

5. CONCLUSIONS AND RECOMMENDATIONS

The Concluding Session of the Consultative Meeting was held on day five (17th June a.m.) and chaired by Mr. Egbert Pelinck, Director General, ICIMOD. Dr. Adam Harvey was the Rapporteur.

Presentations were made regarding the two main expected outputs, i.e., outlines of the training programme for the decision makers and general conclusions. These outputs had been prepared the previous day by two small committees constituted for the purpose.

Training Programme Outlines

Outlines of the Training Programme were presented by Dr. M. Abdullah. He stated that the proposed training programme for decision-makers had been prepared with the following objectives.

Familiarisation of the participants with:

- MMHP in mountain areas as a significant and viable contributor to rural development and rural electrification (overall objective);
- evaluation of MMHP feasibility documents;
- assessment and comparison of every different option; and
- optimum division of responsibilities among the parties involved.

About 20 participants would be selected from senior (preferably topmost) government levels of the participating countries. Participants should be working in areas concerned with rural development, rural electrification, planning, finance, environment, and implementation of MMHP programmes; officers from development banks and donor agencies would also be invited to participate. The duration would be for about 10 days, preferably in surroundings away from homes/offices, but in a stimulating environment and in comfortable conditions.

The following course contents would be taught.

- The role of appropriate energy systems in rural development.
- Rural electrification as a contributor to rural development - integrated approaches. Options available for supplying electricity. Adoption of an unbiased approach; for instance listing of the merits of diesel sets and recognition of the site-specificity of MMHP.
- What is MMHP?
- Institutional arrangements for MMHP. Five current approaches to MMHP.
- MMHP- economic feasibility (should also include social benefits, indirect economic benefits, and long-term national interests), financial feasibility and constraints, environmental considerations, evaluation criteria.
- Funding sources for MMHP (e.g., multilateral sources, regional aid organisations, development banks, commercial banks, NGOs, private sector, etc). Policies and practices of such sources.

- Concept of special tariffs. Methods of tariff setting.
- Significance of the management of MMHP installations (including operation and maintenance issues). Inducements for reliable operation, monitoring of kWh produced. Standards and guidelines for quality assurance.
- Two guided discussion groups focussed on reviews of prevailing policies and institutional arrangements.
 - a. Mini-hydro (participants working in power supply)
 - b. Micro-hydro (participants working in rural development). Plenary presentations from both groups and discussions.
- Budget allocations. Public and private funding of/investment in;
 - a. individual installation and
 - b. institutional support arrangements.
- The contents of the feasibility study. How to evaluate MMHP schemes on the basis of feasibility studies. One rationalised method of preparing feasibility studies and evaluating the plants.

An appropriate structure and proper techniques would be chosen to keep attention, engage, and interact; it should be an illuminating and enjoyable briefing. The techniques would include poster displays, exhibition, working models (if of high quality), synchronised audiovisual aids, OHP, slides, videos, good illustration materials, and site visits. A detailed day-to-day programme was also presented for about 10 days' training, mainly incorporating the above contents. However, in view of various comments during the meeting, as well as during the concluding session, the programme was to be redrawn for a period of five days only as presented in the 'Finalised Outputs' (Annex 3).

The presentation was followed by discussions. The overall idea of holding a training programme was supported. Several participants expressed the view that the proposed 10-day programme was unsuitable for senior decision-makers who would prefer to attend a one to three-day course. Three alternative suggestions were made: hold two courses - one to two days for top-level participants, and ten days or thereabouts for lower level participants; design one course which includes a short module of one or two days for attendance by top-level participants; and design a mid-duration course of four or five days.

The longer course could be approximately as the outline presented, with the objective of creating the capacity to assess feasibility studies, rather than to merely familiarise. The short course could concentrate on familiarisation. The mid-duration (4-5 days) course was not discussed. The working group members agreed with the suggestion that a short course was more suitable for senior officials (the original recommendation had also been for a short course).

A suggestion was made that ICIMOD should establish a continuing capability in providing training and should assist to other institutions in the same. This would allow scope to solve many of the training problems that have become apparent when trying to satisfy all requirements with one course.

One participant suggested that the word 'viable' should be dropped from the objective statement proposed. There was assent to this from at least one other participant. A view was expressed that there was also a need to further clarify the difference between macro-economic, social, and long-term viability and immediate financial viability. It was suggested

that the short training course for senior decision-makers be referred to as a "Familiarisation Seminar" rather than "training". It was suggested that an effort be made to include women as participants and to make sure that gender issues were included in the seminar and/or training course contents. A view was expressed that "elected representatives" as participants may be inappropriate because of very different qualifications and base knowledge levels. They could be invited as resource people for consultation. The importance of including participants from the national finance departments was emphasised, because funding of MHP was ultimately national. A suggestion was also made to include local manufacturing as an additional topic. The participants could benefit from staying in a village for more than a day to get more immediate contact with beneficiaries. A reservation was expressed about the comfort of senior people. A suggestion was made that Switzerland would be a useful venue not just because it could attract senior officials but more importantly because it was a place where the significance of MMHP to a national economy could be demonstrated. There was a reservation about the expenditure being restricted to the region. Tibet was also offered as an alternative venue.

In view of the above discussions it was agreed that the training outlines would be modified.

Conclusions

The Conclusions of the Meeting were then presented by Mr. U. Meier. He stated that the principal concern of policy-makers was the need to achieve sustainable socioeconomic development in the HKH Region to reduce poverty, alleviate drudgery (especially for women), and reverse environmental degradation. In addition to the creation of income-enhancement opportunities, the availability of energy in a suitable form was necessary to meet the needs of agro-processing, cooking, and space heating. The hydropower resource was abundantly available in the whole HKH Region, which itself also had significant advantages. Several decades of experience with indigenous MMHP technology in the region had clearly demonstrated its viability in powering the agro-processing equipment and has amicably contributed towards the concern of the policy-makers, i.e., enhancement of economic activity and reducing the drudgery of women. However, electricity generation through isolated MMHP plants was not being viewed as economically viable as yet. The following factors needed to be addressed in this respect. **Low load factor** was the main problem of isolated MMHP plants, since electricity was only being used during the evening for lighting. The result was that most plants could not generate adequate incomes to meet the O & M and loan amortisation costs. Enhancement of end uses was the answer to this problem. Three end-use categories considered to have the highest potential were agro-processing, pump irrigation, and grid interconnection.

Mr. Meier then presented a number of findings which are summarised below.

- The existing policies, legislation, and institutional support were conducive to involvement of the private sector. However, many ambiguities still remained. Tariffs in most national grids were heavily subsidised; so were diesel or kerosene. Consequently, electricity from an isolated or grid-connected MMHP plant could not be sold at tariffs high enough to allow reasonable profits.
- Load factors could be improved sustainably only if the supply was highly reliable; which could be done through the improvement of technology, resulting in higher

- costs. Thus the prime objective was to **design and build for reliability**. All the components, including civil works, should be improved to make them more reliable.
- Organisational set-ups and effective management had a strong impact on the operational costs, power availability, and, thus, on economic viability. Decentralised schemes required decentralised concepts of institutional set-ups. Management, operation, and maintenance needed to be based on a clear assignment of responsibilities for sustained operation. An incentive scheme based on the amount of energy (kWh) sold could also help to enhance the load factor.
 - Many countries in the HKH Region had been facing the excessive use of fuelwood, culminating in serious ecological problems. Other social benefits, such as facilitating education and literacy, improved health services, reduction of drudgery for women, and psychological aspects, were important but not easily quantifiable. MMHP in such situations could be considered as a viable resource from the socioeconomic point of view.

During the **discussions**, the following main points were raised suggesting additions or alterations to the conclusions.

- Preference for locally-made equipment and local capacities in repair and maintenance.
- More bottom-up networking of active MMHP practitioners.
- The need for subsidies to be spelled out; noting that although direct subsidies on grid electricity had largely been removed in Nepal there were still indirect subsidies.
- On the question of fuelwood consumption, it should be clear that agro-processing and industry were main consumers rather than domestic cooking. Electricity was a potential contributor to saving fuelwood in the industry and processing area; although it was also pointed out that electricity availability may have the effect of encouraging a greater volume of industry/processing, resulting in greater fuelwood usage.

With respect to the future courses of action, the following comments were made.

- A new organisation could be established to be responsible for various tasks such as quality control, feasibility studies, training of decision-makers, etc.
- Such an organisation need not be a new institution but could be an executive arm of an association of players, such as ICIMOD, Governments, NGOs, manufacturers, all of whom have special strengths and functions. ICIMOD's roles could, for instance, be establishment of a regional network, application of a special capability in accessing senior government staff, etc.
- Project execution (e.g., training of practitioners) by technical assistance organisations. Special emphasis on in-country capacities.

It was agreed that a number of these comments and suggestions should be included in the final conclusions and reflected in the document called Finalised Outputs.

After discussions, Mr. Arun Kumar presented his observations about the Consultative Meeting and its benefits on behalf of the participants from the HKH Region. He thanked ICIMOD for organising the meeting and said that it was extremely useful to delineate and discuss various aspects of MMHP within the Region, especially new initiatives to decentralise/ privatise/commercialise the plants. Mr. Kumar remarked that the meeting was

well structured and that the inputs from the support staff had been excellent. He also hoped that there would be adequate follow-up activities by ICIMOD that contributed towards the development of MMHP, especially the establishment of an information exchange network.

Dr. Adam Harvey then expressed his views as a resource person concerning the Meeting. He visualised rural development that could lead to better living conditions and the availability of necessary amenities in the inaccessible and poor mountain areas. In this context, rural electrification was an important component and mini- and micro-hydropower, which was indigenous, environmentally-friendly, and economically viable in many areas, could be easily developed. Dr. Harvey appreciated the efforts of ICIMOD towards the development of MMHP in the HKH Region and stated that he was pleased and honoured to be a part of these efforts, which included participation in the Consultative Meeting. He said that the Synthesis Report was an excellent document highlighting the status, issues, and problems. He also appreciated the level of participation. Dr. Harvey remarked that ICIMOD was well placed and had the capacity to contribute towards the development of mountain areas, including sustainable promotion of MMHP.

Finally, Mr. Egbert Pelinck, the Chairman of the Session, made some concluding remarks about the Consultative Meeting. He thanked all the participants, especially the two groups who had prepared the outlines for a training programme and the general conclusions/recommendations. Mr. Pelinck then outlined the past energy-related programmes of ICIMOD, including 'Rural Energy Planning and Management at the District Level', in the HKH Region and the associated studies, training programmes, and manuals. He also welcomed the generous offer of the Norwegian Government to support the current MMHP programme. Mr. Pelinck further noted that ICIMOD stood for mountain development through the processes of environmental conservation and poverty alleviation, for which MMHP was a particularly suitable energy resource; identification of specific opportunities that mountain areas could provide; and bringing together experts and experiences from different countries in the region. As a facilitator of sustainable mountain development, ICIMOD had been interacting with many government agencies in the member countries, exchanging experiences, and collaborating with a large number of experts in the region. Therefore, ICIMOD was in a unique position to identify and facilitate developments in many important fields. Organisations participating in the Consultative Meeting would also be a source of knowledge for ICIMOD and for the member countries.

With regard to the two major outputs of the meeting, Mr. Pelinck stated that the training programme to create awareness and capacity-building among senior government officers would be implemented as a component of the present project. It seemed clear from the set of wide-ranging conclusions/recommendations, the second output, that a continuing need was being felt for monitoring and evaluating MMHP development in this region and for the evolution of a mechanism to share information concerning the new initiatives. ICIMOD was ready to be part of such an action if requested and supported by the member countries and donor organisations.

Mr. Pelinck once again thanked the participants, organisations, and resource persons, many of whom had made special efforts to attend the meeting and had worked hard to come up with meaningful outputs. He also reconfirmed ICIMOD's commitment to sustainable energy systems for mountain areas.