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## Energy and Environmental Security

**A Regional Dialogue**

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**Institute of Peace and Conflict Studies**



# Energy and Environmental Security

## A Regional Dialogue

### Message from the Secretary General of SAARC

**H.E. Uz. Fathimath Dhiyana Saeed**

I am pleased to note that the Consortium of South Asian Think Tanks (COSATT) is meeting in Colombo to deliberate on the important topic of Energy and Environmental Security: A Cooperative Approach in South Asia. Given the challenges faced by South Asia in this area, the hosting of this conference is, indeed, a timely initiative. I commend the Institute of Peace and Conflict Studies and the Konrad Adenauer Stiftung for organizing this conference and for bringing together many eminent representatives from South Asian Think Tanks to share their perspectives and to deliberate on ways and means to address the myriad challenges posed by our demand for energy and the need to pursue sustainable development. I am confident that the deliberations will engender useful inputs and recommendations for policy makers in South Asia on this important subject.

Energy security is fundamental for humanity and for socio-economic development. Given our ever-increasing dependence on energy, a reliable and predictable supply of energy is vital to sustain social and economic progress and indeed human society. At the same time, our environment provides a range of important ecosystem services that are equally important for mankind. We cannot overlook our responsibility to preserve, protect and sustainably manage our life-supporting ecosystems that provide important services such as water, food and clean air for our future generations. Unbridled exploitation of our natural resources such as minerals, oil, coal and gas, will result in environmental degradation and impact negatively on environmental security which can cause conflict, unrest and human insecurity.

South Asia is on a high trajectory of economic growth and the demand for energy is increasing rapidly and outstrips supply. The pace of socio-economic development in South Asia can only be sustained if there is a reliable and predictable supply of energy. However, as we pursue economic growth and development, we impose more on scarce resources provided by ecosystems and our anthropogenic actions impact adversely on our environment. South Asia's large population and our insatiable demand for energy fueled by the rapid pace of economic growth is putting increasing demands and pressure on our natural endowment.

The use of fossil fuels such as coal, petroleum and natural gas contribute to a higher concentration of green house gases and global climate change. In the pursuit of development, among others, air and water quality are being increasingly compromised, precious biodiversity is being lost, oceans are being over fished, deforestation is increasing rapidly and agriculture land is being degraded.

These challenges have been recognized by the Leaders of SAARC and Member States are working in earnest to strengthen regional cooperation to harness our collective energy resources and at the same time preserve, protect and conserve the diverse and fragile ecosystems of South Asia. In this regard, I wish to take this opportunity to highlight some of the initiatives being pursued by SAARC in the area of energy and environment.

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**The Institute of Peace and Conflict Studies (IPCS), established in August 1996, is an independent think tank devoted to research on peace and security from a South Asian perspective.**

**Its aim is to develop a comprehensive and alternative framework for peace and security in the region catering to the changing demands of national, regional and global security.**

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Since the Twelfth SAARC Summit held in 2002, energy has been identified as a priority area of cooperation among the Member States of SAARC. A Working Group on Energy was established in 2004 and SAARC Energy Centre was established in 2006 to promote and strengthen regional cooperation in energy a focused manner. Likewise, the Energy Ministers from Member States of SAARC meet once in two years to take stock of progress and to strengthen cooperation in the area of energy. Furthermore, four specific Expert Groups on Electricity; Oil & Gas; Renewable Energy; and Sharing of Knowledge/Technology have also been constituted to pursue cooperation in each energy commodity.

Pursuant to Summit directives, a number of important initiatives have been undertaken which include, *inter-alia*, finalization of the SAARC Energy Trade Study; Preparation of an Action Plan on Energy Efficiency and Conservation; the holding of a South Asia Energy Dialogue in 2007; finalization of the concept of an Energy Ring; and evolving a common template on technical and commercial aspects of electricity grid-inter-connection. An Inter-Governmental Mechanism is finalizing a regional inter-governmental framework agreement and a Concept Paper on a Roadmap for developing a SAARC Market for Electricity (SAME) is also under consideration.

An Action Plan on Energy conservation is being prepared by the SAARC Energy Centre (SEC) to enhance cooperation in the energy sector to facilitate energy trade, development of efficient conventional and renewable energy sources including hydropower. SEC has created a web portal on Energy Conservation for exchange of information and sharing of best practices among SAARC Member States. A study on the Regional Power Exchange Concept in the SAARC Countries, with assistance from Asian Development Bank (ADB) is also being undertaken.

In the area of environment, the protection, preservation and sustainable management of the diverse and fragile ecosystems of the region constitutes an important agenda of SAARC. The Leaders of SAARC have consistently underscored the imperative to intensify regional cooperation in the field of environment. Since 1987, successive Summits have expressed deep concern at the fast and continuing degradation of the environment and increased frequency and intensity of natural disasters in many parts of the region. Indeed, the numerous directives issued by various Summits provide continued impetus for strengthening and intensifying regional cooperation.

Today, in addition to endeavours being pursued at the national level by Member States, SAARC has taken a number of initiatives at the regional level. The SAARC Action Plan on Environment (1997); the Dhaka Declaration and Action Plan on Climate Change (2008); the SAARC Convention on Cooperation on Environment (2010) and the Thimphu Statement on Climate Change (2010) are some of the most significant initiatives taken by SAARC to strengthen regional cooperation in the field of environment.

The periodic meetings of the SAARC Environment Ministers and the Technical Committee on Environment and Forestry review progress and guide and steer collaborative endeavours at the regional level. In addition, a number of SAARC Regional Centers such as the Meteorological Research Centre in Bangladesh, the Coastal Zone Management Centre in the Maldives, the Disaster Management Centre in India and the Forestry Centre in Bhutan constitute a framework of SAARC Institutions which address diverse aspects of environment. These initiatives and mechanisms are a reflection of the high priority attached to environmental conservation and sustainable development by the Member States of SAARC.

The Member States of SAARC are bound together by history, geography and the common desire and commitment to improve the well being of the people of South Asia. The SAARC process provides Member States with a platform to share concerns and experiences and to cooperate with each other in a spirit of partnership and shared responsibility. This is the *sine qua non* as we strive to address the numerous challenges confronted by the region and promote regional cooperation.

In this regard, I am confident that the valuable insights and perspectives that participants bring to this regional conference will promote a greater appreciation of the challenges faced by South Asia and the policy actions and measures that we need to undertake to address the imperatives of energy and environmental security in the region.

I thank you and wish the deliberations of the regional conference every success.

**Uz. Fathimath Dhiyana Saeed**



## **Introduction**

### ***D. Suba Chandran***

The main focus of this conference will be on country perspectives on Energy and Environmental security. However, it is important to explore some specific recommendations for country perspective as well as regional perspective. Therefore the speakers are requested to address the question of what specific recommendations can be provided for country perspective and regional perspective during their presentation. Besides country perspective, we are going to have regional perspectives on Gas pipeline, Electricity grid, water management and environmental security cooperation in South Asia. On this part, the speakers are requested to give specific recommendations on regional perspective.



It is a pleasure to inform that the Secretary General of SAARC has sent a congratulatory note for the successful deliberation of this conference. This indeed gives us an opening to reach out them with some solid recommendations on energy and environmental security and regional cooperation in South Asia. At the end of the conference, we would like to have the final paper for publications. All the papers will be published after peer review so the participants are requested to incorporate the inputs and specific recommendations on both country and regional perspectives.

## **Perspectives from Bangladesh**

### ***Col. Nazrul Islam***

The principal indigenous energy resources of Bangladesh are natural gas, coal, renewable energy including traditional biomass. The urban/industrial/commercial sector relies on so-called modern marketed energy sources, mainly natural gas for electricity generation. The rural or household or noncommercial sector is mostly dependent on traditional biomass fuels though there is an increasing trend of using electricity for the agriculture. Electricity and gas supply utilize a centralized distribution system reaching a limited population while traditional fuels rely on a distributed supply system impacting over 80% of the people.

Only 45 percent of the population has access to electricity and such access in the rural area is only 25 percent. Bangladesh has good potential of natural gas reserves. About 69 exploration wells have been drilled, which resulted in discovery of 25 gas fields of sizes ranging from more than 4 Trillion Cubic Feet (TCF) to 25 Billion Cubic Feet (BCF) Gas Initially in Place (GIIP). According to the GIIP, Bangladesh has 21.3 TCF of proven gas. Petroleum products constitute about 23 percent of the commercial energy used in the country. Currently, Bangladesh imports about 1.2 million tonnes of crude and 2.5 million tonnes of refined oil each year. Total imports, including lubricants, vary from 3.2 to 3.7 million metric tonnes per annum. The total coal reserves in five coal fields of Bangladesh are estimated to be 2.9 billion metric tonnes. Presently, 230 MW of hydropower is being produced at the Kaptai Hydropower Plant.

Amongst the renewable energy resources the potential of solar energy is quite high. Wind energy potential is mainly limited to coastal areas. Renewable energy in the form of traditional biomass such as fuel wood, farm waste, cow dung, rice husk, leaves and twigs, etc. is the main source of primary energy in the country. Bangladesh faces many environmental problems both naturally occurring and those caused by human being. The major environmental issues that significantly affect Bangladesh includes: (i) Natural disasters; (ii) Depleting Water Source; (iii) Deforestation; (iv) Land degradation; (v) Salinity; (vi) Unplanned urbanization; and (vii) Climate Change.

To meet the future energy demand, Bangladesh need to evolve an appropriate energy supply mix. A regional energy cooperation framework, based on respecting and complying with international law, should be institutionalized in South Asia. An integrated energy market should be set up in South Asia. It must have the required energy infrastructure facilities with the goal of exploring the most power trading potentials of the region.

## Perspectives from Bhutan

**Tashi Choden**

The energy needs of the Bhutanese economy fall into three main categories as identified by the *Integrated Energy Master Plan for Bhutan* (2010). These encompass resources for generating electricity; fuels and resources for the transport sector; fuels to meet heat and mechanical energy demand of the industrial, commercial and residential sectors, excluding electricity. The total consumption of energy in 2005 was 392,467 tonnes of oil equivalent (TOE). The per capita energy consumption for the same year was 0.62 TOE which was 65.7% below the world's average of 1.81 TOE in 2005. The electricity consumption increased rapidly from no electricity to 1,084 kWh per capita since 1961.

The residential sector uses energy mainly for cooking, lighting, space heating, and for fodder cooking in rural areas, consuming 48.7% of the country's total energy consumption. The industrial sector consumes 25.5% of the total energy supply and is the largest consumer of electricity in the country, accounting for 410 MU or 64.7% of the total electricity consumed in the country. The transport sector accounted for 13.7% of the total energy consumption. Oil is the dominant source of energy for this sector.

The commercial and institutional sector accounted for 10.2% of the total energy consumption. This sector consumed about 18.75% or 119 MU of total electricity consumption in the country. The agriculture sector which is the mainstay of the Bhutanese economy involving about 79% of the population, primarily meets its energy needs from human and animal power. It accounted for only 1.2% of total energy consumption in 2005, as the sector does not find much use for commercial and modern energy resources due to constraints by natural factors. Bhutan's energy supply is dominated by renewable energy sources. The main source of primary energy in Bhutan is fuel wood. With rich forest cover and a predominantly agrarian population, it is reported as one of the highest per capita consumer of fuel wood in the world, with firewood comprising over 57% of total energy supply mix in the country. Electricity contributes to about 16% of total energy supply in the country. Since domestic demand is relatively small, Bhutan exports most of the hydroelectricity generated to India.

The core issues for Bhutan in terms of its energy and environmental security include: climate change impacts and the vulnerability of hydropower; electricity shortage during lean seasons; high dependence on hydropower and little choice of other sources of renewable energy; high per capita consumption of fuel wood and consequent pressure on forests; complete (and increasing) dependence on petroleum imports from India; compounded by relatively weak implementation of environmental policy in certain crucial aspects. Bhutan's energy and environmental security will depend very much on the holistic and long-term thinking, planning and execution of appropriate measures that can be sustained and have least impact on the environment.

## Perspectives from India

**Nitya Nanda**

South Asia is among the fastest growing regions of the world. It remains the lowest per capita incomes in the world. The per capita energy consumption is also among the lowest in the world because the region is poorly endowed with conventional energy sources with more than 20% population share, its share in global oil re-



serve is about 0.6 %; natural gas reserve is about 1.4 % and global coal reserve 10%.

On oil and natural gas, India imports crude but exports refined products and major importers (Pakistan and Bangladesh) do not import from India, others import almost entirely or largely from India. Except India nobody engages in trade as there is no infrastructure. Major gas pipeline plans include: IPI, TAPI, MBI. However, India was most keen on MBI but could not make any progress due to bilateral differences – even IPI progress is hindered due to bilateral differences. Why is it so? Will a regional approach help? What about Nepal and Bhutan's needs for natural gas? Can that help in addressing Indian apprehensions?

The Electricity Trade is the most discussed issue at every regional fora on south Asian energy security. Can there be trade when there is deficit almost everywhere? Why several countries including the US, Canada, France, Germany and Switzerland are all among the top exporters as well as importers of electricity? Minimizing transmission distance leads to efficiency. However, Trade potential can be judged from potential rather than actual electricity generation. Globally, the potential of hydroelectricity generation is about 13000 TWh per year, of which about 1083 TWh (about 8%) is in South Asia. South Asia has however been able to create an installed hydroelectric capacity of 44847MW which is just about 7.5 percent of the potential capacity. Some countries have potentials well in excess of domestic needs.

Potential for cooperation on Hydroelectric projects among South Asian countries are high but less progress has been made so far due to various factors. For instance, Sri Lanka and Bangladesh cannot do much because of geographic reasons. Pakistan has potentials that can satisfy current needs but not in the long run. India has high (50% of the region) potentials but cannot satisfy even current needs. Afghanistan Nepal and Bhutan have potentials for surplus even in the long run and only Bhutan has surplus potential which exports to India. King Wangchuck of Bhutan said, 'Water is to us what oil is to the Arabs.' Variations in power demand within a day (and year) can be source of complementarity and also inability to match supply and demand can lead to major losses. This can be particularly difficult in a country where the climatic conditions remain similar in the entire country. For example, the peak months for hydro-power generation are August-September while the lean remains from January to June. Similarly, in Bhutan/Nepal demand is higher in winter; in India demand is higher in summer. Can energy cooperation take place in the absence of trade/investment integration? Pakistan is keen on energy cooperation even though it does not offer MFN status to India. There might be domestic constituencies against trade/investment integration but unlikely so in the case energy cooperation. On renewable energy India can provide technology and finance? Land Degradation is a major issue South Asia. About 16.6 % of land mass degraded and half of territory in Bangladesh and Bhutan and half of population in Bangladesh, Bhutan and Nepal affected. Poor agricultural practices, excessive use of chemicals, excessive irrigation especially from ground water, Industrialization, urbanisation and deforestation are the main cause for land degradation.

Water Resources are slowly depleting due to climate change and demographic factors. WBCSD – 1700m<sup>3</sup> of water availability as benchmark for stress and 1000m<sup>3</sup> for scarcity. Water availability has been going down. Some regions are already stressed. More regions will be stressed and some regions will become water scarce.

Key climate changes include: Glacier melting, greater variability in water supplies and accelerated demand, fall in agricultural output due to temperature changes as well as reduced availability of water and land degradation and crop damage due to extreme events. There are certain cooperation issues among south Asian countries which need to be resolved. They are follows: Integrated water resources management (including hydro-power); Ecosystem approach to management of land, water and forest resources; Management of biodiversity; Sharing of traditional knowledge; Organic farming practices; Cooperation in adaptation including in technology; Management of risks and disasters (important particularly for smaller countries).

## **Perspectives from Nepal**

***Nischal N. Pandey***

Nepal possesses 83 thousand mega watts of un-harnessed hydropower potential half of which is economically feasible. But the current status is less than 650 MW. The government has recently set a goal to achieve 10 thousand MW by 2020. Achieving this lofty target requires huge foreign investment, market surety, political stability and the ability of the state to make hydro-power and environment security issues of national consensus rather than a politically divisive one. Currently reeling under 14 hours of power shortage during winter and occasionally having to face shortage of cooking gas and petroleum products, Nepal is vulnerable as far as energy security is concerned. On the front of the environment too, fragile eco-system of the Himalayas, melting of the glaciers, deforestation, land degradation, water pollution, air pollution in the cities and soil erosion are some of the major issues. According to estimates, forest cover declined from 45 to 29 percent of the total land area from 1966-2000. Main causes of deforestation include population growth, high fuel-wood consumption, infrastructure projects, and conversion of forests into grazing- and cropland. According to government estimates, 1.5 million tons of soil nutrients are lost annually, and by 2002 approximately 5 percent of agricultural holdings had been ren-





dered uncultivable as a result of soil erosion and flooding. What Constitutes Energy Security for Nepal? Nepal's energy woes is primarily manifested by the huge gap between electricity produced and energy consumed. Due to the technical deficiencies and bilateral tribulations with India as regards to the Koshi and Gandak projects initiated in the 50s, there has also been much politicization over the issue. Various political parties have framed divergent policies as regards to energy issue. The Mahakali Treaty signed with India in 1996 was passed by a two-third majority of the parliament but the main opposition CPN (UML) split over the issue.

Given the existing and expanding needs, there is lot more to do and a major question is how to attract FDI in this sector? In the 80s, FDI inflows to Nepal were minimal with an annual average of US\$ 500,000. FDI inflow showed an increment

during the 1990s averaging US\$ 11 million per annum during 1990-2000, peaking at US\$ 23 million in 1997. This was mainly because of Nepal's liberal trade policies, tariff rate reductions, introduction of a duty drawback scheme, adoption of a current account convertibility and liberalization of the exchange rate regime. A reversal in the trend took place from the beginning of the 2000s.

FDI is considered beneficial in view of its contribution to technological transfers, enhancement of managerial capability and new opportunities for market access. Increases in FDI are also seen as leading to increases in exports by creating international markets through new marketing and organizational skills. However, FDI into Nepal is still in a primitive stage of development. There are technical, system, capital and talent obstacles not to mention other endemic problems such as infrastructure, raw material unavailability and poor law and order situation. In order to attract FDI and provide an incentive to foreign investors, Nepal government has after the economic liberalization move of the early 90s, enacted several laws and Acts related to FDI.

Can Bhutan Model be Duplicated? There are people in Nepal that believe that just like Bhutan has made significant strides in its hydro-power generation by going for power agreements with India, Nepal too can do the same. After all, Nepal also needs revenue, we also need electricity. It is indeed a far-sighted approach undertaken by Bhutan to allow the Government of India to construct projects and purchase electricity at a very low price and receive revenue which has taken its per capita GDP to more than US \$ 5000. However, there are also experts in Nepal that believe that this model cannot be duplicated because of several reasons:- mainly huge construction costs, issue of water sharing and irrigation and also the much more complex political environment within Nepal than in Bhutan. Dipak Gyawali, a hydro-expert says, "if the 336 MW Chukha hydroelectric project has dramatically increased Bhutan's per capita GNP, and the Chukha approach is to ensure something similar for Nepal, the following logic would apply.

Nepal has about fifty times more people than Bhutan, which would imply that India would need to fund 17,000 MW of equivalent hydro development in Nepal on the same terms as it does in Bhutan, i.e. 60% grant and 40% soft loan, with similar per kWh royalty provisions. It is doubtful if India has that kind of development money available: it certainly has not indicated so publicly. If India accepted that there is value in regulated water, priced it appropriately as per the principles laid down in the Columbia River Treaty regarding downstream benefits, it might have been possible to work out a financing plan for these types of hydro developments that could be more equitably justified. But as things stand, the neo-colonial, "cost plus" resource extraction model offers Nepal very little developmental benefits to be particularly excited with the projects and plans on the table.

Nepal is vulnerable not only from the point of view of power but also from the aspects of fuel and cooking gas. Due to the land-locked nature of the country, petrol, diesel, kerosene and cooking gas has to be imported and it has to pass through the volatile areas of West Bengal and North Bihar before entering Nepali territory. Even after entering Nepal, it has pass through the unsecure area of the terai before it reaches Kathmandu, Pokhara and other major cities of the country. The state monopoly Nepal Oil Corporation usually subsidized kerosene and diesel which creates price discrepancies leading to perennial problems with the Indian Oil Corporation. The moment there is some blockage due to civil disturbance, strikes in Bihar or in the terai, long serpentine queues can be seen at the petrol pumps in Kathmandu. Therefore, Nepal is very unsecure even in the area of fuel and gas. There has been a request made for the construction of a pipeline from Raxaul to Amlekhgunj but this is yet to be implemented. It is yet another irony that drinking water is also in scarcity in the Kathmandu valley due insufficient supply, leakage and mismanagement. In a country where there are hundreds of rivers and rivulets,

such a predicament is simply incomprehensible. "Nepal is the upper riparian country for some of the rivers in the Ganga basin. The country currently utilizes less than 10 percent of the available water, but the fact is that it doesn't expect to use more than 25 percent of all the water available even by the year 2025.

Tibet and Nepal are origins of many rivers and rivulets that flow downstream to the Indo-Gangetic plains. Fragile eco system of Nepal, deforestation, disappearing wetlands and rise of pollution levels has alarmed international experts. Additionally, there are concerns of waste problem in Kathmandu and other big cities. Waste disposal becomes a problem whenever there is controversy related to the disposal site with the local villagers unwilling to allow waste to be deposited in the vicinity. Hence, the Kathmandu Metropolitan office has been altering site every now and then. Pesticide pollution is another concern because pesticide is used indiscriminately nowadays by farmers causing health problems to consumers.

SAARC has been at the forefront in recognizing the need for a collaborative mechanism to address this challenge. "The region as a whole is highly dependent on foreign sources for its energy requirements. Regional cooperation can promote utilization of the potential within the region and reduce its outside dependence. Such cooperation will not only be beneficial in promoting greater efficiency within the region, but will also be useful in accessing energy from countries outside the region." The Thimpu Summit held from April 28-29, 2010 made a statement on climate change and made a number of important directives to the SAARC Secretariat such as: "commission a study on climate risks in the region, undertake advocacy and awareness programs on climate change to promote the use of green technology and best practices to promote low-carbon sustainable and inclusive development of the region, plant ten million trees over the next five years (2010-2015) as part of regional afforestation and reforestation campaign, commission on a SAARC Inter-governmental Mountain Initiative on mountain eco-systems, particularly glaciers and their contribution to sustainable development, complete the ratification process for the SAARC Convention on Cooperation on Environment at an early date to enable its entry into force, etc.

## **Perspectives from Pakistan**

### ***Arshad Abbasi***

Last year Pakistan witnessed unprecedented floods which caused the displacement of 20 million people. This shows the vulnerability of Pakistan to environmental disasters. Pakistan's energy mix is playing a fundamental role in environmental degradation. It contributes 189mt of carbon emission to the global emission which is comparatively very less in terms of per capita. However, carbon emission by energy sector is 50 per cent, agriculture is 9 per cent and industry counts 6 per cent of the total emission. In order to cope with environmental challenges triggered by its energy sector due to growing population and economic activity, the Government of Pakistan (GoP) in 1997 decided to diversify natural gas to fuel its transportation sector. Since then, number of CNG gas station has been increased and number of vehicle converted to CNG has also been high.

On the other side Pakistan's power sector contributes almost 20-25 per cent of carbon emission. The energy sources for the power sector are fossil oils, hydro and natural gas. Energy mix of Pakistan is also another factor contributing to its environmental degradation. For example, the hydro contributes 32 per cent, nuclear 2 per cent, coal 1 per cent gas 31 per cent and oil 34 per cent. Therefore, 68 per cent of energy is depending on fossil fuels. What is the result of this? This caused major deforestation, soil erosion, water security and climate extreme. Pakistan's per capita energy usage is also high in this region. Major share goes to household consumption and transportation. Agriculture and industry are the least consumption of energy in the overall energy matrix. Historically, Pakistan has very good record in green energy. In 1994, GoP announced a policy to exploit thermal power and natural gas options instead of relying upon hydropower. This is a great blunder which resulted in huge gas shortage especially during winters. Challenges to Pakistan energy and environmental security are manifolds. First there is a lack of transparency in power sector and it is the most corrupted institution in Pakistan and poor governance and lack of technical expertise in managing energy resources. At regional level, there is enough potential for cooperation between India and Paki-



tion and transportation. Agriculture and industry are the least consumption of energy in the overall energy matrix. Historically, Pakistan has very good record in green energy. In 1994, GoP announced a policy to exploit thermal power and natural gas options instead of relying upon hydropower. This is a great blunder which resulted in huge gas shortage especially during winters. Challenges to Pakistan energy and environmental security are manifolds. First there is a lack of transparency in power sector and it is the most corrupted institution in Pakistan and poor governance and lack of technical expertise in managing energy resources. At regional level, there is enough potential for cooperation between India and Paki-



stan on hydro power generation particularly in Jammu and Kashmir and India is an energy leader in South Asia.

### **Perspectives from Sri Lanka**

***Amal Jayawardene and Chaminda***

As any other South Asian countries, Sri Lanka is also more concerned about energy and environmental security even though it is abundant with natural resources. The key aspects of Sri Lanka's energy security include the sustainable development of energy resources, access to and use of energy services by the entire population, conversion facilities and Safe and reliable delivery of energy services, regionally competitive price, commercially viable institutions and Independent regulation.



The existing energy situation in Sri Lanka is abysmal. Biomass (47%), petroleum (45%) and hydropower (8%) are the main energy resources. Thus indigenous, renewable sources of energy provide only 55% of the national primary energy needs. All petroleum products are imported, and used for transport, electricity generation, household, commercial and industrial requirements. Electricity and petroleum products are the main forms of commercial energy, and an increasing amount of biomass is also commercially grown and traded. Total primary energy consumption is around 10,000 kTOE (thousand tonnes of oil equivalent) with a per-capita consumption about 0.4toe. Demand will increase to 15,000 kTOE by the year 2020 at an average annual growth rate of about 3%. ( e.g: growth forecasts are not updated). In order to maintain uninterrupted supply, the current installed electricity generation capacity of 2,644 MW will need to increase to approximately 5,465 MW by 2019.

The major problems of Sri Lanka's energy sector are the non-availability of electricity where about 20% of the population have no electricity at home, inadequacy and high cost of electricity generation and transmission and distribution, high cost and price of electricity – The cost of producing and delivering electricity exceeds 14 LKR/kWh. The average price of electricity is presently 10.75 LKR/kWh, while being high, is grossly inadequate even to cover the recurrent costs of supply, high debt burden of the electricity sector – The electricity supply industry is burdened with a total debt in excess of LKR 90,000 million and perceived Corruption and Inefficiencies- Corruption and management inefficiencies in the sector have become very dominant in policy debate.

### **Regional Approach: Electricity Grid and Gas Lanes**

***Gen. Muniruzzaman***

The future energy need of South Asia is quite high. In a low-growth equilibrium and attempt to achieve above six per cent GDP growth rate, South Asia is faced with one of the biggest challenges of meeting a higher demand for energy. In last two decades, the energy consumption was 5.8 per cent against low energy production of 2.3 per cent, the demand for energy is growing at a rate of 9 per cent annually. South Asia has the lowest per capita consumption of energy in the world (0.45 toe, total energy consumption per capita) and it is going to have the highest rate of energy consumption in future years. Regional energy grid is an initiative that facilitates the sharing of energy by linking each country's grid to form a unified energy network. It entails interconnectivity and synchronization of the regional and national power networks to facilitate transfer of energy. Such interconnectivity allows regions facing shortage at any point to tap surplus in other areas. It increases the diversification of primary energy resources. It reduces the costs of fuel transportation and allows harnessing the regional resources more efficiently.

Some of the examples of regional energy grid around the world are: West European Gas and Power Grid, Power grid linking Central Asia, North American Power Grid, West European Gas and Power Grid, GCC states power grid bringing the Gulf States-Saudi Arabia, Bahrain, Kuwait, Oman, Qatar and the UAE together.

Why is Energy Grid Important? Higher rates of growth of economy, population and urbanization in the South Asia are resulting in higher consumption of energy well above the world average of OECD rates. To grow at a higher rate and overcome poverty and backwardness, it has to grapple with the energy crisis at both respective national levels, and collectively at inter and intra-regional levels. Rapidly growing power demand coupled with inadequate power supplies is a challenge throughout the region. India is persistently showing GDP growth of 6 to 9per cent per annum in recent years. By 2020, India is expected to import 80 percent of its energy needs.



Afghanistan is showing rapid economic growth of about 8 per cent because of pouring in of huge amount of external assistance. Bangladesh ranks third with about 6 per cent of GDP growth in 2009-10. Bhutan shows a GDP growth rate of about 6 per cent. Maldives, Nepal, Pakistan and Sri Lanka are showing economic growth rate of 3.5 to 5 per cent. It is estimated that the energy demand will grow with the economic growth almost at equal rate.

Gas Corridor in South Asia is an interesting proposal to meet the energy needs of this region. If the 20<sup>th</sup> century has been

described as the century of oil, the 21<sup>st</sup> century is heralded as the era of natural gas. Natural gas emerged as the most preferred fuel due to its inherent environmentally benign nature, greater efficiency and cost effectiveness. The demand of natural gas has sharply increased in the last two decades at the global level. The South Asian Gas Corridor is an idea for the gas supply from outer regions to south Asia. The purpose is to lay the foundation for common energy market among the South Asian countries as well as provide them with sustainable energy supply to help their national economies continue growing.

The Gas Corridor helps to enhance Energy Security of the region. A network of gas pipelines will enhance energy security in the region, essentially of India which would significantly benefit its smaller neighbours. It will also facilitate Regional Economic Cooperation in South Asia in a major way without being hostage to regional politics. Regional economic integration has for some areas proved to be a stabilizing factor in inter -state relations. There is a broad agreement among economists that trade openness-pursued under the right conditions-promotes economic growth. Many countries in the world have combined their involvement into the multilateral system. Gas corridor will ensure balanced distribution of available gas resources in Asia. Myanmar, Turkmenistan, Iran and other Asian countries have surplus gas resources that can be utilized by exporting to deficit countries.

South Asia, proximate to the Persian Gulf and Central Asia, can tremendously benefit from their immense resources of oil and gas. Pipelines by these countries would cost 35 per cent less than the cost of liquid natural gas (LNG) in India and Pakistan.(South Asian Journal, July-September issue.2005). Iran, Turkmenistan, Qatar and Myanmar, are exploring potential markets for their surplus in natural gas. Pakistan is in the shortest land routes between the gas sources of these countries. The following are the Proposed International Gas Pipeline Projects for South Asia: Turkmenistan-Afghanistan-Pakistan-India Gas Pipeline (TAPI); Iran-Pakistan-India Gas Pipeline (IPI); Qatar-Pakistan Gas Pipeline (QP); Myanmar-Bangladesh-India Gas Pipeline (MBI).

Nevertheless, these Gas Corridor Projects face many security and technical challenges. Gas pipelines can be target of terrorist organizations. As the TAPI route passes through areas with major insurgencies, security is clearly an issue. Pipeline security will be an expensive unless cooperation from tribal areas of Pakistan is sought. Companies are unlikely to make investments within a war zone. Many NATO countries would be unwilling to make long-term commitments to support pipeline security in Afghanistan. Pipelines in the territory of Pakistan can be victim to US drone attack. To destroy the terrorist haven America may not consider the issue of state infrastructure.

Moreover, it also encounters Financial Challenges. For instance, establishing gas pipeline will require a huge cost for the countries. The question of Supply cost, maintenance cost, pipeline cost, sharing the burden, poor quality of energy infrastructure may be barrier. Attracting large scale investments is important since it requires a great deal of financial cost. Besides this, physical infrastructure related problems still haunts these mega projects. South Asia lacks adequate infrastructure for gas corridor. The nature of land and topography, the threat of natural calamities such as Earth quake, floods, cyclone pose threat for gas pipeline. It also involves some maintenance issues. Lack of expertise, poor energy infrastructure, and poor energy supply system poses challenge. Dependence on the external sources for technical maintenance pose long term challenge in implementation. Improper maintenance, faulty equipment and improper digging may cause pipeline explosion. Lack of political goodwill create greatest barrier in implementing proposed gas corridors. India's suspicion of Pakistan's goodwill and lack of trust of supply of sustainable basis. The TAPI project has been facing challenges due to fre-

quency of India Pakistan tension/conflict. Interference of External Players also plays a sabotaging role in building a gas corridor.

The recent case of pressure from the United States on India and Pakistan not to import gas from Iran for strategic reasons. Pakistan remains indifference to IPI gas pipeline project due to US pressure. There are other Environmental Concerns relating to the gas corridor projects. Gas pipelines are accident prone (e.g. Houston Gas Pipeline Accident in USA in January 2011). There is no meaningful framework to address the trans-boundary impacts of large gas pipeline projects in South Asia. Improperly installed gas pipelines may pose serious ecological risks. Is gas pipeline environment friendly? Installing gas pipelines may involve uprooting local people and destroying their natural habitats. There remains serious human rights issue in properly rehabilitating the victims. Improperly rehabilitated people may pose long term threats.

### **Regional Approach: Need for a joint effort on Environment**

**Col. P K Gautam**

SAARC has not delivered. It needs to do so now. Is it possible? As high politics animates the realist discourse, the path has many obstacles, as environment is not yet 'high politics'. Why Not Much Has Been Achieved? Inadequacy Tools for Research on Social, Physical and Life Sciences in South Asia.

Non-availability of data. Lack of Early Warning Capacity: Disaster Based Evidence. Cooperative research needs to be undertaken to develop water stress resistant cultivars and changes in agricultural practices. To avoid global warming, tilling is being discouraged in order to keep the soil carbon on earth. Will no till agriculture ever be accepted by South Asian farmers? Rather biodiversity seed bank must be set up at SAARC level. Much of biodiversity is lost and with it resilience. The political economy of water intensive crops such as rice or cotton in semi arid or water short regions needs to be given a fresh look for a change and virtual water taken into consideration.

For each degree Celsius rise in mean temperature, wheat yield losses in India are likely to be around 6 million tons per year. The most practical methods is to focus on water use intensities in agriculture and attempt to change the crops according to the best ecological needs. This may also bring down demand for water for agricultural use which is over 80 %. For fuel, there is a need for planting bio fuels crops as opposed to food crops, feed or agro- forestry. This requirement competes with arable land and also the livelihood concept of Common Property Resource (CPR). CPR to the land less and pastoralists is a legitimate and traditional grazing ground for livestock. Loss of biodiversity also has made us lose the diversity in plant and animal breeds. Monoculture has made us vulnerable as we now lack resilience such as having water tolerant crops or crops suitable for arid conditions. This revival of traditional knowledge could also be an area of cooperative framework.

For long- term and sustainable future there is also a need to revisit and debate concepts of thinking beyond GDP and old theories of Himalayan degradation, forests and floods. Earth is a living system. Seeds of deep ecological thinking based on the Gaia theory need to be broadcast. The suggestions on common understanding within SAARC are those that cannot be ignored. The suggestions for common understanding need further work by think tanks and policy makers. Ideas matter. It is hoped that visionary policy makers of present and future generations will also take these into consideration now in a more focused manner.



### **Regional Approach: Water as Cooperation**

**Dr D Suba Chandran**

There seems to be a problem in understanding the availability of water and amount of which supposed to be shared between upper-riparian and lower-riparian. This is due to non-availability of consensual data on how much water is available in the particular basin and how much to share and on what basis, whether it cut across



religion and national boundaries. Each parties have their own set of data on water and they do not reflect the facts on the ground. So whatever the data available now is based on each community's demand and there is no common understanding on the data in South Asia. Second, there is a crisis of status quo among the upper-riparian due to the demand for change emanating from the lower-riparian and the former wants to maintain the status quo and the latter wants to change it according growing demands. Depending on whose voices are heard loud or powerful in terms of decision-making.

Third, crisis of water governance or management is another issue hindering cooperation between stakeholders. This refers to the institutional set up within the government dealing with water resources. Most of these institution are incapable in responding to the crisis which is mainly because of rampant corruption and poor governance. Fourth, the identity of crisis also play an significant role in hampering any cooperative agreement. Everyone claims the right to access water which is because of their strong attachment to the land and water resources. For example, the Indus river basin is shared by India and Pakistan in larger context but Kashmiris and Punjabis in Pakistan side claims their rights over the usage and even the Ladaki's who are not even Kashmiris also claim their stakes. The moment everyone claims that the water belongs to us, it opens space for other political and social stooge to manipulate the situation.

Lastly, securitizing the water issue by the academic and strategic community by hijacking the interest of the actual stake holder for their own political agenda is a serious issue. For instance, farmers of India and Pakistan are very much willing to work together to sort out the issues by their own. Similarly, the farmers of Tamil Nadu and Karnataka inclined to do so. But media and political leaders are trying to exploit the issue for their own agenda. It is time to allow the actual stake holder to meet and share their grievances by their own and government should facilitate a water dialogue among them instead of being an arbitrator. A series of Track-II level dialogues focusing only on water related issues at bilateral and multilateral levels would perhaps a good lead in that direction.

The academic and strategic community must only play a facilitator role by sitting behind the dialogue between the actual stake holders and they should not be a negotiator. The reason behind the idea of letting the actual stakeholder to meet is to remove the artificial political boundaries imposed upon the social boundaries. We should open up our mind to learn from outsiders. In South Asian context, the Mekong model offers the best model and patterns for cooperation on water sharing issues. Regional research database on technical issues such as data on water availability. Even if SAARC as a regional institution do not help to build such database, we can also get help form other international organization such as World Bank and UNDP. It is also time to look at the future availability of water resources because enough attention been given to the current availability. We need to strengthen the capacity building in terms of technical capacity in this region in order to address the governance issue.

Recommendations: It is time to allow the actual stake holder to meet and share their grievances by their own and government should facilitate a water dialogue among them instead of being an arbitrator. A series of Track-II level dialogues focusing only on water related issues at bilateral and multilateral levels would perhaps a good lead in that direction. The reason behind the idea of letting the actual stakeholder to meet is to remove the artificial political boundaries imposed upon the social boundaries. Regional research database on technical issues such as data on water availability. Even if SAARC as a regional institution do not help to build such database, we can also get help form other international organization such as World Bank and UNDP. We need to strengthen the capacity building in terms of technical capacity in this region in order to address the governance issue.

