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SRES and the Southern perspective

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SRES and the Southern perspective

The Special Report on Emissions Scenarios (SRES) captures the present understanding and knowledge about future global emissions and associated uncertainties. The four scenario families represent the diverse future possibilities based on a range of driving forces such as demographic change, social and economic development and broad technological developments. SRES has a global perspective. However wide regional variability exists in key driving forces across the world. The developmental priorities are also different in different countries, especially in the developing countries where climate change concerns are secondary in the national policy agenda. Their policies are necessarily focused on more fundamental issues of sustainable development such as poverty alleviation and creating basic conditions for human development. In these nations, to gain even primary attention of policy-makers, the climate change policies have to be integrated with national development plans rather than compete with them for resources. For example, the policy decisions about what gases to mitigate, how much to mitigate each gas and where and when to carry out mitigation actions have to be integrated with the actions such as for control of local pollution, energy and infrastructure plans, urban development and industrial location policies. In other words, climate change policy has to be a consistent part of the national sustainable development strategy.

We now present some issues that are not adequately addressed in the SRES but are critical for the South.

Developing national scenarios

SRES provides guidelines for emission scenario development. These global scenarios have to be converted into congruent national scenarios for conducting meaningful policy analysis, especially for vulnerability assessment and adaptation (V&A). We appreciate that global modelling is a complex exercise, however the key driving forces are too aggregate in the SRES, making national assessments difficult. Regional population, GDP do not capture national variability and range. Sketchy details on V&A scenario development in SRES further complicate the national scenario development process. Moreover, for a country as well, many driving forces have prominent sub-regional variations that have profound impact on national GHG emissions. For example, the watering regimes for rice paddy cultivation in India vary from rain fed drought prone to continuously flooded irrigated fields. The corresponding methane emissions vary from 6 ton/km^2 to 25 tons/km^2 respectively. These complexities are lost in a high level of aggregation.

Another related aspect is that SRES projects a wide range of future emissions leading to differences in interpretation. For instance, emissions can range widely for any given range of future population (e.g. between 5 to 20 GtC in case of a low population scenario of seven billion by 2100). Conversely emissions in the range of 20 GtC are possible with global population ranging from 7 to 15 billion by 2100. This emphasizes one important SRES conclusion that similar levels of GHG emissions by 2100 are possible with alternate combinations of key driving forces. However, this leads to differences in interpretations making identification of national coping range difficult.

Although SRES provides economic and governance level indicators, social and institutions dimensions are not well represented. These may have profound impact on GHG emissions especially in a developing country perspective. Market failures in rural electrification, biomass based rural energy consumption, social and economic dynamics of rural energy ladder, institutional barriers in penetration of efficient and cleaner technologies are some such dimensions. Backcasting would have to be employed to take care of some of these issues in the case studies.

Technology transfer issues

Technology is an important driver in SRES. Penetration of cleaner and more resource-efficient technologies is emphasized especially in A1 and B1 scenario families. It is assumed that these technologies would be available to the South. However the technology transfer mechanisms and coordination are not emphasized. These may create barriers that are required to be addressed for realization of specific scenarios. We have to identify critical technologies that have

development and climate change synergies like clean coal and renewable energy technologies, and address technology transfer and absorption issues for the South.

SRES visualizes North-South technology cooperation to certain extent, but does not discuss South-South cooperation, where some exciting possibilities exist. This would also offer contextual synergy and easier adoption of technologies. It would also be prudent to involve the South in long-term technology development in the north. This participation would reduce time lag in technology transfer later apart from providing a hedging option to the South. The climate change response policy of a country that is involved in development of state of the art mitigation and adaptation technologies would be much more comprehensive and robust than that of a country not involved in such cooperative technology development. For instant, if Indian transport industry is made a partner in fuel cell car development by the global industry leaders, the Indian response to mitigate GHG emissions from the transport sector would be more positive and quicker, since the Indian industry would then be geared up for production of fuel cell cars along the rest of the developed world. Of course the financially stronger northern partners have to ensure that resource constraints of the southern partners do not become a stumbling block in this technology cooperation. Backcasting would have to be employed to take care of some of these issues in the case studies.

Security issues

Security includes both earth and human security. Earth security further includes climate concerns like increase in GHG concentration levels, ozone layer depletion, increased occurrence of extreme events, global change, natural resource depletion, etc. Human security concerns include economic security, food security, energy security, etc. Creating security is an indicator for sustainable development. Markets are relatively weak in the South, therefore any additional pressures like climate change may create human security problems. For instance in India, if use of abundant energy resource coal becomes expensive due to climate change induced carbon tax imposition, natural gas would kick in (Garg *et al.*, 2001). Most of this gas would have to be imported since India has limited natural gas reserves, putting pressure on the Indian foreign exchange. Scarce financial resources would then have to be reallocated to energy sector from amongst other equally pressing needs for food, shelter, education and other developmental activities. This would create human security problems.

Regional energy cooperation and power grid integration would increase energy security in South Asia. Bangladesh has large reserves of natural gas, while Nepal and Bhutan have good hydropower potential. Cooperation would ensure economically more efficient use of regional energy resources resulting in overall reduction in new power generation capacity requirements (6% in 2015), investment savings (cumulative US$ 14 billion till 2015) and significant reduction in GHG emissions (Ghosh, 2001). It's a win-win-win situation for the individual countries, region as a whole and the global community.

Another important security issue is the food security issue. Food security may be analysed at three levels namely food availability, access and absorption. Food availability at national level depends upon actual crop production in the country and if the country is not self-sufficient, then

availability of food imports. Crop production has climate change linkages and modelling capabilities exist to project future-cropping patterns globally. India has sufficient expertise in this area and many researchers have done considerable work on these issues (Sinha and Swaminathan *et al.*, 1991; Rao and Sinha, 1994; Kalra and Aggarwal, 1996; Lal *et al.*, 1998). Food imports have income linkages and the foreign exchange issues as indicated earlier. Transportation of food from food excess region mainly in the north to food scarce regions in the South would also be a major challenge in future. Food availability at household and individual level is linked with livelihood security and income distribution especially in a developing country perspective where almost a tenth of Indian population goes to bed hungry.

This brings us to the next issue in food security and that is food access. It's not that India does not have sufficient food stocks. In fact there is a problem of plenty presently and there are sufficient food stocks to take care of all the hungry people in the country. However the food distribution system needs better management and appropriate public policy orientation. Poorest of the poor have almost no capacity to buy and providing free/subsidized food access to these target groups is a mammoth challenge. Access to safe drinking water and environmental hygiene determine food absorption at individual level.

Human capital migration issues

Barriers to capital and goods movement have been mostly released globally and their movement is quite fluid. However strict barriers still exist on movement of people and services across the countries. People are the main resource in the South and therefore removing curbs on exporting services would go a long way at improving the economic security in the South. Releasing labour migration would result in global GDP growth with the advantage accruing more to the South, which would be a net labour exporter. This will have positive effects on development in the South while simultaneously improving global equity reducing income gaps. A portion of the foreign exchange earnings by the migrant labour would be repatriated to the parent country, increasing foreign exchange inflows. This would enhance human security as well. Labour migration may be considered a key driving force and its different realizations will have major reflections on southern welfare. Alternate scenarios may be constructed with low, medium and high levels of labour migration.

Purchasing power parity issues

SRES analysis through global models does not consider how purchasing power parity (PPP) issues would be resolved in future. Goods and services from the South are undervalued and not necessarily due to lower quality. For instance, a 20-km ride in a Mercedes Benz cab in Delhi may cost US$ 5 while a similar ride in Washington DC would cost ten times higher. Discounting for a PPP of roughly 1:5 (World Development Indicators, 2001), these numbers still remain quite different at US$ 25 (India) and US$ 50 (US). The cars would be contributing similar GHG emissions and passenger km. However their contributions to the respective GDPs would be

different, about double for the US on PPP basis. Therefore if the services from the South were paid lower wages, but have to spend it for purchasing commodities from the north at global prices, then this system would be unsustainable. A typical case in point may be future food imports by the South when their production is adversely effected due to climate change. The South may not be able to afford food at global prices even if plenty may be available in the world market. Therefore the PPP issues have to be resolved and SRES has to capture this dynamics explicitly.

Development policy issues

A stated objective of the UNFCCC is to achieve stabilization of GHG concentration in a manner conducive to enable economic development to proceed in a sustainable manner. This objective essentially calls for linking economic, energy and environmental policies. The future energy intensities and therefore GHG emission trajectories of developing countries would depend upon their developmental path. It is neither efficient nor feasible for the developing countries to follow the development paths of the industrialized countries. Past infrastructure decisions have locked many industrialized countries to higher energy intensity paths in comparison with a path where present technological choices were adopted to achieve similar development levels. This is because present technological choices are cleaner and more efficient than those available in the past, and this is a continuing phenomenon.

To give an example, increased urbanization, economic activities and rising incomes are accentuating the regional imbalance in energy consumption in India. This results in rising trend of local pollutant emissions in many Indian urban centers posing serious human health hazards. Transport sector is the main contributor for these emissions. The critical issue is to de-link rising transport and other end-use demands from local pollution. Cleaner and more efficient technological choices offer a solution that was not available to India two decades back. Higher penetration of cleaner fuels like compressed natural gas (CNG), cleaner technologies like electric and fuel cell cars, EURO IV norms for all the vehicles, state of the art metro rail transport system are some of the possible options in the transport sector. Similarly in the power sector, if large new additions in generating capacity are made near coal mine-mouths, there will be increased possibilities of acid rains in surrounding areas due to consolidated sulfur dioxide emissions. Here also improved operations and maintenance of existing plants through computerization, higher penetration of clean coal technologies and use of flue gas de-sulfurisation technologies may facilitate de-linking coal based power generation from emission of sulfur dioxide and other local pollutants.

Developing countries can therefore leapfrog the conventional development path through policy decisions on infrastructure like transport and communication, energy efficient technologies, cleaner fuel substitution, plant locations, managing urbanization patterns and educating consumers to influence the consumption behaviour. Inducing alternate development path bifurcation, like road or rail, transporting coal or transporting electricity, developing fossil fuel based power or renewable power etc, are important policy decisions that offer climate friendly choices to the South where major infrastructure decisions are yet to be taken. Therefore, theoretically, the South has much wider, cleaner and better development options, although

resource mobilization and weaker institutional mechanisms are prominent constraints in exercising these options.

SRES does not capture the dynamics of arriving at alternate scenarios and development paths. The question remains on how to bifurcate developmental paths, especially in the South, towards more sustainable development, that in turn would be more climate friendly as well.

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