2015 4th International Conference on Informatics, Environment, Energy and Applications
Volume 82 of IPCBEE (2015)
DOI: 10.7763/IPCBEE. 2015.V82.19

Exploitation of Conventional Energy Resources–Impacts on Environment–A legal Strategy for Sustainable Development

D.Gopal[1] and R.Thippa Reddy[2]

[1]Director, P.G Studies, HOD, P.G.Department of Environmental Law and Legal Order, Tamil Nadu Dr.Ambedkar Law University, Chennai – 28, Tamil Nadu, India

[2]Director, Dr.Ambedkar Global Law Institute, Tirupathi, Andhra Pradesh, India

Abstract. Energy and Environment are inextricably linked. All energy production, exploitation, utility and consumption have impacts on environment. Once people start exploitation of any type of energy, by any method, there will be an impact either on water, air, land, plants or any human beings. Therefore, environmental concerns are associated with all forms of energy, including fossil fuels, nuclear energy and even renewables, throughout the energy chain, from exploitation, mining, transportation, generation and manufacturing to the end of decommissioning. The extraction of oil, transportation and storage of oil would be causing enormous damage to the environment by oil spilling, discharges, accidents of oil tanks and off-shore drilling. Likewise, the nuclear energy and hydel power are also more vulnerable to the environmental impacts. Several environmental conventions and legislations[3] were enacted for prevention and control of environmental pollution but they suffer for want of conviction and commitment from policy holders and legislators. This paper highlights the environmental problems of overexploitation and utilization of conventional energy resources in India and legal controls available at present in energy utilization and conservation and also provides the strategy for sustainable utilization of energy resources for social and economic development of the nation.

Key Words: Energy, Environment, Exploitation, Conventional, Utilization, Conservation, Sustainable Development.

1. Introduction

Conventional energy resources include oil, gas, coal, nuclear and hydel power. These conventional energy resources are usually fossil fuels. The exploitation and utilization of these conventional energy resources would lead to increased greenhouse gas emissions and other environmental damage.

1.1 Coal and Environmental Impacts

The extraction and tapping and utilization of coal fossil fuel have created a massive impact on environment with far reaching consequences.[4] Nearly 65% of India's electricity is derived from thermal power generation through the power houses for which the feedstock is invariably coal mined in India. Power generation through the Boiler-Turbine route results in atmospheric pollution due to the release of particulate

[1] Corresponding Author : Tel: 044-24641212, 24641919, Mobile : 09444571101,
E-mail :**profgopal2009@gmail.com**
[2] Corresponding Co-author: Ph: 08885511288, 098491161157,
E-mail: **drambedkargloballawinstitute@gmail.com**; **contact@ambedkarlaw.edu.in**

[3] Environment Protection Act, 1986, Air (Prevention and Control of Pollution) Act, 1981, Forest (Conservation) Act, 1980, Water (Prevention and Control of Pollution) Act, 1974, and special legislatures like Electricity Act, 2003, Electricity Conservation Act, 2001, The Oil and Natural Gas Commission Act, 1959, Mines Act, 1952 and the The Civil Liability for Nuclear Damages Act, 2010.

[4] Omar Ellabban, Haitham Abu-Rub, Frede Blaabjerg, Renewable energy resources: Current status, future prospects and their enabling technology. Renewable and Sustainable Energy Reviews 39, (2014), 748–764, p 749

matter, carbondioxide, sulpur and nitrous oxides. Most of the coal would be wrapped up in the bowels of earth through under ground mining operations.[5] The under ground mining raises the problem of acid drainage and health and safety of miners as caving in fires and explosions take a heavy toll of miners.[6] In USA alone about 80,000 workers perished in coal mining accidents and nearly 15% of miners got affected with Bock Lung (Pnenumoconiosis) through inhaling the coal dust in the mining operations.4 Moreover, the open casts mining operations like drilling, cutting , loading , crushing and transportation which release more dust would cause air pollution.[7] Large open cast mines also affect the depletion of ground water table. The noise and vibration around the open cast mines induce hearing loss and affect work performance in human beings. Since wildlife is believed to be more sensitive to noise and vibration than human beings the fauna in the forest too gets affected due to noise and vibration.[8]

1.2 Environmental Impact of the Oil

Oil pollution is an inescapbable fact of life in the 21st century, when the teeming millions depend on oil-based technology for travelling with speed and comfort.The process of extraction of oil, transportation and storage of oil cause enormous loss to the natural and human environment.[9] Oil spilling during off shore drilling both due to routine discharges and accidents affect marine living resources.[10] The onshore drilling results in blow-outs and subsidence of land and soil. Pasarlapudi blow-out in East –Godavari district of A.P in 1990 which raged over a year is an example for onshore blow-outs. Extraction of oil from seabed by installing machines affect the living resources of seabed. Shipping of oil from to one place to other on high seas results sea pollution due to leakage of oil from the ships, consequently, fish , marine birds get killed and shore plants also die. Accidents galore either during the transportation of oil over land or across the seas. The recent Nigerian oil pipeline leakage and burst lingers in memory. Minor accidents of such nature are an inescapable fact of life. India has an over all network of about 30 pipelines covering 18,000 km over its territory. Oil tankers get involved in road accidents quite often. Accidents during storage of oil too are not uncommon. The Indian oil Corporation terminal at Jaipur (Rajasthan) went up in flames recently and Hindustan Petroleum Corporation Ltd (HPCL) at Vishakapatnam blast during 1997 are some examples. Therefore, the loss of natural and human environment due to oil extraction, Oil spills and transportation and storage is at an alarming state.

1.3 Nuclear energy – Environmental Impacts

The government of India was convinced that nuclear energy would play a vital role in ushering a sound energy security strategy and therefore nuclear plants are being set up after having agreed a nuclear deal with U.S. But the dual role of nuclear technology for military as well as civilian purposes together with issues that crop up from international terrorism has restricted Indian role in the nuclear trade. The nuclear accident at Chernobyl and the recent one regarding the Tricastin nuclear plant in France are examples for environmental damage.[11] Further, the fear of environmental contamination by radio-activity due to waste disposal and exposure of wokers to background radiation and inhalation of random gas during mining of the uranium are some of the risks in the production of nuclear power. By products arising out of nuclear fission from the reactor gas escape in liquid and gaseous form which affect the human health. The decommissioning of nuclear plants entails disposal of radio – active wastes.[12]

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[5] M.King Hubbert, " The Energy Resources of Earth" Scientific American Volume 224 (1971), pp. 61-70 quoted by C.S.Rao in " Environmental Pollution Control Engineering Report, Reprint, 2002

[6] "Renewables 2014: Global Status Report". pp. 13, 17, 21, 25. Archived from the original on 4 September 2014.

[7] United Nations Environment Programme. 2007. p. 3. Archived from the original on 13 October 2014. Retrieved 13 October 2014.

[8] Mark A. Delucchi and Mark Z. Jacobson (2011). "Providing all global energy with wind, water, and solar power, Part II: Reliability, system and transmission costs, and policies". Energy Policy 39. Elsevier Ltd. pp. 1170–1190.

[9] Refer "Renewables global futures report 2013" p.18

[10] World Energy Assessment (2001). Renewable energy technologies, p. 221.

[11] New India Express, Vishakhapatnam Edition, dated 14th July 2008 : Residents in southern frame were unable to drink water or to cat fish due to uranium leakage at a nuclear plant. 350 kg of untreated nuclear liquid uranium had leaked from the Tricastin nuclear plant in Bollene.

[12] Integrated Energy Policy, Government of India, p.130

Nuclear plants create 50% more thermal pollution than fossil fuel plants.[13] Natural processes of many aquatic life forms are closely related to water temperature and therefore the temperature gradients disturb their life pattern. The chemical effects of uranium would also cause leukemia, bone cancer which are long term effects, and it also produces short term effects like nausea, loss of hair, sore throat and diarrohea etc. Also, gene mutation may cause the offspring to be born with genetic defects.[14] Because of all these effects on natural and human environment, the people of Tamil Nadu, India are agitating in the antagonistic view against the establishment nuclear plan at kudankulam.

2. Legislative Strategy for protection of Environment and Sustainability

It is undeniable fact that generation, transmission and consumption of energy contribute to environmental degradation. However, the environmental legislation exist in India has been helping in regulating, controlling or mitigating the impact of environment and also maintaining the sustainability for economic and technological development. But the energy law which has been developed in India is fairly isolated from environmental concern. Until today energy law appeared as an addendum to public administrative law with little regard to the principles that have shapped environmental law. In a similar way, energy ethics has been concerned with social justice issues such as access to and fair distribution of energy. Environmental concerns were of little importance.[15]

Several legislations have been enacted by the central as well as state governments for the protection of environment from the energy generated pollutions by the exploitation and utilization of energy resources and several conventions were adopted by the world for the protection of environment from energy related issues. The Air Act, Water Act and Environmental Protection Act can play a significant role in this respect. Under the Air Act and Environment Protection Act, the maximum limits on emissions and pollutants can be laid down. Environment Protection Act confers power on the Central Government to do all that is necessary to protect the environment. The rules made under Environment Protection Act are more useful in reducing the emissions. The notification concerning the environmental assessment specially addresses the question of environmental impacts of energy projects. All the power projects require environmental clearance from the Ministry of Government and Forests and the clearance may be given on the basis of the environmental impact assessment report. The same may be denied if the environment costs outweigh the benefits from the project. Thus it may be understood that EIA notification provides a pre-project control and the environmental legislations like Air Act, Water Act and Environment Protection Act provide for continuous monitoring and control of pollution, once the project is commissioned.

3. Conclusion and Suggesstions

Energy is the bulwark of national development. Promotion of energy projects to create energy sufficiency for India is the sine qua non for the economic and technological development. However, the sustainable development that meets the needs of the present without comprising the ability of future generations to meet their own needs is also important. Therefore, the decisions, policies and making of legislation by the policy makers, legislators and administrators should be in accordance with and in consonant to the principles of sustainability. The energy laws are site specific i.e country specific in the broader sense that they are tuned to the geographical distribution of energy resources. The best international practices should be adopted by the policy makers and legislators while making legislations and policy decisions for growth and development of energy resources.

Energy ethics upholds the concept of sustainable development. The principles of sustainable development is enshrined in Article 21 of the constitution and directive principles of state policy. The evolution of environmental jurisprudence through public interest litigation relating to energy and

[13] Renewables Global Status Report 2012". Ren21.net. Archived from the original on 2014-08-11. Retrieved 2014-08-11 p. 16

[14] Amory B. Lovans, " Rebolting the nuclear genic soft energy paths", 1977, p. 171

[15] Klaus bosseimors, " Energy Implications" Adrian .J, Brad Book et al (eds), The Law of Energy for sustainable development.

environment has created a right to healthy environment. One day the right to access to clean energy also would become a fundamental right to the citizens.

The government of India spelt out policies thorough its documents like Integrated Energy Policy, National Solar Mission, National Action Plan on climate change and Energy Security and Climate change. However, the following suggestions may strengthen the above policies for sustainable development of energy and protection of environment:

- Equity in energy distribution among citizens is necessary through a constitutional amendment. All laws concerning energy may be brought under a legislation. Laws on renewable energy must be enacted.
- All issues cropping up during setting up the energy projects should be referred to arbitration or to be sorted out through tribunals manned by Technocrats who possess 'hand-on' experience and awareness of ground realities
- Promote sustainable energy production by offering financial incentives especially for renewable projects. Renewable energy projects become viable if tax rebates and exemptions from central excise duty and other fiscal incentives are provided.
- New concepts – Safety, Health and Environment (SHE) and Safety, Health and Environment and Energy (SHEE) should be developed. The most modern steel plants and power generating units are adopting the new concepts.
- With regard to conservation of energy, national programmes in all sectors of energy consumption should be laid down and regular energy audit should be conducted in industrial sector and mandatory building codes and energy rating schemes for residential building should be introduced.
- Transmissions losses of electricity should be reduced and the electricity should not be used for non-productive purposes like domestic water heating etc.,
- The expansion of nuclear energy units should be started if the problems of disposal of nuclear wastes are addressed
- The scientific and technological research in relation to sustainable energy production should be strengthened and exchange of information and Research into sustainable energy production and consumption should be enhanced among nations.

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