmental policies and guidelines are formulated, at the national level, by the Ministry of Environment and Pakistan EPA, it is the role of the provinces to implement and enforce them. However, there is currently limited coordination between federal and provincial agencies, and limited coordination between provincial authorities and district as well as sub-district-level authorities. Institutional mechanism needed to involve environmental management agencies in a consultative process for priority-setting, development of long-term action plans, and assessment of performance/impacts of specific initiatives are pretty weak. Inter-sectoral coordination for the oversight of cross-cutting issues, as those outlined in the NEP, is limited to the establishment of Focal Points within other non-environment ministries (e.g. Ministry of Industry), and interactions amongst these Focal Points have not yet been institutionalized.

The National Environment Policy is not only a response to the environmental concerns of Poverty Reduction Strategy Paper I but extends it to other relevant sectors and themes with a view to mainstream environment. The Policy is a valuable prelude to poverty-environment focus of PRSP-II, which is being finalised these days.¹² For example, the Policy mainstreams the Environment in the Energy sector by: (i) formulating energy conservation guidelines and audit standards, (ii) strengthening financial mechanisms, institutions, and associated policies and regulations to provide innovative lending specially in the demand side efficiency improvement, (iii) developing and implementing a plan for conversion of public transport to CNG, (iv) promoting renewable forms of energy (wind, solar, biomass, biogas, and others.) at a wider scale.

The Ministry of Environment has resolved to accord priority to addressing the causes of environmental degradation that affect primarily the poor and the environmental risks that have been identified as the leading causes of children mortality, such as air pollution and inadequate water supply, sanitation, and hygiene. Such actions to arrest environmental degradation will also be consistent with the MDGs.

The Ministry of environment is also planning to develop a climate change strategy to identify priorities for action to increase private and public sectors' abilities to mitigate and adapt to the environmental and socio-economic impacts of climate change, while simultaneously contributing to address the national environmental challenges identified by NEP. But it appears that MOE is looking the Climate Policy more in the context of realizing MDGs due to the potential of climate change to reverse progress in achieving the MDGs.

The Ministry of Environment, it appears, realises the importance of developing the institutional capacity to manage the environmental effects of the development of infrastructure and key economic sectors, including the strengthening of the Environmental Impact Analysis (EIA) system and the adoption of environmental management systems that contribute to enhance competitiveness. To what extent would the Ministry be able to devise concrete strategies to realise these objectives is not very clear.

12 The government is expected to announce the PRSP II in January 2009.

The cross-cutting nature of environment poses major policy challenges in Pakistan as it would do in any other country. The ineffectiveness of coordination mechanisms can hamper the efforts to foster collaboration among governmental agencies to incorporate environmental considerations in the sectors that can have a more important impact in poverty reduction. For example which Ministry or forum should own/introduce/manage/develop policies aiming to enhance industrial competitiveness while simultaneously yielding environmental benefits, through the adoption of practices that foster energy efficiency, quality control, Corporate Social Responsibility and compliance with the environmental standards of export markets?

The governmental documents speak of a large number of achievements over the past few years such as:

- CNG stations and conversion of vehicles to CNG;
- Environmental awareness;
- Institutionalization of devolution and its rationalization and strengthening;
- The ever increasing use of information technology and government disseminating Information through websites;
- Vaccination of children against communicable diseases;
- Creation of enabling environment for the private sector and civil society for enhancing their contribution to environmental sustainability. In this regard, Corporate Social Responsibility (CSR) funding by the private sector is being complied extensively by UNILIVER SHELL, ICI, MERCK, SUI SOUTHERN GAS COMPANY, PSO, Oil and Gas companies, Packages Limited, etc.;
- Large-scale poverty reduction demonstration projects in rural areas focusing on community participation and sustainable use of natural resources, e.g. Mountain Areas Conservancy Project-MACP, Environmental Rehabilitation in NWFP and Punjab Project-ERNP, Protected Areas Management Project-PAMP and Pakistan Wetlands Conservation and Management Project-PWP);
- Improvements in weather forecasting which helps in sound and timely decision making in agricultural practices and better management of natural resources and disasters;
- Supportive role of civil society environmental/rural development organizations including IUCN, WWF, LEAD, SDPI, SUNGI Foundation, SHEHRI, Shirkat Gah, RSPs, etc.;
- Gradually increasing use of environmental impact assessment for investment programs;
- Integrating environment in disaster management - earthquake and Tasman Spirit Oil Spill;
- Launch of the SMART Programme of Pakistan Environment Protection Agency. SMART is a self-monitoring programme for industries.
- Adoption of Environmental Fiscal Reform [EFR]

The Ministry of Environment has of course achieved significant success to protect Pakistan's environment but a lot still needs to be done as our environmental challenges are pretty complex and daunting. MOE would need a much larger policy space to establish itself as the leader in steadying the concepts and practices of sustainable development in Pakistan. For example, where it is commendable that the NEP has adopted Environmental Fiscal Reforms (EFR), in other words, the principle of 'Polluter pays', yet it also needs to be noted that it does not back-date its implementation. EFR is actually a good example to understand the policy dynamics of environmental management in Pakistan.

Environmental Fiscal Reform (EFR) is an important policy instrument that can address environmental hazards by making greater use of tax sources, cost recovery and removing environmentally harmful subsidies. Some key factors of degradation of the environment are market failure (under pricing, under-valuation), institutional failure (e.g. property rights) and policy failure (perverse incentives, deliberate under-pricing or bias). EFR refers to the introduction and application of a range of taxation and pricing measures including: (i) Tax on natural resources extraction, (ii) Removal of environmentally damaging subsidies, (iii) Introduction of specific product taxes, levies and user

charges, (iv) Pollution charges, and (v) Reforming other taxes in favour of the environment. More specific uses of EFR in Pakistan include:

- (i) User charges to consumption of water, energy and other resources
- (ii) Minimization of subsidies to reduce inefficient energy and water use e.g. tube wells and electricity,
- (iii) Subsidy on energy and water efficient technologies for poor households e.g. efficient stoves; energy efficient insulation, siding and windowing; clean fuels substituting fuel wood, efficient water and energy appliances,
- (iv) Payment for environmental services (e.g. compensating the farmers for water shed management practices to reduce silting of mega dams)

The environmental policy space created by the adopting the principles of EFR and effecting certain measures such as the reduction of subsidies on tube wells and user charges on water, energy and other resources is however fraught with the possibility of suspicious trade offs. It appears that EFR has been adopted and now promoted in Pakistan the way the gender reform budgeting has been adopted. Disparate measure being undertaken in different sectors at different levels, more importantly under different impulsions are regrouped under a fashionable rubric and presented as an achievement. In case of EFR also, it appears different outcomes of diverse 'reform' initiatives are clubbed together as EFR. For example, the decision to enhance the user charges was historically taken a long time back as a result of the Structural adjustment Reforms and at that time the environmental considerations were not mentioned. Similarly the reduction of subsidies on agricultural inputs is more in the optique of the liberalization of agriculture in Pakistan. The possibility of less usage of pesticides is actually an argument being used by the proponents of such an agricultural reform which wants the prices of agricultural products to be pegged with the international prices. The same lobbies are promoting Contract Farming as Pakistan's future whereas it is very clear that the Contract farming would result in more intensive agriculture and higher pesticide and fertiliser usage. The policy trade offs in case of environmental protection are very complex and are more often than not a hostage to group interests. There is a need to introduce sustainable development, which would comprise the environmental and climate change impacts, through economy wide CGE Models to have a fairer idea of the principle trade offs involved for all the sectors.

In order to address linkages between environmental protection, sustained economic growth and poverty reduction, many more efforts are needed to be undertaken to strengthen the institutional capacity for environmental management, consistent with the provisions of the NEP, both at the federal and the provincial levels. This will include providing federal and provincial governments with the tools and resources needed to identify and develop priority setting and coordination mechanisms, increase the effectiveness and efficiency of the national environmental management system, and engage a broad range of stakeholders to continuously improve environmental policies.

3.2 Ensuring safe and sufficient Water supply for human as well as agricultural purposes and for the ecological balance

Fresh water availability has recently emerged as one of the most crucial issues for sustainable development in Pakistan. Per capita water availability has dropped from 5,300m³, or water-affluent, in 1951, to 1,200m³, or water-deficient in 2005. The flows of the Indus River and its tributaries constitute the main source of surface water for the country. The average annual inflow of the western rivers at the rim station amounts to 140 million-acre feet (MAF). The flow varies by some 65 percent from year to year. The groundwater storage capacity in Pakistan is estimated to be around 55 MAF (67.8 billion m³). Indiscriminate pumping at 15,504 large capacity public tube wells and 4,69,546 low capacity private tube wells in the absence of proper monitoring and in neglect of aquifer chemistry and hydrodynamics has contributed to the pollution of aquifers in certain pockets. Already, major cities in Pakistan face problems of groundwater mining and lowering of the water-table (Ahmad, Bari and Muhammed, 2003). However, water availability and distribution varies widely by region and socio-economic group. Considerably less water is available in Balochistan and Sindh. This is also the case for

people at the tail end of the irrigation distribution system, and for the poor. This suggests that water management, rather than water availability, is at the core of Pakistan's water crisis. The unequal distribution, coupled with population pressure, rapid urbanisation, and increasing industrialisation, together pose a serious challenge to water management in Pakistan in the 21st century (Siegmann and Shehzad, 2006).

Currently, around 97 percent of the fresh water is used in the agricultural sector and only 3 percent is available for domestic and industrial use. Most of the urban and rural water is supplied from the ground water sources except for the mega cities. A total requirement for urban and rural domestic, livestock, commercial and industrial needs is estimated at 10 MAF by the year 2010 and 16 MAF by the year 2020. Almost 80 percent of the domestic, municipal and industrial water diversion returns to the system but with a degraded quality. The available water supply in Pakistan is thus inadequate; what is available is of poor quality due to chemical pollutants, such as nitrate, arsenic, fluoride and bacteriological contamination.

The water of Indus River is of excellent quality. The Total Dissolved Solids (TDS) range between 60-374 parts per million (ppm), which is safe for agricultural irrigation, domestic and industrial usage. The water quality deteriorates down stream but remains within permissible limits up to Kotri Barrage. The TDS in most of tributaries of Indus is beyond safe limits, though. The quality of ground water varies widely, ranging from less than 1,000 ppm TDS to more than 3,000 ppm. Almost 14.2 million acres are underlain with ground water having salinity less than 1,000 pmm TDS, 4.55 million acres has salinity ranging from 1,000 to 3,000 ppm TDS and 10.59 m.a. with salinity more than TDS. Presently, only 60 percent of the urban population and 23 percent rural population have access to piped water supply (Federal Bureau of Statistics, 2005). In most cities, municipal wastewaters as well as the effluent from industries are disposed of untreated to the natural surface water bodies. About 2,122 million-gallon tones of sewage is being thrown in water bodies and there is no proper mechanism for sewage collection and treatment/safe disposal. There is a need for protection of fresh water resources from contamination in the country, for which adequate capacity does not exist with the relevant agencies.

Consolidated public spending on water supply and sanitation has decreased over the last few years, both in nominal terms and as a percentage of GDP. Expenditures on water supply and sanitation came down from Rs. 6.3 billion in 1995-96, at 0.30 percent of GDP, to Rs. 4.5 billion, i.e. 0.13 percent of GDP, in 2000-01. As a result, the extension of public water supply and sanitation facilities has failed to keep pace with the growing needs of the rising population (Planning Commission, 2001). [Need latest figures]

The combination of poor coverage and quality of water supply and sanitation has severe consequences for national health. In Pakistan, 25-30 percent of all hospital admissions are connected to water-borne bacterial and parasitic conditions, with 60 percent of infant deaths caused by water infections (Memon, 2004). According to some estimates, more than 10,000 people die annually of renal infection due to polluted water (Qutub, 2004).

Pakistan is highly dependent on irrigation for its agricultural production. Insufficient water for food production, loss of soil fertility through water-logging and salinity, seepage, unequal distribution in the irrigation system, and droughts lead to reduced agricultural production and thus endangers small farmers' food security. The availability of water for food production varies by socio-economic group. In the past, it has been argued that due to the unavailability of water for small farmers as the crucial input, the Green Revolution actually caused increases in relative poverty (Zaidi, 1999). It is still the case today that today the distribution of irrigation water discriminates against small farmers because of the unequal power of small and large landowners in the villages (Khan, 1999). Food production is endangered due to the high degree of water-logging and salinity on agricultural land. In 1998, 9.1 million hectares (ha) of agricultural land were affected by water-logging and 4.9 million ha by severe water-logging, i.e. 33.7 and 18.2% of the agricultural land, respectively. Almost 13% of the cultivated land is saline (Ministry of Food, Agriculture & Livestock, 2004; FAO, 2004). These twin menaces have led to

crop declines of about 30% in yields of major crops (Pinstrup-Andersen and Pandya-Lorch, 1994) and thus threaten Pakistan's food security. The impacts of water-logging and salination also have a socio-economic dimension, affecting farmers with small landholdings most (Rafiq, 1999).

3.2.1 Recommendations

- Protect watersheds, water-bodies and sustaining fisheries;
- Increase coverage of water supply and water treatment facilities and make installation of water treatment plants as an integral component of all drinking water supply schemes;
- A genuinely participatory approach in water management including the voices of all stakeholders in particular women and the poor;
- Promote low-cost water treatment technologies at the community and household levels;
- Promote appropriate technologies for rain water harvesting in rural as well as urban areas;
- A pro-active approach to tackle landed and bureaucratic power structures;
- Capacity building in user groups and in government agencies rather than investment in infrastructure alone;
- Economic incentives, such as secure property rights and metering, to improve access to water for the marginalized and more efficient use of scarce resource;
- Water conservation, e.g. through more efficient irrigation management,
- Creation of additional medium and large size reservoirs
- Leveraging the Water Resource for Development by implementing a comprehensive set of measures for the development and management of water resources, integrating the above recommendations

3.3 Promoting Sustainable Agriculture

If a country has a big agricultural sector, it has a multiplier effect on the socio economic and industrial growth of that country because of the multifunctional nature of agriculture and its linkages with other sectors across the economy. This makes sustained agricultural growth essential for improving the welfare and wealth of the majority of Pakistan's poor. As in most developing countries, agriculture in Pakistan occupies an important position because of its major share in the economy in terms of its contribution to national income and employment. The sector provides food to consumers, fibre to the leading domestic industries, and a market for industrial production. It is also a major source of foreign exchange earnings (nearly 2/3) in the form of raw and semi-finished products. With the help of farm and off farm activities, agriculture in Pakistan is the main source of income in rural areas, where 60% of the population lives. The sector has strong forward and backward linkages. The crucial role of agriculture in contributing to GDP has remained consistent since 1980. Although the share of agriculture has been slowly decreasing down from 53 percent in 1949 to 20 % in 2008, the agriculture sector is still the most important part of the economy of the country employing around 43.4 percent, although down from 65 percent in 1950, of the total labour force. There is a common perception that many prevailing policies discriminate against the agriculture sector, with price support policies undervaluing agricultural output alongside other institution interventions.

The agriculture sector can be broadly subdivided into four major sub-sectors, comprising major crops, livestock, fisheries and forestry. The crop sub-sector makes the second biggest contribution in agricultural value added to the GDP by contributing 47.2 percent, while the emerging livestock sector contributes about 49.6 percent of the agricultural value added to the GDP. Forestry and fisheries contribute little more than 2.5 per cent to the GDP. The health of these sub-sectors is crucial for the survival of the human and animal communities which rely on them. Pakistan's farmers and agricultural policy makers have achieved a series of significant successes in agricultural development, although these successes are still inadequate in number and scale to counter Pakistan's daunting demographic challenge. Focused efforts have led to sustained gains in certain commodities like rice, production of which been encouraged in order to increase exports to the Middle East; and cotton, which is planted over 14 percent of all area under cultivation in order to supply the textile sector with

raw material for export led manufacturing. Livestock production in Pakistan represents the fastest growing source of farm income by bringing sustainable financial benefit to millions of smallholders. Dairy production remains highly profitable for smallholders, and despite poor veterinary facilities and few input subsidies for the sector, market liberalization has raised the output prices smallholders receive.

Still, the productivity of all food crops is considerably below their potential in Pakistan. Considering the importance of agriculture to Pakistan's economy, there is a need to accelerate growth in this sector to feed its fast-growing population and generate enough supplies for exports in order to earn foreign exchange. The agricultural sector is beset with the problems such as decreased irrigation water, deteriorating soil health due to water-logging and salinity and deterioration of the quality of sub-soil water. The agricultural sector has the potential to shape the landscape, provide environmental benefits such as land conservation, guarantee the sustainable management of renewable natural resources, preserve biodiversity, enrich culture and contribute to the long-term viability of rural areas. Agricultural production across Pakistan has changed considerably since 1948. Today, over 22 percent of the cultivable area is cropped as compared to 12 percent in 1948; and land is increasingly used more intensively with more than 7 percent area sown more than once annually as compared to less than 1 percent area sown more than once in 1948. This expansion is largely the result of improvements in the irrigation system that makes water available to additional farm land. However, a substantial amount of fertile farmland has been lost to urbanization and water-logging, but losses have thus far been compensated by the addition of new land.

Ecologically, small land holders deploy a range of intensification technologies, from purely range-fed systems in arid areas to zero grazing stall fed regimes. In the intensive system they recycle manure and fodder between crop and livestock enterprises.

Through the adoption of a few varieties of crops, farming in Pakistan has quickly become a monoculture with low tolerance for diversity. The soil which housed these new plants has begun to suffer, losing nutrients because of a lack of sufficient recovery time or organic matter and has been damaged by the improper management of the irrigation demands of these crop varieties. This is not to deny that the green revolution was a phenomenal leap forward in the path towards meeting the nutritional requirements of a growing population. The Green Revolution increased yields and thus put off the spectres of famine in many parts of the country. However, this revolution unwittingly fostered the pollution of the environment by intensively using chemical fertilizers, which, in turn led to the heavy use of pesticides. Cotton, being one of Pakistan's most prized cash crop accounts for as much as 80 percent pesticides use in the country and about 70 percent of its foreign exchange. Cash cropping uses excessive farm inputs. Significantly, such inputs lead to nitration of water, water contamination and soil salination. Cash cropping per se also leads to various respiratory diseases.

Pakistan needs an efficient and competitive agricultural sector based on principles of sustainability, diversification and modernization to ensure food security, sustainable livelihood and with ability to contribute to the economic development for Pakistan.

3.3.1 Recommendations

- For most national economies, agriculture has traditionally been, and still is, subject to regulation and financial support by governments above all other sectors. State interventions have produced risk-free environments necessary to encourage massive investment enabling expansion in production capabilities through the provision of input subsidies, deficiency payments, subsidized credit, and guaranteed prices. But this support might have contributed to environmental degradation enabling input intensification by reducing the cost and thus boosting the application of such chemicals as nitrogenous fertilizers or noxious pesticides responsible for toxic runoff and water contamination. There is a need to realign farmers' incentives with more environmentally-responsible economic activity.

- To enhance the competitiveness of the agricultural sector the following steps need to be taken 1) strengthening science-based organizations and technology resources in order to enhance basic agronomic research into new varieties of crops and to reduce the high level of post-harvest losses; 2) as smallholders employ environmentally- sound multi-cropping and crop management practices, from the sustainable development perspective, land-reforms should be undertaken. 3) improving process efficiency and minimizing waste (and managing biological effluent disposal); 4) promoting the integration of food factories with backward and forward linkages; 5) improving the standards of safety both within the workplace and most particularly of the food products themselves with regard to ingredients and overall hygiene, 6) increasing public awareness of the advantages of quality/healthy foods; 7) encouraging access to export markets via improved infrastructure facilities (e.g., reduced waiting periods at major ports) and improved packaging and labelling able to meet international standards of health and hygiene.
- Increasing investment in agriculture to enhance medium term sustainability. More investments in transportation, research, extension, communication and irrigation infrastructure to strengthen markets and reduce marketing costs(farm-to-village road construction, which would improve the distribution of inputs and the marketability of outputs, especially high-value agricultural products), research to develop appropriate crop varieties, extension services to spread suitable inter-mediate technologies and raise farm productivity, timely public market information to help stabilize markets and irrigation infrastructure to ensure the most efficient use of water (water courses to improve water delivery, in addition to programs for better water management through user's association
- Biological Control of pests: IPM should be promoted as a first step, and trainings held on farms should demonstrate low input and synthetic chemical free approaches to first handle pest outbreaks.
- Mechanical Processing and Packaging: Crops headed for the international or high end local market require uniformity in the fruit's size and texture. Highly perishable commodities would benefit significantly from low cost/low energy packaging units; the supply and distribution of which after initial introduction should be left to the private sector.
- Soil fertility management: Over the past 60 years, much of Pakistan's production growth has come from yield gains as well as area expansion. The pattern of intensive cropping, in which farmers reduce fallow periods, and apply insufficient quantities of organic fertilizer has resulted in a loss of soil fertility. As area expansion has become gradually unfeasible, increasing attention will need to be devoted to maintaining soil fertility.
- Provide safety nets to support vulnerable groups: Short term targeted interventions are needed to support these groups in years of crop failure owing to natural calamities.
- Promote the practice of agro-forestry: This system of planting crops alongside trees is one that can be well suited for the various ecological zones of Pakistan. The concept is to create a complex and complete eco-system in which biodiversity is encouraged, and sustainability is achieved. Developing a sustainable agro-forestry system would be of great value Pakistani small farmers, based on a close analysis and intimate understanding of the region's environment and thorough education of the rural community. The variety of foods grown would improve the diet of the severely impoverished and allow them to take advantage of the limited land that they have without jeopardizing the health of the farm ecosystem.
- Development of an effective legislative infrastructure: Land disputes take up a big chunk of the farmers' time and resources and are a burden on the courts also. Local Government Ordinance 2001 aimed at promoting the alternative dispute resolution mechanisms but its impact has been minimal. There is a need to reduce the cost of litigations on the farmers and all the stakeholders need to work towards this goal

3.4 Noise Pollution

Noise is a subjective term commonly used for a class of over-loud sounds that are unwanted, disturbing and unpleasant in some situations. The sound level is measured in a unit called decibel (dB). The uninterrupted sound level that varies < 5dB during the entire period of observation is called continuous noise e.g. fan. While a noise which continues for >1 second and is then interrupted for > 1 second is called intermittent noise e.g. drill machine. Impulsive noise is characterized by a change of sound pressure of at least 40dB within 0.5 second with duration of < 1 second e.g. blasting (Tripathy, 1999). The sources of noise in the urban sector are generally classified as stationary sources and non-stationary sources. Noise sources related to heavy manufacturing and located mainly in an industrialized zone or in a shop such as stereos in music shops, loud speakers in mosques, are termed as Stationary Noise Sources. The mobile sources of noise such as transport (buses, cars, trucks, planes/aircrafts etc) are classified as non-Stationary Sources of noise (May, 1978).

The cost of noise is quite high in terms of psychological and physiological impacts on people. Noise may affect human health in a number of ways, including annoyance, interference with communication, performance, social behaviour, hearing loss and high blood pressure.

The Environmental Protection Agency has proposed the following noise level standards for different areas of activity.

Table 1: Proposed national standards on noise

Category of area	Standards effective from July 2007		Effective from July 1, 2010	
	Day time	Night time	Day time	Night time
Residential area (A)	55	45	55	45
Commercial area (B)	65	55	65	55
Industrial area (C)	75	70	75	65
¹³ Silence zone (D)	50	40	50	45

Source: draft noise standards proposed by Pakistan Environmental Protection Agency (EPA), 2007

However, according to the different noise level measurement surveys, no city of Pakistan comes anywhere close to following the prescribed standards. Maximum-recorded daytime noise level at major roads of Islamabad city is 104.5 dB (A) while the minimum is 47 dB (A) (Qureshi and Irfan, 2002). The situation for Rawalpindi city is more or less the same: the maximum and minimum measured noise levels are 108.5 and 48 respectively (Qureshi and Shaikat, 2002). For Gujranwala and Faisalabad the maximum noise levels are 100 dB (A), and the minimum noise levels are 41 and 47 respectively (JAICA, 2003).

High levels of noise could produce direct damage to the ears and could indirectly induce stress, especially, when they add up to air pollution and traffic congestion. Pakistan needs to start taking Noise as a major pollutant and undertake effective measures to reduce levels on roads and near/on sensitive places such as Hospitals, education institutions.

3.4.1 Recommendations

- The National Environmental Quality Standards (NEQS) for noise should be revised, and then should be strictly enforced on all sources of noise with a special emphasis on vehicular noise.
- In Pakistan, most people still don't consider noise as a form of pollution. In this regard, awareness should be created among general public via print and electronic media. An awareness campaign can be launched in this regard. The banners with caution of "Silence Zone", "No

¹³ Silence Zone: an area comprising not less than 100 meters around hospitals, educational institutions and courts.

Horns” and “Speed Limit” must be displayed within 100 meters of schools, hospitals and courts.

- Regulate and control ‘Noise’ at the emission level.
- Revise the noise standards to a realistic level suitable to Pakistan’s situation.

3.5 Air Pollution

The problem of air pollution in Pakistan is very acute. The Ministry of Environment has developed the Pakistan Clean Air Programme (PCAP) as a vehicle to support a range of ongoing and proposed initiatives for the management of urban air quality, involving a variety of sectors, levels of government and development partners. Under the PCAP, the Pakistan Environmental Protection Agency with grant assistance of the Government of Japan¹⁴ has set up seven continuous Air Quality Monitoring Stations¹⁵ and three Mobile Air Quality Monitoring Stations to measure PM10 and PM25 (Particular Matter). Presently these units are being run on trial basis. Data generated so far has shown that PM10 and PM25 in urban centres have reached alarming levels. In this light, Ministry of Environment has taken the following steps:

In consultation with Ministry of Petroleum and Natural Resources, Engineering Development Board, Pakistan Automobile Manufacturers Associations and other stakeholders, the Ministry of Environment decided that: (i) all petrol driven vehicles imported or manufactured locally will comply with Euro-II emission standards with effect from July, 2009. Existing models if not complying with Euro-II emission standards will have to switch over to Euro-II models by no later than three years if not immediately; (ii) all diesel driven vehicles imported or manufactured locally will comply with Euro-II emission standards with effect from July, 2012. The Ministry of Petroleum and Natural Resources will ensure availability of Euro-II compliant diesel (with sulphur contents 0.05 percent) with effect from January 2012.

In consultation with provincial governments, the Ministry of Environment has worked out a model for vehicle examination/emission testing to be established in the country to follow a uniform procedure for motor vehicle inspection for public and private vehicles. The first pilot project in this regard has been approved at a cost of Rs 294 million. It is expected that motor vehicle centres will be established with the help of public private partnerships throughout the country.

Air Pollution is too big a challenge for Pakistan given its implications for public health and degradation of the habitat. It still needs much more and more effective efforts by all the stakeholders to effect a real reduction in the air pollution levels.

3.5.1 Recommendations

- a) Enact the National Clean Air Act.
- b) Ensure effective enforcement of the National Environmental Quality Standards regarding air pollution.
- c) Renewed policy focus on the reduction of harmful emissions by strengthening regulatory programs
- d) Establish standards for vehicles at the manufacturing stage.

14 The Bank’s support for the NEP is initially focused on providing technical assistance to M/o Environment for the development of **provincial action plans**. We are doing it. The aim is to facilitate a process through which provincial authorities will establish their own priorities within the broad matrix of national environmental goals laid out in the NEP. For implementation of the PCAP, while JICA is funding monitoring equipment which will provide necessary data, there is limited capacity to plan and implement specific interventions. The Bank will initially provide technical assistance, with the possibility of subsequent investment support as plans become more concrete.

15 Two continuous Air Quality Monitoring Stations have been installed in Karachi, two in Lahore, and one each Islamabad, Peshawar and Quetta.

- e) Update and enforce fuel specifications.
- f) Make use of catalytic converters in new and in-use vehicles mandatory.
- g) Phase out sulphur from diesel and furnace oil.
- h) Promote cleaner production technologies.
- i) Phase out two stroke vehicles completely.
- j) Encourage cost effective inter-city mass transit systems in major cities.
- k) Promote non-motorized means of travel such as cycling and walking through provision of adequate walkways and cycle lanes in cities.

3.6 Sustainable Management of Forests

Forests, scrubs or trees planted on the farm lands cover about 4.22 million hectares (ha) area in Pakistan, which is only five percent of the total land area of Pakistan (GoP, 2005). However, according to the United Nations Food and Agriculture Organisation (FAO) (2005) only three percent of the total land area of Pakistan is under forest cover. The difference in statistics stems from the definition of legal areas of forestland as an indication of forest cover. Areas usually described as “forest areas” in Pakistan are the lands that are under the administrative control of provincial forest departments rather than tree canopy (Suleri, 2002). Therefore areas officially designated as forests may be devoid of trees.

Most of the country’s forests are found in its northern part (40 percent in NWFP, 16 percent in Northern Areas and six percent in Azad Kashmir). The total forest cover of Pakistan is very low when compared with the world average of 30 percent, while in Asia the forests cover 18 percent of the total land area. The forest area of Pakistan is even lower as compared to the South Asian countries of the region. For example in Bhutan, Sri Lanka, Nepal, India and Bangladesh, forest area is, 64, 30, 27, 22 and 10 percent respectively of the total land area of these countries (FAO, 2005).

There are two main categories of forests viz. state owned and private. The provincial forest department manages both of these types of forests. In private forests the owners have some rights regarding forest use but in state or public forests, the local people have very limited access and rights, therefore local people and the forest departments are always in the state of confrontation with one another.

Pakistan has not been lacking in introducing policies and plans to change the situation for better. The National Conservation Strategy (Ministry of Environment, 1992) provided the following core areas for addressing the issues of forestry:

- Protecting watersheds
- Supporting forestry and plantations
- Restoring range lands and improving livestock
- Conserving bio-diversity
- Increasing energy efficiency
- Developing and deploying renewables

The main thrust of the Forestry Sector Master Plan (1993) was on development of farm forestry for supply of wood, and participation of people for improvement and conservation of forest, watersheds, rangelands, and environmental stability.

The government also resolved that the commercial timber harvesting shall only be resumed in those areas whose right-holders and owners undertake to fully participate in the management and regeneration of their forests in association with the Forest Department, with due regard to meeting the minimum sustainable needs of the non-rights-holders to the extent of the productive capacity of each forest (MoE, 2002).

But despite the presence of all these policies, the deforestation rate in Pakistan is very high, as 39 thousand hectares of forests are vanishing annually. Between the years 1990 and 2000, the deforestation rate in Pakistan was 1.5 percent annually (FAO, 2005). Increase of population and urbanization, forest cuttings for roads construction and farming purposes, dependence of rural population on wood for fuel and heating, over grazing of land by cattle and timber mafia are main causes of forest depletion. The top-down non-participatory forest management strategies by the state forest departments has also been reported as the major cause of deforestation (Ahmed and Mahmood, 1998; Shahbaz et. al., 2007).

3.6.1 Recommendations

At the global level, participatory or joint forest management (JFM) has evolved as a major strategy for mitigating the problems of forest depletion and ensuring the sustainable livelihoods of the local communities living in and around forests. The (draft) National Forest Policy (MoE, 2002) also mentions improved livelihoods of people as its fundamental goals, acknowledging a people-centred approach to sustainable forest management.¹⁶ It is an umbrella policy providing guidelines to the federal government, provincial governments and territories for the management of their Renewable Natural Resources (RNR). The policy calls for involvement of local communities in implementation of projects, management of forests and protected areas, and implementation of social forestry.

The policy seeks to launch a process for eliminating the fundamental causes of the depletion of RNR such as forests, watersheds, rangelands, wildlife, biodiversity and their habitats through the active participation of all the concerned agencies and stakeholders, to realize the sustainable development of the resources. The real challenge now is to put the precepts into practice. Pakistan needs to uphold the principle of social equity for stakeholders, in policy as well as in practice, in forestry and satisfy environmental imperatives, including biodiversity conservation, plantation management, natural forest management, wildlife management (Khan et al., Detailed reference needed)

3.7 Waste Management

3.7.1 Solid Waste and Sewage

Pakistan is estimated to suffer an annual loss of at least Rs. 650 billion due to wastage in almost all sectors of the economy including agriculture, manufacturing, water resources, transportation, education and health. Wastage in the agriculture sector consist of post harvest losses in various crops, fruits and vegetables, low yields, sub-optimal use of water and seepage, theft of forest wood and cutting of trees, and a lack of veterinary facilities in the rural areas causing damage to livestock and poultry. About half the water supplied to cities and towns is wasted through physical leakages, pilferages, and inefficiencies in billing and collection.

Municipalities in Pakistan across the country are facing a serious challenge of handling greater amounts and types of wastes each year, as population and consumption levels rise. Hazardous waste is also a fast growing problem, resulting from ever increasing use of chemicals for industrial, agricultural, household and health care activities. Besides, there are huge stocks of obsolete chemical dumps at depots/stores in different parts of the country. [For example, Pakistan possesses approximately 5,000 tons of obsolete pesticides] In Pakistan, there is no operative integrated solid waste management programme at the national level at present. The bigger cities have now started having better systems for waste disposal. But still, according to conservative estimates, around 40 percent of the waste is discarded in the streets or at collection sites. Extensive scavenging at waste dump sites apparently reduces the waste quantity but the scavengers usually leave the waste scattered over larger areas as they sift through it. In other words, even in those cases, where the dump sides are available, the waste is allowed to pollute a bigger area. Improperly-disposed garbage makes its way into the roads, streams, lakes and rivers by various means e.g., wind, rainwater flows etc. This huge

16 Is the Forest Policy Still a Draft Policy?

quantity of debris makes the country more vulnerable to water-borne diseases and dirt. In ecosystem, this waste gets entry into the food chain and poses serious hazards for health. Domestic water use is very limited in rural Pakistan, which itself poses a serious threat to the health of the people. The main reason for this is the lack of clean water supplies and provisions for rural communities. As compared to the cities where the water consumption is 32 gallons per head per day, rural per capita water consumption measures at just one gallon per day according to an IUCN estimate.

As far as the urban wastewater is concerned, less than half of it is disposed off in sewers. But most of the sewage remains untreated. In Pakistan's largest city, Karachi, the Karachi Water and Sewage Board manages less than 20 percent of the sewerage system; the remainder is managed by other public and private actors such as the Karachi Municipal Corporation, District Municipal Corporation, Cantonment Boards, co-operative housing societies, builders, and the people themselves. Some cities in Pakistan, such as in Karachi and Islamabad have constructed a few wastewater treatment plants, but the quantity of these Plants falls short of treating the entire quantity of the wastewater generated. The situation will continue to pose serious direct threats to public health and environment, until control measures, both preventive and curative, are developed and implemented with the involvement of all stakeholders at the planning/policy levels.

3.7.2 Sanitation

Proper sanitation facilities are available to only 42 percent of the total population, with significant gaps between rural and urban areas: 65 percent in urban areas and 30 percent in rural areas (Planning Commission, 2005). Whereas flush toilets are common in urban areas of all provinces, a considerable proportion of the rural population has to do without any sanitation system and uses agricultural land for defecation. However, even in urban locations, open drains are the most common form of sewage (Federal Bureau of Statistics, 2005). According to an estimate, in Pakistan, 34,370 tones of human and animal excreta is being produced per annum and dumped into the environment. Out of this, approximately, 21,096 tones (80 percent) of the excreta is produced in rural areas and ultimately deposited in agricultural lands. Girls and women are particularly affected by lack of access to latrines, since they have to wait for nightfall to relieve, exposing themselves to security as well as health risks. Pakistan needs to strictly implement the guidelines of the Convention on Persistent Organic Pollutants (POPs) to reduce dumped chemicals to the non-harmful level.

3.7.3 Waste Reduction as a measure of efficiency in Production

Wastages in the manufacturing sector result from material wastages, high energy consumption, poor quality, and inadequate skills. In the minerals sector, there are losses due to improper and poor mining, cutting and polishing of gemstones. The performance of the transport system has been poor, with high economic losses from inefficiencies, congestion, and poor quality roads. In the power sector, huge revenue is lost annually due to high transmission, distribution, and auxiliary losses and pilferage. Considerable energy losses and wastages also occur due to poor and old equipment. All these different kinds of wastes are usually released to the ecosystem directly or indirectly. The prevalence of these 'wastes' in almost all the sectors and activities makes a national challenge; perhaps a cultural problem too.

Minimizing and eliminating wastages in the economy is an important focus of the MTDF 2005-10. It is expected to be achieved by administrative and technical efficiencies, skill development and programs for upgrading of facilities and equipment as appropriate. By making the environmentally sound management of sewerage and solid waste a core issue in the National Conservation Strategy of Pakistan, and recently launched National Environmental Action Plan of Pakistan, the government hopes to keep a sustained focus on better asset management, including an emphasis on maintenance, management, rehabilitation and upgrading of existing facilities, wherever feasible. (Source: Planning Commission, 2005). However, still most of the sectors are not willing or motivated enough to enhance

their efficiencies by controlling the generation of waste and/or reducing the harmfulness of the waste being produced.

3.7.4 Recommendations

- Strengthening institutional capacities in hazardous waste management and environmentally sound management of solid waste and sewage-related issues
- Development of a Hazardous Waste Management Plan for an environmentally sound management of hazardous wastes including the prevention and minimization of hazardous waste and illegal international traffic in hazardous wastes
- Mandatory development of master plans for Urban Wastewater Treatment Facilities and creation of Advisory Service Unit for establishment of integrated system for management of chemicals and hazardous wastes
- Policy focus to be shifted to support waste reduction at source, waste reuse, recycling and waste composting;
- Ban on import of products either for disposal;
- More training programs should be developed and launched in health care units across the country for sanitary and paramedical staff in safe and environmentally sound handling, transportation and storage of hazardous chemicals, contaminated equipment and health care wastes;
- Manufacturers should be obliged to take the responsibility for environmental and health impacts caused at all stages of their products life cycle, including wastes by introducing a policy of an Extended Producer Responsibility or Producer Take Back policy, based on Polluter Pay Principle;
- The on-going program of self-monitoring and reporting (SMART) to assist the industry to draw and implement their environmental improvement plan need to be strengthened, made mandatory for high risk sectors, with strong support for its effective and wider implementation across the country;
- Adoption of SAICM (Strategic Approach to International Chemical Management) linking the chemical management to national development planning to practice an integrated and coordinated approach to national chemical management (including waste management).
- Stricter enforcement of the National Environmental Quality Standards and Self-Monitoring and Reporting System.
- Introduce discharge-licensing system for industry.
- Making installation of wastewater treatment plants an integral part of all sewerage schemes.
- Devise and implement the National Sanitation Policy.
- Enforce the rules and regulations for proper management of municipal, industrial, hazardous and hospital wastes. Develop and enforce regulations to reduce the risk of contamination from underground storage tanks.
- Devise and implement guidelines for sustainable management of mining and oil exploration interventions as well for rehabilitation of expired mines/exploration sites.
- Launch National Oil Spill Contingency Plan.
- Frame Pakistan Oil Pollution Act and adopt measures for mitigation of pollution caused by oil spills.
- Establish a Marine Pollution Control Commission.
- Provide financial and other incentives (reduction/elimination of tariffs, low- interest loans, appreciation certificates and awards) for technology up gradation, adoption of cleaner technology, implementation of pollution control measures and compliance with environmental standards.

3.8 Environmental Disasters and Emergency Management

Natural calamities, as the name suggests are unavoidable. However, these calamities can be prevented from turning into human disasters if the right policies are in place and if they are effectively implemented.

Pakistan has recently experienced two environmental catastrophes, worst in its history, i.e., the earthquake of 2005 and floods of 2007. Both of these disasters claimed thousands of human lives (80,000 in the earthquake alone), displaced millions, and adversely affected the physical, natural, social and financial assets of the affected population. Lack of preparedness, slow mobilization of rescue operations, and poor coordination among different relief agencies, price gouging and lack of transparency were some of the challenges identified during these emergencies.¹⁷

Although disaster preparedness agencies both at national as well as provincial level have been established, a high level body called National Crisis Management Cell is up and running and Earthquake Relief and Rehabilitation Agency [ERRA] is taking care of earthquake survivors, however it is widely believed that disaster management policies and practices still lack the capacity to possible environmental disasters, which are expected to increase in South Asia, as this region is particularly vulnerable to Climate Change related upheavals. Pakistan now has 'emergency response' services in major cities to combat the emergencies such as fire etc. An extensive network with appropriate capacity can improve the overall preparedness and capacities, which then could be used at the time of major calamities.

3.8.1 Recommendations

The policies and practices shape human activities that may either induce or reduce vulnerability to environmental emergencies. At the same time, it is an established fact now that human activities are primarily responsible for climate change. Various studies on poverty-environment indicators and linkages in Pakistan suggest that poverty in Pakistan is policy led, which in turn, is one of the main cause of widespread natural emergencies. Pakistan needs to reduce poverty to reduce the vulnerabilities on the one hand and undertake effective capacity building initiatives to enhance preparedness to face the natural disasters and calamities.

3.9 Energy Sector

The energy demand in Pakistan for primary fuel as well as electricity is increasing steadily. The fossil fuel resources, however, will not last for many years. In fact, at the current rate of production the oil and gas reserves will last for only 14.4 and 22.9 years respectively¹⁸. According to some estimates, a large hydroelectric potential – to the tune of around 30 gigawatts – exists, which is likely to form the backbone of future electricity generation. But apart from the costs, there are issues – environmental, social as well as political - that make large-scale dams controversial.

Energy consumption needs of Pakistan are overwhelmingly being met by fossil fuels (55%) and biomass (40%). Over 90% of the energy is consumed by industry, transportation, households and commercial users. Of the total consumption of oil, 64% is used in the transport sector and 20% is needed for electric power generation. Nearly half of the natural gas production is consumed in electric power generation, and the rest in the industrial, domestic and commercial sectors.

Energy consumption in Pakistan is heavily dominated by fossil fuels but domestic oil production, however, is able to meet only about 15% of the need. The rest is imported at a heavy cost to the foreign exchange earnings. The country has, over the years, developed a vast infrastructural network for the supply of natural gas. The government also follows a policy of increasing natural gas supplies

¹⁷ Reference

¹⁸ Energy Year Book 2007, Ministry of Petroleum and Natural Resources, Government of Pakistan.

in the country. Pakistan is now one of the largest natural gas user country in Asia. This has a bearing especially on the transport sector, which is the third largest energy-consuming sector after the electric power and industry sectors.

The growth rate of electricity consumption in the residential sector alone is estimated at an annual average of over 10%. Another reason for the high consumption rates are that the electric appliances being marketed in Pakistan typically consume 25% more energy than high efficiency appliances currently being marketed in other countries.

In these circumstances, the importance of developing renewable energy cannot be over-emphasized. More than the availability and affordability, these are negative impacts on the Climate Change and local pollution of our current mix of energy which require that Pakistan addresses different dimensions of the energy problem of Pakistan to let it contribute to the sustainable development in Pakistan.

The national energy system in Pakistan is and has been traditionally demand based, with supply deficiencies being addressed variously through imports, rationing and price equilibration- the last being a recent recourse. The level, structure and evolution of this demand are derived from socio-economic variables; population growth, economic activity and the efficiency of energy use at the sector level. On a cross-country comparison basis, Pakistan is shown to be both 'energy deficient' and 'energy profligate.'

Renewable energy is still in its infancy in Pakistan except for hydel power generation. The potential for renewable energy with the exception of mini and micro hydel power generation has largely remained unutilized. While it will take considerable political will and financial resources to harness and utilize this resource, measures to improve energy efficiency are relatively more viable. However, because of the limited additionality that this recourse offers, it is imperative that both options (energy efficiency and renewable energy) be seen as complementing rather than competing with each other.

3.9.1 Search for a balance between the Renewable and non-renewable Energy

The current energy mix in Pakistan has the dominant share of fossil fuel. It is not only the pollution which is creating problems for Pakistan, the usage of oil is also not financially sustainable, as the circular debt to the oil importing companies and refineries has resulted in a sharp fall in power production, resulting in significant economic losses, especially in 2008. Similarly, the extensive and somewhat wasteful usage of natural gas as an alternative to imported oil is not sustainable as the gas deposits are fast depleting. Pakistan has initiated a few wind and solar energy projects but the results have been non-significant due mainly to a nonchalant attitude of both the government and private sectors. Bio-fuel and hydro power therefore remain as the major possible alternatives.

3.9.2 Alternative of Bio-fuel

Though the recent food scare in Pakistan, as well as at the global level, has obliged the policy makers to re-visit the bio-fuel option more critically, especially after the recent dramatic fall in the oil prices in the international market, yet it could still be a useful option for Pakistan. In Pakistan the specific bio-fuel is ethanol, extracted from molasses, a by-product of sugar. The potential for producing bio-fuels from corn, rice husks and wood waste exists, but has not yet been tapped.

The sugar industry in Pakistan is the second largest after textiles -- 76 sugar mills are currently operating at or below their capacity. The production of sugar is above 4.0 million tones in 2007-08, up from 2.89 million tones in 1991-92. The production potential, however, has not been fully realized in Pakistan, as the sugarcane yield remains well below the global average. Because of sugar prices doubling since 1992, Pakistan has become rather non-competitive globally. The emerging markets in

industrial alcohol and fuel ethanol do offer good prospects of making sugarcane production economically viable, without creating food insecurity.

About 80-85 per cent of the total sugarcane production goes towards producing sugar. The remaining 15-20 per cent is converted into gur, a local variant of sugar, which is largely produced and consumed in the NWFP. Cane crushing produces sugar and molasses as a by-product. The molasses-to-bioethanol conversion process is conducted in distilleries. Currently, 21 distilleries produce industrial alcohol in the country. Most of these distilleries are a part of sugar mills and are situated on-site, making the production cycle an integrated one. The mills receive the cane, crush it for sugar, store the molasses in storage tanks on-site and then pass it on to the distilleries for industrial alcohol production. Industrial alcohol can be converted into fuel alcohol by using molecular sieve technology, which requires a capital expenditure of about \$1.5 million and a completion period of five to six months. As many as eight distilleries have so far installed the molecular sieve technology to process industrial ethanol into fuel ethanol. The fuel ethanol conversion plant is linked to the industrial alcohol plant.

Export trends

Until recently, the bulk of the raw molasses was exported -- with exports ranging between 0.70 million and 1.75 million tones -- and only small quantities were converted into industrial alcohol for domestic use and export. In the last five years, however, a substantial proportion of these molasses was converted into alcohol. Fuel-grade ethanol, which is blended with petroleum products, fetches the highest price in the world market.

The distilleries in Pakistan have three major buyers. The domestic industry purchases industrial alcohol for various purposes. Fuel ethanol is currently only being sold domestically in small quantities to the Pakistan State Oil (PSO), as part of a pilot project under which ethanol (10 percent) is blended with gasoline (90 percent). The third and predominant outlet is exports. Most of the industrial and fuel ethanol produced in the country is exported through international trade houses. Alcohol exports have increased rapidly in the last five years, reaching 167,600 tones in 2006-07.

Sustainable development implications

Bio-ethanol is produced entirely from molasses, a direct by-product of sugar production. While other indigenous raw materials -- such as maize, rice, wood pulp and other forest residues -- are available in large quantities, they do not offer the same scope for value addition that sugarcane does. In other words, the opportunity cost of producing bioethanol from sugarcane is substantially lower than from other available sources. The sustainable development implications are, therefore, positive. Bioethanol production is not likely to displace food crops or cause deforestation. This is because there is a large untapped potential to convert raw molasses into bioethanol, provided the right kind of policy incentives are in place. However, in the long term, the sustainable development concerns may materialize if the production of bio-fuels [sugar] in Pakistan takes off. In view of the increasing scarcity of water and land, land-use conversions (deforestation) and crop-switching (threatening food security) would then become legitimate concerns. The wriggle-room here could be provided by sugarcane yield increases and the introduction of sugar beet on a large scale. Sugar beet can be inter-cropped with sugarcane, and it has relatively higher yield as well as a higher molasses-to-ethanol conversion ratio.

Another environmental concern relates to industrial effluents. Wastewater flowing out of distilleries is highly contaminated; if left untreated; it can pollute fertile land and harm aquatic life in water bodies. However, contrary to the general lack of effluent treatment by industries in Pakistan, most distilleries have installed treatment plants, albeit with varying efficiencies. Cost savings associated with waste treatment are the main incentive for distilleries to be environmentally conscious. Distillery wastewater treatment is an anaerobic process through which the organic components of the wastewater are converted into biogas, with negligible excess sludge production.

The two major products of the treatment process are methane gas and carbon dioxide. Methane gas is recycled as an energy source in the distilleries, meeting as much as 70-90 per cent of the total energy requirement. In effect, distilleries have a 'closed carbon cycle'. The final discharge, when diluted with subsoil saline water, has BOD and COD concentrations reduced by as much as 97 per cent and can be used for land irrigation. The environmental gains from wastewater treatment are thus obvious, while the cost-savings incentives to distilleries are too. In relation to the end-use, the consumption of fuel ethanol in automobiles leads to a substantial reduction in emissions. The blended fuel provides a higher-octane content without any presence of lead (traditionally used in gasoline as a booster), thus enhancing car performance and at the same time reducing disease-causing emissions from car exhausts. Although no Pakistan-specific estimates are available, the general norm is that for blended gasoline carrying 22-24 per cent fuel ethanol, reduction of fossil carbon dioxide from the tailpipe could be as high as 80 per cent. Pakistan government has not yet made any mandatory threshold for ethanol mixing with gasoline which clearly demonstrates that economic and environmental benefits associated with bioethanol production have failed to induce adequate policy response.

3.9.3 Expanding the Energy Production

Energy is the lifeline of economic development. Pakistan historically has been subjected to energy demand suppression due to limited supplies and lack of infrastructure development for provision of energy to the industrial sector. The non-availability of sustained and affordable energy to industry has suppressed economic growth and created a declining tendency for industrial investment in the country. The per capita energy consumption, which is one of the key development indicators as well as a measure of quality of life of a country, is low with only 14 million BTUs, as compared to 92 million BTUs for Malaysia and 34 million BTUs for China. The input dependence of the country for energy at 24 percent is also high. It is now more important than ever that an adequate supply be made available to industry to drive economic growth, and create employment opportunities. Energy has also to be made available to the domestic sector and the life-line segments of society to provide economic support and the convenience of clean fuel for cooking and heating and prevent the continuing environmental degradation and deforestation by massive use of wood for domestic fuel. The commercial availability to various sectors of the economy will help in increasing job opportunities, enhancing agricultural productivity, improving standard of living and preserving environment through reducing deforestation

Energy is very high on government's agenda. A long term integrated Energy Policy covering the period up to 2030 has recently been approved by the Government. The energy sector development is aimed at:

- (i) enhancement in the exploitation of hydropower, and exploration and production activities of oil, gas and coal resources, and to increase the share of coal and alternative energy in the overall energy mix,
- (ii) optimum utilization of the country's resource base to reduce dependence on imported oil through an institutionalized strategy,
- (iii) creating an environment conducive to the participation of the private sector, and
- (iv) developing the local energy scenario in the context of regional perspective. The current energy mix includes 30 percent oil, 50 percent natural gas, 6.5 percent coal, 12.7 percent hydro and 0.8 percent nuclear. By 2010, the share of oil and gas is targeted to be reduced to 26 percent and 49 percent respectively with corresponding increases in the share of coal to 9 percent, hydro to 13.9 percent, renewable to 1 percent and nuclear to 0.9 percent. The government aims, over the long term, that the share of coal, renewable and nuclear components in the energy mix would increase, with substantial reduction in the share of oil. Whether the government would be able to mobilise the necessary investments in coal, wind and nuclear remains to be seen, however.

3.9.4 Energy Conservation:

The energy conservation appears to be high on government's agenda. A programme in this regard is being undertaken, including enactment of necessary laws, by Ministry of Science and Technology and ENERCON (National Energy Conservation Centre, Ministry of Environment), for energy efficient building designs, use and manufacturing of energy efficient appliances. Co-generation technologies to conserve energy would be promoted. ENERCON would develop a mechanism to monitor strict compliance of energy conservation laws. The Alternate Energy Development Board (AEDB) was established in 2003 as a central national body which will facilitate development of renewable energy (such as wind and solar energy) projects. But the pace of implementation and the resultant progress in energy conservations remains painfully slow. Pakistan has not yet fixed any mandatory energy efficiency targets for particular sectors. China has set a very ambitious energy efficiency target for its industry. Such a policy could help Pakistan too. Subsidizing energy savers alone can not help.

3.9.5 Strengthening Energy Production and Conservation Policy of Pakistan

The government has been promising that it would promote energy efficiency and renewable sources of energy in order to achieve self-reliance in energy supplies and as a means to sustainable development. To this end, the government may devise and implement National Energy Conservation Policy, containing the following elements:

- a) Formulate and enact energy conservation legislation and audit standards.
- b) Make the Building Energy Code as part of the Building Code of Pakistan.
- c) Strengthen financial mechanisms, institutions, and associated policies and regulations to provide innovative lending especially in the demand side efficiency improvement.
- d) Give preferential status and tax incentives to energy efficient domestic products and imports.
- e) Develop and implement a plan for conversion of public transport to CNG.
- f) Establish energy resource and information centres in provinces
- g) Institute the National Energy Conservation Awards.
- h) Promote renewable forms of energy (wind, solar, bio-gas etc.) at all levels.
- i) Encourage use of waste resources for energy production.
- j) Commercialization of wind power potential in Pakistan.
- k) The production of Solar photovoltaic (PV) systems, which are currently prohibitively expensive, should be subsidized
- l) Wind energy potential should be charted out in the coastal areas and investment in wind farming may be incentivised.

Chapter 4

Promoting Sustainable Development as A Social Policy in Pakistan

The crucial difference between the traditional development discourse and practice and sustainable discourse and practice is that the latter accounts for the social and environmental aspects of the development while measuring the Progress in a society. Traditional GDP calculations do not in fact include the environmental and social factors. With the emergence of scholarly work on developing more comprehensive indices such as the British Measure for Domestic Progress [MDP] adjusts personal consumer expenditure to account for a variety of economic, environmental and social factors not included in the GDP. MDP adds in the benefits of household labor, accounts for income inequality, subtracts social costs (such as crime, congestion, family breakdown) and environmental costs (such as air pollution, resource depletion and the 'hidden' costs of climate change) and makes adjustments for long term investment and economic sustainability. Though, in Pakistan, we do not yet have an Index like MDP, but it is expected that by using methodologies developed across the world, more realistic account of progress would soon be available than is provided by economic output on its own. The NSDS aims at initiating a re-centering the debate on the 'real social progress' being achieved by the Pakistani society till date and in the coming years on way to the realization of the ideal of Sustainable Development for Pakistan. Looking at the social scene in Pakistan marred by crime, insecurity, trust deficit, cynicism, social problems, stress on the family and social fabric, one arrives at the conclusion that the social progress in Pakistan has become increasingly decoupled from economic growth over the last 60 years and is worsening lately at an alarming speed. The numbers of mobiles or motorcycles actually do not give a true picture of the progress of the country. There is little doubt that the government is failing to achieve sustainable development. Pakistan government actually does not have Sustainable Development targets of its own. It has piggy backed on MDGs. In other words MDGs define government's road map to a minimum of sustainable development targets. It is midway to 2015 and the realization of MDGs on all the accounts is far from being achieved.

The most important Social Policy, the government of Pakistan has is the Poverty Reduction Strategy. In this Strategy, we continue treating Social Policy as a tool to address the slowness of trickle down. It appears Pakistan has drawn few lessons from the experiences of late industrializers that have been successful in reducing poverty in very short periods. These countries did not focus on poverty reduction in particular, but on long term processes of structural transformation that included employment expansion and/or the pursuit of Universalist social policies. The experience of the now developed countries demonstrates the critical role of social transfers for reducing poverty, where social-democratic models have been the most successful at doing so. The decision makers need to realize that the role of social protection goes beyond risk management and poverty reduction. Pakistan desperately needs to take a broad approach, which takes into account that social policy has the potential to contribute to economic development, (gender-) equality and equity, democratization and political legitimization, as well as social cohesion. Pakistan needs to adopt such a notion of Social Policy, which is concerned with redistribution, production, reproduction and protection and works in tandem with economic policy in pursuit of national, social and economic goals. Recent UNRISD research has shown that, for social policies to be inclusive and equitable, the various roles of social policy must be equally represented in a national social policy strategy. In particular, pursuit of the productive and protective objectives of social policy should not come at the expense of the redistributive or reproductive ones. There is a need to revisit the theoretical assumptions of PRSP II as far as its treatment of Social Policy is concerned and adopt such a Social Policy in Pakistan, which could contribute to the realization of sustainable development goals of Pakistan.

4.1 Taking Care of Health Care System in Pakistan

In the domain of Social Policy, Health Policy is the most important and relevant policy when it comes to the mitigation of the ongoing negative effects of wrong economic policies and the degraded environment. Health problems are not always a result of environmental degradation but such a large number of maladies and epidemics are traceable directly to the quality of environment or are confounded due to environmental factors that Health policies and expenditure have to be the most important element of any Strategy of sustainable Development. In Pakistan, we are witnessing a growing awareness of these linkages, which is not only creating an added awareness to reduce different kinds of pollutions; more funds are being allocated to the prevention such as to the quality of water and waste management. The positive socio-economic effects of successful healthier policies can hardly be over-emphasised. Preventive and palliative health policies therefore make an integral and important part of any Sustainable development strategy.

Environmental degradation has a far-reaching impact on the health of the population, which in turn has a direct effect on the productivity of the country's labour force, its competitiveness and the overall potential for economic growth. Environmentally related factors cause roughly one third of all child mortality in Pakistan, which is the highest in South Asia. High children mortality and morbidity rates, and the impacts of environmental quality on cognitive development of children reduce their opportunities to attend school and become skilled workers, hence limited their ability to escape the poverty cycle they have been trapped in from generations.

4.2 Sustainability Concerns Regarding Pakistan's National Educational System

The combined effect of the factors such as misplaced policy focus and direction, inefficient designs, in-effective implementation and supervision, horizontal and vertical disconnects, low and varying capacity at the local and provincial levels have weakened Pakistan's national educational system to the extent that it appears to be incapable of robustly responding to the competitive pressures brought about by the globalization on Pakistan economy and society in the beginning of 21st century. Nor has our educational system succeeded in reducing disparities and divisions in the society. The challenges thrown by the globalization are not unique to Pakistan. But our failure to provide an effective response is characteristic. Riddled with too many weaknesses and ills, the fragmented and disparate educational delivery services in public and private sector is incapable of rising to the occasion without reforming itself. Pakistan has not lacked in bringing out new national educational Policy almost every five years on an average. A new National Education Policy is being finalised these days aiming to provide the guiding principles of a comprehensive reform program. Whether this Policy would enable Pakistan's educational system to fulfil its emancipatory promise and can help Pakistan transform the challenges of globalization into opportunities, only the time would tell. But as the Education is the most important building block towards the realization of sustainable development in any country, it is extremely important that the educational system in Pakistan performs way better.

Following are the challenges that provide overarching framework for the policy responses given to varied specific challenges at different levels of education:

1. Globalization & Competitiveness
2. Unity & uniformity in the national educational system
4. Effective management of Pakistan's educational system to give national response in an effective way.

4.2.1 Unity and Uniformity in Pakistan's Educational System

The national educational systems in different countries have evolved with the state in such a way that they appear to flow from each other. That is the reason, modern states have one educational system, customarily called the 'national educational system'. No other systems in a State, except the national army and the national educational system, share the ideals, objectives, purpose of a State. The institution of Education in fact acts as the repository of the trust which the citizens have in the State, mediating the achievements of the past with the aspirations of the future for ALL the citizens of any given State. It is this identity between the State and the Educational System, which bestows the singularity to the national educational system, making it a unified and unifying entity. To promote and protect this Unity, the national educational systems strive to establish the uniformity in structures and modes of education throughout the country. As the national educational systems evolve also as a response to the particular demands of distinct ethnic, social, economic, religious, political groups and communities, there is always a space for diversity. This diversity can lend strength to the educational outcomes, especially in a federation like Pakistan, if this does not work at cross purposes with the uniformities, which any national system would need to retain its unity and to be able to offer a national response to challenges, which have the potential and possibility of affecting whole of the country such as the loss of competitiveness, extremism, security threats, subversion of national values etc.

The emergence and continued presence of the private sector run parallel systems of education in Pakistan i.e., private schools and madaris apparently violates the principle of the unity of the educational system seriously. The provision of educational services is a public function. Our Constitution expects the public sector to take the lead in performing this public function. The relative failure of the governmental educational system has resulted in the emergence of the alternate education provider i.e., the private sector. When, a private educational institution is providing educational services for a fee or as a public good, with an almost total administrative autonomy, it still remains a public function. The assurance of uniformity therefore would remain the responsibility of the State. It can do it entirely on its own or can develop public-private partnerships to ensure that the exigency of uniformity in standards and purpose of education is not compromised.

The loss of Unity in our educational system is best evidenced in the lack of beneficial and synergetic linkages between the Technical, Vocational, Professional and Scientific Education. If Pakistan has to become a talent rich country, it needs to integrate and gel all the four with the national educational system.

Governance refers to the way in which any social unit – from society as a whole to the smallest community organization – organizes itself politically to undertake a range of public functions. The governance in the educational system in Pakistan is very weak.

Recommendation: The Educational Policy in Pakistan should try to create a minimum level of uniformity in order to protect the unity of the Pakistan's educational system as a tool of social progress and of all round development in an increasingly globalized and competitive world.

4.2.2 Confidence in Public Education System

Lack of confidence in the public sector schools to deliver quality education has convinced parents either to shift their kids to private schools or absorb additional financial burden by arranging private tuitions. Where neither is affordable, the households prefer to have their children drop out from school and join income earning activities. The average student of the public sector education system cannot compete in the job market. This leads to further social exclusion of the already poor. This state of affairs has been reached over the last many decades and it is pointless to place the blame on a particular government. The decline has primarily resulted from political interference and corruption that has permeated the entire sector. Recruitments, transfers and postings became politically driven.

Absentee teachers and non functional schools have been discovered under various exercises. Cheating in examinations is a widespread phenomenon. Primary sufferers of all these malpractices are the most poor and underprivileged in the system. Those who make it to higher education in the public sector cannot get employment due to absence of merit or poor quality of their educational abilities. The cumulative effect of our past failures is such that few believe that the public sector education can promise a future, which has created a generalized cynicism stressing the social fabric.

4.2.3 Globalization and Competitiveness

Globalization is not a new phenomenon but its pace in recent years has been unprecedented. This has also created opportunities and challenges for countries all over the world. An education system cannot remain in isolation of these challenges and opportunities, in the fields of business and commerce, technology, cultural values, identity and many more. Unfortunately a comprehensive national analysis and debate on the potential impact and possible benefits of globalization has been lacking in Pakistan. Work that has been undertaken has been confined to the business sector. Even here the feedback into the education system to develop a desired response has been missing. The relevance of Pakistan's education to global competitiveness can be seen in the table from the Global Competitive Index (GCI) 2008, given below. Pakistan has been compared with its major competitors in an international context. (Higher the number assigned to a pillar, the lesser the performance.)

Pillars/ Parameters	Pakistan	Bangla Desh	China	India	Malaysia	Sri Lanka
1. Institutions	79	121	80	34	18	82
2. Infrastructure	67	117	60	62	23	76
3. Macroeconomy	86	47	50	88	31	110
4. Health and Primary Education	108	90	55	93	42	36
5. Higher Education and Training	104	108	77	49	32	81
6. Market Efficiency	54	83	56	21	09	71
7. Technological Readiness	89	114	75	55	28	83
8. Business Sophistication	66	96	65	25	20	71
9. Innovation	60	109	46	26	21	53

It can be seen that in education and health related indicators, Pakistan falls behind all other countries. It has to be realized that the sustainability and improvement of other indicators depends on education.

An important product and enabler of globalization have been technologies like the internet and satellite television. This impact has overtaken the perceptions of the policymakers, most of who grew up in an era when these technologies did not exist. These are important tools of education as well as potential detriments to the objectives of national education. There has been no analysis to comprehend its potential impact on children both in the positive as well as negative aspects.

In the wake of the challenges delineated above, Pakistan has not been able to present a national response to numerous and complex problems faced by the education system. The challenge to transform the education governance machinery into a transparent and accountable system that can help realize the national policy objectives in effective and efficient manner is still largely unmet.

Education is not only about the individual, it has a societal role a societal role of selecting, classifying, distributing, transmitting and evaluating the educational knowledge, reflecting both the distribution of power and the principle of social contract. In a country with alarming inequities of income and opportunities, reducing the social exclusion needed to be one of the principle objectives of any Educational Policy. The educational system in Pakistan is accused of strengthening the existing inequitable social structure as very few people from the public sector educational institutions could move up the ladder of social mobility. If immediate attention is not paid to the reduction of the social exclusion and moving towards inclusive development, Pakistan can face unprecedented social

upheavals Education is going to play the most crucial role in the success or otherwise of the sustainable development policies in Pakistan.

Education in Pakistan needs to become a tool of social reform and social development. Uneven distribution of resources and opportunities and apprehensions of sliding down on the scale of poverty promote social exclusion. Increased levels of social exclusion express itself in different forms like ethnic strife, sectarianism, extremism, terrorism etc. In the Pakistani context, the Reduction of social exclusion and promoting national cohesiveness are the prime concerns sustainable development. Education needs to be employed to provide greater opportunities to the citizens and areas that had been largely excluded from the mainstream development and participation in the national processes by ensuring even and equitable human development across Pakistan.

The educational status of women in Pakistan is unacceptably low, in fact, amongst the lowest in the world. The problem emanates at the primary level, as low participation and high dropouts at that stage prevent females from reaching higher education and equitable opportunities for such furtherance do not become available to the female gender. According to the Ministry of Women Development, only 19% of females have attained education up to Matriculation, 8% up to Intermediate, 5% a Bachelor's degree and 1.4% achieved a Master's degree. 60% of the female adult population is illiterate. Of the 3.3 million out of school children, 2.503 million are girls. 73.6% of primary age girls attend school, compared with 92.1% of boys. Moreover, a sizeable majority of rural girls drop out of primary schools. Right from 1947 till 1998, the emphasis on girls education finds due articulations in the policy documents but the physical targets have never matched with financial and social investment in the cause of female education, and hence the appalling state in which the underprivileged women of Pakistan find themselves.

There are vast differences in education services between rural and urban areas which continue to broaden the gulf between the urban population and the comparatively marginalized rural population. Similarly, within urban areas, there are urban slum dwellers, who live on the social margins of the urban centres, and have little access to quality education. Unfortunately, the issue of quality service delivery in rural areas and urban slums receives scant attention. Poverty is one of the main obstacles to acquiring quality education and also the result of poor education available to the economically deprived.

One of the most pressing problems in education sector in Pakistan is its deteriorating quality. The poor quality of education is evident from poor student performance. Rote learning or reading without comprehension by students is a common problem. According to a study conducted by Pakistan Psychological Foundation, only 2.7% children of grade I and 33.5% children of grade V could read with comprehension. Similarly, only 17.4% students of grade 5 could write a simple letter.

According to the findings of another study conducted by Multi Donor Support Unit, poor quality of education was being imparted to the students. The survey included 22 basic mathematical and general knowledge questions asked from 11,563 students, including both boys and girls. The results revealed that the students were not able to answer 41% of the mathematical and 38% of the general knowledge questions correctly. Moreover, it was revealed that around 20% of 10-14 years old students were almost illiterate despite the fact that they were enrolled in schools.

Absence of schools in many areas is a major factor in low accessibility to educational services by people. According to estimates, there is only one primary school for a population of 770 persons and a middle school for 5220 persons. The number of middle and secondary schools is much lower than primary schools. According to the figures of 2005, there were only 38,449 middle and 22,955 secondary schools as compared with 122,349 primary schools in Pakistan. This seriously jeopardizes the possibility of accessing education in the country.

Recently many new initiatives have been taken by the government aiming at providing missing facilities. Traditional approach of improving infrastructure and providing brick & mortar is no doubt

necessary, but not sufficient for quality education delivery and sustainable economic development in the existing burgeoning global competitive milieu. Recently some initiatives also focus/ target on improving teaching quality and learning environment, building capacity of education managers and administrators, etc. Apart from the Ministry of Education, many other initiatives have been launched in the recent past by different Ministries, organizations and departments like National Commission for Human Development (NCHD), Higher Education Commission (HEC), National Vocational & Technical Education Commission (NAVTEC), Ministry of Social Welfare and Special Education (MoSW&SE), Labour & Manpower Division, to develop the Human Resource of Pakistan in a bid to meet the emerging challenges. It has been observed that some of these good initiatives are working in isolation from each other, thus not adding much value to the national objectives. These programs need to dovetail in such a way that their impact is multiplied and we get best return on our investment and efforts.

4.2.4 Recommendations

1. There is a need to have a holistic approach having coordination and linkages among varied components of the national education system, using the National educational Policy as an integrating instrument by aggregating various sectors of education and creating a complementary interface among ministries and departments. Strategic recentralization both vertical and horizontal shall be explored to reinforce the uniformity of education standards, enhance performance of the system, ensure accountability and strengthen institutional inter-dependence.
2. Different provinces and different departments should have the space for introducing and testing innovative approaches but within the larger national framework. It would help learning from each other and contribute to informing national frameworks and goals.
3. There are so many initiatives in the field of education in Pakistan, many of which are funded by the international donors. All these initiatives shall be coordinated to leverage their outputs in such a way that they respond to the emerging challenges of globalization in a concreted way. The Ministry of Education shall be brought to the centre stage of reforms, articulation, aggregation and integration of/ linkage with other inter-dependant and mutually reinforcing sectors.

4.3 Reducing Social Vulnerability in Pakistan

The recent down turn in economic growth rate with its adverse repercussions for employment and the unprecedented hike in price level, particularly of food items, has had a severely negative impact on the lower income strata, which were already hard pressed, experience different kinds of vulnerabilities and little opportunities to come out of the grinding poverty. The ongoing measures in the stabilization process will also lower GDP growth and employment further pushing the ones at the margin of poverty will fall below it.¹⁹ Any further shock of vulnerability could really be dramatic as Pakistan does not have universal social security system. Historically the social protection/security of ordinary Pakistanis has been left at the mercy of ‘trickle down’ and philanthropy. Pakistan does have a Social Security arrangement on the basis of contributions from the Industry for labor. This social security system which provides primarily health care and old age benefits and in some cases educational facilities is extremely limited in coverage as it secures only 5 % of the labor due to non-registration of the labor with the relevant provincial Social Security Institutions²⁰. This social protection system prefers the voluntary approach and leaves virtually whole of the Agricultural and Services sector out.²¹ The government is trying to make available adequate funds for social protection. But given the multiple dimensions of uncertainty in the global, national and household economy, government would hardly be able to afford protection to the most vulnerable segments of the household economy where uncertainty can lead to irreversible damage – in the shape of high morbidity and mortality, decline in

19 Pakistan entered into an IMF Stabilization programme in November 2008, due to severe BOP crisis.

20 According to the latest Labour Force Survey, informalisation has risen above 76 % in Pakistan.

21 Pakistan has adopted a Social Protection Policy in 2005 with little change on ground.

the nutritional status of children and women, and withdrawal from schools. The programs announced by the government-Benazir Income Support and the Punjab Food Support programs- are expected to cover about 5 million households. The government hopes to increase the programs from Rs. 56 billion to about Rs. 84 billion to mitigate the impact of the stabilization programs and reduce the number of people below the poverty line. Though there are fears about the targeting and implementation mechanism to ensure coverage of the poorest, yet it is important to continue such programs and possibly finding additional resources by a reduction of PSDP. But in the medium term, the government needs to revisit the Social Policy radically and enshrining the state's primary responsibility for a universal coverage of Health, education and social security, with less than 5 % coverage to be provided by the private sector.

The government Pakistan has a patchy Employment Policy, which largely rests on the investment rates in the private sector and public spending. Both have failed to generate employment in Pakistan up to recently.²² Though the government intends to start employment intensive public work programs, initially in districts with high poverty levels in the guise of national employment guarantee programs, yet given the resource constraints, it would not be able to make a significant difference. The government also has an existing nutritional support programs.

The government also tries to incentivise microfinance and housing finance credit line, by commercial banks through a special tax credit on the quantum of annual lending and has started many direct and indirect micro-finance with the help of philanthropic initiatives by the local communities and international donors. All these programs could be useful and need to be continued with an attention to effective implementation but it needs to be realized that such efforts at addressing some of the symptoms of systemic weaknesses in the social security system could not have a sizeable effect in mitigating such a huge presence of poverty and misery in the society. Recently, the government has been considering the proposals to build a National Social Policy Platform to implement targeted social protection measures, based on the principles of targeting from a well-defined universe using transparent, verifiable and dynamic criteria with in-built channels of beneficiary exit.’’²³ The preparatory work for the National Social Policy Platform may begin in financial year 2008-2009 with support from donors who have already expressed an interest in improving the governance of social policy measures in Pakistan. The basic infrastructure of the National Social Policy Platform is expected to be in place by the end of the stabilization phase (2009-2010), when its activities are expected to be diversified to improving the implementation and accountability of all social policy measures. But both the government and donors need to realise that the dire social security needs of Pakistan with wide spread poverty, huge in-equality and an ageing population, need much more than ‘better targeting’ of paltry social funds.

22 Pakistan has a draft National Youth Employment Policy

23 ‘Report of the Panel of Economists, November 2008. The Panel of leading economists was appointed by the current government to advise the government on the ways and means to restore macro-economic stability in Pakistan.

Chapter 5

Developing Climate Policies to Produce 'Sustainable Green Order' in Pakistan

“Global Warming” primarily evokes the impression of an increase in average temperature of the air, landmass and the seas. This up and down fluctuation of cooling and heating of the earth surface has been observed since long. The earth came out of the Ice age by melting down of Ice glaciers from our north and south areas of the equator which are still covered with ice. Modern studies assume and have shown convincingly that the variation in the temperature of the earth is due to the variation in the greenhouse gas, like CO₂ levels. Warming of the earth appears to have raised the average temperature during the last century by 0.5 °C and by 1.5 °C in the Northern Hemisphere. However, in the 1940s and 1950s the temperature in the Northern Hemisphere dropped so rapidly that it was considered as a prelude to another ice age. The trend reversed towards the late 1960s and a slight increase in temperature is now being attributed to emission of CO₂, NO_x, resulting from burning of fossil fuels, and of methane and CFCs together known as greenhouse gases GHGs. The temperature of the surface of Earth is on average 15 °C that has increased during the last century by about 0.5 °C. Some scientists have predicted a further warming of 1 to 3.5 °C by the year 2100. The publication of “Climate Change 2007 Fourth Assessment Report” has however helped generate a consensus among almost all the stakeholders to the reality of global warming and its catastrophic implications for the present as well as future generations.

There is now a new kind of climate change under way, foreshadowing drastic impacts on people, economies and ecosystems. Levels of carbon dioxide and other ‘greenhouse gases’ in the atmosphere have risen steeply during the industrial era owing to human activities like fossil fuel use and deforestation, spurred on by economic and population growth. Like a blanket round the planet, greenhouse gases trap heat energy in the Earth's lower atmosphere. If levels rise too high, the resulting overall rise in air temperatures – global warming – is liable to disrupt natural patterns of climate. The most important fact to be noted in this context is that the developing countries will suffer more than others, as their lack of resources makes them especially vulnerable to adversity and emergencies on a major scale. Yet, it is entirely another matter that, on a per person basis, people in developing countries contribute only a small proportion of greenhouse gas emissions.²⁴

Reduction in Global Warming has emerged as another global public good. The world nations though are finding hard to protect it in an agreed way till date. Whether there would be a deal by December 2009 in Copenhagen, it is anybody's guess. Even if a deal is not clinched, every country would be better advised to undertake necessary mitigation and adaptation actions for their own people. The problem of climate change is interlinked with development in many key ways. Economic growth is essential for developing countries to improve the health, economic livelihood and quality of life of their citizens. Economic growth is also essential to increase the capacity of developing countries to adapt to the negative impacts of climate change. But historically, increased economic development and the corresponding increase in energy use have also led to increased emissions of greenhouse gases. The challenge of addressing climate change for the countries like Pakistan is to break the link between economic development and unacceptable greenhouse gas emissions, with or without international and national collaboration.

24 Pakistan's per capita GHG emission is ...Pakistan is the 43rd polluter in the world.

5.1 Understanding the Context

The Kyoto Convention's provisions concern all greenhouse gases not covered by the 1987 Montreal Protocol to the United Nations Convention on Protection of the Ozone Layer. The focus of the Kyoto Protocol, however, is on the following six:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF₆)

The first three are estimated to account for 50, 18 and 6 percent, respectively, of the overall global warming effect, arising from human activities. Although these gases are naturally occurring, their emissions have increased dramatically over the past two centuries due to human activities. CO₂ is produced in large quantities from the consumption of energy from burning fossil fuels, and deforestation. CH₄ and N₂O emissions are produced mainly from agricultural activities. The HFCs and PFCs are used as replacements for ozone-depleting substances such as chlorofluorocarbons (CFCs) currently were being phased out under the Montreal Protocol. SF₆ is used in some industrial processes and in electric equipment.

National and International Response to Green House Gases Kyoto Convention Commitments

All Parties to the Convention – those countries that have ratified, accepted, approved, or acceded to it, Pakistan being one of them – are subject to general commitments to respond to climate change. They have agreed to compile an inventory of their greenhouse gas emissions, and submit reports – known as national communications – on actions they are taking to implement the Convention. To focus such actions, they are bound to prepare national programs containing:

- Climate change mitigation measures, i.e. measures to control GHG emissions
- Provisions for developing and transferring environmentally friendly technologies
- Provisions for sustainable management of carbon 'sinks' (a term applied to forests and other ecosystems that can remove more greenhouse gases from the atmosphere than they emit)
- Preparations to adapt to climate change
- Plans for climate research, observation of the global climate system and data exchange
- Plans to promote education, training and public awareness relating to climate change.

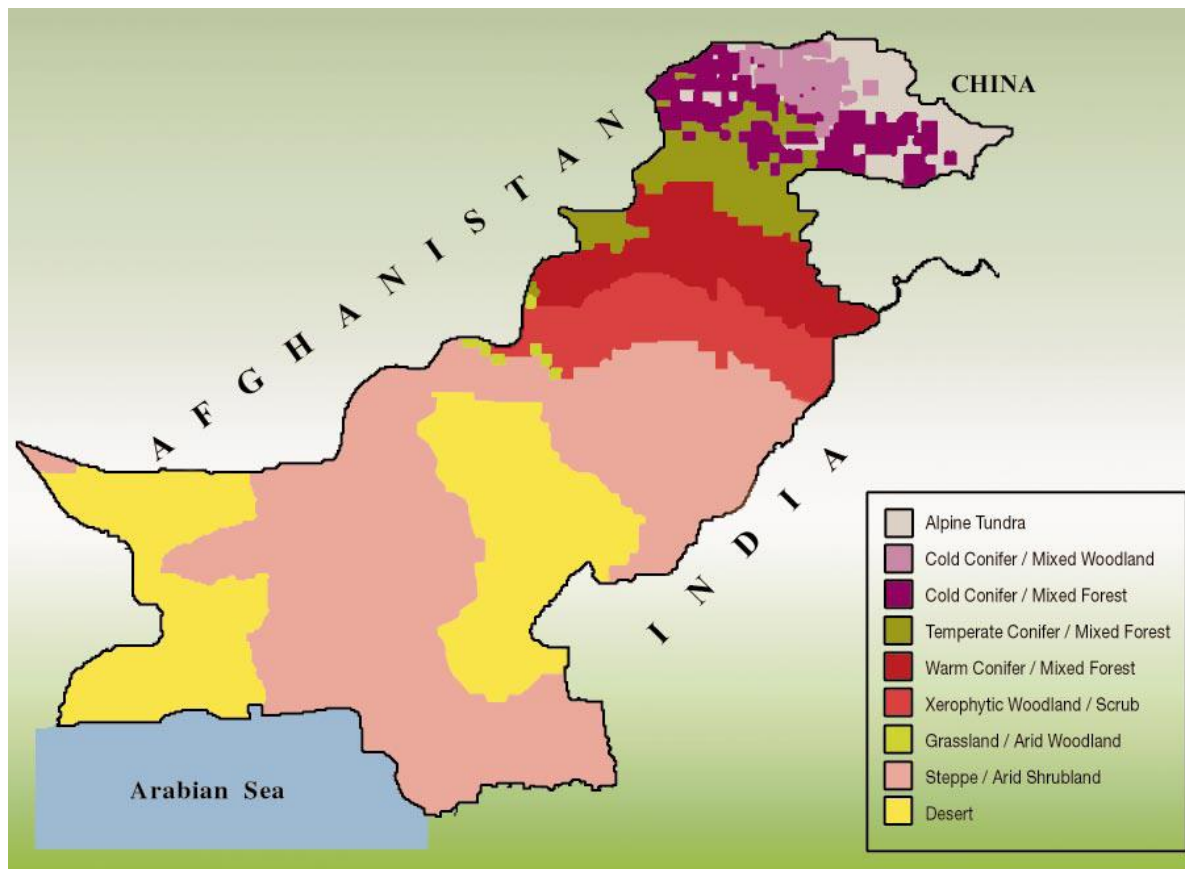
5.2 Climate Change Scenario In Pakistan

Pakistan is situated between 241° and 371° N and 611° and 751° longitude covering an area of 79.6 million hectares. The country inherited highly variable topography, climate and culture.

Pakistan's status as developing country, dependent mainly on agriculture, makes it particularly susceptible to the effects of climate change. Added to this is the fact that like most other developing countries, Pakistan does not have adequate monitoring systems for the prediction of likelihood of occurrence of extreme events or the assessment of possible changes in weather patterns thus making the task of developing short term response or disaster mitigation strategies extremely difficult.

Pakistan, like many developing countries, is a society in transition from agriculture to a modern industrial economy. The transition entails high population growth, rapid urbanization, infrastructure degradation, soil erosion, water and air pollution, increased morbidity etc. Many of these processes create conditions very similar to those caused by climate change. Pakistan's emissions are expected to reach a figure of 475 million tons of CO₂ in the year 2020. This, in a relative sense, is low, both in absolute and in per capita terms. However, the more alarming implications from a national and global

perspective are the exponential growth of emissions over this period. Clearly, high levels of pollution accompany development. When socio-economic factors and natural elements combine in this manner, existing vulnerabilities tend to be exacerbated.



Despite Pakistan's high geographical sensitivity to climate change, Pakistan till date has very limited expertise about the science of climate change. Most weather predictions are supplied from international centres, and even international news channels outside Pakistan. The country also lags behind other regions in terms of availability of comprehensive technical details of its climate. Limited resources are allocated to this issue at the federal level, since climate is seen as a lesser priority as compared to other critical needs.

Apart from the above the country also faces the following problems:

- Lack of provincial and district-specific socio-economic scenarios.
- Deficiencies in data collection, quality control, archiving, retrieval, preparation and analysis of data.
- Lack of comprehensive studies on possible adaptation measures and cost-benefit analysis of adaptation options.
- Lack of legal mechanisms to monitor deadly CO₂ emissions by industries.

Though the environmental capabilities in Pakistan are still growing, a number of policy initiatives have recently been undertaken. These include ratification of the Kyoto Protocol, Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal, Montreal Protocol on Substances that Deplete the Ozone Layer, welcome amendments to the Liquefied Natural Gas policy, and ongoing progress on the National Land Use and Forestry Program and the National Sanitation Policy. An autonomous Global Change Impact Studies Centre has also been established that is engaged in research on impacts and adaptation to climate change in the country. The Centre is now well equipped with the staff and resources and is engaged in modelling base research on climate change. The budget allocation for environment for FY 08-9 is PKR 6.7 billion [**To be reconfirmed**],

including allocations for climate change research for the period 2005-10, which will significantly contribute towards ensuring the environmental sustainability.

5.3 Sources of GHG in Pakistan

Energy Sector

In Pakistan, the energy sector was/ is the highest contributor of CO₂ emissions, contributing 81 % of total CO₂ emissions when measured according to the source categories approach. The forestry and land use change sector accounted for 7% of CO₂ emissions, while industrial processes accounted for 12%.²⁵

Agriculture

Agriculture sector in Pakistan is the primary source of CH₄ emissions in the country, accounting for 87% of all CH₄ emissions, while fugitive emissions and emissions from waste management accounted for the remainder of CH₄ emissions. The bulk or 81% of N₂O emissions also came from the agriculture sector. NO_x emissions from the agriculture sector, from field burning of residues, were negligible.

Transport Sector

The primary source of CO emissions was the transport sector, accounting for 81% of all CO emission, industrial processes and field burning of agriculture residues also contributed to CO emissions in the country.

Industrial Sector

Emissions of NMVOCs rose primarily from industrial processes.

5.4 Climate change Impacts on Pakistan

There are several aspects that are susceptible to the detrimental effects of climate change in Pakistan. There is now sufficient evidence and literature available to demonstrate that the pressures generated as a direct result of climate changes impact multiple sectors including water, agriculture, forests, biodiversity, livestock, coastal zones etc.

The survey of Pakistan classifies the country into eight zones, which roughly concur with the Koppen Geiger classification where zones are defined on the basis of monthly temperature and precipitation data. According to the Koppen Geiger classification of climatic zones, where zones are defined on the basis of monthly temperature and precipitation data there are 11 distinct as well as overlapping climatic zones in the country. These range from zones characterized by mild, moist, winters and hot, dry summers in the north to semi-arid and arid zones in the west and parts of the south. The north-eastern mountainous and sub-mountainous areas receive more than 1,700 mm annual precipitation with major share (over 1,000 mm) from the summer monsoon. On the other hand, the extremely arid plains of southwest Baluchistan receive only 30 mm during the whole year. Thermal regimes exhibit extreme diurnal, seasonal and annual variation; temperatures can fall as low as -26° C over the northern mountains and go as high as 52°C over the central arid plains. In the semi-arid plains, temperatures of 42°C are recorded at various stations in the months of May and June. The areas comprising Pakistan have seen several droughts, the most recent of which was the worst experienced for the last hundred years and affected several districts of Sindh and Baluchistan during 1999-2000. The drought is estimated to have affected over 3.3 million people and 30 million heads of livestock.

25 Reference

Given the nature of scientific knowledge and the problems associated with the availability, accuracy and reliability of data in the country, the task of a scientifically sound basis for impact assessment and vulnerability assessments becomes all the more daunting. Furthermore, the difficulties of differentiating between impacts caused naturally as a process of climate change from the ones emanating as a result of human induced activities poses additional difficulties in formulating appropriate policy responses.

5.4.1 Impact of GHG

Pakistan contributes very little to the overall GHG emissions, but remains severely impacted by the negative effects of climate change, being a predominantly agriculture economy and vulnerable to extremes of climate. Pakistan therefore has a real interest in protecting itself from the adverse impacts of climate change. The recent recurrence of extreme weather events displayed by drought and excessive floods in the country has raised the awareness regarding the enormity of the task at hand and of the difficulties in dealing with the issues, on an urgent basis.

Another serious impact of changes in atmospheric and sea temperatures is the increased risk of occurrence of severe cyclones and storm surges. Cyclones are associated with strong winds and heavy rains, while a storm surge is an abnormal rise of sea level caused by a cyclone moving over a continental shelf. The cyclone provides the driving forces caused by a cyclone moving over a continental shelf. The cyclone provides the driving forces in the form of very high horizontal atmospheric pressures gradient and consequent strong surface winds. As a result, sea level rises and continues to rise as the cyclone moves over shallower waters and reaches a maximum on the coast near the point of landfall (i.e., the point of crossing of land by the cyclone). Seawater inundates vast stretches of coastal area and sweeps away all that comes in its way. Such events can cause widespread devastation and loss of life and property. The islands at the approaches of the creeks in the Indus delta have been severely eroded. The creeks which are near the present outfall of the Indus river at the concave bulge of the delta are facing erosion due to natural hydraulic forces, such as reduction in the supply of sediments by the river and wave reworking in the comparatively recently formed delta together with the arid condition of the delta itself. On the west (Makran) coast, this erosion already threatens coastal property, coastal agriculture land and habitats and such effects may intensify in the event of further sea level rise. Lost sediments produced by erosion and in some places accretion, are also a serious threat for the fisheries sector and to navigation.

There is a considerable uncertainty regarding the methodologies to be used for conducting socioeconomic impact assessments of climate change, as a universally accepted framework for analysis does not exist in this area. For the purpose of this analysis in NSDS, the socioeconomic impacts are largely assumed to be derived from the impacts occurring in sectors such as agriculture and livestock, forestry and land use change, coastal zones etc. Some other direct socioeconomic impacts are also likely to occur, primarily in the form of health impacts. As detailed region-specific scenarios are not available, predictions relating to health effects of climatic changes have to remain general and speculative. Except for a few diseases, there is insufficient data for any kind of projections. Nevertheless, while discussing various health effects, potentially related to climatic change, it is necessary to put them in a demographic context, as many of the conditions discussed hereafter have specific distribution patterns in the population. The poorest sections of society, representing more than one-third of Pakistan's population, will bear the brunt of adverse health impacts due to the inadequacy of health systems in the country. Within the low-income households, women, children and rural and urban slum dwellers will be at greater risks.

5.4.2 Sectoral impacts

Vulnerability and impact assessment studies were conducted in Pakistan recently for key sectors as part of the research undertaken for the Pakistan National Communication Authority. These studies were undertaken to evaluate the effects of climate change and to understand the long run impacts that

the changes in climate variables such as temperature and precipitation can have on key sectors of the economy. Impact assessment and adaptation studies were carried out sector wise and covered agriculture, forestry, biodiversity, coastal zones, livestock, water resources, energy and socioeconomic sectors. The climate change scenarios used in all the studies were synthetic scenarios, based on incremental changes in meteorological variables, such as temperature and precipitation. The national study team in consultation with experts from the Intergovernmental Panel on Climate Change, reviewed scenarios generated by the Pakistan Meteorology Department (PMD) and formulated scenarios consistent with scenarios generated using the model for assessment of greenhouse gas induced climate change (MAGICC)-software used extensively by the United Nations Environment program (UNEP) and other UN agencies.

In compliance of article 12.1 and decision 10/CP.2, non-Annex 1 Parties are required to submit a national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal protocol, to the extent its capacities permit, using comparable methodologies agreed upon by the conference of parties. Pakistan has prepared its national inventory for the year 1994 using IPCC-recommended methodologies. This inventory has been generated through the enabling activity project funded GEF through UNEP.

Water Resources

The effect of climate change on water resources in Pakistan is expected to be significant. An analysis of changes in Pakistan's hydrological regime provides a basis for estimating the impacts of climate change on water resources. In general, increase in temperature could not only increase water demand because of higher evaporation rates, but may also increase rainfall due to additional moisture supplied to the clouds because of higher evaporation rates, but may also increase rainfall due to additional moisture supplied to the clouds because of higher evaporation from the sea surface. Similarly, increased rainfall is expected to cause an increase in magnitude of floods.

The result of the analysis for hydropower generation for the year 2020 under the no change in precipitation scenario, the increase in hydropower is 0.03%, whereas under the increased precipitation scenario, the increase in hydropower generation is expected to reach 2 %. In the decreased precipitation scenario, there is a decrease of 1.5% in hydropower generation. Overall impacts on hydropower generation, which are based on average base inflows, are expected to be insignificant. In drought scenarios, however, impacts on hydropower generation are likely to be significant.

Agriculture

Climate change is feared to have significant impacts on agriculture. The potential impacts include vulnerability of crops to heat stress, possible shifts in spatial boundaries of crops changes in productivity potential, changes in water availability and use and changes in land use systems. Even a fractional rise in temperature could have serious adverse effects such as considerable increase in the growing degrees/days. This would not only affect the growth maturity and productivity of crops but also would require additional amount of irrigation water to compensate heat stress. Cooling of crops might become an essential element of the crop production system. Similarly, temperature increases coupled with variations in rainfall would increase the net irrigation water requirements of sub-humid, semiarid and arid climatic zones.

Forestry and Land Use Changes

In general, a shift in the location of different biomass is likely under the change in precipitation scenarios. Cold and temperate conifers will show a northward shift, pushing against the cold conifers/mixed woodland, which in turn encroach upon the southern and lower edges of the alpine tundra. Similarly the northern boundaries of warm conifers/mixed forest will also move north, pushing against the southern boundaries of the temperate conifers/mixed forest. This northwards shift of conifers biomass will increase their size at the cost of the extent of the alpine tundra. A change in species composition may also occur as those species that are hardier and have a wider distribution are likely to shift to other biomes in the north and south. Due to less severity and frequency in the incidence of frost and rise in temperature because of climate change, the frost tender species which are at present confined to the southern biomes will start moving northwards.

Coastal Zones

Pakistan, which has a coast extending over approximately a thousand kilometres, is one of the countries classified as being particularly vulnerable to the effects of sea level rise. The data processed at the National Institute of Oceanography (NIO) shows that sea level rise along the Pakistan coast is approximately 1.1 mm per year, a figure that is in consonance with global predictions of a sea level rise of up to 90 cm by 2100. These results were tabulated using sea level data rerecorded at Karachi for the last one hundred years.

The primary impacts of sea level rise are the direct physical effects on the coastal zones due to the changes in coastal dynamic processes because of sea level rise. Such impacts may include the risk of erosion, flooding inundation and displacement of wetlands and lowlands and Salinization of ground and surface water.

Biodiversity Loss

Substantial data on different aspects of biodiversity and ecosystems necessary for quantitative analysis is currently not available in Pakistan. Moreover techniques, such as eco-climatic classification and analysis through climate envelopes and profiles, are not applicable due to resource constraints. Nevertheless, it is estimated that an increase in atmospheric CO₂ can have significant impacts on both plants and ecosystems. Various components of the carbon like photosynthesis, respiration, biomass accumulation and allocation are affected by CO₂ concentration. Temperature and CO₂ interact to affect photosynthesis and growth. In general, optimum temperature increases net photosynthesis. However if temperature becomes extremely high or low it will retard growth and photosynthesis. Higher CO₂ levels can affect plant responses to different limiting factors including water, light, and nutrient availability positively.

Similarly, changing climate could affect competitiveness of species or groups by altering growth and mortality rates differently as well as the regeneration success rate.

Effects of Climate Extremes

Amongst the possible effects of climate change is the likelihood of increased frequency and severity of occurrence of extreme events such as floods and droughts. Since Pakistan is particularly susceptible to such events and has experienced large scale destruction on these accounts in the recent past, the analysis of possibility of occurrence of extreme events in the shape of natural disasters and their impacts becomes all the more essential.

Pakistan's vulnerability to the impacts of climate change guides its overall national response in dealing with the issue. In view of limited resources, the level of studies and work undertaken has largely been in the area of mitigation, although a few important studies have also been commissioned on impacts and adaptation.

It is now universally accepted that we are experiencing the beginning of an age of climate change in Pakistan. At the moment, the very face of earth is being altered by rising tide, drying riverbeds, flash floods, and desertification. Last year, the floods in Baluchistan alone affected two million people in over 15 districts. Sea intrusion in Indus Delta has destroyed the eco-system of the area and has rendered over two million hectares of cultivatable land, along the coasts of Thatta and Badin sterile. A mass migration of thousands of displaced families is underway at present. Such migrations will increase and spread all over Pakistan, once climate change places heat stress on cash crops like wheat, sugar and cotton and farming communities begin the search for new cultivatable lands. Women, children and the economically distressed would be disproportionately at risk in such a situation. Though it is hard to set timelines for the arrival of dangerous thresholds but, it appears, the climate change has already started having a low intensity impact with noticeable social re-percussions in some areas of Pakistan.

In the North Western Frontier Province of Pakistan, the loss of forest and tree cover – due to climate change and the illegal timber trade – has increased the risk and vulnerability of flash flooding. Poor

construction in slums and katchi abadis, in big cities like Karachi and Lahore, even now bear the brunt of rains as they can't stand up to increased precipitation. In case of bigger events such as hurricanes and cyclones, these slums housing millions and millions would simply be wiped out from the face of earth.

Impact of Climate Change on Health

Geographically, Pakistan is not among the countries where public health will be hugely affected as a result of the climate change, because it is neither a small island nor a densely populated coastal area. Still, it remains under the threat as the other risk factors like high levels of air pollution, high density of population and poor sanitation are widely present here. Also, climate-sensitive diseases like diarrhoea, malnourishment and malaria -- described as the largest global killers amid rapidly changing climate -- are already rampant in country. **[Recommendation]** There is a dire need for understanding the dynamics of the burden of these diseases, take policy measures to avert the possible damage that would occur because of these and educate the masses so that they can adopt preventive measures.

In Pakistan, diarrhoea is one of the three most common diseases among children aged less than five. The data pertaining to adult age group also reflects high incidence of infective diarrhoea and dysentery, likely to increase further as a result of the climate change. Growing temperatures of prolonged summers will compromise the supply of fresh waters. Water stagnation coupled with warmer temperatures will facilitate growth of microscopic organisms, while the rapid but unplanned urbanization with poor systems of sanitation and disposal of waste will be another contributing factor. Combined together, all these will facilitate further increase in the incidence of water- and food-borne diseases.

Malnutrition (under nutrition) is another disease listed high among the global killers of human kind. According to the WHO, being underweight is the top-most risk factor leading to disease, disability or death. The ongoing climate change can cause a massive increase in the prevalence of this risk factor. This will happen because the rising temperature and variable precipitation are likely to cause a decrease in production of staple foods, especially in the poor countries. Given the inequitable distribution of resources, a small decrease in production of food is liable to affect a disproportionately large number of the poor.

According to the latest National Nutrition Survey, 38 per cent of Pakistani children aged under five have less than normal weight. This suggests that appropriate amount and type of food was not available to these children. This survey also shows that almost 37 per cent of the children belonging to this age group were stunted. The stunting of growth results when food scarcity affects the child for a long period of time. High malnutrition rates represent a major obstacle in the country's development. Malnutrition is said to be directly or indirectly responsible for nearly half the deaths of children under five in Pakistan. Those who survive, go on to become physically weak and prone-to-disease adults, who cannot perform up to their full potential. Thus they remain poor, which increases the chances of malnutrition in their next generation and the cycle goes on. In a country with fertile agricultural lands, diversity of crops and abundance of other nutritional resources, such an abysmal nutritional situation is intriguing. The climate change is going to further compound this problem.

Malaria is the third among the climate-sensitive diseases present at a large scale in Pakistan. It is feared that the changes in climate will prolong the transmission seasons of malaria and similar diseases, which are spread by vectors like mosquitoes. The changes are also believed to alter the geographic range of these diseases, increasing the chances of their spread to regions where the population has no or little body resistance or where a strong public health infrastructure is not present. Malaria, along with other infectious and parasitic diseases, occupies the top position among the causes of sickness in Pakistan. According to research reports, on average 1.5 per cent of deaths occurred during the last ten years were because of malaria.

Whether it is diarrhoea, malnutrition or malaria, an important point is that these negative implications of climate change are highly inequitable in their distribution: the greatest risks are to the poorest

people, who have contributed least to the temperature-raising emissions. Populations of poor or middle-income countries share very little responsibility for the global warming. Per capita emission of gases in the United States is seven times higher than in China and 19 times higher than in the whole of Africa. Most importantly, the largest health risks are to the children belonging to the poorest communities, who contribute least to this global warming. These poor and marginalized segments of society need change in policies at large and in consumption behaviors at an individual level. It is very important that Pakistan plays an active part in producing consensus in Copenhagen. But we also must start preparing to undertake large mitigation and adaptation programs, even without large doses of international aid.

5.5 Climate Mitigation and Adaptation

The terms “adaptation” and “mitigation” are two important terms that are fundamental in the climate change debate. The IPCC defined adaptation as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploits beneficial opportunities. Similarly, Mitchell and Tanner (2006) defined adaptation as an understanding of how individuals, groups and natural systems can prepare for and respond to changes in climate or their environment. According to them, it is crucial to reducing vulnerability to climate change. While mitigation tackles the causes of climate change, adaptation tackles the effects of the phenomenon. The potential to adjust in order to minimize negative impact and maximize any benefits from changes in climate is known as adaptive capacity. A successful adaptation can reduce vulnerability by building on and strengthening existing coping strategies.

In general the more mitigation there is, the less will be the impacts to which we will have to adjust, and the less the risks for which we will have to try and prepare. Conversely, the greater the degree of preparatory adaptation, the less may be the impacts associated with any given degree of climate change.

For people today, already feeling the impacts of past inaction in reducing greenhouse gas emissions, adaptation is not altogether passive, rather it is an active adjustment in response to new stimuli. However, our present age has proactive options (mitigation), and must also plan to live with the consequences (adaptation) of global warming.

The idea that less mitigation means greater climatic change and consequently requiring more adaptation is the basis for the urgency surrounding reductions in greenhouse gases. Climate mitigation and adaptation however are not an alternative to each other, as they are not discrete activities but rather a combined set of actions in an overall strategy to reduce greenhouse gas emissions.

5.5.1 Mitigation Strategies

Climate change involves complex interactions between climatic, environmental, economic, political, institutional, social, and technological processes. It cannot be addressed or comprehended in isolation of broader societal goals (such as equity or sustainable development), or other existing or probable future sources of stress.

In the United Nations Framework Convention on Climate Change (UNFCCC) three conditions are made explicit when working towards the goal of greenhouse gas stabilization in the atmosphere:

1. That it should take place within a time-frame sufficient to allow ecosystems to adapt naturally to climate change;
2. That food production is not threatened and;
3. That economic development should proceed in a sustainable manner

On the basis of the GHG inventory prepared in Pakistan for the year 1993-94, the main emitting sectors were explored for viable GHG mitigation opportunities. These options were then analyzed and

evaluated to assess their emission reduction potential and the economic and financial implications of their implementation. The sectors studied for the mitigation options analyses were energy, forestry, and agriculture. For each of the mitigation options, essential abatement potential and cost effectiveness indicators were calculated. A total of 21 options were developed for the sector, distributed among the various sub-sectors, including the residential and commercial sectors, the transport sector, the industry sector, and the agriculture sector. Options Assessment for the energy sector was carried out on the long range energy alternative planning (LEAP) model prepared by the Stockholm Environment Institute. Six options were considered for assessment in the forestry sector. These options were selected on the basis of suitability, ease of implementation, and potential for carbon abatement. Two mitigation options were developed for the agriculture and livestock sector, both targeting methane emissions.

5.5.2 Adaptation Strategies

The United Nations Framework Convention on Climate Change refers to adaptation in several of its articles: Article 4.1(f): All Parties shall “Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change.”

Development and diversification are still important strategies wherever possible, but ultimately the international community will have to find ways to support alternative responses, including the managed resettlement of some people in these states. This will bring many challenges, particularly for those people that must move. There will be much greater pressures if unabated climate change leads to sea level rise that threatens much larger populations in low-lying coastal areas.

Running counter to the technological and economic potential for greenhouse gas emissions reduction are rapid economic development and accelerating change in some socio-economic and behavioral trends that are increasing total energy use, especially in developed countries and high-income groups in developing countries. Dwelling units and vehicles in many countries are growing in size, and the intensity of electrical appliance use is increasing. Use of electrical office equipment in commercial buildings is increasing.

Some adaptation is occurring now, to observed and projected future climate change, but on a limited basis. There is growing evidence since the IPCC Third Assessment of human activity to adapt to observed and anticipated climate change. For example, climate change is considered in the design of infrastructure projects such as coastal defense in the Maldives and The Netherlands, and the Confederation Bridge in Canada. Other examples include prevention of glacial lake outburst flooding in Nepal, and policies and strategies such as water management in Australia and government responses to heat waves in, for example, some European countries.

Adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions.

The array of potential adaptive responses available to human societies is very large, ranging from purely technological (e.g., sea defences), through behavioural (e.g., altered food and recreational choices), to managerial (e.g., altered farm practices) and to policy (e.g., planning regulations). While most technologies and strategies are known and developed in some countries, the assessed literature does not indicate how effective various options are at fully reducing risks, particularly at higher levels of warming and related impacts, and for vulnerable groups. In addition, there are formidable environmental, economic, informational, social, attitudinal and behavioral barriers to implementation of adaptation. For developing countries, availability of resources and building adaptive capacity are particularly important.

Adaptation alone is not expected to cope with all the projected effects of climate change, and especially not over the long run as most impacts increase in magnitude. Vulnerability to climate change can be exacerbated by the presence of other stresses.

Non-climate stresses can increase vulnerability to climate change by reducing resilience and can also reduce adaptive capacity because of resource deployment to competing needs. For example, current stresses on some coral reefs include marine pollution and chemical runoff from agriculture as well as increases in water temperature and ocean acidification. Vulnerable regions face multiple stresses that affect their exposure and sensitivity as well as their capacity to adapt. These stresses arise from, for example, current climate hazards, poverty and unequal access to resources, food insecurity, trends in economic globalization, conflict, and incidence of disease such as HIV/AIDS.

Sustainable development can reduce vulnerability to climate change, and climate change could impede nations' abilities to achieve sustainable development pathways. Sustainable development can reduce vulnerability to climate change by enhancing adaptive capacity and increasing resilience. At present, however, few plans for promoting sustainability have explicitly included either adapting to climate change impacts, or promoting adaptive capacity.

On the other hand, it is very likely that climate change can slow the pace of progress toward sustainable development either directly through increased exposure to adverse impact or indirectly through erosion of the capacity to adapt. The Millennium Development Goals (MDGs) are one measure of progress towards sustainable development. Over the next half-century, climate change could impede achievement of the MDGs.

The systematic studies on assessing impacts are still in infancy, especially at the national level in Pakistan. A small number of impact assessments have now been completed for scenarios in which future atmospheric concentrations of greenhouse gases are stabilized. Although these studies do not take full account of uncertainties in projected climate under stabilization, they nevertheless provide indications of damages avoided or vulnerabilities and risks reduced for different amounts of emissions reduction.

5.6 Recommendations

Pakistan attaches great importance to the effective, implementation of article 6 of the Convention, requiring parties to encourage education, training and public awareness programs, within respective capacities and resources. Such a support is crucial in achieving the ultimate objectives of the Convention. Environmental education initiatives have been outlined both in the National Conservation Strategy (NCS) and the National Environmental Action Plan of the GoP. The Ministry of Environment in partnership with key stakeholders is spearheading efforts aimed at incorporating environmental education concepts in school curricula.

In Pakistan, through a mix of public-private partnerships, activities in the domain of education, training and public are being organized on a continuous basis. Most of these activities are part of larger programs and action plans initiated by the government to engender a more sustainable development path. Some of these activities of the government include organizing workshops, seminars and observing specific international days like Earth Day, World Environment Day etc. the government has recently announced that Year 2009 would be the Year of Environment. The government makes use of the electronic and print media in airing environmental messages. However the net impact of these awareness related activities is still minimal. Much more resources and expertise are required in developing climate change specific policies and implement them effectively.

A portfolio of adaptation and mitigation measures can diminish the risks associated with climate change. Even the most stringent mitigation efforts cannot avoid further impacts of climate change in the next few decades, which makes adaptation essential, particularly in addressing near-term impacts.

Unmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt.

This suggests the value of a portfolio or mix of strategies that includes mitigation, adaptation, technological development (to enhance both adaptation and mitigation) and research (on climate science, impacts, adaptation and mitigation). Such portfolios could combine policies with incentive based approaches, and actions at all levels from the individual citizen through to national governments and international organizations. In, Pakistan, the time is now ripe for developing such a portfolio and implementing it. The starting point in this regard is the introduction of the consideration of climate change impacts in development planning process. NSDS has proposed major changes in the functioning and planning process of the Planning Division, government of Pakistan. It is expected that with a big focus by the Planning Division on Climate Change, we would start a portfolio of Mitigation and adaptation Policies in Pakistan announced and implemented soon. [We need to talk about the climate Change response infrastructure in Pakistan]

5.6.1 Proposed Government Actions

- a) Devise and implement the National Climate Change Policy and Action Plan.
- b) Establish National Clean Development Mechanism (CDM) Authority at the Ministry of Commerce or Industry which in turn should develop and implement policy and operational framework for effective management of CDM process.
- c) Developing and sustaining well-equipped observing networks, which look at the both surface and air indicators to improve climate related information and for risk management.
- d) Analysis of past climate data to establish baseline patterns of climate in various parts of Pakistan
- e) Providing advanced training, especially in satellite applications for monitoring and change detection.
- f) Setting up more weather stations to support provision of services specifically related to floods, rains, droughts and other relevant climatic occurrences.
- g) Longer term training in vulnerability and adaptation assessment, developing national communications, and sustaining expertise.
- h) Establishing provincial climate change committees.
- i) Set mandatory targets to reduce Green House Gases and other pollutants by improving fuel efficiency in road transport sector projects by building institutional capacity to review transport options, expand pilot projects to tune-up urban vehicles, and develop options with regard to technology transfer, regulations and pricing.
- j) Zoning of industrial activities.
- k) Enforcement of EIA regulations.

Chapter 6

Making National Sustainable Development Strategy Work for Pakistan

Sustainable Development, in its coverage, encompasses almost everything done by the government. It is the new idiom for the development strategies of the government as it encompasses economic, social and environmental aspects. Sustainable Development as a wholesome development experience in the Pakistani context is comprised of five core elements:

- Strategic new thinking about the whole development planning and implementation
- Time bound effective mitigation in priority areas
- A short and long term Adaptation in priority sectors in particular, in response to the strategic vision of sustainable development, suited to Pakistan's objective realities and international development
- Successful undertaking of new Green development initiatives with high sustainability contents and concerns such as efficient natural resources utilization, minimum damage to the environment and consumer and reduction of in-equality in Pakistan
- In the long term, frame and implement economic policies to sustain a Social Policy, which aims at implementing the 'social contract of sustainable development' between the State and citizens on the basis of Sustainable Development as a Fundamental Right.

The first and last are the critical elements in steadying Pakistan on the path of sustainable development. The reason we are unable to make significant headway on this path is the weakness of these 'foundational elements'. It is the Planning Commission, naturally, which has to be the bulwark of the proposed National Sustainable Development Strategy, different aspects of which have been delineated in the preceding chapters. As this a national strategy, aiming to provide holistic answers at the public policy level, there needs to be a national institutional response. In this respect, it is suggested that the government recast the present day Planning Commission of Pakistan. The first step in this direction would be to re-name it as the Sustainable Development Planning Division, government of Pakistan.

6.1 National Commission on Sustainable Development

The government recently set up a Task Force on Climate Change in the Planning Commission. This Task force is closest to the ideals of Sustainable Development in its mandate and tasks. It is proposed that this Task Force be transformed into the National Commission on Sustainable Development with the necessary enhancement of its role and responsibilities. The Commission is proposed to have the following Mandate:

- Adoption of a five year National Sustainable Development Plan, setting quantifiable Sustainable Development goals for Pakistan
- Definition, Adoption and Promotion of the Concepts of 'Environmental Capital of Pakistan', 'Natural Resource Endowment' & 'Living within the environmental means of Pakistan' at all levels.
- Strengthen Ministry of Environment, government of Pakistan in its policies and programs
- Setting Quantifiable Targets of resource exploitation, replenishment, status of Environmental capital every 3 years.
- Suggest measures to enhance the Scientific Capacity for coping with the sustainability challenges
- Propose effective Implementation Mechanisms to different stakeholders and develop a system of evaluation of outcomes vis-à-vis the sustainable development goals

- Articulation and publication of government's response to major Reports/events
- Promote Sustainable Development as a social movement
- Establish a Sustainable Development Knowledge Management System in the country
- Organize the development of Sustainable Development Indicators and Indices for Pakistan
- Organization and capacity building of Sustainable Development expertise in Pakistan

6.1.1 Proposed Action Plan of the CSDP

Some of the Actions the Commission could start during the first year of its existence:

- Creation of Standing Committee for Sustainable Development in Senate as well as National and Provincial Assemblies and District Governments.
- Initiate Integrated Urban Development Pilot Projects in 4 middle sized cities in all the provinces.
- Training of four urban government in Sustainable Development techniques with the help of technical assistance from UN HABITAT/UNEP
- Launching of a national campaigns on Sustainable Development priorities and targets and preparation of celebrating Year of Climate Change, Year of Waste Management, and Noise Reduction etc.
- Holding one National and at least 1 International Conference in Pakistan on Sustainable Development.
- Official publication of Sustainable Development Report of Pakistan along with the Economic Survey of Pakistan
- Holding of symposia for developing Sustainable Development Indicators and Sustainable Development Index of Pakistan, preferably as a UNEP project
- Strategise to revamp and strengthen the Sustainable Development Support infrastructure in the country

Role of principle stakeholders

NSDS has proceeded with the identification of different deficits which impact negatively on the development and implementation of much needed programs and initiatives of sustainable development in Pakistan. The first and foremost of these is the Awareness Deficit. SD awareness in Pakistan does exist but it is in piecemeal and is not sufficient enough in strategic groups. As long as the SD awareness is not present at the right levels, in crucial sectors, there would always be problems in getting due participations from the Strategic Groups. The goals of Sustainable development need to be understood as Strategic National interests. But our Industry, by and large, still thinks of the SD goals in terms of externally imposed 'compliance issues'. The lack of understanding, cooperation or imagination on behalf of the Industry actually confounds the other deficits such as Policy Deficit, Implementation Deficit and Financing Deficit. There is need to involve the Industry in Pakistan as a Strategic Green Group, promoting Green Organizations and Green Sectors.

Media and civil society, at least in the bigger cities is fairly aware of the principle issues of sustainable development in Pakistan and have been giving their input. But still a lot needs to be done to enlist genuine participation of civil society groups and communities.

6.2 Recasting the Role of State and its Institutions

Being a strategic national interest and a fundamental right, the assurance of development for the future generations is the responsibility of the State. The eventual responsibility for the enforcement of sustainable development as a right would be the responsibility of all the principle organs of State, including the Executive and Judiciary. Sustainable Development is to do more with the State and citizens. Government can be a tool or an obstacle. The State, as a custodian of sustainable development for the present as well as the future generation is the most important stakeholder. The role of its institutions therefore would be central in making National Sustainable Development Action Plan a success. As it transpires in the above chapters, Pakistan has endowed itself with a formidable

institutional infrastructure, which is handling the *public policy* in Pakistan, from formulation to evaluation. But a more important datum of the ground realities is that almost all the major institutions of Pakistan are in the midst of reforming themselves or under pressure to reform. It appears that the ‘structural reforms’ we resolved to undertake in mid 80’s has become an open ended eternal phenomenon. The so called first generation reforms implemented so far, according to the Planning division include: financial sector reforms, capital markets reforms, tax and tariff reforms, reforms in tax administration, fiscal transparency, reforms in privatization programme, governance reforms, particularly with respect to devolution and capacity building, agricultural reform and the passage of the Fiscal Responsibility and Debt Limitation Act 2005. The government is in the process of introducing the second generation of these reforms, which would focus on “strengthening institutions, improving the competitiveness of domestic industry, building a robust financial sector in an environment of global financial restructuring, further strengthening of tax administration, promoting transparency in economic policymaking, further reform of capital markets and strengthening the country’s physical and human infrastructure.”

In a situation where almost every crucial institution of State is *on the move*, the policy coordination, avoidance of policy overlaps, and synergetic multi-stakeholder implementation get compromised. As a result, most of such governmental policies and initiatives, which require vertical and horizontal involvement of other governmental entities, produce little result. Where there have been many efforts to create new ‘instances’ of inter-ministerial/inter-departmental coordination, the responses have also included the creation of either new entities under Cabinet Division or Prime Minister Secretariat. In some cases, the Ministries have started their own duplicates. One such example is the establishment of export promotion outfits by the Ministries of Industries, whereas the primary task of export promotion rests with Trade Development Authority of Pakistan, which is an affiliate of the Ministry of Commerce.

6.3 The Governance Challenges of Implementation

Governance, or sound development management, is at the core of sustainable development. The proposed Commission, keeping in mind the above five core elements of Pakistan Sustainable Development Strategy should have implementation efficiencies as its hall mark. The institutions are as good as the individuals running these institutions. It is hoped that this time around, this point would not be missed at the government of Pakistan/Planning Division.

Public Private Partnerships as a principle tool of implementation

Given the involvement and importance of Industry and civil society and donors in realising the ideals of Sustainable Development in Pakistan, Pakistan would be better served if it could realise the potential of Public Private Partnerships (PPP) by combining skills, expertise and other resources from different entities to achieve outcomes that are unattainable by traditional development actions. Apparently, there is a growing realization in government about the significance of such partnerships and perhaps there is also greater capacity and willingness in the private sector today to engage in profitable partnerships with the government. But the relative dearth of successful PPP in Environmental management projects suggest that Pakistan has been slow to learn from international experience and is perhaps low at such partnerships which are based on shared vision and cooperative action.²⁶ Pakistan has a poor record of ‘cooperatives’. Modern PPPs are actually a modern version of old style Cooperative Movement. A massive public diplomacy campaign by the proposed commission can possibly influence the public opinion about the need of cooperative PPPs. It should be very clearly understood by the decision makers in Pakistan that if the cooperative PPPs fail to take off in Pakistan, all the Voluntary approaches would also have little chance of success, be it the of Social

26 The Planning Division, government of Pakistan has approved a PPP titled Water for Development in the end of 2008, which is its first ever PPP Project with high relevance to Sustainable Development, in partnership with Sustainable Development Policy Institute, Islamabad. Successful outcomes of this project might unleash the latent potential for carrying out many more similar projects.

Security or Clean Production or SMART Initiative or Sectoral Approaches in industry or even self assessment in taxation. The governments can act better as an enabler and facilitator in those societies where the well of cooperative PPPs is not dry. Otherwise, the government has to strengthen its role as a strong regulator. In India, despite the fact that the PPPs are doing way better than in Pakistan, especially in the area of climate Change and Environmental protection, still the government continues to exercise a strong control on the economy. The private sector in India has also realised that the ideal of ‘development for all’ puts a special responsibility on the State. In case of Pakistan, there is a strong likelihood that the interface between the industry and consumer/citizen is not going to significantly change by itself, if it continues to be set in the perspective of voluntary reform. NSDS favours a better blend of voluntary and mandatory approaches to save the consumer/citizen and the ecosystem from the excesses of ‘market’, though it also implies allocation of more resources by the government to achieve the sustainable development goals for Pakistan. The proposed Commission would be required to come up with a better working reform agenda to better manage the interface of market and the ecosystem in Pakistan.

Human and technological capacity for sustainable development

Pakistan Human Development Indicators have not kept pace with its economic performance. While these indicators have improved somewhat over time but much more needs to be done. The first step for any human resource development strategy in Pakistan has to start with Health, Education and Social Security Policy. All of the three are important but the Education has to be given more importance as the educational attainment has a positive impact not only on economic growth and poverty reduction but is also directly linked with technological adaptation, innovation, and increased productivity, generating positive spin-offs and growth effects for the economy.

In the immediate, promotion of innovation and technology would require its own strategy, including the development of requisite technical expertise. Till date, Pakistan has been allocating more resources to skill development of a rather basic level. It is the technical education and expertise, which can give the necessary green impetus. Planning Commission/proposed Commission on Sustainable Development would need to engage HEC, NAVTEC and Ministry of Education for re-centring their efforts on Technical & Scientific Education and Vocational Training, which is a pre-requisite to remain competitive and undertake successful mitigation and adaptation benefitting from the technology transfers. It needs to be underscored that the principle reason we are losing our competitive edge is that we are unable to embrace new technologies. Our dismal record in initiating CDM and achieving energy efficiency are enough testimony to our failure to realise the importance of ‘technological capacity’ for realising the sustainable development goals of Pakistan.

6.4 Role of a ‘Culture’ in Implementation

Sociologists have long recognized that public policies are related to national cultures (Berezin 1997, Lamont and Thévenot 2000, Dobbin 1994). Usually, national cultures are seen as source of pride. Policies are designed to guarantee national prominence or to guard against threats created by either outside powers or internal forces (Tiryakian cited in Arnason, 1990). Public policies serve to reinforce cultural values by legislating limits and by sanctioning behaviour occurring outside these limits. In Pakistan, reckless exploitation is so rampant that it has become deeply embedded in national psyche and has started operating as a cultural value. As this reckless exploitation with no end in sight has created massive poverty and inequality, we see the emergence of a survival culture of poverty in Pakistan which breeds another set of ‘values’ of mistrust and criminality. We see an increasing trend to use illegal means such as fraud, corruption, crime as a tool of economic survival. While the ‘cultural debate’ in Pakistan pre-occupied itself all these years with the issues of cultural conservatism, the social ethic was taken over largely by a Culture of Poverty. Prevalence of a Culture of Poverty over a long period of time affects the creativity and innovation of the society by reducing cooperative sentiment and trust which sustain creativity and innovation. The public policy discourse needs to involve itself in a genuine process of an auto-critique: a critique of national values and

behaviours. The relationship between national culture and public policy in Pakistan has become very complex. We possibly still have some active, positive elements of our cultural *repertoire*, which could be used to challenge other ---negative--- aspects of our culture, specifically the disregard shown by our Industry and elites to the rights of future generations of Pakistan on us TODAY.

International Cooperation

Mitigating past and current damages to the environment and saving itself from the negative impact of climate Change is a task which can not be adequately handled by Pakistan without international cooperation, especially in the domain of technological up-gradation. Pakistan should seek international cooperation much more aggressively but with a very strong attention to the effectiveness of foreign aid. Ensuring aid effectiveness is not the responsibility of the donor. Pakistan would not be able to make much headway in handling Climate Change impacts if its record on aid effectiveness continues to be as low as it is at present.

Pakistan should also explore the opportunities offered by South-South Cooperation more actively. The levels of south to south investments have grown impressively in the recent past. Given the fact the economies in the South share the production patterns; it should be easier to share the technologies. Many countries in the South are developing green technologies which could be more appropriate and affordable. As the regionalisation is on the rise these days, developing green regional supply chains, involving green technologies could offer a much needed window to countries like Pakistan in coping with the twin challenges of Globalization and Climate Change.

6.5 Financing the Change

As the proposed NSDS is based on the presumption that in order to promote sustainable development in Pakistan, Pakistan needs to work more in the domain of Policy re-centring, policy coordination, enhancing implementation capacity and creation of a mechanism in the Planning Division to take care of the Sustainable Development concerns and tasks in the long term, the financing need should not be daunting.

It is presumed that the respective entities are aware of their financing needs in respective domain such as agriculture, Energy, Water etc. and it is expected that the government and donors would be more forthcoming in allocating more resources to the areas of high relevance to Sustainable Development in Pakistan.

It is expected that the proposed Commission on Sustainable Development would take upon itself, in the first instance, the task of mainstreaming of Sustainable Development considerations and concerns in the Planning Process in Pakistan.

NSDS has attempted to map the areas of high relevance to Sustainable Development in Pakistan. The proposed Commission would be required to undertake a budget tracking exercise to know the levels of current financing to sustainable Development issues in Pakistan. Once, the policy re-centring is sanctioned by the Planning Process in Pakistan, whole of the PSDP and foreign funding could be channalised to realise the synonymous Social Policy goals and Sustainable Development goals, possibly in the framework of Vision 2030, with suitable re-orientation in the latter.

In the immediate however, the proposed Climate Change Policy of Pakistan, which makes an integral part of NSDS would need sufficient funding. As the government currently is facing severe financial crunch, which would keep Pakistan economy in an envelope for the next few years, it is the international community and industry in Pakistan who have to come forth, more than the government. Pakistan needs to establish a Climate Change Fund or Sustainable Development Fund at the Planning Commission. With effective fund mobilisation by the Commission on Sustainable Development, the Fund can start playing an active part in kick-starting urgent mitigation and adaptation programs.

Many donors in Pakistan are undertaking different projects of high relevance to Sustainable Development and Climate Change. The government would need to persuade these donors to strengthen the Sustainable Development Fund.

Pakistan is actively trying to un-block 'Financing for Technology' as a part of the Climate Change negotiations under UNFCCC. This financing should be able to leverage the Climate Change Fund proposed above.

6.6 Establishment of Knowledge Management System on Sustainable Development:

In Pakistan, there is a need to have one institution responsible for the strategic thinking and monitoring of Sustainable Development related planning and expenditure, like the SD Commission of UK. The proposed sustainable development Commission can set up a National Knowledge Management System which can deal with putting all the pieces of jigsaw puzzle in their place and suggest the need to creating synergies and identifying the gaps and pointing out the possible solutions. Realization of sustainable Development goals requires integrated assessments and synergetic actions. To be able to do it Knowledge and technological expertise also need to be integrated through a KM System. Our scientific research establishment is fragmented. The Commission should be able to accumulate and generate knowledge about the challenges and solutions to our problems of Sustainable Development.

Pakistan needs to work an awful lot to develop reliable Data Sets and indicators of Sustainable Development. Up until now, Pakistani scholars and planners use secondary resources and Indices developed elsewhere to have an idea of the state of environment or climate Change in Pakistan. That is primarily the reason that we have not developed and used Sustainability Models in Planning Process in Pakistan. As result, neither are we able to develop a system of benchmarking projections nor are we able to measure our social progress over time. We continue with useless, as far as their policy relevance is concerned, predictions about the growth, employment and poverty rates. Our planning process needs to be geared to factor in social and environmental costs in their calculations. Presence of a robust Knowledge Management System with the active involvement of public policy institutes and academia both in public and private sectors is necessary to support the NSDS in the long term.

6.7 Strengthening the Role of Civil Society/Major Groups in NSDS

6.7.1 *Situation analyses*

It has been well realized that a broad public participation, through major groups of civil society, in decision-making is one of the fundamental prerequisites for sustainable development. The importance of engaging major groups and stakeholders as partners has been gradually recognized by national governments, as major groups can help implement their programs beyond governments own capacities, specially in the developing countries. Major groups provide advocacy to foster accountability, expertise, base line data, raising public awareness, effective information dissemination and formal & informal education at all levels of society.

Major groups have also played an active supporting role in developing some of the multilateral environmental agreements (MEAs) by the states governments.

In Stockholm Convention 2001, parties agree to promote and facilitate, within their capabilities, public participation in addressing issues, developing responses and providing inputs regarding implementation at national level¹. Similarly, "High Level Declaration" and "Overarching Policy Strategy" of Strategic Approach to International Chemical Management (SAICM 2006), acknowledging major groups important role, ensures their meaningful and active participation in

regulatory/decision-making processes and declares enhanced partnerships and synergies with all stakeholders².

Major public groups recognized³ and generally accepted so far, include non-governmental organizations, farmers, women, religious scholars, the scientific and technological communities, children and youth, indigenous peoples and their communities, workers and trade unions, business and industry, legal communities, donors, media and local authorities.

The very important contributions, major groups are making/could make towards policy development and implementation processes are:

- Enhancing technical support and capacity building
- Strengthening knowledge and information
- Building awareness raising, understanding and concerns on national issues
- Building support within multiple sectors of society for reforming policies/practices
- Coordinating and developing multi-stakeholder sub-national, national, sub-regional, regional and international joint forums & networks.
- Developing links between government and local communities, ensuring communities due ownership and promoting innovative ideas

According to study⁴ conducted in 2001, there were 10, 000 to 12, 000 registered and active NGOs in Pakistan, mostly in Punjab province. Non-registered organizations are estimated to be around 50, 000. Mostly these are concerned and involved in education, health, women development and community development.

Nine of the 14 Pakistan national conservation strategy (NCS) program areas rely on community participation for their implementation⁵. National environmental policy also encourages federal, provincial and local governments to build strategic partnerships with private sector and civil society organizations for effective environmental management through creation of enabling environment, for expansion and improvement of services and establishment of sector specific advisory committees⁶. Although some of the Ministries regularly involve major groups in developing policies/plans for sustainable development, the engagement tends to focus on one or a few major groups and the exchange among them seems limited. Some organizations also seem to monopolize major groups representations on different national and provincial committees/bodies, thus minimizing wider participation and experience sharing as well as lesser opportunities of representation/participation by not too reputed organizations or groups in the making.

A recent report⁷ based on twenty case studies carried out in Pakistan has revealed the existence of three types of cross- sector collaboration between government and civil society: (i) contractor – client relationship (17%) (ii) donor driven relationship (17%) and (iii) marriage of convenience (65%). Only 1% of the cases in the report provided evidence of a relationship where the two parties were jointly involved in policy formulation.

Greater use of multi-stakeholder dialogues and consultations for NSDS process would be most useful. Involving various major groups in a systematic way on specific sustainable development issues would provide opportunities to integrate their views and expertise on specific thematic areas (e.g. chemicals, water, climate change, energy etc.) from the very beginning. This would not only improve the quality of the policies, strategies, action plans, guidelines/standards developed but a clarity of the same and feeling of ownership, among stakeholders, would also facilitate their effective early implementation.

6.7.2 Vision

- Promote, facilitate and ensure major groups meaningful and active participation in addressing sustainable development issues, developing responses and providing inputs, both in regulatory decision-making and implementing processes, at all levels.

- Enhanced partnerships and synergies among all stakeholders for NSDS process.

6.7.3 Strategies

While strategizing for an enhanced and strengthened role of major stakeholders of the civil society, it's essential to look at ways & means:

- (v) for getting an effective support from stakeholders,
- (vi) for mobilize major groups,
- (vii) to provide incentives,
- (viii) for effecting lasting change in social attitude of the society for sustainable development and
- (ix) for the implementation of NSDS as major groups collective responsibility.

A participatory and consultative approach, with the involvement of both public & private sectors as partners, needs to be adopted for getting any support from the major groups. Communication among the stakeholders must be effective. Inputs from all the stakeholders be acknowledged and accepted/rejected after their analytical evaluation. Involvement of stakeholders be ensured both at the policy development as well as implementation phases.

Major groups involvement for the development of individuals, society & nation be realized and recognized. Information dissemination, awareness, training and capacity building programs are key for the mobilization of major groups as human resource for national sustainable development. Opportunities for major stakeholders be identified and created to involve them and benefit from their existing or developed capacities in implementing NSDS.

Major groups participation towards NSDS process be encouraged by providing incentives to them, such as in cash and kind support, technical know-how, facilitation of expertise, appreciation and recognition through awards and where possible, empowering relevant major groups. Self-initiated successful programs by major groups at local levels be projected through their publicity and supported for further implementation at provincial and national levels.

Awareness and education are considered fundamental in changing social attitudes that inhibit sustainable development. Media has to play a key role in sensitizing major groups about ground realities, promoting national spirit and a sense of ownership. Religious scholars at their own as well as by joining media and other stakeholders can also provide substantial support in this regard. Opportunities for exposure of stakeholders, participatory approach, sustained coordination among stakeholders and results-oriented effective enforcement of national policies and frameworks would further help in developing a positive attitude to promote and work for sustainable development.

We need to benefit from our own earlier success stories of stakeholders partnership towards development and implementation of national policies, while strategizing for the implementation of NSDS with major groups enhanced involvement. Both the national "Environment Standards Committee" and "Clean Fuel Committee,"⁸⁻⁹ constituted earlier by Pakistan Environmental Protection Council (PEPC), met most of their objectives, as national environmental quality standards and clean fuels since long have been introduced in the country. Some salient features of membership and working modalities of these committees¹⁰⁻¹² are given below for consideration:

- The two committees were constituted by a high level national body of stakeholders, like PEPC with members from the government, private sector and a few major groups.
- The Chairman of the committee, appointed by PEPC, was a well reputed & respected individual from one of the major groups and not a government employee,
- Equal number (almost) of representatives from the government, private sector and major groups constituted the committees.
- A line department of the relevant ministry and an organization from one of the major groups worked as joint secretariat for the committees.
- Venues for the meetings were by rotation among government, private sector and major groups.

- The committee constituted issue specific “Expert Advisory Sub-Committees,” with almost equal representation from among the government, private sector and major group, to develop and submit policy papers, strategic/action plan, guidelines etc, as assigned by the committee under instruction from PEPC.
- The Joint Secretariat organized and held “Stakeholders Round Table” meetings at provincial capitals for wider consultations/feedbacks on the draft documents developed by the Expert Advisory Sub-Committees.
- The final draft, after consideration by the Committee, was submitted to the national body of stakeholders, PEPC, for approval & implementation in the country.

Constituting issue specific national sustainable development stakeholders committees (NSDS – Committees) at all levels, with composition and working modalities as described above, could be a practical and effective way to enhance and strengthen real involvement of major groups in NSDS process and sustainable development in the country.

Participation of youths & women, as observers, if not regular members, in the NSDS committees meetings be ensured. The role and responsibilities of major stakeholders need to be clearly identified and through their representatives on the NSDS committees, be accordingly assigned to the respective major groups. Periodic monitoring and performance evaluation, followed by updating & revision of programs/action plans in the light of the feedbacks, be made an essential part of the NSDS.

The following would further enhance and improve the role of major groups in implementing NSDS:

- Development of a “Criteria” in consultation with representatives of all major groups for a formal /official affiliations on the committees.
- Development of principles for government-major groups collaboration by NSDS committees.
- Guidelines for appropriate participation/conduct during meetings.
- Major groups be proactive or be encouraged/supported, to establish their respective issue specific focal points for intra- as well as inter- coordination among stakeholders.
- Any barriers for intra- and inter-consultation among stakeholders be discouraged and removed.
- Major groups be encouraged to form their issue specific experts advisory groups, for developing on their behalf statement/position on sustainable development issues. There is a need for an efficient coordination mechanism to be put in place for an early and appropriate submission/receipt of these statements and their participatory & transparent consideration.
- Development of inter-& intra networking and web links among stakeholders
- Stakeholders massive student/un-employed internship programs (offer, hiring & placement) at national level
- Separate meetings of all major groups be held at the earliest to identify individual major group specific role and responsibilities in the NSDS implementation process.

Major groups ‘s right for independent research, access to information for the same and opinions/point of views need to be respected. There should also be due realization that whereas major groups may be single issue-oriented, the state have to take many diverse viewpoints and the national interests into consideration.