<table>
<thead>
<tr>
<th>Title</th>
<th>Energy profile of South Asian countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Reza, Sadrel A. L</td>
</tr>
<tr>
<td>Date</td>
<td>1988</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10220/321">http://hdl.handle.net/10220/321</a></td>
</tr>
<tr>
<td>Rights</td>
<td></td>
</tr>
</tbody>
</table>
Energy Profile Of South Asian Countries

By

Sadrel A L Reza
ENERGY PROFILE OF SOUTH ASIAN COUNTRIES

Non-Commercial Sources of Energy:

Energy is an essential input for furthering socio-economic development and improving the quality of life. In developing countries traditional or non-commercial sources of energy comprising mainly fuelwood, agricultural and animal wastes constitute the major supply of energy.

In Nepal 95.7% of the total energy consumed in the country is obtained from traditional sources. Of the total non-commercial energy consumed in Nepal in 1986-87, 76.3% was obtained from fuelwood, 10.9% from agricultural wastes and 8.5% from animal waste.

In 1983, 68% of Sri Lanka's total energy was supplied from traditional sources. The household sector absorbed 83.3% of Sri Lanka's total non-commercial energy.

In 1984-85, 67% of Bangladesh's total energy consumption was met from traditional sources. Of the total traditional sources, cowdung supplied 18.7%, rice straw 15.7%, twigs and leaves 14.2% and other wastes 11.8%. Since 1975-76 the share of twigs, bagasse, and other wastes had increased while that of cowdung had declined.

In India traditional energy accounts for a little below 50% of the total energy consumed in the country. The total availability of fuel wood is about 50 million tonnes meeting about half of the total requirements. The consumption of
agricultural wastes for fuel was estimated at around 41 million tonnes in 1975-76. Animal dung forms about 15% of the total energy consumption in the rural sector. Out of an estimated production of 324 million tonnes of animal dung, about 73 million tonnes have been estimated to be burnt for energy purposes which is more than the total fertilizer consumed in agricultural production in India.

In Pakistan the share of non-commercial energy in total energy supply was 31.8% in 1987-88. Of this fuel wood accounted for 53.9% and biomass 46.1%.

The indiscriminate use of non-commercial energy based on depleting forest cover, is likely to lead to ecological and energy crisis. Hence the need to develop commercial sources of energy to reduce pressure on traditional sources calls for urgent action.

Production and Consumption of Commercial Energy:

According to information available in UN Energy Statistics, in 1980 the production of commercial energy in relation to consumption was relatively high in India, Pakistan, Bhutan and Bangladesh being 80%, 65%, 50% and 42% respectively. In Sri Lanka, Nepal and Maldives the production of commercial energy in relation to consumption was relatively less being 12.4%, 13.7% and nil respectively.
Over the period 1980-86 the annual compound growth rate in production of commercial energy exceeded consumption in Bangladesh, India and Sri Lanka. In these three countries production increased at an annual compound rate of 17%, 12% and 10% respectively whereas the annual growth rate in consumption was 8.7%, 8.9% and 4.4% respectively. Consequently the percentage share of production to consumption in Bangladesh, India and Nepal increased to 65.2%, 94.9% and 17.1% respectively in 1986.

In case of Bhutan, Nepal and Maldives domestic production failed to keep pace with consumption. The average annual growth rate in Bhutan, Nepal and Maldives during 1980-86 was -12.2%, 15.4% and nil respectively. During the same period the average annual growth rate in consumption of Bhutan, Nepal and Maldives was 28.5%, 13.6% and 36% respectively. Consequently the percentage share of production to consumption in these three countries declined to 5.5%, 11.6% and nil respectively in 1986.

Given the high annual growth rate in consumption of commercial energy in all South Asian countries, the per capita consumption of all these countries improved in 1980 over 1986. India, Pakistan and Maldives had relatively higher per capita consumption at 272, 249 and 201 kg. per capita of coal equivalent respectively. In the same year the consumption in Kg. per capita of coal equivalent in Sri Lanka, Nepal and Bhutan was relatively lower at 115, 27 and 12 respectively.
Structural characteristics of primary commercial energy consumption differ among South Asian countries. Gas is the principal component in Bangladesh and Pakistan comprising 62.2% and 41.7% of total consumption of commercial energy consumption in 1986. Solids are relatively more important in India and Nepal comprising 67.8% and 34.2% the same year. Liquids are important source of commercial energy consumption in all South Asian Countries, but relatively more so in Maldives, Sri Lanka and Nepal where their consumption in total consumption was 100%, 82.8% and 53.7% respectively, in 1986.

Structural changes have taken place in the principal sources of commercial energy consumption in 1986 over 1980. In Bangladesh the share of gas has increased from 39.8% to 62.2% during this period. Since 95% of Bangladesh's production of commercial energy originates from gas, the consumption pattern is being brought in line with its production pattern. Liquids became more important components of consumption of primary commercial energy in Bhutan and Pakistan, their share having risen from 25 - 83% and 37.2 - 41.6% respectively in the same period. Solids became more important in India, Nepal and Pakistan their share in total having risen from 65.0% - 67.8%, 12.4% - 34.2%, and 7.9% - 8.7% respectively during this period. This has again helped to bring the consumption pattern more in line with their production pattern. The share of electricity in total consumption of commercial energy improved only in
Sri Lanka, its share having increased from 12.4% to 17.1% between 1980-86.

Differences in production and consumption of commercial energy has been met by imports. Owing to higher production rate as compared to consumption, the quantum import of commercial energy has been brought down in Bangladesh, India, Pakistan and Sri Lanka. However, due to lack of domestic production in Maldives and inadequate growth of domestic production in Bhutan and Nepal, quantum energy imports in these countries has increased during the same period.

Principal Sectors in Commercial Energy Consumption:

Sectorwise final consumption of commercial energy in Bangladesh reveals that in 1984-85 the use of natural gas as raw material in fertilizer factories absorbed as much as 28.6% of commercial energy followed by 25.3% in the industrial sector. The domestic sector absorbed 19.2% followed by 16.1% in the transport sector, 6.1% in other energy use sector and 4.7% in commercial sector. Since 1977-78, the share of natural gas used as raw materials in fertilizer factories had increased the most from its share of 17.2% that year. The share of other sectors had declined (except other energy use sector).

In India the principal consuming sector for commercial energy in 1984-85 was industry followed by transport absorbing 36.4% and 31.4% respectively. The household and agricultural sectors absorbed 18.2% and 9.8% respectively. The principal
The principal consuming sector for oil was transport (56%) followed by household sector (29%). The principal consuming sectors for electricity were industry (62%) followed by agriculture (16%). The principal consuming sector for coal was again industry (78%) followed by agriculture (13%). The share of the household sector had increased marginally from 15.7% in 1979-80 to 18.2% in 1984-85.

In Pakistan the industrial sector (including power, fertilizer and commercial establishments) absorbed 54% in 1986-87, followed by transport sector (19.9%), domestic sector (17.6%) and agriculture (5.2%). Between 1982-83 to 1986-87 the share of energy consumption in the domestic sector had increased from 14.5% to 17.6%. Of the total energy consumed in the domestic sector in 1987-88, electricity accounted for 51.3% followed by gas (26.8%) and oil (21.5%). In the transport sector oil accounted for 99.6% of the total energy consumed in this sector. In the industrial sector (excluding fertilizer, power and commercial establishments) electricity, gas and oil accounted for 33%, 30.9% and 18.4% respectively, of the total energy consumed in this sector. In the fertilizer and power industries gas was the most important source of energy.

In Sri Lanka according to the data available for 1983, industrial and commercial sectors absorbed 33.2% of the total commercial energy. The transport sector absorbed another 33.4% and the household sector 16.4%.
Non-Renewable Energy Reserves:

In India proved reserves of bituminous coal of thickness 0.5 m. or more in depths up to 1200 m. is estimated at 34,413 million tonnes. Proved reserves of lignite are 1900 million tonnes.

The total proved coal resources of Pakistan are 197.5 million tonnes. The quality of coalfields ranges from lignite to sub-bituminous.

In Bangladesh known reserves of one billion tonnes of good quality bituminous coal are available in Jamalganj areas at a depth of about 3000 feet. Recent bituminous coal discoveries at much shallower depth (500-1200 feet) in Barakpukuria area of Dinajpur is being investigated. Some 150 million tons of peat can be extracted from Khulna, Faridpur and Sylhet area.

As on 1984 the balance net recoverable reserves of oil in India (gross reserves less production) were placed at 511 million tonnes and gas at 478 billion cubic metres.

In Pakistan the recoverable reserves of natural gas from dry gas fields and associated gases from oilfields are estimated at 441 billion cubic metres (about 19 trillion cubic feet).

In Bangladesh there are thirteen gas fields including one in the off-shore in the eastern part of the country with an estimated reserve of 11 trillion cubic feet of natural gas. Except for coal and peat discovery in the Western part of the country, no gas has yet been found there.
Renewable Sources of Energy:

Traditional renewable sources of energy as noted earlier, is used mainly in the household sector and has its origin in fuel wood, agricultural and animal wastes.

The other major renewable resource of commercial application is hydropower. In 1980 the installed capacity of hydropower in Nepal was 51.6 MW (120 MW under development) as against a potential of 83,000 MW. In Pakistan the installed capacity was 1567 MW. (980 MW under development) as against a potential of 21,000 MW. In in the same year India had installed capacity of 9200 MW (6900 MW being under development) as against a potential of 70,000 MW. In Bangladesh the installed capacity was 80 MW (50 MW under development), as against a potential of 1772 MW.

Among new renewable sources of energy mention may be made of the enormous potential of bio-energy. A large component of the bio-energy is the development and utilisation of biogas in meeting the energy needs of cooking, lighting and fertilizer in rural areas. Also given the significant use of fuelwood, which is bound to continue, there is clearly identified need to grow biomass of all types under different agro-ecological conditions. The importance of developing solar energy and wind energy is clearly being recognised in most South Asian Countries given their abundance and non-polluting as well as non-degenerating characteristics.
Biographical Note

Dr. Reza did M.A. in Economics from Dhaka and Manchester Universities. He was awarded D.Phil by the University of Sussex. He began his career as a Staff Economist at the Pakistan Institute of Development Economics in 1963. Later, he switched over to teaching and is currently serving as Professor and Chairman, Department of Economics at Dhaka University. He has worked as a consultant to various national and international organisations. He has published extensively both at home and abroad. He has authored and co-authored books including, International Economics; The Export Trade of Bangladesh; Private Foreign Investment in Bangladesh; Bangladesh in South Asia and ASEAN etc.