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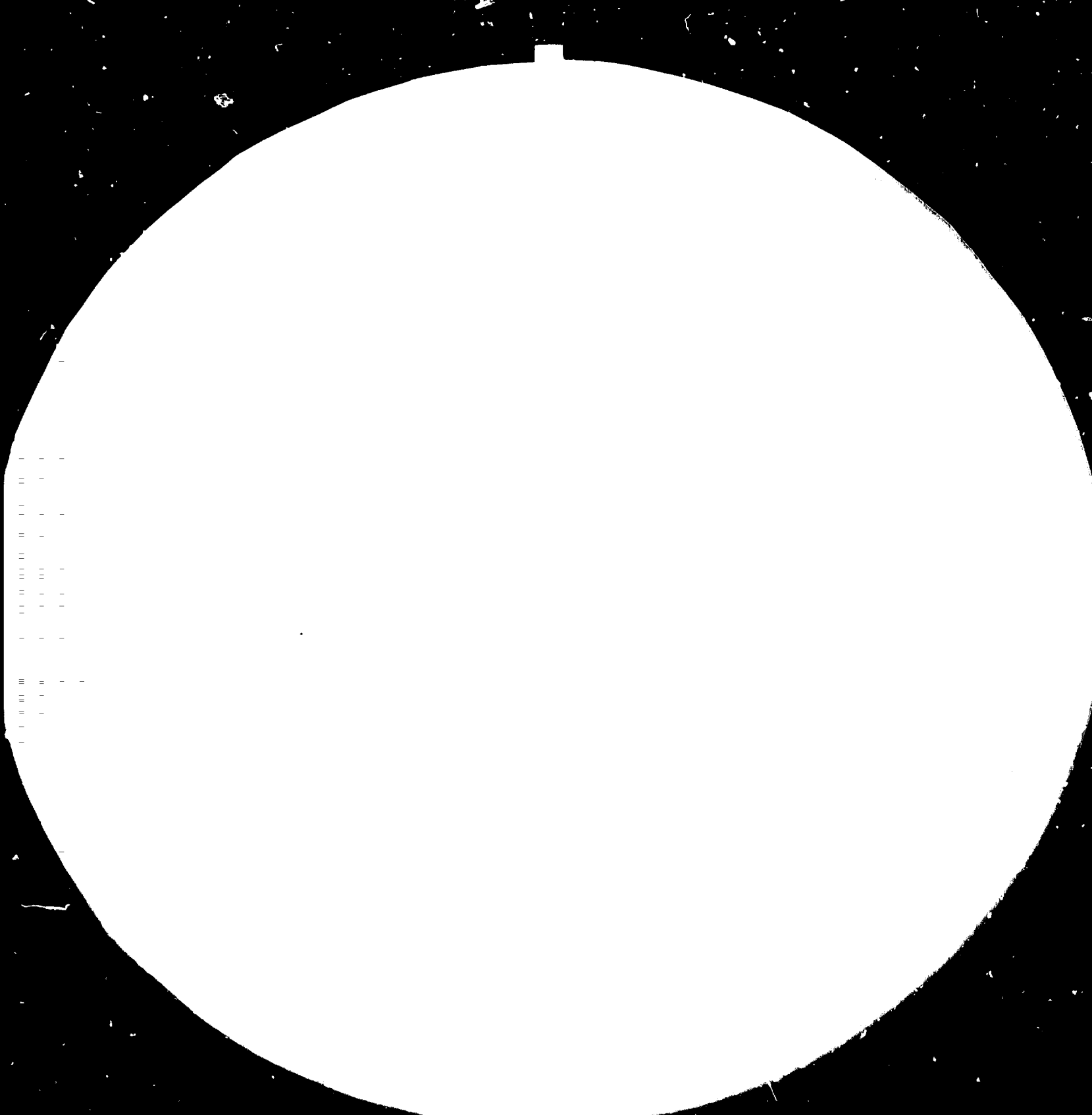
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The Joint Workshop of Senior Experts on Small Hydropower Development^{/*} has set-up the following objectives:

- i. to elaborate on a simple methodology for feasibility and other studies appropriate for SHP;
- ii. to exchange views on ways and means of cost reduction compatible with viability and utility requirements;
- iii. to exchange experiences on the methodology of centralized management of small hydropower development as compared to the decentralized approach, including discussions on the translation and conversion of small hydropower development programmes into practical projects and their implementation;
- iv. to review ways and means of promoting local design and manufacturing of small hydropower equipment, machineries and ancillaries; and
- v. to exchange views on Regional Network Systems in Asia and Pacific, Caribbean, Africa, etc.

The following remarks might be taken into consideration in the deliberations.

1. Simple Methodology for Feasibility and other Studies Appropriate for SHP

It has been recognized in many cases that although the technology of small-mini hydropower and its application has been in practice for many years, particularly in the rural areas as well as for specific individual purposes, due to the reduction of the cost of large-scaled hydropower, it had lost its economic advantage during the last 30-40 years. This situation resulted into the fact that very few engineers, technicians and specialists fully conversed with the pros and cons of small-mini hydropower, are available for promoting projects in this field. In many cases, the planning, programming and implementation of such projects are carried out by applying directly the basic concept and approach of developing large-scale hydropower projects. The Second Seminar-Workshop/Study Tour recognized this fact and urged the need for developing a methodology for feasibility and other studies

*/ For sake of convenience, the Second Seminar-Workshop/Study Tour set-up the following definitions of generating unit sizes for MHG:

- a) Small-hydro-electric generation units are units with a rated capacity in the range twelve thousand (12,000) and one thousand and one (1,001) kilowatts;
- b) Mini-hydro-electric generating units are units with a rated capacity in the range one thousand (1,000) and one hundred and one (101) kilowatts;
- c) Micro-hydro-electric generating units are units with a rated capacity of one hundred (100) kilowatts and below.

appropriate for small hydropower development, which basic framework should be simple, low-cost, easy to construct, operate and maintain. Accordingly, the following points may be required to be elaborated:

- i. What are the main elements required to be looked into in the prefeasibility and feasibility study for a small hydropower project?
- ii. The sequence of carrying out the prefeasibility/feasibility studies, and benchmarks to review and take decisions. Whether to further continue the plans or not.
- iii. Would there be a different criteria for feasibility studies for micro-mini and small hydropower stations?
- iv. Would it be possible to design a criteria for decision making in the selection of mini hydropower systems, selection of machines and equipment, etc.?
- v. Would it be possible to develop a standardized methodology for the prefeasibility and feasibility study suitable for mini-small hydropower? If so, what are the terms of reference for such studies.

2. Exchange Views on Ways and Means of Cost Reduction Compatible with Viability and Utility Requirements

One of the advantages of small-mini hydropower is that it is a simple technology that can be constructed and operated with the involvement of and under the responsibilities of the local people -- users of the generated power. Since the majority of these power stations are expected to be constructed in remote and isolated areas, the possibility of reduction of initial investment as well as operation and maintenance cost is of prime importance. Many developing as well as developed countries, have been elaborating on the cost reduction scheme compatible with the viability as well as the utility requirements. This experience would be most useful for all concerned in order that selection and application of the most appropriate methodology could be facilitated.

It might be useful if brief case studies could be collected and made into a volume for easy and effective dissemination of the information and the experiences.

3. Exchange Experiences on the Methodology of Centralized Management of Small Hydropower Development as compared to the Decentralized Approach, including Discussions on the Translation and Conversion of Small Hydropower Development Programmes into Practical Projects and their Implementation

One of the objectives of the Second Seminar-Workshop/Study Tour was to look into the form of management of promoting and implementing small hydropower projects in China and the Philippines. In both countries the methodology adopted is of a decentralized management nature, as compared to the methodology adopted and practiced in Malaysia, namely centralized management and operation of their small hydropower programmes.

Such methodologies should be considered and practiced to best suit the circumstances, possibilities and requirements existing in each country. Discussions on the pros and cons of the centralized versus decentralized systems of management, could in this respect be of benefit to the participants. It would also be useful to make a compilation of the divisions of responsibilities and work for establishment of SHP stations, including the supply of drawings, supervision of the construction, etc. between the two management systems. In both cases, the type, scope, nature, objective and format of carrying out training courses, seminars and workshops to build up and strengthen the human resources requirements would be an important element and could be most useful for learning from experiences of others. Another problem which is often seen in many developing countries is the translation and conversion of small hydropower development plans and programmes into practical projects and their implementation. Where should the braincentre exist, who should be the driving power, what are the required inputs to be provided by whom in order to start up a small hydropower project, are some of the subject matters which can be hopefully clarified through the discussions.

4. Review Ways and Means of Promoting Local Design and Manufacturing of Small Hydropower Equipment, Machineries and Ancillaries

By nature of its size, location and characteristics of promoter, implementer and operator of small-mini hydropower projects, the availability of small hydropower equipment, machineries and ancillaries at low-cost, and preferably in local currency, plays a decisive role in how such programmes can be promoted. It follows by logic that if these equipment, machineries and ancillaries could be locally designed and manufactured, a great part of this problem would be solved by itself.

Although the degree of sophistication would have no upward limits, it can also be mentioned that to a certain degree, a large portion of these elements, components and parts would be at comparatively simple and low-cost technology levels, which could permit the promotion of local manufacturing, and eventually designing of the necessary equipment and machineries. The simplest way of such local production would also be through technical co-operation, licencing and know-how transfer, joint production agreements, etc. While it would also require a firm commitment on the part of the government authorities to promote such local production arrangements, the cases might be utilized for creating such capabilities by expanding locally already available metal-working facilities in an objective-oriented manner. The main discussion should be focussed on "How to start local manufacturing of SHP equipment, machineries, etc.

The exchange of experiences of those countries/firms which are already engaged in such activities would be most useful as reference to other countries interested in this possibility. A guideline for steps to be taken towards creating and building up such manufacturing capabilities on a step-by-step basis would also be of great interest to all concerned.

5. Exchange Views on Regional Network System in Asia and Pacific, Caribbean, Africa, etc.

The importance as well as the benefit of promoting international co-operation, particularly technical co-operation among developing countries,

has been recognized in a number of meetings organized within and outside the framework of the UN system. Whereas in the Latin American region, such systematic approach has been initiated and promoted by OLADE, similar efforts are being made in the Asia and Pacific region as well as in the Caribbean and African regions.

The subject has also been discussed at the Senior Expert Group Meeting in Hangzhou, in connection with the establishment of a Regional Network for Small Hydropower (RN-SHP), and it was decided that this Network should initiate its activities on the basis of an interim arrangement for 1983/1984, with the Hangzhou Regional Centre acting as its focal point as well as its interim period secretariat. It is important to recognise that the success or failure of such Regional Network systems lie almost completely on the degree of commitment, involvement and contribution of the member organizations and countries.

How could this objective be met, and how best could the member organizations/countries be motivated to participate actively in such regional co-operation arrangements would be a key answer to the problem. Discussions and exchanges of views on the experiences accumulated could largely contribute to an effective operation of the RN-SHP.

Since the subject matter of small hydropower has a pan-regional nature with little regionally restricted conditions for application, it would also be useful to exchange views on how interregional co-operation could be stimulated and promoted for the benefit of all concerned.



