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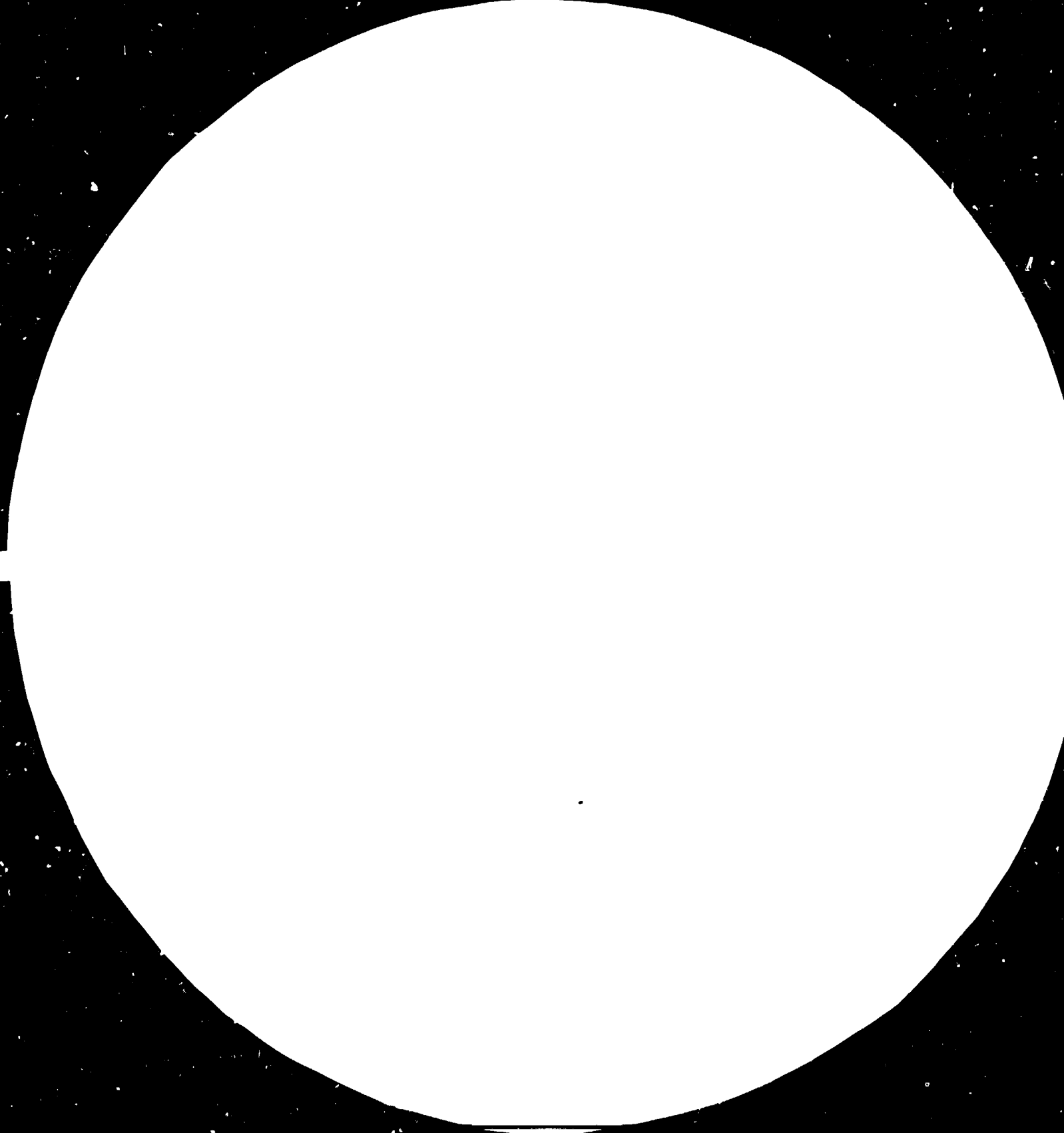

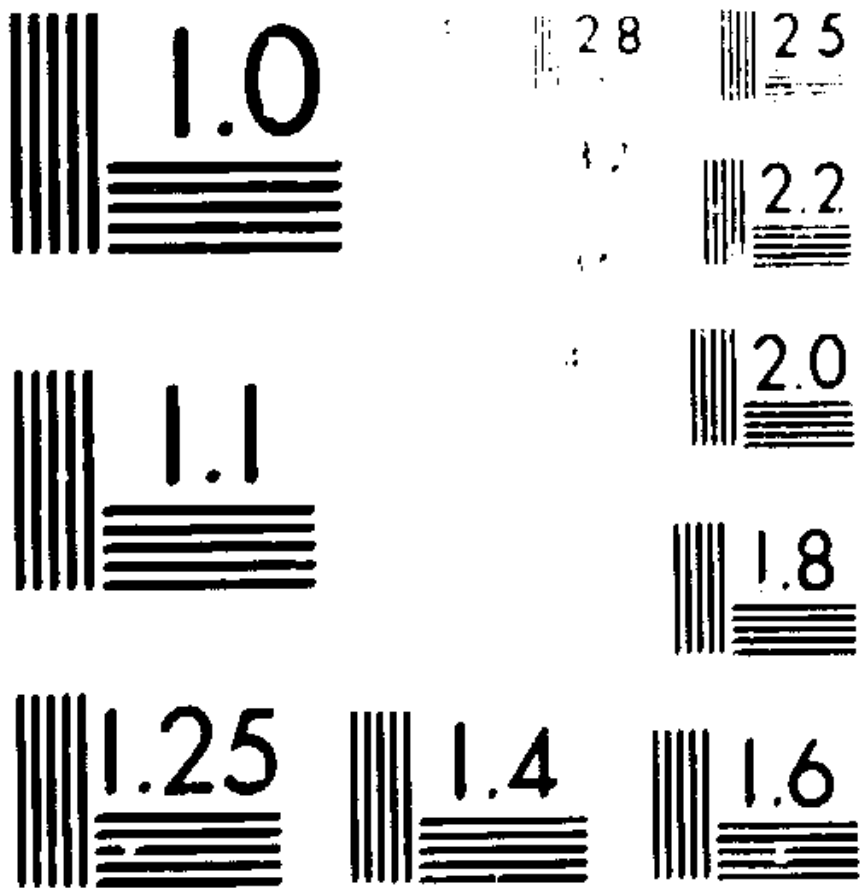
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WORK PROGRAMME FOR THE REGIONAL NETWORK FOR SMALL HYDRO POWER (RN-SHP) AT THE HANGZHOU REGIONAL CENTRE (HRC)*/

by

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CONTENTS

1. INTRODUCTION

The main purpose of this document is to provide a draft outline of a Programme of Activities for the Regional Network (RN-SHP) and the Hangzhou Regional Centre (HRC) for Asia and the Pacific, for the years 1983-1984, with projections for 1985-1986.

The Draft Report of the Hangzhou meeting of July 1982, provides the basic guidelines for the paper; however, the scope of activities proposed has been restricted to a group of relevant projects, considering the obvious limitations derived from the present international situation regarding financial resource availability, and the importance of starting the operation of the RN-SHP and the HRC with activities that have a fair chance of being successfully completed.

On the other hand, the specific experiences of the author have some influence on the scope of the programme proposed, even though an effort has been made to consider them in light of the prospects for their application in the Asian and Pacific regions.

It is intended that this paper should be considered as an input for the Senior Experts Workshop on SHP Development to be held in Kuala Lumpur; therefore, it has been designed in such a way that this structure could be maintained, even if the scope of activities is extended or reduced.

It should also be noted that for the purposes of this document, in most cases there is no specific differentiation between the tasks to be assumed by the HRC and the RN-SHP, as a function of the conclusions of the Hangzhou meeting regarding the interim arrangements for starting operation of the RN within the framework of the HRC. However, in the case of activities that may be carried out outside the context of the HRC, they are defined as specific tasks to be coordinated by the RN-SHP.

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2. CONCEPT, OBJECTIVES AND STRATEGY

2.1 Concept

The purpose of this programme is to define the fundamental guide lines for the initial phase of activities of the RN-SHP and the HRC under the interim arrangement for the period 1983-1984, and with projections for 1985-1986.

2.2 Basic Objective

The main objective of the programme is to assist the member countries of the RN for improving their SHP development prospects by employing the HRC as the main instrument of support for its activities and executing a number of projects of high priority in the following specific fields of activity:

- Research and development
- Training
- Information services
- Advisory services

2.3 Specific Objectives

a. Research and Dvelopment:

- To develop methodologies for evaluating small-scale hydro resources and energy requirements.
- To develop methodologies, manuals and guidelines for project assessment, civil works design, site selection and optimization of alternatives.
- To assimilate and/or develop non-conventional technologies for civil works tending to maximize the use of indigenous materials.
- To assimilate and develop technologies for the use of energy generated by SHP in the rural areas, emphasizing the use of electricity for productive activities, with the purpose of increasing productivity, improving capacity factors, and consecuently obtaining better economic performances of SHP.

- To assimilate, adapt, and/or develop designs, standardization and manufacturing technologies for equipment and materials for SHP, in the form of manuals and methodologies.

b. Training:

- To organize courses and seminar for training high-level personnel with an engineering degree or its equivalent, in all aspects regarding SHP development and equipment and materials selection, design, standardization and manufacture of equipment and materials.
- To organize courses for "trainer trainees" who will have the task of intermediate and low-level training at the national level, in civil engineering and in the installation and operation of electromechanical equipment.
- To organize a programme of temporary exchange of engineers and technicians.

c. Information Services:

- To set up a publication or newsletter for disseminating experiences and information available on "the state of the art", experiences in the region and outside, technical and commercial information on equipment, end-use application, etc.
- To establish a data bank and reference library on SHP and related subjects, with emphasis on information generated in the region. The information should include materials directly available from the data bank and bibliographical lists of information available at identified institutions.
- To develop an information exchange system based on the data bank and linked with information and SHP lead centres in the region and outside.
- To develop directories of manufacturers and engineering consultancy capacities at the regional level, by means of the preparation, dissemination and data processing of suitable questionnaires.

- To develop surveys on equipment prices and SHP costs, based on commercial information from manufacturers, and actual experiences in specific SHP projects.
- To gather and disseminate information on institutional problems and solutions, for project development and utility operation and organization at the rural village level.

d. Advisory Services:

- To provide short-term advisory services to member countries and to their institutions, on specific problems related to SHP development.
- To assist research institutions and/or manufacturers, regarding equipment design, standardization and/or manufacture.
- To advise government institutions and manufacturers, on technology transfer evaluation and negotiation.
- To advise on institutional and organizational problems for SHP development and operation, at the request of governments and official institutions.

2.4 Strategy

The following strategical considerations, together with the objectives stated, provide the frame of reference for the activities included in this work programme.

- It is necessary to start with a limited number of feasible projects having a fair chance of implementation, even under unfavourable financial conditions or under any initial difficulties in the operation of the RN and the HRC.
- The initial activities should have a high impact and relatively low cost.
- For the implementation of the Work Programme, it should be considered that the international financial situation is expected to be relatively more difficult for 1983-1984 than for the previous years, besides the lowering of oil prices will some-what affect the short-term economic and financial justification of some SHP projects.

- The promotion of regional capacities in engineering and equipment manufacture should have a high priority,
- The extra-regional perspectives of cooperation are also an important factor, particularly South-South cooperation with institutions involved in SHP development at the regional level, such as OLADE.
- The continuing support of international organizations from the UN System, such as UNIDO, UNDP, UNCTAD, and others, together with regional organizations such as ESCAP, REDP and RCTT, is a necessary condition for the development of the work programme. Therefore, a close and effective co-ordination among those institutions, in support of the RN-SHP and the HRC, should be maintained.
- The interim arrangement by which the RN will be initiated within the HRC, even though the HRC is a part of the RN, should provide an adequate starting point for the initial operation of the RN-SHP; however, when the network is capable of operating as such, and there are material and human resources for establishing a small technical secretariat for the RN, it could be necessary to separate its functions from those of the HRC.
- The establishment of a regional, inter-governmental energy organization for Asia and the Pacific could provide an optimal institutional framework for the development of the RN. However, this goal is strictly conditioned to the will and decisions of the governments in the region.

3. SCOPE OF ACTIVITIES AND EXPECTED RESULTS

The projects herewith described are consistent with the objectives and strategy defined for this work programme. In their selection, the scope of activities and project concepts of the Hangzhou meeting Draft Report have been considered, but an attempt has been made to select for 1983-1984 only those projects that are more likely to have a larger impact and that require limited amounts of resources. To permit a more consistent approach, in some cases the projects defined integrate some of the activities mentioned in the Hangzhou Draft Report; while in some other cases, the scopes for the short and medium terms have been reduced or modified.

For the period 1985-1986, the projects to be initiated are stated without including detail.

3.1 Projects To Be Started during 1983-1984

The projects defined in this part have specific "project outlines" in Appendix I.

a. Research and Development:

RD-01 - Methodologies for Evaluating Small-scale Hydro-energy Resources and Energy Requirements

Concept: To prepare manuals on approximate evaluation of energy requirements, on overall evaluation of small-scale hydro resources and on preparation of SHP inventories.

RD-02 - Guidelines for Project Formulation, Definition of Scope of Studies and Project Evaluation

Concept: Preparation of a reference guide for the above.

RD-03 - Manual for Civil Works Design, Construction and Application of Non-conventional Technologies

Concept: Preparation of a comprehensive manual.

RD-04 - Technological and Industrial Profiles for End Use of Electricity Generated by SHP

Concept: Profiles of small-scale industries that can be established in rural areas, for the transformation of mining and agricultural products or for services required.

RD-05 - Design, Standardization and Manufacture of SHP Equipment. First phase: Manual on Cross-flow Turbines and Electrical-Electronic Speed Regulators

Concept: Preparation of a two-volume manual, including hydraulic and functional design procedures, mechanical design, materials, standardized series, detailed drawings and lists of materials.

b. Training:

TR-01 - Seminar on Regional Capacities for SHP Development

Concept: Preparation of country papers, seminar, garnering and processing of information regarding national capacities and institutional organization, consultancy, engineering, R+D, production of equipment, etc.

TR-02 - Regional Course on SHP Design

Concept: Training of engineering professionals on a multidisciplinary basis, regarding site evaluation specifications, civil works design and construction, equipment selection and installation , start-up, testing and initial operation.

TR-03 - Regional Training Course for SHP Operators

Concept: To qualify instructors for the training of operators and application of didactic methods.

TR-04 - Exchange of Personnel

Concept: To promote exchange of experiences and understanding of various approaches for SHP development.

c. Information Services:

IS-01 - Publication of SHP Newsletter

Concept: To provide an instrument of diffusion of new technologies, "state of the art" regional experiences, availability of engineering capacities and equipment, and information on future events.

IS-02 - Data Bank, Reference Library and Information Exchange System

Concept: To set up the basic information services stated above, with emphasis on information generated in the region.

IS-03 - Directory of Regional Manufacturers of Equipment and Materials for SHP

Concept: The directory will be prepared as a result of processing the information included in questionnaires previously prepared and disseminated among manufacturers in the region.

IS-04 - Survey on Prices of Equipment and SHP Costs

Concept: To prepare the survey based on commercial information gathered from manufacturers and specific projects.

IS-05 - Survey on Institutional Arrangements, Problems and Solutions

Concept: It includes a diagnostic on the various institutional structures adopted by the countries in the region and outside, with the purposes of identifying problems and solutions and defining alternative schemes adaptable to various circumstances.

d. Advisory Services:

This field of work is considered as a single project with an open and self-evolving nature, based on the provision of short-term technical assistance on SHP development to the countries that may request it.

3.2 Summary of Expected Results

The expected results for each project are described. In the project outlines included in Appendix I. However, in this part of the work programme we list the most significant results expected for the period 1983-1984 for each one of the four fields of activities under which the projects have been classified.

a. Research and Development:

The activities are oriented towards the development of a group of manuals and methodologies that should become basic technical tools for the most important aspects of SHP development.

b. Training:

The proposed seminar will facilitate the assessment of existing engineering and manufacturing capacities, and will also promote the personal acquaintance of people involved in SHP development in the region.

The course on of SHP design will qualify no fewer than 50 engineers from the countries of the region, in aspects related to civil engineering design and the selection and installation of equipment. The course for operator instructors will permit the training of no fewer than 30 instructors who will later on continuously train SHP operators. The exchange of personnel will improve the exchange of experiences among institutions.

c. Information Services:

A newsletter, non-periodical at the beginning, will be published to disseminate information on the "state of the art", experiences in SHP development, application of new technologies, availability and supply of equipment, activities of the RN and the HRC, etc. The establishment of the data bank and the reference library will have to be modest in scope at first, giving priority to information generated in the region or other areas in the world, that are frequently outside the information systems. The information exchange system will link the data bank and reference library with national centres that generate and/or gather information on SHP. The Directory of Regional Manufacturers will be prepared after processing the information gathered from the manufacturers themselves, by means of a suitable questionnaire.

The surveys proposed on prices of equipment, SHP costs and institutional arrangements will be based on the collection of available information and reports from national focal points.

d. Advisory Services:

It is difficult to assess the expected results regarding the provision of these services; however, it is intended to establish a mechanism for requesting services and identifying advisors, as well as a financial mechanism that could be based on the payment of air fare and per diems by the receiving country, and the payment of salaries or fees by the donor country.

3.3 Projection for 1985-1986

The execution of some of the projects defined in 3.1 will extend beyond 1984, as can be noted from the time schedule. In this part we will mention only a few guidelines for further activities to be initiated during this second period.

a. Research and Development:

Methodologies and manuals applying specific fields of knowledge to SHP, such as hydrology, geology, geomorphology, ecology etc., should be developed. Regarding equipment, the extension of the manuals on design and standardization to other turbines, oleo-mechanical speed regulators, generators, electrical systems for SHP, etc., should be continued. Besides, it is expected that the laboratory facilities of the HRC and other lead centres will be consolidated; therefore the activities of prototype testing will be strengthened.

b. Training:

The courses at an advanced level will tend to become more specialized in comparison with what we expect for 1983-1984. It is assumed that the HRC will be in a condition to provide a continuous, on-going training service, in which there will be post-graduate courses con SHP for various engineering fields and specialization requirements. It is also expected that the training of instructors for rural operators will have a more continuous nature.

c. Information Services:

The newsletter should be periodical and there should be regular publication of papers and technical documents. During this period the data bank should have access to some international technical information services. There should be available some capacity for publishing books and papers produced in the region.

d. Advisory Services:

The RN should have a small core of experienced engineers as its technical staff, complemented by a significant number of qualified consultants who could be involved in extensive activities for providing technical assistance to the countries.

4. HUMAN AND MATERIAL RESOURCES REQUIRED

4.1 Human Resources

A significant part of the human resources required will be provided by the HRC and the Secretariat of the RN-SHP, in accordance with the execution responsibilities defined in the individual project outlines (Appendix I); and additionally, it will be necessary to contract experts that could be entrusted with specific tasks, under the supervision of the HRC or the RN.

The expert-month requirements stated below for the projects are defined independently of the origin of the expert (HRC, RN or outside experts).

a. Research and Development:

RD-01 - 15 expert-months, including an expert on demand evaluation (economist or experienced engineer) and an expert on resource assessment and SHP inventories (Hydrologist or experienced engineer). As an additional possibility, a cooperation agreement could be reached with OLADE.

RD-02 6 expert-months requiring an expert on SHP project formulation (economist or experienced engineer).

RD-03 - 15 expert-months, requiring an expert on SHP design and construction (civil engineer qualified in hydraulics and civil structures) and additional short-time support from an expert on mechanical equipment, selection, installation, and testing (mechanical engineer) and from an expert on electrical installations and electrical system design (electrical engineer).

RD-04 - 3 expert-months per year, using one expert on small-scale agro-industry with experience in SHP operation (industrial or agricultural engineer or an engineer from a different specialization, with specific experience in this field).

RD-05 - 16 expert-months, requiring one expert on hydraulic and mechanical design of turbines (mechanical engineer) and an expert on control equipment (electrical or mechanical engineer).

b. Training:

TR-01 - 4 expert-months, for the organization of a seminar and the preparation of materials (engineer with experience in SHP development).

TR-02 - 8 expert-months for the organization of the course and preparation of additional technical documents (civil, mechanical and electrical engineers and/or economist).

TR-03 - 8 expert-months for the organization of the course and preparation of methodologies and teaching methods (engineer with experience in SHP installations and operation, and with experience in training at the rural level).

TR-04 - No specific expert requirements for organizing the exchange of personnel.

c. Information Services:

IS-01 - 4 expert months/year, requiring an engineer with experience in publications and information handling and with broad experience in SHP development.

IS-02 - 12 expert months/year, requiring a qualified librarian or information expert.

IS-03 - 6 expert-months, requiring an engineer with broad experience in SHP, who be will be assisted by specialists on specific equipment components.

IS-04 - 2 expert-months (engineer or economist).

IS-05 - 2 expert-month (engineer or economist).

d. Advisory Services:

Due to the nature of the project, it is difficult to assess at this stage the extent and qualification of the experts required for technical assistance.

4.2 Material resources:

The basic requirements for the development of the proposed projects are associated with the implementation of the HRC and its facilities for R & D, training and information services, and with the establishment of the RN-SHP under the interim arrangement.

However, the material resources required could be classified as follows:

- Secretarial, editoring and printing facilities for the preparation of methodologies, manuals and technical documents.
- Copying facilities for all the activities proposed.
- Building and logistic support for the seminar, course and meetings considered.
- Establishment of an information centre.
- Drawing office facilities for the preparation of graphs, technical drawings and lists of materials associated with the manuals and methodologies proposed.
- Small-scale manufacturing capacities for prototype construction (turbines and speed regulators).
- Testing facilities for prototypes and for training courses.
- Resources to cover transportation costs and per diems associated with the projects.
- Office and technical materials.

5. TIME SCHEDULE

An approximate timetable is proposed as follows:

PROJECT	1983				1984			
	1st.Q	2nd.Q	3rd.Q	4th.Q	1st.Q	2nd.Q	3rd.Q	4th.Q
a. Research and Development								
RD-01				=========	=========	=========	=========	
RD-02				=========	=========	=========	=========	
RD-03			=========	=========	=========	=========	=========	=========
RD-04			========				========	
RD-05			=========	=========	=========	=========		
b. Training								
TR-01				===				
TR-02					===			
TR-03							===	
TR-04				=========	=========	=========	=========	=========
c. Information Services								
IS-01			===		===	===	===	====
IS-02			=========	=========	=========	=========	=========	=========
IS-03			=========	=========	=========	=========		
IS-04					=====			
IS-05			=========	=========				
d. Advisory Services				=========	=========	=========	=========	=========

6. CONCLUSIONS AND RECOMMENDATIONS

For the appraisal and execution of the proposed work programme, the following comments should be considered:

- The scheme proposed for the work programme is adequate for making modifications on the extension and scope of the projects to be considered, at the stage of final approval.

- Once a final selection of projects is defined, it will be necessary to prepare a more detailed project sheet, which could be a format as presented in Appendix II.

- The selected projects should be divided into two groups. The first one would be integrated by the projects for which there are available or assured human, material, and financial resources; therefore they could have definite time schedules. The second group of projects would be considered for requesting and negotiating the required resources; therefore, their time schedule will be structured on "relative time", i.e with an undetermined start date.

- The work programme should be linked with the implementation process of the HRC and the RN-SHP.

APPENDIX I - PROJECT PROFILES

1. PROJECT CODE: RD-01

2. PROJECT TITLE: Methodologies for Evaluating Small scale Hydro Energy Resources and Energy Requirements.

3. OBJECTIVES:

i. Evaluation of approximate energy requirements and thermal plant replacement needs in villages.

ii. Evaluation of the overall small-scale hydro potential of basins and river.

iii. Preparation of inventories of projects for the areas with more important energy requirements and with availability of resources.

4. SCOPE OF ACTIVITIES:

i. Compilation of information regarding methods for evaluating of demand and small-scale hydro resources.

ii. Methodology for approximate evaluation of energy requirements for large groups of villages, and not for individual project development.

iii. Methodology for evaluating the small-scale hydro potential of basins and rivers, without identifying specific sites.

iv. Methodology for preliminary site selection and alternatives at the inventory level, to attend identified energy requirements.

v. Approximate design and cost estimates for sites considered in inventory.

vi. Project profile preparation for inventory and selection of optimal alternatives.

vii. Establishment of priorities for basins and projects for planning SHP development.

5. EXPECTED RESULTS

i. Manual for approximate evaluation of energy requirements.

ii. Manual for overall evaluation of small-scale hydro resources of basins and rivers.

iii. Manual for SHP inventories for attending identified energy requirements.

6. EXECUTION

By the permanent staff of the Regional Centre, assisted by experts from the participating countries and short-term advisors supplied by multilateral/bilateral agreements. Some cooperation from OLADE could be agreed upon, to use as reference material similar to that being prepared by that organization.

7. DURATION

One year (1983-1984)

1. PROJECT CODE: RD-02

2. PROJECT TITLE: Guidelines for Project Formulation, Definition of Scope of Studies, and Project Evaluation.

3. OBJECTIVES:

i. To provide methods and terms of reference for the development of pre-investment studies for SHP projects.

ii. To define the scope of pre-investment studies, depending on the size of the project and investment reliability requirements.

iii. To elaborate methods for evaluating studies.

4. SCOPE OF ACTIVITIES

i. Definition of pre-investment study requirements for SHP projects, for isolated projects and for groups of projects within an inventory.

ii. Terms of reference for various stages and types of studies (reconaissance, feasibility, detailed engineering), based on cost of studies against expected investments and availability and need to generate data.

iii. Reliability and evaluation of pre-investment studies.

iv. Costs of pre-investment studies against extension of contents.

5. EXPECTED RESULTS

i. Guide for project formulation definition of pre-investment studies, and their evaluation.

ii. Editing and dissemination of guide.

iii. Agreements with financial institutions to accept the guide as a valid reference for project definition and evaluation.

6. **EXECUTION**

By the permanent staff of RN and outside advisors.

7. **DURATION**

One year (1983 - 1984).

1. PROJECT CODE: RD-05

2. PROJECT TITLE: Manual for Civil Works Design, Construction and Application of Non-conventional Technologies.

3. OBJECTIVES:

i. To provide consistent design methods for civil works that could be used by qualified engineers without specific experience in SHP design.

ii. To define design and calculation methods for the practical application of non-conventional technologies.

4. SCOPE OF ACTIVITIES

i. Definition of technical parameters and project specifications.

ii. Design methods for each component of the SHP civil works (dams, intakes, canals, forebays, desilting, penstocks, powerhouse, anchorages, discharge, etc.).

iii. Range of application for each design type.

iv. Safety factors and design; type of civil works execution and design requirements.

v. Design methods and practical application of non-conventional technologies and use of indigenous materials, such as non-metallic penstocks, wooden dams, etc.

5. EXPECTED RESULTS

i. A comprehensive design manual.

ii. Dissemination of the manual.

6. EXECUTION

By the HRC permanent staff and contracted experts. There are prospects for cooperation with OLADE.

7. DURATION

1 1/2 years (1983 - 1984)

1. PROJECT CODE: RD-04

2. PROJECT TITLE: Technological and Industrial Profiles for End Use of Electricity Generated by SHP.

3. OBJECTIVES:

   i. To provide elements for selecting productive activities in rural areas that could be advantageously initiated, following the installation of an SHP.

   ii. To improve productivity, and hand increase SHP load factors.

   iii. To provide a firm economic base for the continuity of operation of SHP plants.

   iv. To create conditions for an effective improvement in living conditions, by generating occupation and higher aggregate value to agricultural products.

4. SCOPE OF ACTIVITIES

   i. Preparation of profiles for agroindustrial activities, services support industries, mining and concentration, etc., which could become important users of electricity.

   ii. The profiles should include guidelines for market research, raw material supply assessment, processes, equipment and installation requirements, energy requirements, other supplies and services (water, gas, drainage, waste disposal, etc.) investment requirements, technology availability and sources, prospects for self-development, labour requirements for construction and operation.

5. EXPECTED RESULTS

   i. Production of at least five (5) rural industry profiles per year.

   ii. Dissemination of profiles.

6. EXECUTION

   By RN staff and data bank staff.

7. DURATION

   Undetermined, but estimated as 5 years, starting 1983.

1. PROJECT CODE: RD-05

2. PROJECT TITLE: Design, Standardization and Manufacture of SHP Equipment. First phase: Manual on Cross-flow Turbines and Electrical-Electronic Speed Regulators.

3. OBJECTIVES:

   i. To create a technological base for regional development of low-cost standardized equipment for SHP.

   ii. To promote regional manufacturing of cross-flow turbines and Electrical-Electronic speed regulators.

   iii. To develop and adapt technologies, open and available to member countries.

   iv. To develop and adapt technologies that cover all the stages required up to manufacturing level.

4. SCOPE OF ACTIVITIES

   i. To develop hydraulic design methods (for cross-flow turbines) and functional design methods (for speed regulators).

   ii. To define criteria for standardization, ranges of application to be considered, and a basic standardized series.

   iii. To define mechanical design methods.

   iv. To define criteria for selection of materials.

   v. To elaborate detailed dimensional design, detailed drawings, manufacturing methods and processes, and lists of materials.

   vi. To set bases for establishment fits and tolerances.

5. EXPECTED RESULTS

   i. A manual for design, standardization and manufacture of a series of cross-flow turbines.

ii. A manual for design and manufacture of a group of electric-electronic speed regulators, suitable for operating jointly with the standardized cross-flow turbines series.

6. EXECUTION

A short-term advisor and a consultant will be recruited, who will be located at the focal point, which agrees to provide facilities and assistance for their work, mainly regarding drawing office support and available prototype manufacturing capacities.

The results will be disseminated by an agreement in each case, by the co-ordinator of the R.N.

7. DURATION

One year (1983-1984)

1. PROJECT CODE: TR-01

2. PROJECT TITLE: Seminar on Regional Capacities for SHP Development.

3. OBJECTIVES:

   i. To gather information on existing capacities for SHP development in the region, regarding institutional structure and organization of consultancy services, engineering capacities, community partipation, research and development, production of equipment, installations, operation and maintenance, and training.

   ii. To promote the acquaintance of people involved with SHP development in the region.

   iii. To exchange views regarding ways and prospects for cooperating within the region.

4. SCOPE OF ACTIVITIES

   i. Preparation of country papers, structured under the various activities mentioned above.

   ii. Identification of problems limiting intraregional cooperation and alternative solutions.

   iii. Establishment of a network of institutional and personal contacts.

5. EXPECTED RESULTS

   i. Chart of capacities and activities for the countries in the region.

   ii. List of problems and solutions, associated with the promotion of intra-regional cooperation.

   iii. Involvement of no fewer than 60 participants in the event.

6. EXECUTION

   H.R.C. will be in charge of the coordination and organization of the event.

7. **DURATION**

   Five days of meetings and four days of visits (1983).

1. PROJECT CODE: TR-02

2. PROJECT TITLE: Regional Course on SHP Design.

3. OBJECTIVES:

   i. To provide training to engineering professionals, in site evaluation specification, civil works design and execution, selection of equipment, mechanical and electrical installation, start up and testing procedures and initial operation of SHP.

   ii. To increase the engineering capacities of the participating countries.

   iii. To provide materials and a group of trained engineers for latter development of courses at the national level.

4. SCOPE OF ACTIVITIES

   i. Training of multi-disciplinary groups.

   ii. Adequate combination of theory and practice.

   iii. Production of technical documents and reference materials.

   iv. Development of specific cases in small teams.

5. EXPECTED RESULTS

   Participation of 50 trainees.

6. EXECUTION

   H.R.C. will be in charge of the coordination, organization and execution of the course.

7. DURATION

   21 days (1983 or 1984).

1. PROJECT CODE: TR-05

2. PROJECT TITLE: Regional Course for Instructors of Rural SHP Operators

3. OBJECTIVES:

   i. To define didactic methods for training operators.

   ii. To qualify instructors that will train SHP operators of rural origin.

4. SCOPE OF ACTIVITIES

   i. Production of reference manuals for operation and preventive maintenance of SHP.

   ii. Provision of basic training and information on SHP design and installation.

   iii. Methods and procedures for SHP operation.

   iv. Preventive maintenance.

   v. Teaching methods.

   vi. Teaching of basic knowledge requirements regarding arithmetical calculations, elementary principles of electricity, applied mechanics and civil works; basic elements of bookkeeping and work organization.

   vii. Safety Standards

   viii. First aid.

5. EXPECTED RESULTS

   Training for 30 instructors from the participating countries.

6. EXECUTION

   The HRC will be in charge of the coordination, organization and execution of the course.

7. DURATION

   15 days (1984).

1. PROJECT CODE: TR-04

2. PROJECT TITLE: Exchange of Personnel

3. OBJECTIVES:

   i. To exchange experiences.

   ii. To promote the assimilation of different ways of approaching and solving problems of SHP development.

   iii. To promote understanding among countries and institutions in the region.

4. SCOPE OF ACTIVITIES

   i. This is a self-evolving project, depending on needs and available capacities of the participating institutions.

   ii. Its execution is conditioned by the availability of financial resources for travelling and living expenses.

5. EXPECTED RESULTS

   Promotion of not fewer than five personnel exchanges a year, within the region.

6. EXECUTION

   By all participating countries and focal points. The coordination will be carried out by the RN-SHP.

7. DURATION

   Between two and six months in each case; the project should start in 1984.

1. PROJECT CODE: IS-01

2. PROJECT TITLE: Publication of Regional SHP Newsletter

3. OBJECTIVE:

To provide an instrument of information on SHP, for the participating countries and their institutions.

4. SCOPE OF ACTIVITIES

The newsletter should include information on the following matters:

- "State of the art"
- Regional experiences and news on SHP development.
- Application of non-conventional technologies.
- Equipment for SHP.
- Availability and requirements for consultancy services, construction, equipment supply, technology transfer, etc.
- Regional and extraregional events on SHP.

5. EXPECTED RESULTS

To disseminate the newsletter within the region and outside, non-periodically at the beginning.

6. EXECUTION

HRC will be in charge of the co-ordination, organization, editing and dissemination of the newsletter.

7. DURATION

1983: Non-periodical
1984 - on: quarterly

1. PROJECT CODE: IS-02

2. PROJECT TITLE: Data Bank, Reference Library and Exchange of Information System.

3. OBJECTIVES:

   i. To establish a data bank with technical papers and documents related to SHP, givin priority to the information generated in the region.

   ii. Set up a Reference Library with text books, manuals and detailed papers, related to SHP or to engineering topics required for SHP development.

   iii. To initiate on exchange of information system among focal points institutions and individuals.

4. SCOPE OF ACTIVITIES

   i. At the begining the Data Bank should adopt simple methods for classifying the information available. The use of computer systems, should be established only when the volume of information and requests justify it.

   Besides the information stored by the Data Bank, it should keep abstracts of references in possession of other information centres and identified institutions.

   ii. For establishing the library, it is necessary to prepare a list of texts, books and manuals and then ensure adequate resources for their acquisition.

   iii. The exchange of information system, is based on the supply of information from the Data Bank as in exchange for information received from institutions and individuals, on page equivalent terms. The requests of information not associated with on exchange should be charged.

5. EXPECTED RESULTS

To set up the Data Bank, Reference Library and an exchange of information system on SHP.

6. EXECUTION

The HRC will be in charge of the co-ordination, organization and execution of the project.

7. DURATION

Indefinite; expected to start in 1983.

1. PROJECT CODE: IS-03

2. PROJECT TITLE: Directory of Regional Manufacturers of Equipment and materials for SHP.

3. OBJECTIVE:

   i. To prepare a comprehensive, multiple entry directory of established manufacturers of SHP equipment and materials in the region.

   ii. To promote the use of equipment of regional origin, and provide on information base for intra-regional co-operation.

4. SCOPE OF ACTIVITIES

   i. Prepare a questionarie and instructions for filling it.

   ii. Disseminate the questionaire among manufacturers and institutions linked with SHP development in the region.

   iii. Collect filled-up questionaries and process information.

   iv. Design Directory format.

   v. Prepare the Directory.

5. EXPECTED RESULTS

   To have and diseminate a regional Directory of manufacturers of equipment and materials for SHP.

6. EXECUTION

   By an expert or institution contracted under the supervision of the RN-SHP. It should be noted that OLADE is executing a symilar project in Latin America.

7. DURATION

   One year (1983-1984).

1. PROJECT CODE: IS-04

2. PROJECT TITLE: Survey on Prices of Equipment and SHP costs

3. OBJECTIVES:

To provide statistically processed indexes and formulas for estimating current equipment prices and project costs

4. SCOPE OF ACTIVITIES

i. Gather price lists and catalogues from various manufacturers, gather information of equipment prices from quotations made for specific prospects.

ii. Select correlation curves of equipment prices, and fit the data to determine empirical equations.

iii. Gather information on project costs and correlate it against the basic technical specifications and features of the projects, in order to define empirical equations for cost estimation.

iv. Define indexes of materials and labour requirements for SHP projects, as a function of their capacity and technical features.

5. EXPECTED RESULTS

Data sheets and formulas for estimating equipment prices and SHP projects costs.

6. EXECUTION

By the RN-SHP with the support of the HRC.

7. DURATION

Indefinite, Periodical yearly adjustments. Expected to start in 1984.

1. PROJECT CODE: IS-05

2. PROJECT TITLE: Survey on Institutional arrangements, problems and solutions.

3. OBJECTIVES:

   i. To identify various types of organization and institutional set-ups for SHP development and operation.

   ii. Identify problems and solutions.

   iii. Design alternative schemes

4. SCOPE OF ACTIVITIES

   i. Diagnostic of existing institutional schemes and their problems.

   ii. Resumé of institutional problems affecting SHP development.

   iii. Definition and detailed organization design, of alternative schemes for SHP development and operation.

5. EXPECTED RESULTS

   To have a comprehensive view of the various institutional schemes adopted in the region for SHP development, identify the main institutional problems encountered, and propose alternative schemes.

6. EXECUTION

   Contracted by RN-SHP.

7. DURATION

   Six months (1983).

1. PROJECT CODE: AS

2. PROJECT TITLE: Advisory Services

3. OBJECTIVE:

Assist the national institutions on specific SHP development problems, providing short term technical assistance.

4. SCOPE OF ACTIVITIES

i. This project is self evolving, depending on the specific requirements of the country, availability of resources, and availability of qualified experts.

ii. For its application within the region it would be necessary to finance air tickets, perdiems should be provided by the receiving country and the donor country could cover salaries or fees of the expert, on the basis of regional co-operation.

5. EXPECTED RESULTS

It is difficult ot asses them due to the nature of the project.

6. EXECUTION

The coordination will be made by the RN-SHP with the countries involved.

7. DURATION

Indefinite. The specific tasks of advisory services should not last longer than three months.

APPENDIX II : Reference Format for Detailed Outline of Selected Projects

olade

ENERGY PROJECT
REQUEST FOR FUNDING

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PAGE NO :

PROJECT TITLE:	PROJECT NUMBER:	PRESENTATION DATES :
	OLADE :	INITIAL :
	OPEC:	REVISION 1:
		REVISION 2 :

1. BACKGROUND :

1.1 OLADE.-

1.2 PLACE.-

1.3 COUNTRY AND INSTITUTION.-

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE:	PROJECT NUMBER: CLADE: OPEC:	CONTINUED PAGE Nº 2

BACKGROUND (CONTINUATION)

1.4 OF THE PROJECT.-

1.5 FINANCING OF PREVIOUS PROJECTS.-

2. OBJECTIVES:

2.1 PURPOSE OF THE REQUEST.-

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE:	PROJECT NUMBER: OLADE: OPEC:	CONTINUED PAGE Nº 3

OBJECTIVES (CONTINUATION)

2.2 IMMEDIATE.-

2.3 FINAL.-

PROJECT TITLE:	PROJECT NUMBER: OLADE: OPEC:	CONTINUED PAGE Nº 4

3. PROJECT DESCRIPTION:

3.1 ACTIVITIES.-

3.2 STAGES.-

3.3 ORGANIZATION AND PROCEDURES FOR EXECUTING PROJECT ACTIVITIES.-

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE:	PROJECT NUMBER: OLADE: OPEC:	CONTINUED PAGE Nº 5

PROJECT DESCRIPTION (CONTINUATION)

3.4 QUALIFICATIONS AND TERMS OF REFERENCE.-

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE :	PROJECT NUMBER: OLADE : OPEC :	CONTINUED PAGE Nº 6

4. JUSTIFICATION :

4.1 SCOPE OF THE ENERGY PROGRAM.-

4.2 TECHNOLOGICAL SCOPE.-

4.3 OVERALL RESULTS.-

4.4 OPEC FUND PARTICIPATION.-

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE:	PROJECT NUMBER: OLADE: OPEC:	CONTINUED PAGE Nº

5. BUDGET :

ITEMS	OPEC FUND THOUS US $	NATIONAL COUNTERPART PLACE-OTHERS THOUS US $	TOTAL COST THOUS US $

OPEC FUND

LATIN AMERICAN ENERGY ORGANIZATION
PERMANENT SECRETARIAT

PROJECT TITLE:	PROJECT NUMBER: OLADE: OPEC	CONTINUED PAGE Nº 8

6. SCHEDULE

ACTIVITIES	YEAR												YEAR											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D