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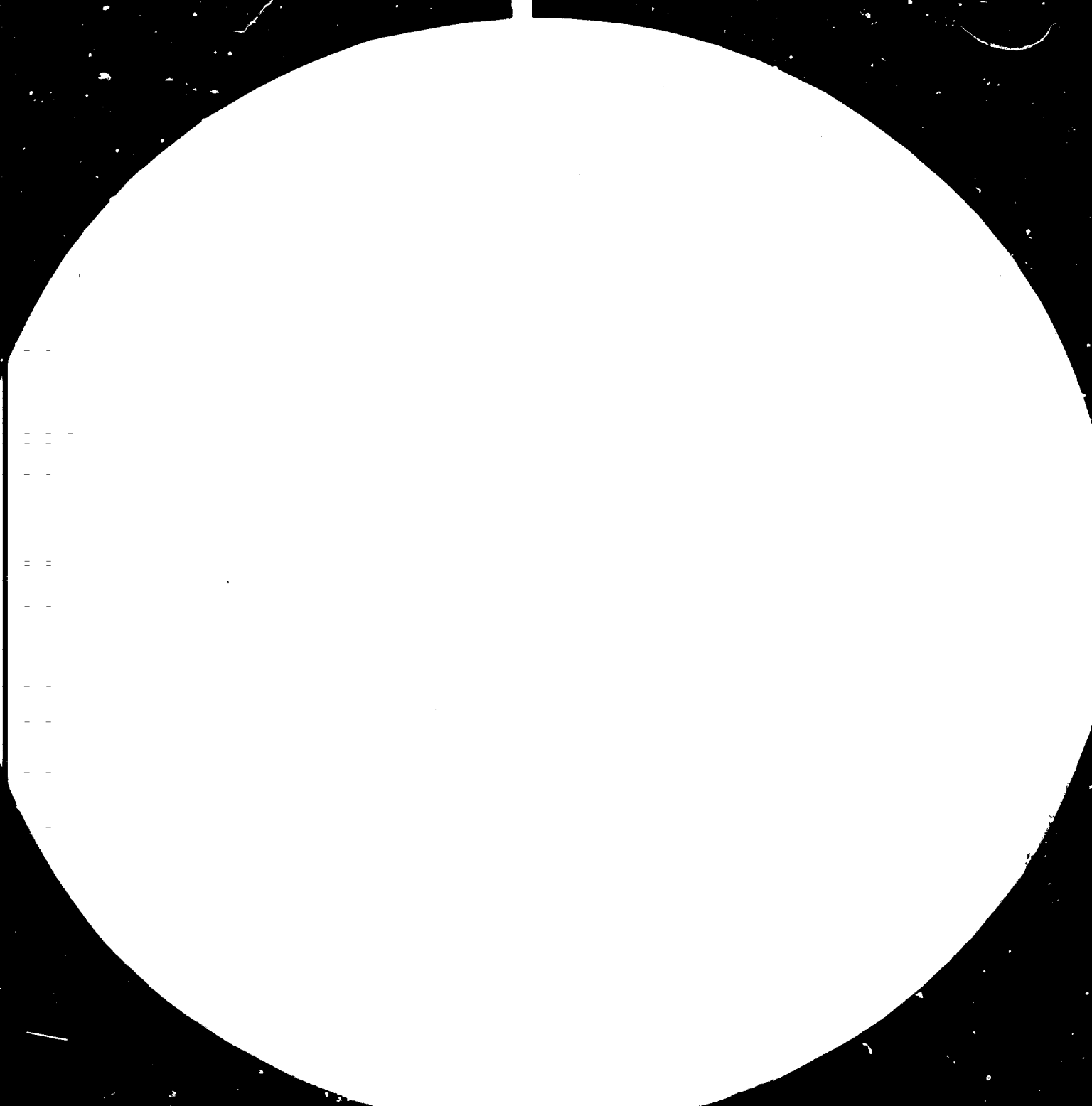
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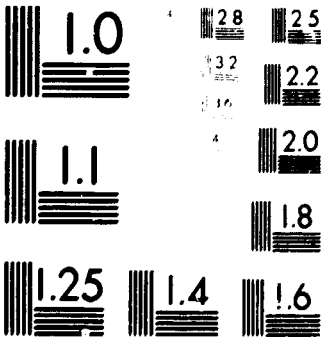
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Joint UNDP/UNIDO/ESCAP/China Senior Expert  
Group Meeting on the Creation of a Regional Network  
System and the Assessment of Priority Needs on  
Research Development and Training in the field of  
Small/Mini Hydro Power Generation

Hangzhou, P.R. China, 12-17 July 1982

**Technological Network for Small  
Hydro Power Generation \***

by

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## 1. The Network Concept

A network in technology development and transfer consists of a group institutions in different countries, engaged in a particular field of activity or research, design and development, acting as a group to exchange experience and knowledge, to co-ordinate R, D and D to minimise duplication, to undertake joint research, to offer training and advisory services to one another, to disseminate information and generally to co-operate to advance a technology and its application. Every participating institution will have an important role in the network; for convenience of operations, a specific aspect of the technology may be assigned to an institution which will be the focal point for that aspect; thus there may be several focal points in a network. Each focal point will establish communication with every other institution, and with institutions outside the network, concerned with that aspect and disseminate information, data and research results obtained from them to all participants in the network. To enable each institution to build capacities in all aspects of the technology, the aspects may be rotated among the institutions after a period of three to five years.

The focal point institution will be expected to provide following services in the assigned aspect :

- Organise an information service (technical and general)
- Accept for training personnel from other institutions
- Make available short-term advisory services
- Report on relevant developments and trends in the world and on conferences and meetings
- Provide host facilities for meetings of network participants.

The sponsoring organisation (UNDP, UNIDO, ESCAP or RCTT) could provide :

- Guidelines and assistance
- Modest supplements to budgets of the focal points to enable them to carry out network responsibilities
- Specialist expert services and training not available within the network
- Books and equipment as supplement to focal points' own resources
- External costs of meetings, training and advisory services.

## 2. An Asian and Pacific Technological Network for Small Hydro Power Generation

Development of mini and micro-hydro power generation (hereafter referred to as small-hydro power generation, SHG) is relatively new in the Asia and the Pacific with the exception of the People's Republic of China where SHG was introduced soon after the liberation and spread rapidly. Spurred by the energy crisis and by the desire to take electricity to the rural areas, other countries in the region are undertaking programmes to develop SHG. A few of them are embarking on large investments with assistance from international lending institutions. SHG technology is being developed and transferred by manufacturers and institutions in developed and developing countries. The types of equipment available in the market vary in capacities, efficiency, price and ease of maintenance. The hydrological and geological studies required, environmental impact, socio economic aspects, the civil engineering involved, promotional policies and many other matters associated with SHG development are country specific or even site specific. Yet there is an urgent need to evolve a system which would enable the developing countries to share among themselves the knowledge and experience gained and to pool their intellectual resources for their mutual and common benefit.

This need can be fulfilled to a great extent by a network of institutions and agencies engaged in SHP development.

To evolve such a network, it would be useful to first consider the various component aspects of SHG. The following is an indicative, though not exclusive, list.

- Estimates of energy demand;
- Hydrological and geological studies and site selection;
- Feasibility studies; cost/benefit ratios;
- Assessment and selection of generating equipment and of storage equipment;
- Civil engineering work;
- Distribution system and end-uses;
- Environmental aspects;
- Associated uses - e.g. irrigation, fisheries etc.;
- Socio-economic aspects; promotion of industries using SHG;
- Pricing policy; community involvement; government support;
- Operation and maintenance;
- Manufacture of equipment and spare parts;
- Institutional and legal issues;

- Training of personnel and of manufacturers;
- Testing and evaluation of equipment;
- Research, design and development.

These aspects could be grouped as follows :

- 1) Hydrological water flow assessment environment aspects and geology
- 2) Equipment, installation, operation and maintenance
- 3) Distribution and pricing
- 4) Socio-economic aspects and promotion of industries
- 5) Local manufacture of equipment and spare parts.

The above is again a suggested list. The Meeting may wish to refine the list or amend it, bearing in mind that it would be best if the number of groups is kept small - not exceeding five.

Should this approach be acceptable, the Meeting may then proceed to recommend focal points for each of the grouped aspects. The confirmation of each of the recommended focal points should be subject to negotiation with and the concurrence of the government concerned.

### 3. Relationship of the Network to the Regional Centre for Mini-Small Hydro-Power Generation, Hangzhou

It is evident and logical that the Regional Centre for Mini-Small Hydro-Power Generation (Regional Centre) should play a leading role in the network both by reasons of it being the regional institution in this field for Asia and the Pacific and because of the expertise available and experience gained in China in small-hydro-power generation. It is therefore proposed that the Regional Centre be the centre for the network. While the participating institutions will, through focal points, be strengthening the network largely by sharing experience and methodology applied in country specific situations, the Regional Centre could also, in addition, strengthen the network through publication of results of research design and development, guidelines on training for specific skills etc. Focal points could seek information and guidance from the Regional Centre and propose areas for research and development or for training; the Regional Centre may also refer inquiries to the relevant focal points. Further, there will be residual subjects not covered by any of the focal points which the Regional Centre could attend to.

#### 4. Financial support for the Network

It is expected that the Network would function on TCDC lines to the maximum extent possible. Nevertheless some support would be necessary for at least part of the expenditure arising from an institution undertaking focal point responsibilities that cannot be covered by the institutions' normal budget. External costs for meetings and advisory services need also to be met unless the governments concerned are prepared to absorb them in their TCDC programmes.

In the initial stages of network activity, requirements for financial support will however be modest.

#### 5. Work Programmes for the Regional Centre

While the areas for research and the training programmes which could be undertaken by the Regional Centre will emerge in the course of discussion at the Meeting, the following specific activities are suggested as being worthy of being undertaken by the Regional Centre :

- (a) A publication on China's experience in small-hydro-power generation; the problems faced and how they were solved; development and design and manufacturing activities
- (b) A catalogue of SHG equipment available world-wide with information on where they have been installed
- (c) A High level meeting of policy makers in the ESCAP region to identify measures needed to promote SHG.

#### 6. RCTT activities in SHG development.

RCTT's interest and involvement in mini-hydro power generation began with cosponsoring with UNIDO and ESCAP the Seminar/Workshop on MHG held in Kathmandu, Nepal in September 1979. RCTT is assisting the Government of Malaysia by providing a consultant on SHG to advise the authorities on turbine design and installation in connection with the Government's programme for SHG development. RCTT will soon organise a regional meeting on SHG to be held in Malaysia. In its "Newsletter" and "Technical Digest", RCTT has been giving prominent coverage to developments in SHG.

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