

Energy Security in India : Problems and Challenges

Sadashiva Shivalingappa
Research Scholar
Dept of Political Science
Gulbarga University, Kalaburagi

Introduction

Energy has a significant place in the development of human history. To a great extent, the social and economic growth of society depends on energy sources and the sustainability of this growth is determined by the way of energy usage as well as the type of energy resources. Mankind made use of various types of energy resources in each stage of development. The primitive societies used energy from the sun without knowing its importance and they solely relied on their somatic energy¹ (Smil 2004, 549-50). The somatic energy is acquired by human beings through food such as plants, fruits, seeds and meat etc., and which is also derived from the sun. Likewise, almost all the energy resources are the reservoirs of energy from the sun through photosynthesis or some other ways. During hunting and gathering period, humans used the muscle force and some simple tools accelerated the reach of the muscles. Ultimately, the sun was the energy provider for them and they had been worshipping the sun for a long period of time. So, the earlier period's energy sources were the sun and various food items. And, the sun acts as the fundamental element in the food chain also. Even now, the commercial energy resources like fossil fuels are also the result of photosynthesis of plants. The wind, water and the rest of the resources are indirectly linked with the sun. Then fire was discovered and came to provide a wide variety of uses such as for heating, cooking and safety from predators. The burning of biomass and wood provided heat and light. It was one of the major developments in the human history. It was accessible to everyone, due to the abundant availability of biomass including dead wood and leaves from the forest. Further, the domestication of fire led to other developments such as invention of pottery, agricultural growth and secure human settlements.

Agricultural era contributed to the large production of food, permanent settlements, domestication of animals, expansion of energy sources and so forth. Hence the settlers had to depend on more new sources of energy for their advanced purposes. The power of muscles was very limited for their bulk farming, so that they used tamed animals, better tools and human labour for cultivation. Exploiting human

labour force through slavery was one of the primary energy source for ancient Egypt as well as Greece. Human and animal powered treadwheels boosted the progress of mankind in the middle ages. According to Smil a good horse was considered to be equivalent to 10 men, or at least 700 W. Later, water and wind mills were introduced as energy sources. Wind was behind the sailings, discoveries of new land and trade routes through seas. It marked a spot in the history and helped the European voyages and the following Western dominance over far away lands.

Energy: A Historical Approach

In A Brief History of Energy Use, Bithas and Kalimeris (2015) provides an overview about the development of human history and the role of energy in it. The energy use of traditional society was started from the sun which is the whole source of energy behind almost all forms of energy sources directly or indirectly. He stresses the significance of energy in the evolution of modern society and the depth of human dependence on energy. He also provides a clear picture on the evolution of energy usage. Fouquet (2009) argues that energy is the source for all human progress and survival. He examines the role of food as a major source of energy for human beings. According to him, sophisticated energy usage improves the quality of life and the source and forms of energy are different in different periods. By focusing on the similarities between societal metabolism and human metabolism, Krausmann (2011) argues that the environmental problems in societal metabolism, if unchecked, can destroy the entire living system in nearby future. During the time of evolution of society, the disposal of wastes, emissions and other pressures on environment are increasing. The study uses Material Flow Analysis from the history.

Smil (2004) in World History and Energy, sketches out a detailed history of energy. He deals with earlier, medieval and modern evolution of energy usage. In the earlier historical phase, the sun, fire, slaves, animals and biomass etc., were used while water and wind mills, tread wheels were in use at a later stage. Afterwards, the use of various sources like fossil fuels, coal, oil, nuclear energy and new technologies on renewable energy constitutes the history of energy.

As it is pointed out by Nakamura (2002), the control over these resources for the strategic achievement changed the energy dynamics in the 20th century. After 1980s market became liberalized and industrial countries focused on supply and demand of energy. The removal of restrictions and allowing freedom in the energy trade happened during these days. The dynamics of the market approach,

globalization and interdependence changed the oil industry. Besides, the threat of environmental hazards renewed the importance of renewable energy.

Realist and Geopolitical Approach

Yergin (1991) in the monumental work entitled *The Prize: The Epic Quest for Oil, Money, and Power* narrates the oil history from World Wars to 1990s and argues that the energy will be shaping our future international arena. The discovery of oil in Pennsylvania in 1859 created the history of modern day world. The Kerosene replaced whale oil as lighting fuel and since 1865, the gasoline changed the concept of energy resources. John D. Rockefeller monopolized the oil market in the early years. The book provides a broad history of energy and explains the dynamics of oil politics during the two World Wars. Less oil was used in the First World War, but the large usage of tanks and airplanes increased the dependency on oil in the Second World War. The book is more or less a history of the 20th century and recounts the incidents during the war period through the perspective of energy. Germany needed more oil reserves during the Second World War and they captured Maikop in 1942 but they had lost Rumanian oil fields due to the bombings from Russia. They failed in the attack on Baku and Grozny oil fields of Russia. The tensions in Crimea and Caucasus region in these times were due to the issues relating with access or control over the oil fields. In 1956, Nasser nationalized the Suez Canal, which was the main route of Arab Oil to the Europe and gave momentum to the other wars in this region. So, the twentieth century history could be explained through the lens of energy and it is more accurate than others.

While attempting to redefine energy security, Yergin (2006) argues for diversification of energy such as oil, natural gas, nuclear energy and renewable sources. The investments in new technologies help to increase the energy production as energy interdependence is an essential requirement for nations. So, the foreign policy strategies should be shaped by energy availability. It analysed the major disruption after 2000 on energy security. Yergin (2011) in yet another monumental work, *The Quest; Energy, Security, and the Remaking of the Modern World*, captures the energy scenario after the first Gulf War. By stating that energy is an element to shape the world, he deals with various issues like the reduction or scarcity of oil, the consumption growth of China and disruptions in the Middle East. The growth of the US and Europe after the Industrial Revolution and the impact of oil for the development of these economies are also discussed. The impact of energy on the environment is also dealt with. Since the First World War, energy is considered as a strategic component for attaining national power and energy is crucial in the war

and conflicts. So, the powerful countries struggle to get access and control over these resources. Energy security is vital for the economic development.

Market Approach on Energy

Since 1980s, globalization and market approach have taken place in the energy field. The consumer countries are in vulnerable stage during this time. The market adjustment mechanisms changed the situation and realized the significance of cooperation between states in the reduction of supply disruptions. Now it is more or less a controlled system and can absorb shocks and balance supply and demand in a controlled manner. But it concentrates on reliable supply with reasonable price. Oil became a commodity and we can buy it at any time from the market. It influenced the diversification of energy and new technologies in this sector. Deregulation is a need for the stable supply of energy resources. According to market approach, militarization is not the solution for energy access. It is interdependence, integration and especially liberalization which will provide security of supply (SOS) with availability, accessibility, affordability and accessibility of energy sources (Kruyt et al. 2009). Free market with environment tax is also considered in this aspect and it is more open and cooperative rather than realist arrangements. International regulations, good governance and corporate social responsibility are helping hands to avoid the illicit practices of the market. International regimes and treaties such as IEA and Energy Charter Treaty regulate the market function.

Liberals consider oil as a commodity in the global market place. Verrastro and Ladislaw (2007) in *Providing Energy Security in an Interdependent World* attributed the complex interdependence and the international institutions are significant in energy security. The market approach of energy security emphasizes more on market as a suitable mechanism for the distribution of oil as for any other trade good. Oil is a unique natural resource and a trade good that can be the object of negotiation. Liberals point to the advantages of multilateral and institutionalized cooperation. This will make a trade web through which regimes and states will engage in cooperation and get benefitted from it. Cooperation is more significant than conflict for achieving energy security. Promotion of regional and international energy regimes such as IEA or the Energy Charter Treaty and institutions is the main characteristics of this approach. Srivastava and Misra (2007) advocate proposals for regional energy cooperative institutions, such as those proposed for South Asia or for North-East Asia to bring together Russia, China and Japan into a mutually beneficial rather than competitive energy relationship. The EU is an example for this and liberal and institutionalized energy policies enhanced the solutions to its energy security concerns.

Resource Nationalism

The producing nations use this tactic as a national government's ownership rights over oil and gas reserves within their territorial boundaries. It contradicts liberalization principles and international investments, and work against the interest of the international energy companies (Stevens 2008). The international oil companies had control over major oil producing nations or its assets in the 1970s and 1980s. After 1980s, the market took control and cooperation was visible in this field (Vivodo 2009). Deregulation and privatization took place in 1990s and the price fell down. However, the resource nationalism came back because of the 21st century price hike and increased taxes and royalties (Vivodo 2008). The Latin American states such as Bolivia, Venezuela and Ecuador paved the way for it. They increased their share in oil sector and Yemen stopped the operation of some International Oil Companies. In 2007, Zimbabwe used the nationalization technique to threaten foreign companies involved in uranium, coal and methane projects. After 2003, Russia renationalized their companies and increased their taxes. Nigeria, Angola, Chad and Sudan also demanded large share in oil sector. The supply states stressed the need to strategic influence over the production and marketing of the hydrocarbon reserves. The supply cut offs, from both Hugo Chavez of Venezuela and President Mahmoud Ahmadinejad of Iran had threatened the consumer nations. The oil producing countries and IOCs changing relations turned as an anti-western campaign and the Persian Gulf, North Africa and Latin American countries were part of it. Mamadouh (1988) in *Geopolitics in the Nineties: One Flag, Many Meanings* explains the '90s oil politics in the international landscape. Walde (2008) also focuses on the changes of the oil producing nations and analyses the present day challenges in the investment in energy sector.

Critical Theory on Energy

In the global capital system, there is an unfair economic distribution resulting in the North-South divide and the critical theory is concerned largely about this. The energy rich nations export raw materials to core western world and are exploited by the latter. Some of the OPEC countries are benefited from the oil, hence they differ from the common pool of South or peripheral countries. Therefore, in the opinion of Sekhri (2009), there is a South -South divide as well as a result of the high oil revenue. However, even these resource rich countries are also depending on the North for their market, stability and other benefits. They are deprived of the core countries due to its lack of knowledge and technological advancement. In the case of oil and other energy resources, developing and underdeveloped nations are dependent on the North or the core countries. In every field of energy, the global West played a significant part and they

take maximum resources and the rest gets only the left over. The big nuclear business nations sell their nuclear technologies to the underdeveloped nations. As far as the South is concerned, energy availability is confined mainly for the privileged strata. There are millions of people who have no access to electricity or clean fuel.

As mentioned earlier, the concept of energy security is part and parcel of national security. However, the energy searches of nations to achieve their national security lead to creation of new insecurities. The world is turning out to be insecure due to the unscientific usage of energy resources. Therefore, the need of this security is also questioned in terms of, for whom or for what purpose. Dalby (1997) underlines the importance of a rethinking about the state centric security discourses. In *Security and Environmental Change*, Dalby (2009) gives an account of the risks associated with the global economic development and the relationship between the climate change and human interventions on the ecosystem. He mentions the problems of environmental change and its impact on human security also. Dalby (2010) in *Critical Geopolitics and Security*, highlights the weakness of traditional geopolitics and stresses the importance of environmental factors in the new geopolitics. Dalby's works elucidate environmental security aspect and it is very useful in the energy studies. His submits that the mainstream approaches neglected the individual and climate security. The policies of energy from the states are relied on the state security approach and neglected the marginalized sections.

CONCLUSION

Energy is an indispensable part of every one's life as well as the society since the very existence of human being. Along with solar energy, muscle power, simple tools, animals and fire contributed towards the primitive energy landscape. The biomass, wind and water were also instrumental in enhancing the quality of human lives. But with the arrival of hydrocarbon resource in the energy sphere has accelerated the growth of modernization, industrialization, mechanization and in all sectors of social life. Invention of oil added to the progress of human development in a rapid pace. The new energy applications reduced the labor and increased the productivity. The industrial efficiency and transportation facilities boosted the energy consumption causing the possession of certain energy sources in determining the power of the nations. Sometimes it did lead to conflict or even war. Even though the fossil fuel energy sources played an essential role in the development of human society, it also provides a lot of environmental threats to the very existence of planet Earth and the living things. Nuclear energy came at this juncture. Nevertheless, the large scale accidents and the radiation problem limited the scope of this

source. Now the world recognizes the impact of our energy choices, its economical, political, social and environmental consequences as well as significance of energy transition and efficiency. In this study an attempt has been made to analyze India's pattern of energy landscape and the prospects towards a sustainable future.

India is the third largest consumer of energy in the world and it is one of the major contributors to the growth of global energy demand. It is mainly because of the fact that India is a major economy and wants to satisfy the energy aspirations of more than 1.3 billion and it needs to solve the energy poverty of the large section of the people who has limited access to electricity and clean cooking fuels. For this, currently the country depends more on hydrocarbon resources. It consumes Coal (56%) Oil (29%), Gas (6%), Nuclear (1%) Hydro (4%) and Renewables (3%) and it is predicted that coal and oil would continue to dominate India's energy scenario for the next 20 years. In power sector, around 63% comes from thermal power plants. The cheap and abundant availability of the resource is a major attraction for the energy intensive sectors. The transport sector is the significant contributor to the green house gas emissions and 99% of it depends on the fossil fuel. The 80% of India's oil requirement depends on import, while also importing coal, natural gas and uranium from other countries. India is an emerging economy in the world and its development aspirations require continuous availability of energy. So, the present energy engagements try to ensure the rich commercial energy supply.

Reference

- 1) APERC (Asia Pacific Energy Research Centre). 2007. A Quest for Energy Security in the 21st Century: Resources and Constraints. Japan: APERC. https://aperc.icej.or.jp/file/2010/9/26/APERC_2007_A_Quest_for_Energy_Security.pdf.
- 2) Barnett, Jon. 200. The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era. London: Zed Books.
- 3) Barton, Barry, Catherine Redgwell, Anita Ronne, and Donald N Zillman. 2004. Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment. New York: Oxford University Press.
- 4) Bielecki, J. 2002. "Energy Security: Is the Wolf at the Door?." The Quarterly Review of Economics and Finance 42(2): 235-50.

- 5) Bithas, Kostas, and Panos Kalimeris. 2015. "A Brief History of Energy Use." In *Revisiting the Energy-Development Link: Evidence from the 20th Century for Knowledge-based and Developing Economies*, edited by Kostas Bithas and Panos Kalimeris. 5-10. London: Springer.
- 6) Cherian, John. 2017. "From Non-alignment to Strategic Partnership". *Foreign Policy*, September 1, 2017.
- 7) Doyle, Michael W., and G. John Ikenberry, ed. 1997. *New Thinking in International Relations Theory*, Colorado: Westview Press.
- 8) Gault, John C. 2006. "Energy Security, Globalization and Global Security." In the Program on the Geopolitical Implications of Globalization and Transnational Security GCSP Policy Brief Series. no.8. September 28. Geneva: Geneva Centre for Security Policy.
- 9) Jafar, Majid. 2004. "Kazakhstan: Oil, Politics and the New 'Great Game.'" In *The Caspian: Politics, Energy and Security*, edited by Shirin Akiner. London: Routledge.
- 10) Klare, Michael. T. 2003. "For Oil and Empire? Rethinking War with Iraq." *Current History* 102(662) March: 129-35.