

## RESEARCH NOTES

### **NEXUS BETWEEN ENERGY AND CLIMATE CHANGE: The Case of Pakistan in Global Perspective**

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#### **I. Introduction**

Global Climate Change has become the central and worldwide issue which has emerged as a major scientific concern and subject of public policy. Two reports by the Intergovernmental Panel on Climate Change (IPCC), (2001) and (2007)] and many other recent scientific papers have indicated climate change as an unequivocal fact to which human beings are basically responsible. A number of scientific and climate modeling breakthroughs have taken place since 2001 and have made it possible to adjust estimates on an ongoing basis. IPCC's [(2007) Fourth Assessment Report] provides an extreme variation between 1.1°C and 6.4°C (4°C on average) when its closer to the termination of the 21st century, considering 1990 on an average, as a reference. In addition to temperature increases, changes are expected in rainfall patterns, although these projections are more difficult and remain extremely uncertain.

The heating up of global system of climate is unprecedented. The average temperature of air and ocean globally has steadily increased over a period of time, resulting in exceptional and pervasive snow and ice melting. The average sea levels at global stage are also on the rise.

The serious analysis regarding meeting the challenge of climate change, done in 2006, led to conclusion that one per cent of global gross domestic production will be required to prevent negative impacts of climate change. Stern (2008) estimated the figure which is twice than the previous one per cent. It was also reviewed and estimated that the global GDP could increase manifold e.g., from 5 per cent to 20 per cent, in order to engage in activities which curtail the negative fallout of climate change by the year 2100.

It is increasingly improbable that its impacts can be avoided, simply through mitigation efforts by the richest nations because of the annual emissions by some

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developing but sizeable economies like China and India in the South Asian region, and in Latin America, such as, Brazil which are now higher than those of several developed economies (in absolute terms, but not on per capita basis).

Global warming is an issue that will primarily affect the poorest (and therefore most vulnerable) populations, and there is just a very little time to opt for inaction. Among other pollutants that cause climate change, the focus has been mostly on CO<sub>2</sub> emissions as significant and key noxious waste. The CO<sub>2</sub> emissions constitute the largest portion of the pollutants which are global in scale.

The major responsibility of incessant emissions of carbon dioxide (CO<sub>2</sub>) is on various human driven activities.

- The largest source of CO<sub>2</sub> emissions is globally the combustion of fossil fuels, such as coal, oil and gas in power plants, automobiles, industrial facilities and other sources.
- A number of specialized industrial production processes and product uses, such as, mineral production, metal production and the use of petroleum-based products can also lead to CO<sub>2</sub> emissions.
- The main engine of economic growth is the 'energy' and it will continue to remain so. Globally, most of the energy producers make use of the fossil fuels. The system of worldwide energy usage is currently the major factor liable to climate change as a result of more than 60 per cent of total emissions of greenhouse gases. The existing unsustainable configuration of usage of energy in the overall production system and consumption is detrimental to environment on local scale, as well as globally. The fossil fuel combustion which results in to erratic pattern of climate change also yield air pollution in the urban areas and contaminate land and water bodies through acidification.<sup>1</sup>

The phenomenon of energy usage induced climate change has its roots in history beginning from the eighteenth century industrial revolution. The use of firewood and charcoal was pervasive as main source of energy during the early period of eighteenth century. The use of windmills and water for energy purpose was also witnessed during the same period as the human existence was very much depended on the productive capacity of nature. The use of oil and gas and coal during the early industrialization period played phenomenal role in turning human life massively productive and itinerant. The global human population also soared from 700 million people in 1709 to approximately 7 billion people in recent years. Centuries long natural process of decay and compression of plants and animals which converts

<sup>1</sup>The contribution of energy to climate change: A feasible policy direction (2012).

in to fossil fuels got accumulated in the earth crust. At the start of the 21st century it may be noted that one to two million years' worth of these fossil-fuel deposits is being burnt every year. This routine use of stored hydrocarbons has truly changed the world.<sup>2</sup>

Energy demand will continue to increase since population is increasing as developing countries are following the path of developed countries. Much of the energy systems of these countries are also based on fossil fuels. Pakistan is facing the increasing energy demand as its population is also increasing since the last many years; therefore, Pakistan is already facing the energy shortage. The current energy mix is biased towards the use of fossil fuels; it is creating environmental concerns in the country and is adding to the global emissions. The following sections will discuss the matter in great detail.

This research note deals with the correlation of energy and climate change. This note highlights and discusses:

1. The extent of energy which is responsible for CO<sub>2</sub> emissions,
2. The type of energy responsible for major part of emissions and sectors which contribute to most of the emissions, and finally, and,
3. The available options to reduce the energy related climate change.

Each of these questions is discussed in separate sections and the world perspective is being highlighted. Pakistan's contribution in energy driven climate change scenario is explored. The rest of the note is structured in the sequence of the questions stated above, followed by the conclusion.

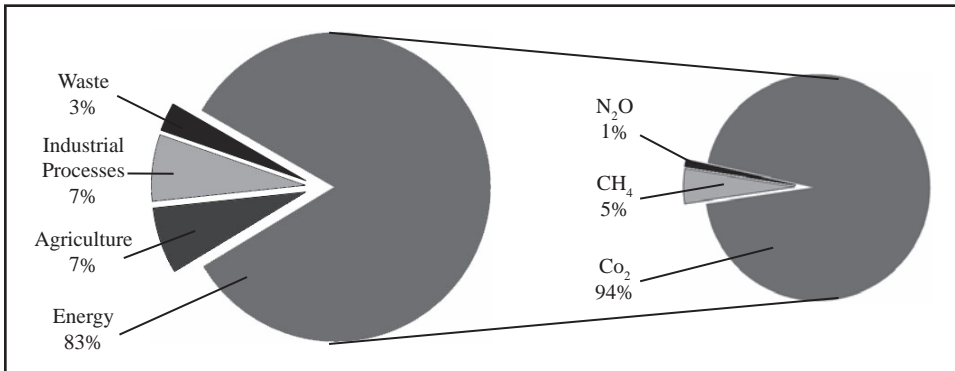
## **II. How much Energy Contributes to Climate Change?**

Growth and development require energy. The production of energy and its various forms of consumption results in negative consequences for environment which includes changes in the global climate. The use of energy contributes extensively in emissions of Green House Gases.

As shown above, energy contributes to more than 80 per cent of the GHG, and more dominantly, it is responsible to more than 90 per cent emissions of carbon dioxide. Contribution of agriculture which largely produces methane and nitrous oxide is not much prominent as its share, whereas industrial production and processes which are not based on energy emit, mostly fluorinated gases and nitrous oxide.

The following points give a brief description about the gases and the cause of their emission.

<sup>2</sup>A Renewable World Energy, Ecology, Equality: A Report for the World Future Council by Girardet and Miguel (2009).



Source: Captured by authors from the UNFCCC cited in IEA (2010).

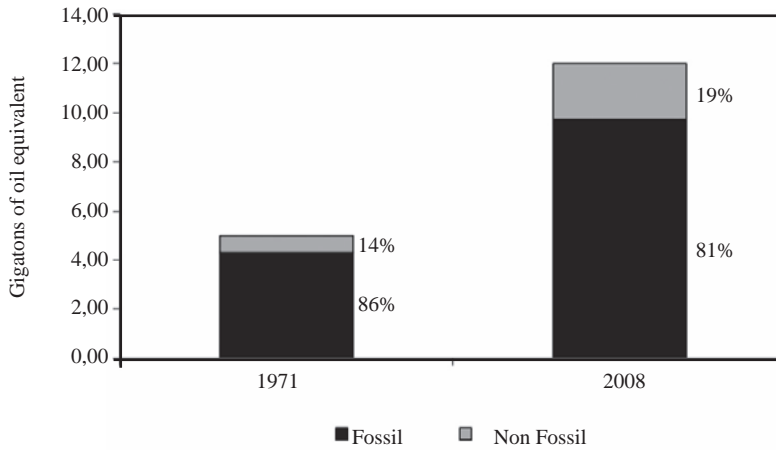
**FIGURE 1**

Shares of GHG Emission in Annex-1 Countries 2008<sup>3</sup>

1. Carbon-dioxide is a byproduct of combustion of fossil fuels, wood products and solid waste. Some measures like land use changes in disturbing the soil and planting new forest areas, and the growth of large forests lands could lead to decrease in carbon dioxide levels in the atmosphere.
2. Methane is a gas that gets emitted in extraction and production activities of thermal fuels like coal, natural gas, and oil. It is also emitted during transportation of these fuels. Solid waste and organic waste are used in land filling and in various other activities and, practices in the agriculture, livestock and industrial sector.
3. Nitrous-oxide emissions of this gas are a result of activities in both the agriculture and industrial sector. The burning of fossil fuels and solid waste also produce this gas.
4. Fluorinated-gases per-fluorocarbons, sulfur hexafluoride and hydro-fluorocarbons are produced in various industrial ventures and course of actions in different commercial and household use.

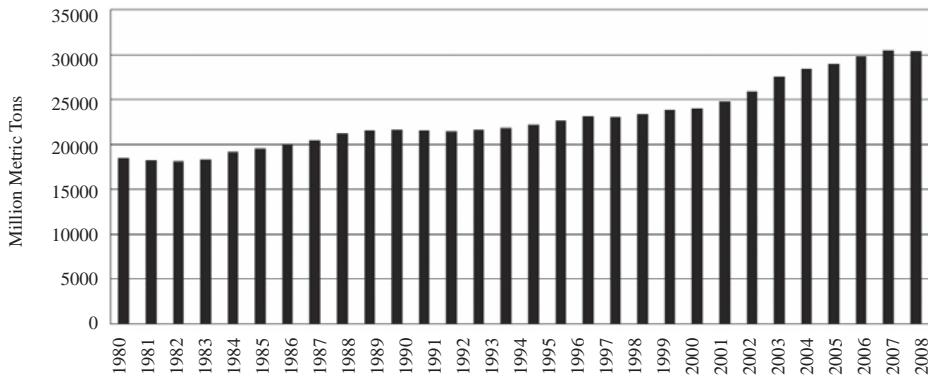
Now, we know that configuration of combustion of Coal, Gas and Oil as fossil fuels to produce energy is the central cause of climate change, worldwide, as these fuels continue to remain the leading source of energy globally.

<sup>3</sup>The contribution of energy to climate change: A feasible policy direction (2012).



Source: Captured by authors from the UNFCCC cited in IEA (2010).

**FIGURE 2**  
World Primary Energy Supply<sup>4</sup>

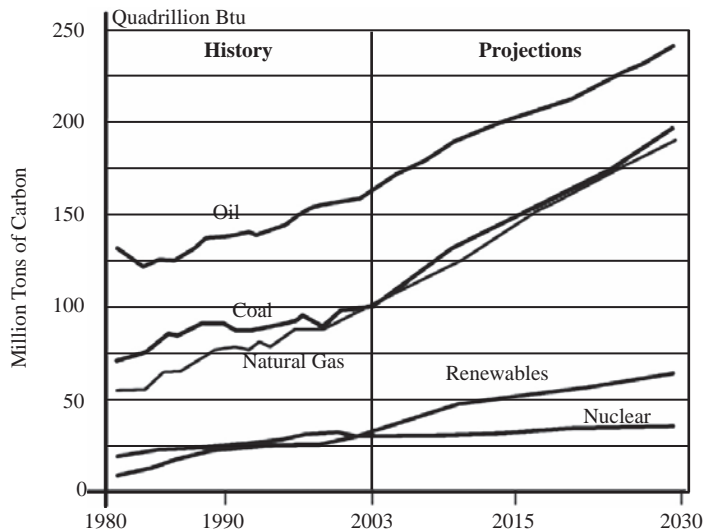


Source: <http://www.eia.gov/> (International Energy statistics).

**FIGURE 3**  
Trend in World's CO<sub>2</sub> Emissions from Fossil Fuels (1980-2009)

Clearly, this is the cause the CO<sub>2</sub> emissions have reached to the level that is almost double at which it was in 1980's as seen in the Figure 3. According to a recent estimation, the carbon dioxide emissions since industrial revolution, which was almost nil in 1870s has risen to the level of 30.3 million tons in 2009. This shows tremendous increase in its intensity.

Figure 4 shows as to what will happen to the carbon emissions by the year 2030 given the use of the fossil fuels increase by the same rate. The CO<sub>2</sub> emissions will intensify more, due to the increased demand by some of the major industrialized countries like India and China; and unless some dramatic measures are not taken, it will reach to a state of climatic change where mitigation or reduction will be very difficult. The need to curtail emissions as well as Green House Gases in the environment has become quite critical.



Source: <http://www.eia.gov/> (International Energy statistics).

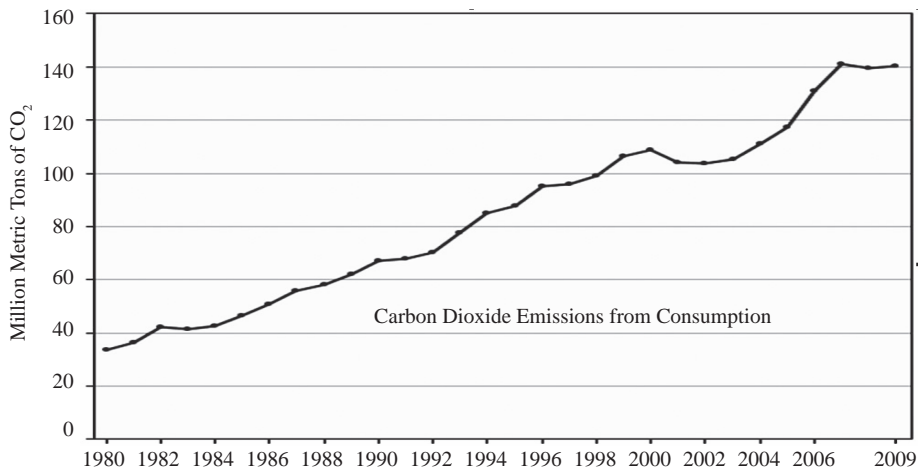
**FIGURE 4**

World Marketed Energy Use by Energy Type, 1980-2030

Energy generation and combustion activities contribute to the emissions of green house gases significantly in Pakistan, which amounts to around 70,000 Gg, or approximately 60 per cent of the emissions level that has been estimated in total in the country.<sup>5</sup> Although it is less than the developed countries like the one mentioned in the first figure of this topic but it is still high.

Similar to the world pattern, the combustion of fossil fuels in Pakistan are responsible for the higher CO<sub>2</sub> emissions. This trend shows about four fold increase in the CO<sub>2</sub> emission from 1980 to 2008. The CO<sub>2</sub> emissions were 139.75 Million Metric tons in 2008. This is the worst situation and the trend is expected to rise even further, due to the heavy reliance of energy on fossil fuels, due to the plan of use of coal for energy generation.

<sup>5</sup>EPA Pakistan, State of the Environment Report. (2005).



Source: <http://www.eia.gov/countries/country-data>.

**FIGURE 5**

Emissions Pattern from the use of Petroleum,  
Natural Gas and Flaring of Natural Gas

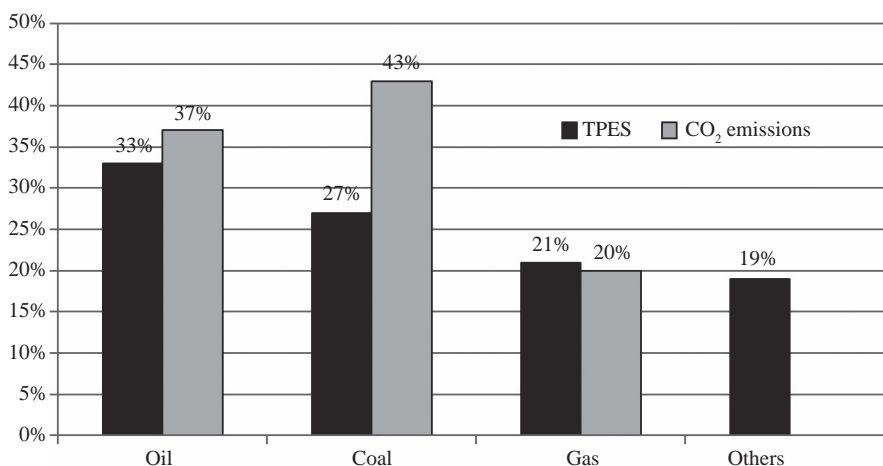
### III. Energy Contribution to Climate Change: A Further Disaggregated Analysis

It is now clear that energy has important role in the climate change and it may be worth to know as to which type of energy source has the greatest effect and those sectors which use energy have the greatest emissions.

The TPES shows the total primary energy source. It may be noted that although coal constitutes about one quarter of the energy supply but it has the greatest emission levels. Coal is much more emission intensive as compared to gas on an average, rather it is twice the emission intensive.

During the period of 1999 to 2006, the utilization of coal as a fuel has grown around 30 per cent; it is the main cause of emissions of CO<sub>2</sub>. The incessant use of coal across the world, in power generation, creates almost 11 billion tones of CO<sub>2</sub> on annual basis. If the new coal fired electricity generation plants are installed regularly, 60 per cent increase in CO<sub>2</sub> will be witnessed by the end of 20130.<sup>6</sup> The rapidly developing countries with huge level of production like India and China have increased their level of energy demand and they also contain vast reserves of coal as compared to other energy sources. The demand for oil and gas will also go up as a result of its increased demand which in turn will result in increase in their prices; thus the importance of coal will be more pronounced.

<sup>6</sup>The contribution of energy to climate change: A feasible policy direction (2012).



Source: Enercon.

**FIGURE 6**

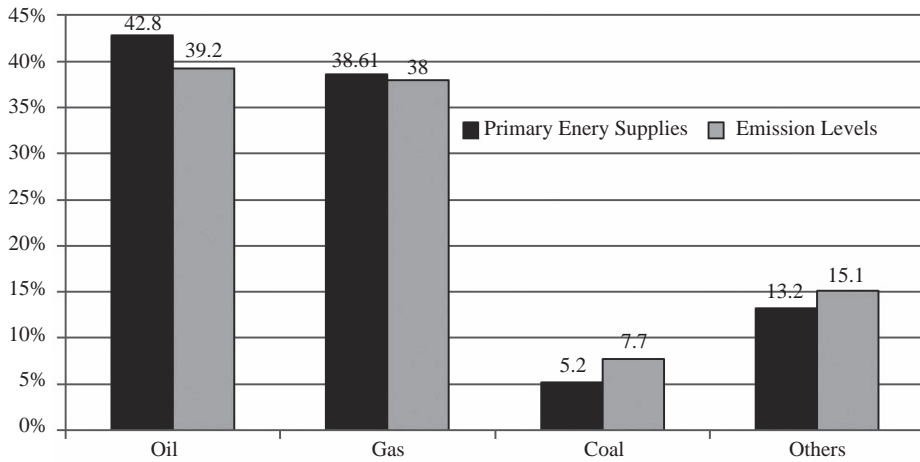
World Primary Energy Supply and CO<sub>2</sub> Emissions:  
Energy Shares by Fuel Type 2008<sup>7</sup>

Another evidence about coal being the most intensive in carbon emissions is clear in the Figure 6. This shows the composition of the sources of energy generation in Pakistan and their respective emission levels. As compared to the world, Pakistan's energy supply is less dependent on coal which is a better sign from the environmental perspective as given in Figure 7. The emission levels from it is higher than its share in energy supply; while oil and gas are almost equal in their share in energy supply and also in the emission intensity. In future, this trend is expected to change because of the high and increasing oil and gas prices and the use of Thar coal reserves which is under consideration by the Government of Sindh. In February 2012, the KESC signed a deal to change its Bin Qasim Plant into a coal-fired generation plant. This will replace the residual fuel oil (RFO) based boilers with coal fired technology. This may be the first step towards the replacement of fuel type in producing energy. This also shows that the aim is to produce cheaper energy and no environmental measures are kept in mind, while designing the policies.

Figure 8 shows the trend in the emissions caused by use of the fossil fuel by type in Pakistan. It can be seen that emissions from the gas has increased with respect to other fuel types.

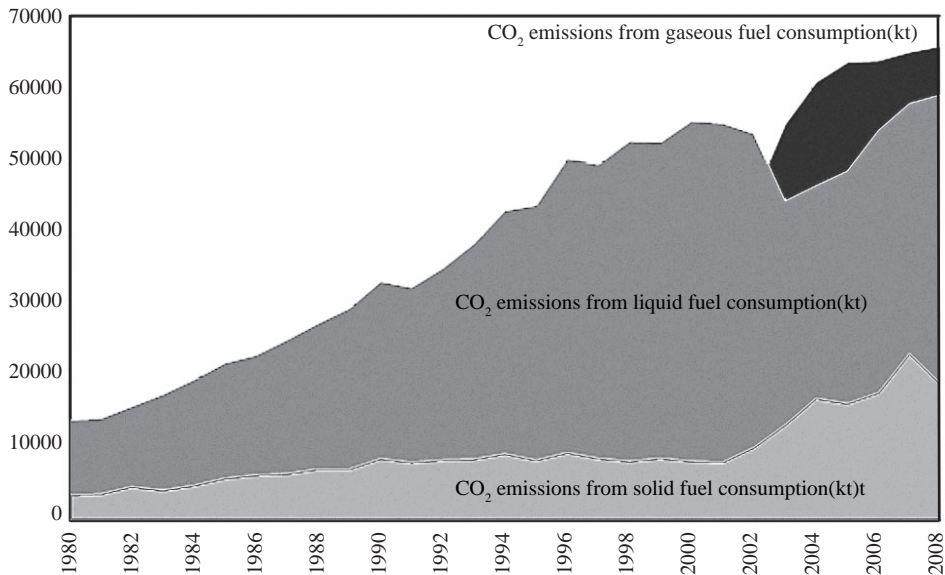
In terms of emissions by sector, Figure 9 provides very usefull informations. According to the figure, three major sectors contribute to the emissions; namely, electricity and heat production, manufacturing industries and construction, and the transport sector. Among them electricity and manufacturing are the highest contributors





Source: Enercon.

**FIGURE 7**  
 Pakistan Energy Supply and CO2 Emissions (%):  
 Energy Shares by Fuel Type 2005



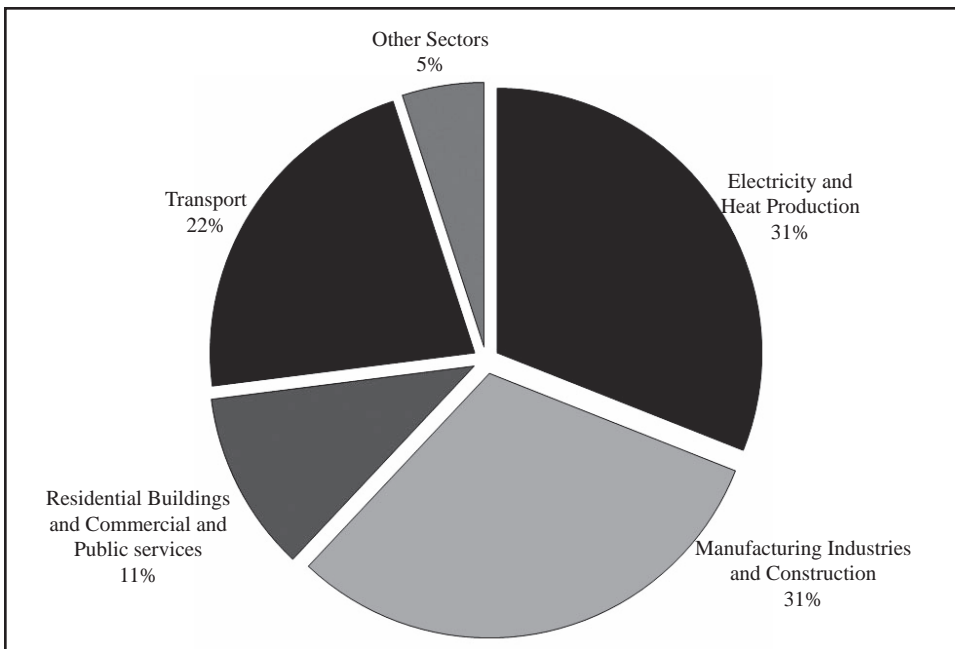
Source: World Bank.

**FIGURE 8**  
 Trend in Fossil Fuel Emissions, Pakistan

followed by the transport sector. The global trend is much the same with a slight difference where electricity dominates, followed by the transport sector and then the industry. All sectors in Pakistan use oil and gas as their source of energy; while globally, coal is used in the electricity sector and oil and gas are used in transport as well as the industrial and other sectors.

#### IV. Energy Driven Climate Change: Options for Mitigation

We have seen that the link between energy and climate change is a very strong challenge faced by the world. It should be clear that all countries should participate in the mitigation of emissions. The developed countries who are the initial and major emitters, should be more willing and must contribute more towards mitigation of CO<sub>2</sub>, as they are mainly responsible for the emissions and have enjoyed the benefits of the burning of fossil fuels through industrial revolution. The developing and transition economies are facing a tradeoff between economic growth and reducing energy related CO<sub>2</sub> emissions. The mitigation process should not take much time and options as mitigation should be adaptable at regional and country levels. Following are some of the options which are most discussed and studied in the literature.



Source: World Bank.

**FIGURE 9**

Pakistan CO<sub>2</sub> Emissions by Sector, 2008

### ***1. Increasing Energy Efficiency***

Energy efficiency is concerned with the use of energy in a better way. It includes minimizing the energy loss due to line losses, theft, etc., and the use of latest equipments which consumes less energy and give the same output. This will have two impacts: first, it will free the resources for other purposes and second, it will reduce the green house gas emissions.

### ***2. Investment in Renewable Energy***

The most important solution lies in the use of the renewable energy like solar, wind, biomass, etc, which are more environment friendly than the conventional fuels. This has multiple effects. It is normally argued that renewable energy has high installation costs; but it is more costly than the environment and the damages caused by the climate change. This point should be considered by policy makers. A simple logic can answer the argument of high costs. If renewable energy is used and the equipment is produced at wide scale, the installation cost will decline. It has been proved in a report by Greenpeace International, indicating that the cost have been declining and the power sector will generate more jobs in future than in the business; as the usual running power sector dependent largely on fossil fuels.<sup>7</sup> Investment should be promoted and awareness be created among investors and regulations be made for renewable energy.

### ***3. Increasing Public Awareness***

The general public should be informed about the consequences of climate change and the role they can play in saving the environment. The public is mostly unaware about the hazards which the energy sector especially the coal chain of custody has in it; and what does the developed countries and the mafias who are holding the fossil fuels reserves, are playing with the lives of people and the globe.

### ***4. Emission Taxes***

It is obvious that the pricing reforms which results in energy prices reflecting production may still be far from reflecting social costs. The externalities caused by the energy which results in climate change, can be controlled by using emission taxes. High emission taxes may reduce the use of high-carbon intensive fuels and hence reduce emissions. There is a problem with these taxes. The burden of the taxes is not necessarily borne by the producers or the emitters but instead the burden may be shifted on the poor, who are the final users of goods.

<sup>7</sup>Working for the Climate Renewable Energy and the Green Job. Evolution, Greenpeace, 2009.

## V. Conclusion

Climate change has disrupted the life on earth causing damages which will take long time to recover. The climate change is not natural but it occurs due to the activities of mankind. Among them, the combustion of fossil fuels is the greatest source of climate change. It was observed that energy contributes to more than 80 per cent of the GHG and more than 90 per cent of the CO<sub>2</sub> emissions. However, in Pakistan the contribution is about 60 per cent of total GHG. It has been observed that energy supply relies mostly on fossil fuels. This is the major cause of increasing CO<sub>2</sub> emissions trend. Disaggregating the energy supply it is revealed that coal is the most carbon intensive among other fuel types. The energy sector was disaggregated further and it showed that electricity and heat production, and, transport and industry sector contributed significantly to carbon emissions than the other sectors. The mitigation of hazards of climate change is very important and needs prompt action from all around the globe, especially by the developed and industrialized countries. There is no single option but multiple options need to be combined to mitigate climate change. Among top of them is the investment in the renewable energy which has a greater role in the future of energy.

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## **LAND POTENTIALITY AND PROSPECTS FOR DEVELOPMENT: The Case of Balochistan Province**

**Nighat Bilgrami-JAFFERY\* and Khalida MAHMOOD\*\***

### **I. Introduction**

Balochistan covers an area of almost 44 per cent of an area of Pakistan; but have a thin population density of hardly 20 persons per sq. km. against the country's density population of 164 persons per sq. km. Two thirds of labor force in the province is employed in the agriculture sector which accounts to half the province's domestic production, where as, the area under cultivation is just 6 per cent. In Balochistan, low precipitation, dry highlands, semi-desert environment, scarcity of irrigation water and poor infrastructure (roads, railways, markets, electricity, gas, etc.) have made the agriculture sector to progress at a very slow pace. The problems of tribal system coupled with nomadic life and kept the population away from the modern sustainable agriculture. Herd keeping (goats and sheep) remains the most favored economic activity of the pastoral community of the province. The total cultivated area of the province is 2.05 million hectares but only 0.48 million hectares is irrigated through canals and that too mainly in Nasirabad and Jafarabad districts (84 per cent), followed by the Kalat and Sibi districts. Rest of the province has to depend on rains and tube-wells.

Despite all these constraints the province is the single largest contributor to the national production of a large variety of fruits like apples, dates, grapes, peaches, almonds and pomegranates. Cotton cultivation has also taken momentum in Sibi, Nasirabad, Kohlu and Barkhan. In view of the above mentioned facts economic policy makers will have to prepare a comprehensive plan for investment in the agricultural sector of Balochistan because 80 per cent of population in the province lives in rural areas, earning livelihood from agriculture, in one or another way.

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## II. Objectives of the Problem

The province of Balochistan is underdeveloped but there is variation in the level of development of its districts. The study focus on 26 districts of the entire province including Quetta, the provincial capital which is the focus of economic activities in the province.

## III. Significance of the Study

The word 'Balochistan' means the area where Baloch tribe/people are inhabited. Archaeological evidences points to the existence of rural communities in Balochistan even before the Indus age (2500-1500 BC), revealed by the excavation at Moenjodaro, Harappa, etc. The inhabitants lived in small villages in various basins separated from one another by hills. Examination of such areas with uneven level of development is important and attracts attention of planners and decision-makers. There is no conscious effort towards systematic organization of such research in geography structured on levels of development in Balochistan.

The existence of significant regional variation in the level of development in Pakistan is widely recognized. Balochistan is generally seen as relatively backward province among other provinces of Pakistan. This backwardness must have several reasons but it is the inaccurate administrative sub-division or lack of financial allocations or politico-administrative turmoil [Pasha and Hasan (1982)]. It is an important province having tremendous resources like mineral, forest, fishing etc. It is, therefore, desirable to conduct a research for the evaluation of potential for development in Balochistan.

## IV. Discussion

It is common observation that large spatial disparities exist, in terms of the level of development, in the province of Balochistan. Quetta serves as a highly developed district in the entire area as a mean of enhancing the level of development in the province in terms of revenue and job opportunities as well as providing certain services and goods to the whole hinterland [Harris (1954)] and thus radiating chain reaction of growth and development in the rest of the province [Mahmood (2004), Pasha and Hasan (1982)].

In order to measure the level of development and to identify inequalities in the province of Balochistan, a multivariate analysis called Principal Component Analysis has been employed, using seventeen indicators namely: urban population, literacy, primary and secondary enrollment, immigrants, non-agricultural labour force, employment in manufacturing, banks, manufacturing value added per capita, doctors, roads, voters, population potential, shape of districts, owners,

farms cultivated land and value of cash crops per capita rural population. The data was derived from the diverse sources like various censuses of population, manufacturing and agriculture, and other government publications. The districts are presented in the Population Census of 1998.

Principal Component Analysis produces components in descending order of their importance; the first component explains the maximum and the last component explain the minimum amount of variation in the data [Rogerson (2001)]. In this study four components emerge from the analysis, and collectively explain the total variation in the data [Doultrety (1976)].

In order to obtain a spatial pattern and to rank the districts in terms of the level of development there was a need to combine the emerging component scores in form of a composite score. To compute this composite score these individual component scores were added to obtain the Weighted Component Score (WCS). The weights correspond to the Eigen value of each component. These WCS have been used as index for ranking various districts of Balochistan on the basis of general characteristics of the variable set. The analysis was conducted for the whole country.

An analysis of the WCS shows that Quetta has secured the top position as most developed district in the province. It is very clear that Quetta exhibits its importance as an administrative center of the province and is the only highly developed district in Balochistan. It is a pocket of development in this under developed province. Here an interesting point is that Lasbela and Gwadar follow Quetta with a sharp difference of development level between them. This is another area of development which has emerged in the southern part of the province contiguous to Karachi. This implies that Karachi stands out with the highest level of development in the country and serves as a catalyst of development to the neighboring districts located in Balochistan. Lasbela includes Hub, which is a secondary industrial center in the province.

The results clearly highlight the importance of physical and socio-economic infrastructure which leads to improvement in quality of life (Table 1). The idea that provision of goods and services is more efficient and cost effective in cities and towns like the provincial capital of Quetta and the industrial towns of Hub and the newly developing port of Gwadar. This explains the high degree of correlation between urbanization and development.

The WCS states that the Quetta emerges as the most developed district of the province. The second most highly developed district of the province is Lasbela. It is interesting to note that Quetta district include the largest urban center of Balochistan province where as Lasbela includes Hub, a very large industrial center of Balochistan which is in close proximity of Karachi. Gwadar emerges as the third developed district because of its specific identify for being a port city [Mahmood (2004)]. It is a potential port which is turning fast into a major commercial and trade center in the wake of mega projects to be launched by the government

recently [DAWN (2004)]. Rest of the districts, fall into very poor level of development. Twenty three districts out of the total twenty six are Sibi, Chagai, Kech, Kila Abdullah, Ziarat, Khuzdar, Zhob, Loralai, Mustung, Punjgur, Kila Saifullah, Jafarabad, Pishin, Kalat, Kohlu, Bolan, Kharan, Musa Khel, Dera Bugti, Barkhan, Nasirabad, Awaran and Jhal Magsi.

**TABLE 1**

District	WSC	District	WSC
Quetta	1.20	Kila Saifullah	-0.56
Lasbela	0.25	Jafarabad	-0.57
Gwadar	0.24	Pishin	-0.62
Sibi	-0.12	Kalat	-0.63
Chagai	-0.18	Bolan	-0.64
Kech	-0.26	Kohlu	-0.64
Kila Abdullah	-0.40	Kharan	-0.69
Khuzdar	-0.41	Musa Khail	-0.69
Ziarat	-0.41	Dera Bugti	-0.70
Zhob	-0.44	Barkhan	-0.71
Loralai	-0.45	Nasirabad	-0.80
Mastung	-0.45	Awaran	-0.86
Panjgur	-0.55	Jhal Magsi	-0.99

The difference in the level of development and quality of life of these districts and the three most developed districts like Quetta, Lasbela and Gwadar, is quite large. Therefore, special efforts at improving the level of economic activity and quality of life in twenty three districts will contribute to more balanced regional development in the province of Balochistan.

The high and persistent level of Balochistan is clearly indicated. Except for Quetta, Lasbela and Gwadar, all show poor level of development. These districts have some areas with underdeveloped transportation and communication network. Many of the districts have a weak economic base with hardly any industrialization. The profile of backwardness which emerges from the analysis reflects poor access to basic infrastructure and services like health, education, employment and poorly developed transport network, specially the metalled roads as shown in the analysis [SPDC (2001)].



Such pockets of developed districts with high level of development among majority of poorly developed districts indicate a wide disparity [Ladd (1994)]. Better position of Lasbela and Gwadar districts can be attributed to close proximity of these districts with Karachi. A number of development projects are in process. The completion of such projects like Coastal Highway from Karachi to Gwadar and Gwadar port might improve economic situation of the province in future.

Such a wide regional inequality in development level can be attributed to one major factor - the remoteness resulting from poor transport and communication. Now that, greater attention is being given to roads construction; it is expected that remoteness will be much reduced, if not eliminated. The Balochistan Road Development Project will support institutional development, improvement of provincial roads and national highways, and construction of a new cross border facility into Afghanistan. Such projects will directly benefit a large number of people living near the roads – most of them can be classified as poor. A regional transport corridor is underway in the province through improvement of the National Highway 25 (NH 25), from Kalat to Quetta and Quetta to Chaman, forming part of the Central Asia-Afghanistan-Pakistan.

This will go a long way towards boosting fruit cultivation which is the mainstay of people in the whole province. Fruits from Balochistan are supplied on a large scale to all parts of the country and also exported to a number of Asian countries.

The mineral deposits in Balochistan need special attention and development of these deposits along with growth of new industries; the underdeveloped districts could certainly enhance their development level to a considerable degree. Balochistan is geographically well placed on the map of the world to play an increasing role in regional cooperation, linking landlocked Afghanistan and the Central and South Asia. It will certainly improve and promote economic and social development in the province and thus will reduce the wide regional disparity.

As far as industry is concerned the situation in Balochistan does not show a better picture. There are less than two-dozen small industrial plants in and around Quetta - a few flourmills that serve the market of Afghanistan, a small steel re-rolling mill, animal feed plants, etc. The large Pak-Iran Textile Mills at Uthal and Quetta are not functional. The rest of the industrial base in Lasbela district is just an hour drive from Karachi. For all practical purposes the industrial estates of Lasbela serve as an extension of industrial zones of Karachi [DAWN (2005)]. It is therefore natural that investors in these districts are either from Sindh or the Punjab. Skilled manpower and service providers are also predominantly from Sindh and the labour and other benefits to the people of Balochistan is marginal. The industrial estates at Uthal, Winder and Hub do not generate much revenue for the provincial government as these industries are run on tax concessions.

Out of 204 units in the industrial estates of Lasbela district, 107 are closed while only 97 units in operation, out of 176 units at Hub 82 units are in operation while 97 units have been closed down. In the Winder Industrial Trading Estate, out of 17 units, only 9 are in operation. In Gidani industrial area (GIA) only two out of three units are in operation. In Special Industrial Zone (SIZ) of Winder two out of three units are functional.

The government has launched a number of mega projects; the Gwadar Deep Sea Port and the Makran Coastal Highway. The state, the people and the private sector (both local and foreign) are partners in development. It is therefore, necessary to adopt an accommodative approach of promoting mutual understanding for the ultimate goals of sustainable development.

One more sector that needs attention is the transport and communication. By virtue of its geo-strategic location Balochistan has the potential to be a gateway to the Central Asia and the Southwest Asia. It also has significant amount of world's known oil and gas reserves and its geo-strategic location makes it attractive for transit traffic to the land locked states of Central Asia and Afghanistan.

There is little doubt that situation in Balochistan is point of courses for planners. The tremendous potential which Balochistan has in many sectors lays solid foundation for future economic growth, development investment and trade. Major industries of Lasbela Industrial Trading Estate (LITE) are cotton yarn spinning, polyester fiber, automobile engineering processing, casting and light-engineering, pharmaceutical food and confectionary, chemical industries, marble processing, electric and electronics, oil-blending and fabrication and electricity generation. However, there are many problems that need to be resolved, for example, new allotment policy, provision of gas and electricity, construction of new infrastructure and special minutes for investors. There is a need to construct a road-network in under developed areas of Balochistan.

Like Karachi and Port Qasim, Gwadar will be another feeder port because it can only handle the first generation vessels with a maximum of 30,000 DWT (deed weight ton) or having a capacity to carry 900 containers.

The province's strategic location gives it added significance in view of rapidly changing geo-polities of the region. However, lack of government attention and investment has kept it behind other provinces in terms of development. The economic potential of this province could only be realized through infrastructure development and more spending on the social sector.

According to the Federal Bureau of Statistics, Balochistan produced more than 1791 thousand tons of coal in 2003-04, followed by 242 thousand tones of marble, limestone 229 thousand tones and 358 mmcf of natural gas. The province is contributing bulk of the country's gas supply (almost 60 per cent) but a tussle over royalty is yet to be resolved.

## V. Conclusion

The study provides a very grim picture of disparity in the development pattern all over Balochistan. Such wide disparities breed discontent and thus bring instability of all kind. The process of development is very slow and efforts to narrow the wide gap of development among different districts of the province have not been very significant. The vast potential of mineral-rich, strategically located province with 800 km. long coastline can transform the life of people of the province and brighten the fate of the entire country.

The study reveals that Balochistan presents a depressing picture of uneven level of development. Such pattern attracts attention of planners and decision makers. There is no conscious effort towards systematic organization of such research in geography structured on the levels of development in this province. This study suggests that districts with poor level of development need proper attention of planners. The precious mineral resources, forest, and fishery, etc., of this province can be significantly utilized to improve the pace of development in this province. The Government will have to make a comprehensive plan to improve the agricultural sector, which is the mainstay of population of Balochistan. Some important steps by the government towards industrial sector can certainly improve industries in Balochistan, which have been suggested in the beginning of this chapter. The functioning of Gwadar Port will be an era of development which will increase trade activities in Balochistan and this province will certainly play a vital role in development of the country.

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