
Policy Recommendations

This session was chaired by Dr. T. S. Papola. Dr. Kamal Rijal presented a framework for the development of renewable energy technologies. He suggested that this framework would be helpful for integrating the issues raised and suggestions made during the previous two days, and that he would appreciate further comments on them. Detailed discussions were held on the framework proposed. Following this presentation, Nepal-specific recommendations were made for the development of RETs.

The proposed framework for policy recommendations to promote renewable energy resources and technologies had six components. These were as follow.

Recognising the Benefits of Renewable Energy. It was crucial to recognise the long-term economic and social benefits of renewable energy resources and technologies in order to make the mountain energy system sustainable. The exploitation of RETs would result in reducing the level of emissions caused by fossil fuels; ensuring economic sustainability, which most often was reflected adequately in energy markets; increasing energy supply security, as the availability of renewable energies were more equitable in terms of their geographical distribution; and reducing the impending

drudgery on women and children in particular. In addition, there was an increased opportunity of equitable distribution of social and economic benefits through exploiting renewable energy resources and technologies, as access to these resources were more equitable in terms of both geographical distribution and income levels. Also, the nature of these resources demands a decentralized institutional structure because they were available in scattered locations and because of the suitability of small-scale technologies.

Reforming Energy-price Signals. The growth of renewable energy technologies would be feasible only if the prices of various forms of energy reflect their long-term social and economic benefits. The prevailing price structure of various forms of energy resources favours the overexploitation of fossil fuels and biomass fuels beyond their regenerative capabilities. This situation is further aggravated due to the low purchasing power of the mountain population. There is an urgent need to reform energy prices so as to reflect the true economic cost of resources, taking into consideration the environmental mitigation costs. This can be achieved by internalising the social costs of exploiting various sources of energy and thereby subsequently

influencing energy supply choice. There are packages available in terms of energy taxes. The subsidies that various energy technologies receive are not properly understood and, in most cases, they result in distortion as there are no energy markets in most mountain communities. Given this situation, two policy options are available: either to create countervailing subsidies for renewable energy technology or to minimise subsidies for fossil fuels. At the same time, energy subsidies should be targeted at poor populations to increase their access to renewable energy resources and technologies.

Revamping the Energy Decision-making Process: The existing mechanism of the centralized decision-making process tends to favour large-scale energy investments. The equity concerns of poor mountain populations, or social obligations, are assumed to be taken care of by providing electricity to villages from the grid without assessing the physical limitations of such extensions, understanding the local needs for energy services, investigating possibilities of developing suitable small-scale renewable energy technologies, and understanding the long-term economic and institutional implications of such development. Currently there are various renewable energy technologies to meet the needs of mountain populations within the HKH Region and beyond. In this context, the involvement of beneficiaries and entrepreneurs engaged in developing RETs, while selecting forms of energy to fulfill demands should be mandatory. This would not only ensure the economic sustainability of the programme but also institutional sustainability.

Changing Energy Users' Investment Incentives: Entrepreneurs need to be encouraged to manufacture and market renewable energy technologies to reduce the cost of production and generate awareness among energy users about the benefits of

RETs. For this to happen, energy price signals should favour renewables and improve investment incentives for RETs, e. g., loans below the normal rates of interest, grants, rebates, tax incentives and tax credits, exemptions, and deduction. Substantial improvement in policy implementation by integrating policy approaches, developing marketing strategies, providing technical support services and information, conducting training programmes, evaluating cost effectiveness, and systematic monitoring and evaluation of RET performances are needed. In this context, appropriate institutional arrangements need to be established to promote RETs. Care must be taken not to duplicate institutions at local level but to involve existing indigenous institutions or NGOs or entrepreneurs as a vehicle for technology transfer by maximising the participation of beneficiaries. In addition to these, what is more important for decision-makers and planners is the promotion of private entrepreneurs in development of RETs by reducing financial risks and costs, realising the benefits of modularity of RETs, reducing unforeseen risks, and relaxing resource rights.

Accelerating Investment in Renewable Energy Commercialisation: There was no concerted effort to commercialise RETs in the past, but most of the time they were subsidy-driven and, in addition, considered as poor people's energy options. This situation needs to be avoided if meaningful development of RETs is envisaged. Investments made in promoting RETs are comparatively meagre. To derive the full advantages of RETs, investment in commercialisation of renewable energy needs to be increased. This could be achieved by providing enough support for research and development and establishing demonstration units (RD & D). Public investment in RD & D can be improved by allocating public funding, integrating RD & D into a broader context of economic gains for mountain

communities, and improving the effectiveness of RD & D institutions. Investments in RETs can be increased by attracting private investment, and for this targeted incentive packages need to be devised. These incentives should be a part of the commercialisation plan in order to reduce investment risks.

Developing a Coordinated Commercialisation Plan: A commercialisation plan for each of the renewable energy technologies needs to be developed. The efforts required might differ according to the level of development that each technology has reached in a specific country. Appropriate participation of each stakeholder in the development of RETs and consensus among them are crucial for the successful implementation of the commercialisation plan. In this context, the role of the government should be to create the right kind of policy atmosphere, as mentioned above, whereby reluctant entrepreneurs are attracted to invest in renewable energy technologies. Further, broad guidelines should be given to various donor agencies to avoid duplication of efforts. Some donors may be interested in capacity building, some in marketing technologies, and others in research and development. Yet others may be interested in promoting these technologies in specific areas or to specific ethnic groups. Each of them should be allowed to function with clear mandates and objectives. The lessons and successful strategies learned in promoting RETs must be taken into consideration in designing programmes related to RET promotion. The role of donor agencies has been effective in terms of capacity building and research activities. The implementation of various renewable programmes should not be directly handled by donors as it builds up local capabilities. The implementation of the programme should be carried out in partnership with local institutions, whether they be government or non-government organizations or local traditional institutions.

Discussions and Suggestions Made

During the discussions, **Dr. R. D. Joshi** suggested that policies should be classified at two levels, namely, planning and operational. He added that recommendations should be as few as possible because only then would the recommendations actually be considered for implementation.

Dr. Joshi stressed that RETs should not be implemented without properly assessing their viability in the given circumstances. In the case of Nepal, some of the RETs were pushed at rural communities without properly understanding the sociocultural needs of the society and, therefore, had failed miserably. He pointed out that RETs were feasible only in certain settings and there was scope for all. They are supplementary in nature, especially in the case of Nepal. Therefore, all RETs should be evaluated within a common framework. RETs should not be promoted on an *ad hoc* basis as if they were religion but on a very solid footing, and adaptation of technology should have a solid base.

Dr. Joshi stressed the need for dissemination of information and knowledge with regard to various RETs so that thereby users could have a fair choice. The aim of promoting RETs should be to promote rural development through rural industrialisation rather than just providing electrical power to villages and to increase the coverage and add to statistics.

Mr. S.L. Shrestha pointed out that the institutional gaps should be dealt with and institutions made more efficient. There should be recognition of the value of inputs. In the context of RETs, he said subsidies were the main issue and could bring about a breakthrough. He added that solar PVs might not be within the reach of the very poor but, through these technologies, other income-generating activities might benefit

the poor. He stressed that literacy programmes and creating awareness were essential in this context.

Dr. Junejo said an authentic database and its exchange between HKH countries were needed. He also suggested that a framework to evaluate awareness raising and training for different groups should be developed. Mr. Hussain requested ICIMOD to play a vital role in creating a database for HKH countries.

Mr. G. R. Shakya pointed out that a lot of funding was provided to discover the problems, but no funding was available for finding the solutions. He added that solar water heaters had been successful in Nepal without a single incentive from the government. He stressed the fact that projects can be successful even without policies if the initiative and working spirit are present.

Mr. J.N. Shrestha brought up the issue of solar rights, which had already been discussed in some western countries. A good institution must be established for the standardisation of the sub-system.

Ms. Dutta stressed that performance should be linked to subsidies and that the conditions in which projects would work should be identified.

During the discussions, emphasis was given to monitoring, supervision, quality control, strengthening of existing institutions, and government impetus for the promotion of RETs.

General Recommendations

The framework presented by Dr. Rijal was agreed upon, as it provided broad policy guidelines for the development and promotion of RETs in the context of the HKH region. These were as follow.

- a) Recognise and measure the benefits of renewable energy technologies (RETs) with an emphasis on drudgery reduction
- b) Reform energy-price signals to provide a level playing field for each energy source
- c) Revamp the energy decision-making process to promote decentralized renewable energy technologies and involvement of local-level institutions
- d) Change energy users' investment incentives by attracting the participation of the private sector and NGOs in manufacturing and promoting RETs
- e) Accelerate investments in commercialisation of RETs by supporting RD & D, capacity building, and information and awareness generation through public sector or donor funding and by providing attractive incentives to manufacturers
- f) Develop a coordinated commercialisation plan for each RET to suit country-specific needs.

Nepal-Specific Recommendations

Besides these recommendations, the following specific recommendations were given for Nepal, based on the presentations and discussions.

Policy and Institutional Recommendations

- a) Legislation is needed to clearly define ownership rights on various natural resources such as forests, water, wind, and sun.
- b) Need for legislation to protect intellectual property rights to promote private sector R&D.
- c) Need for high-level commitment to the promotion of RETs.
- d) Develop standards incorporating safety guidelines for manufacturing and construction of RETs.
- e) Product warranty should be made mandatory for manufacturers and service providers.

- f) Encourage private entrepreneurs to develop RETs by reducing financial risks and costs, reducing unforeseen risks through insurance, and improving investment incentives, e.g., loans below market rates, grants, rebates, tax incentives and tax credits, exemptions, and deductions.
 - g) Develop a framework for subsidies with respect to each RET based on the service they provide.
 - h) Develop simplified banking procedures and interest rates and standardise other loan conditions for all RETs.
 - i) The Alternate Energy Promotion Centre (AEPCC), a recently established institution, should function as a task manager to promote RETs. Care must be taken not to duplicate institutions at local level but to involve existing indigenous institutions or NGOs or entrepreneurs as a vehicle for technology transfer by maximising the participation of the beneficiaries. Coordination, monitoring, evaluation, and technical backstopping functions are crucial for the commercialisation of RETs. The AEPCC should take on this responsibility.
- e) Proper evaluation of the socioeconomic setting, technical and managerial capabilities, and adequate survey and design must be ensured while carrying out feasibility studies. Accountability on the part of surveyors and manufacturers is essential.
 - f) Community-owned and managed micro-hydropower plants should be promoted. Care must be taken to build up or establish strong community organization, cohesiveness of the community, democratic leadership, good technical and managerial capabilities, and strong technical back-up.
 - g) Diversification of end uses for productive purposes such as agro-processing, cold storage, ice factories, power looms, carpet weaving, wood carving, and food processing should be promoted.
 - h) The quality of raw materials used, safety codes to be followed during installation, and rated power of turbines and generators should be standardised.
 - i) Promotion of smaller units, such as improved *ghatta*, to replace traditional ones should be given priority.
 - j) Preparation of construction manuals and codes and enforcement of standards are essential.
 - k) Preparation of training manuals on operation and maintenance as well as on book-keeping and provision of training to micro-hydropower operators and owners are essential.

Technology-Specific Recommendations

Micro-hydro Power

- a) Water rights were a critical issues. Prevailing laws do not ensure the right of prior use for agro-processing and electricity production. There is a need to provide appropriate compensation to owners if water is diverted from micro-hydro plants for irrigation purposes.
- b) An integrated approach to promoting micro-hydropower development needs to be adopted.
- c) The participation of women in planning and implementation of micro-hydro plants needs to be ensured.
- d) Simple and transparent procedures for

Biogas Technology

- a) Low cost biogas plants should be promoted through easy access to credit facilities for low-income households through community loan schemes for landless and women's groups.
- b) Demonstration biogas units must be established by identifying progressive farmers willing to install them.

- c) The subsidy policy for biogas plants should be made consistent.
- d) Strict enforcement of quality control and standardisation is needed. But care must be taken not to overdo it as it prevents innovation.
- e) R&D should emphasize reducing the cost of the plant.
- f) Plant owners should be made aware of how to apply slurry on their fields and to develop appropriate tools/equipment (such as trolley) for slurry handling.
- g) BSP programmes should be integrated with livestock development programmes along with rural development initiatives.

Improved Cooking Stoves

- a) A long-term vision for a healthy kitchen environment should be developed along with the reduction of fuelwood consumption. The programme needs to be conceived from the perspective of kitchen improvement.
- b) An institution with the responsibility for providing technical back-up and monitoring of the programme should be created.
- c) Various types of models needed for different locations and ethnic groups should be developed and demonstrated.
- d) The use of local materials and indigenous skills should be promoted and training imparted to women for the construction of ICS.
- e) Strong research and development with adequate financial support are needed.
- f) Capabilities should be built up at village level. Selection of persons to be trained as ICS technicians should follow the criteria that these people should be unemployed, local, innovative, have good motivation skills, and preferably be women. Users should also be oriented so that they understand the importance of each com-

ponent of the ICS and should be involved during the placement and construction of the same.

- g) Promotional activities related to ICS dissemination should be subsidised.

Solar PV Technology

- a) Areas suitable for the promotion of SPV technology should be identified.
- b) Subsidies for SPV technology are justified in terms of creating demonstration effects in remote areas to popularise initial phases.
- c) Various technical constraints (low power conversion efficiency, storage problems, and climatic uncertainty) need to be resolved for the smooth functioning of SPV systems.
- d) Stand-alone SPV systems should be promoted rather than centralized systems.
- e) Institutional linkages and coordination must be promoted among the various institutions involved in the development and promotion of SPVs. A newly established organization, AEPC, should play the lead role in facilitating the efforts of various organizations to promote SPV technology.
- f) Innovative funding mechanisms are needed. In this respect, formation of village-level cooperatives could be an important beginning, and for this the government might have to provide seed money. This approach needs to be tested prior to its replication.
- g) There is a need to integrate SPV technology promotion with income generation and social development activities in order to justify the subsidy scheme.
- h) There is a need to seek active women's participation as SPV systems provide opportunities for women to participate in various income-generating and social development activities.