ENVIRONMENTAL AUDITING- PROGRESS IN PAKISTAN

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Abstract

Some severe environmental problems are inherent in the country, which is of great ecological concern regarding its sustainable economic future. These include soil erosion, pesticide misuse, deforestation, desertification, urban pollution, waterlogging & salinity, freshwater pollution and marine water pollution, just to name a few. The primary constraint to overcoming these problems, in-fact perhaps the main contributor to their intensity is the population growth, which is very high in contrast to the limited natural resources that are available to the people. Also included in the constraints is the unsustainable use and management of these resources. The rate of population growth is one of the fastest if the population continues to grow at this rate; it would take a severe toll on the environment. The reason is that the country is not endowed with the resources required sustaining a considerable population.

Introduction

Although it is primarily an agricultural country, the landscape is predominantly arid. Water, already a scarce commodity in most parts of the country is now facing further shortages. This shortage is hindering the country's potential to develop agriculture. There are limited indigenous sources of energy, fossil fuel reserves are low, and there is no potential for the biomass energy. The combination of a large population and poor resource environment means that judicious means of energy use and minimum waste systems of production as well as lifestyles must be employed for sustainable development. The picture in Pakistan is however very different in fact opposite to this. Energy use is excessively inefficient; Pakistan's GDP per unit energy used is 4.0, which ranks it 69th out of 110 countries for which data is available. (UNDP). This waste of energy is combined with the need to import fossil fuels, and as a consequence, there is a very low productive per capita use of energy. The use of raw materials is also inefficient, and many reusable resources are discarded as waste. Only 3% of the industrial plants meet international waste treatment standards. There are serious effluent problems and lack of sanitation affecting the natural resources and posing unmitigated health risks.

Environmental Threats in Pakistan

The primary water sources in Pakistan are rivers, glaciers, rainfall, and groundwater. The rainfall pattern is extreme due to the varied topography of the country. The average rainfall is between 50 to 1000 mm, but in the isolated northern mountains, it may exceed 2000 mm. On the other hand, the dry areas receive less than 125 mm on an average. Almost 75% of the countries receive less than 250 mm annually. The rainfall is dependent on the two monsoon seasons, the most important being the Southwestern monsoon between June to September. The high temperatures mean that there is high evaporation, which leads to loss of water everywhere.

Pakistan occupies the basin of three major rivers, which is of considerable importance to the country. Indus (70% of land area), Kharan closed basin (15% of the land area), and the Makran coastal basin (15% of the land area) are the three basins, with the Indus basin representing the largest potential. It mainly draws its water from snowmelt and precipitation. The surface waters of the rivers have not been exploited, as they are seasonal and irregular. The Indus Water Treaty (1960) between India and Pakistan has restricted Pakistan's access to the water in the Indus basin, to the Indus, Chenab and Jhelum rivers. Around 90% of the food and fiber production depends on irrigation. Irrigated land is 82.3% of the total arable land, and surface water is mainly relied upon for irrigation. The irrigation water available per irrigated acre has risen to 35% from the 1960s. Out of the water tapped from the Indus basin, only 30% reaches the roots of the crop. The majority is either lost in canals or when it is being applied to the fields (PNCS- Where we are, where we should be and how to get there). 90% of the groundwater is already being used through tube-wells. In any case, groundwater has a higher salt content. When it is used in fields, it leaves behind a high level of salts after evaporation, thus increasing soil salinity.

All of the above environmental issues combined with certain others mean that Pakistan is swiftly heading towards an environmental instability.

Due to environmental degradation and poor resource management, Pakistan continues to suffer economic loss. The impacts of degradation and biodiversity loss on productivity and public health are in the tune of 3% of GDP per year.

CEPEC & use Coal for Energy

The strategic ties between Pakistan and China have been on an upward trajectory with a visible thrust on economic interaction after the initiation of China Pakistan Economic Corridor (CPEC) Project. CPEC is a revolution in the field of economics. Under CPEC, China would invest $46 billion in Pakistan for the development of infrastructure and energy. CPEC is a futuristic economic dimension of Pakistan in the 21st century. This multi-dimensional project has opened Pakistan’s rebalancing options from geopolitics to geo-economics, but its main component is making of electricity from coal. But there are many problems with coal:

1. It is not a renewable resource.
   At some point, if we are continuously using coal for our power and energy needs, it will eventually become depleted. As a fossil fuel, there is a finite supply. We may have centuries of stockpiles available in some regions, but at some point, there must be a backup plan in place that can be implemented.

2. Coal contains a high level of carbon dioxide per British Thermal Unit
   Scientists believe that one of the greatest contributors to global warming is carbon dioxide that is manually produced. When comparing all forms of energy and power production that we use today, coal contains the most carbon dioxide for every BTU that is produced. According to the

EIA, coal with a carbon content of 78% and a heating value of 14,000 BTU would produce about 204.3 pounds of CO2 per 1 million BTU.

3. Coal power can create high levels of radiation.
   A byproduct of burning coal for power, called "coal ash," produces radiation. This ash then settles around the surrounding areas of the coal plant. According to Scientific American, a coal power plant can produce up to 100 times more radiation than a nuclear power plant. Coal combustion can also produce mercury, nitrous oxide, heavy metals, and other potential environmental dangers.

4. Coal emissions are linked to health concerns.
   People who are exposed to coal and its emissions have an increased risk of experiencing asthma and other air passageway inflammation conditions. Breathing in coal dust or ash is also known to be a cause for lung cancer development over time. A coal mining disease called "Black Lung" can impact total lung capacity, is incurable, and is often fatal. People with Black Lung literally die of suffocation.

5. Even clean coal still has high levels of methane.
   Even with the best CCS technologies in place, clean coal still produces carbon dioxide and other environmental contaminants. CCS technologies do not address methane either. Although methane dissipates in the atmosphere rather quickly, it can sink to the bottom of the sea and impact our oceans and marine life for an indeterminate period of time.

6. Coal mines cause relocation and destruction.
   Many coal mines use an open-cast method, which causes local animal habitats to be destroyed. Green spaces, waterways, and other spaces are impacted by coal pollution, which can eliminate fields and forests with fast devastation. Fires connected to coal mining create underground burning that can be difficult to remove. Established communities sometimes need to move to avoid the pollution Coal and coal waste products (including fly ash, bottom ash and boiler slag) release approximately 20 toxic-release chemicals,
   including arsenic, lead, mercury, nickel, vanadium, beryllium, cadmium, barium, chromium, copp er, molybdenum, zinc, selenium and radium, which are dangerous if released into the environment. While these substances are trace impurities, enough coal is burned that significant amounts of these substances are released.

Global Threat

Environmental degradation is not a local problem. Around 300 million world children breath toxic air (The News, Dec 7, 2017).It may be caused due to destruction in another part of the world. When coal is burnt in India smog is created in Pakistan. When there was a nuclear disaster in Chernobyl, it resulted in deaths in other countries of the world. During combustion, the reaction between coal and the air produces oxides of carbon, including carbon dioxide (CO_2, an important greenhouse gas), oxides of sulfur

(mainly sulfur dioxide, SO_2), and various oxides of nitrogen (NO_x). Because of the hydrogenous and nitrogenous components of coal, hydrides and nitrides of carbon and sulfur are also produced during the combustion of coal in air. These include hydrogen cyanide (HCN), sulfur nitrate (SNO_3) and other toxic substances.

SO_2 and nitrogen oxide react in the atmosphere to form fine particles and ground-level ozone and are transported long distances, making it difficult for other states to achieve healthy levels of pollution control.

The wet cooling towers used in coal-fired power stations, etc. emit drift and fog which are also an environmental concern. The drift contains suspended particulate matter. In case of cooling towers with sea water makeup, sodium salts are deposited on nearby lands which would convert the land into alkali soil, reducing the fertility of vegetative lands and also cause corrosion of nearby structures.

Approximately 75 Tg/S per year of Sulfur Dioxide (SO_2) is released from burning coal. After release, the Sulfur Dioxide is oxidized to gaseous H_2SO_2 which scatters solar radiation; hence their increase in the atmosphere exerts a cooling effect on climate that masks some of the warming caused by increased greenhouse gases. Release of SO_2 also contributes to the widespread acidification of ecosystems.

Regulatory Guidelines of IAASB

International Public Sector Accounting Standards (IPSAS) are a set of accounting standards issued by the IPSAS Board for use by public sector entities around the world in the preparation of financial statements. These standards are based on International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB).

ISAE 3410 defines a GHG Statement sets out the constituent elements and quantification of an entity's GHG emissions for a period. It also includes, where applicable, comparative information and explanatory notes, including a summary of significant quantification and reporting policies. An entity's GHG Statement may also include a categorized listing of removals or emissions deductions. An ISAE 3410 engagement adopts a risk-based approach, regardless of whether it is a reasonable or limited assurance engagement. For all engagements performed under ISAE 3410, the practitioner:

- Obtains an understanding of the entity and its environment, including the entity's internal control;
- Identifies and assesses the risk of material misstatement in the GHG Statement;
- Performs procedures to address the identified risks; and
- Reports of findings.

ISAE 3410 does not mandate the circumstances in which a reasonable or limited assurance engagement is undertaken; law or regulation will determine this.

Environmental Audit Techniques

The performance of the environmental audit puts the previously developed protocols into use. A typical audit consists of five essential parts: a pre-audit meeting, a facility tour, measurement of environmental

data, interviews with operational and management personnel, and follow-up visits to the audited location.

- The Pre-Audit Meeting

  A pre-audit meeting brings together the full staff of the audit for the first time. Often a key manager in the audited operations and a representative of higher level firm management will also attend. The meeting should cover two key topics. First the meeting reviews site operations and audit objectives. Second, the responsibilities of each staff member and team should be presented. The meeting should also review audit protocols and deadlines.

- The Facility Tour

  The site work of an environmental audit begins with a facility tour. Either a tour is prearranged with local management or local management is notified of a pending environmental audit with the understanding that the audit team could show up unannounced. The tour allows for visual inspection of operations. Site management should answer any initial questions about unexpected findings during the tour (Blumenfeld, 1989).

- Interviews

  The audit team should interview staff at all levels of facility operations. Auditors should give careful consideration to questions of confidentiality and job security in this process. Interviews should include questions about operations, unusual incidents, management decisions, and knowledge about environmental policy and regulations regarding the operations being audited. Written records of the interview may be shared with the interviewee as a check for accuracy.

- Measurements

  The measurement of environmental data in the auditing process should follow the written protocols. Auditors should note any deviation from prescribed practices. The type and duration of measurements depends largely on the objectives of the audit. Some audits may require strict scientific data collection while others may just require a review of recorded measurements. This step requires technical direction and supervision.

- Preliminary Data Review and Follow-Up Visits

Data collected during the audit should be recorded as the audit proceeds. This allows preliminary review of the data. Auditors note any unexpected measurements or labor practices. More information on these items is often necessary for full understanding of operations. Audit staff collects this information on follow-up visits.

- Reporting the Results of the Audit

  The results of the audit are developed by comparing the information collected during the conduct of the audit with the standards of good operational practice identified before the start of the audit. These results are reported in at least two forms: a preliminary report and a final report.

- The Preliminary Report

  The preparation of a preliminary report is an important step. Preliminary results from the audit are shared with operational staff of the operation audited. The results should include recommendations, findings, and exceptions identified. Recommendations should address compliance, improvements to administrative procedures, operating practices and increasing environmental awareness (Chollak, 1990). The findings should note both positive and negative aspects of operational management. Audit staff should carefully report negative audit findings. The preliminary report may also be shared with a company's legal division. A company's lawyers draft comments on the legal implications of the audit findings. These comments are used to prioritize implementation proposals and they can be incorporated into the final audit report.

- The Final Report

  The production of the final report is the last step of the audit. This report formally summarizes the finding and is a crucial step in the audit (Pelletier, 1990; Cleghorn, 1990; Holliday, 1990; US EPA, 1986; Woolard, 1996) The final report should incorporate the responses to the preliminary report. Any inaccuracies found in the preliminary report are corrected. Findings of the audit should be prioritized as is done by Polaroid (Borghesani, 1996). The final report is developed for company management, operational management and legal counsel for the company. Often only a summary of the report is sent to top management. Detailed findings are shared with the appropriate operational managers.

Rule of SAI Pakistan in Environmental Auditing

Accountants and auditors have traditionally not been associated with the conservation or environmental movement. However, as providers of information, reports, and assurance on which business and government decision are frequently based, they have increasingly been drawn into the environmental arena. The influence of accountants and auditors comes from their access to financial and performance information. They analyze the report and communicate information on which decisions are based, and performance is evaluated. They can encourage greater transparency and informed decision about the application of resources and the impact of activities on environmental outcomes without distorting existing accounting standard. Air pollutants particles such as magnet can lead to oxidative stress which is common cause of neurudegeneration (Time of India Nov 2017).Smog in Lahore during November 2017 has made levels of dangerous particulates known as PM 2.5 small enough to penetrate deep into lungs and enter the blood stream, reach 1077 micrograms per cubic meter – more than 30% times what Pakistan's government considered safe limit (New York Times Nov 2017). According to WHO, 60,000 Pakistanis have perished from high level of fine particles in the year (NYT Nov 10, 2017). UNICEF has stated that children are uniquely vulnerable to air pollution, breathing faster than adults on average and taking in more air relative to their body weight. The report also notes that air pollution is a major factor in the deaths of around 0.6 million children under age 5 every year and threatens the health, lives and future of millions more. Keeping in view these alarming situation rule of SAI Pakistan in environmental audit becomes utmost important.

Case study;

Looking at smog situation in Pakistan in month of November it is urgently needed that environmental audit is made regular feature of audit and special directorate is established for it by SAI Pakistan.

Pakistan audit department had conducted environmental audit of Social Forestry project at Malaknad wherein the results were shocking. Main purpose of the project was reforestation with financial support of Holland. In conducting environmental audits there were five objectives:

- Verification of legislative and regulatory compliance;
- Assessment of internal policy and procedural conformance;
- Site Investigation;
- Identification of improvement opportunities;
- Report Generation.

During verification of legislation it was observed that forest department of Kh. Pakhtoonkhwa had not carried out any legislation regarding reforestation. Old rules of 1881 regarding forest conservation were still in vogue. Powerful timber mafia was blatantly violating the rules and cutting the trees indiscriminately. No rules were framed regarding reforestation, only sale/ smuggling of timber was regulated. It was observed that no futuristic plan was in pipeline and no study was available regarding guidelines for reforestation.

There was no coherence in internal policy. There were two policies regarding forest in same province. In Hazara Division which consisted of Mansehra district, Abbotabad, Hairpin, Kala-dhaka and Ogi was allowed to cut trees and export it. Local people had 50% ownership rights of the trees. While in Malaknad Division which consisted of Swat, Malaknad agency Dir, Bunir, Shangla and Kohistan districts, the forest belonged to the government and cutting of trees was illegal. Despite being illegal timber mafia in connivance with forest officials were regularly cutting the trees and hills were becoming deserts like by leaps and bounds. Previously, Malakand agency was fully covered by the trees but indiscriminate cutting had raised need for reforestation; it was where the project had been launched.

Site of the plantation is very beautiful and it was visited again and again. It is main entrance to the beautiful Swat valley which is a very famous tourist resort. Invaders from Alexander to Mughal king Baber have passed through this valley, therefore reforestation was definitely aiding to beauty of the area. However, they planted Eucalyptus plant in the area, which is notorious for consuming large amount of water. Though large number of trees had been planted but it had caused scarcity of water in the area and thus had resulted in elimination of other vegetables. Besides financial loss it caused destruction of ecosystem and elimination of many plants species. Instead of improving environment and producing oxygen it destroyed fauna and flora. The area had many medicinal plants which became extinct and sucked water from soil. Water table went down and natural streams were dried.

It was observed that if instead Eucalyptus local trees like Pinus longifolia should have been selected and planted. Ecosystem develops and matures in thousands of years. The previous forest which was existing here consisted of Pinus longifolia and was quite in line with natural habitat. Exotic species was not suitable for the area. But since it takes years for pinus to grow there Eucalyptus was selected which grows very rapidly. Being a semiarid area, it was further deprived of underground water. It was observed that Eucalyptus was consuming so much water through transpiration that sound of water flowing upward through xylem and phloem tissues of the big trees could be heard by putting human ear close to the stem of the tree.

It was also observed that since no water was available for the plants, therefore labor had to carry water on shoulder escalating the cost of forestation brings investment to Rs 6000 per plant. If a local plant like pinus had been planted then there would be no need of making such massive investment, and it would have saved cost and time.

The report was presented to concerned forums, and now recently one billion trees have been planted in the province. But as suggested by the report local trees of Pinus longifolia have been cultivated, and the area has even reforested, but in Malakand Eucalyptus is still there and it may take many years to replace it with pinus. This show that while facing an environmental problem utmost care must be taken and audit have to suggest an improvement, and environmental audit is need of the hour for the survival of humanity.

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