

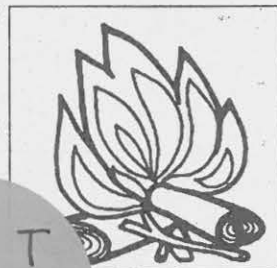
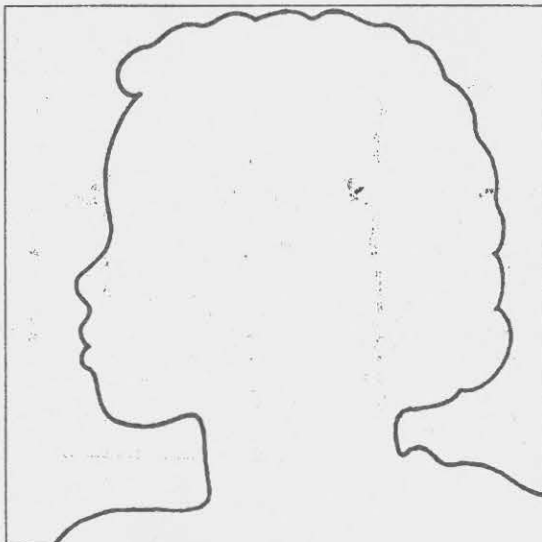
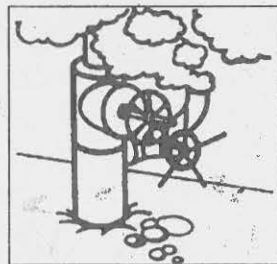
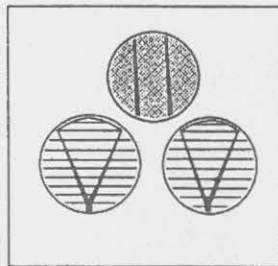
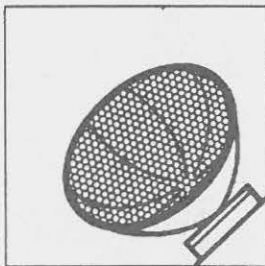
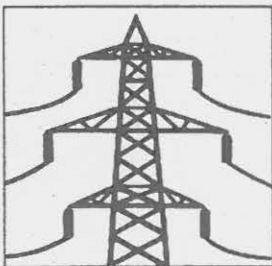
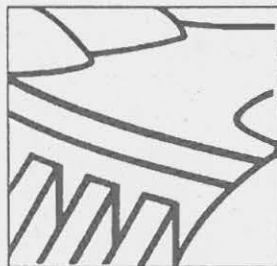
# INSTRAW

United Nations International  
Research and Training Institute  
for the Advancement of Women



## *Regional Training Seminar on Women and New and Renewable Sources of Energy*

*Addis Ababa, Ethiopia  
16 - 20 October 1989*



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ENE-AFR

#### NOTE

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Regional Training Seminar on  
Women and New and Renewable Sources of Energy  
Addis Ababa, Ethiopia\*  
16-20 October 1989

Organized by the  
United Nations  
International Research and Training Institute  
for the Advancement of Women

in co-operation with

The United Nations Economic Commission for Africa

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## I. INTRODUCTION

The regional training seminar on Women and New and Renewable Sources of Energy was held at the United Nations Economic Commission for Africa (ECA) Headquarters in Addis Ababa, Ethiopia, from 16 to 20 October 1989. The seminar was organized by the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) in co-operation with ECA, using a prototype multimedia modular training package, "Women and New and Renewable Sources of Energy", prepared by INSTRAW and the International Centre for Advanced Technical and Vocational Training of the ILO/Turin. The seminar was financed by the Government of Italy.

The seminar was attended by seventeen participants from the following 13 countries: Burkina Faso, Burundi, Egypt, Ethiopia, Guinea, Kenya, Lesotho, Rwanda, Senegal, Sudan, Tanzania, Tunisia and Uganda (see Annex I). Twenty-four observers from the United Nations specialized agencies and organizations, governmental, non-governmental and women's organizations also attended the seminar (see Annex II).

## II. ORGANIZATION OF THE SEMINAR

### A. Opening addresses

The opening of the seminar was co-ordinated by Mr. Peter N. Mwanza, Chief of the Natural Resources Division of ECA. In his opening statement, the representative of ECA welcomed the participants on behalf of the Executive Secretary of ECA to the Headquarters of the Economic Commission for Africa and to the regional training seminar on "Women and NRSE" organized by INSTRAW in co-operation with ECA. He expressed his satisfaction for the excellent level of collaboration between ECA and INSTRAW in organizing this seminar. He also expressed his gratitude to the Italian government for the generous financial assistance provided for the seminar.

Mr. Mwanza said that the regional seminar was intended for development planners, senior officers of energy programmes and senior officials of women's and non-governmental organizations at national, regional and international levels.

The representative of ECA stated that the development of NRSE in Africa is a very important activity, as it is related to the implementation of the Nairobi Programme of Action adopted in 1981, which enabled Member States to have an opportunity of pursuing the goal of diversifying their energy sources in order to lift the burden of expensive imported oil and petroleum products.

Moreover, Mr. Mwanza said that in the field of women and energy, ECA's interest dated back to 1980 when a workshop on firewood and energy development for rural African women was organized jointly by ECA and FAO in Bamako, Mali. This was followed by a subregional seminar on fuelwood and energy development held in April 1983, in Lusaka, Zambia. The seminar, which was attended by high-level experts, recognized the need for further research, education and training for adequate and efficient utilization of energy in the region. Sound recommendations were made for increased participation of women in policy formulation and management of energy programmes. He stressed that it is important that the issue of women and NRSE is addressed comprehensively because in the rural areas of Africa and to a large extent in the urban areas, it is women who are the managers of energy resources and their utilization; it is the woman who bears the burden of procuring energy for all household purposes. He said some of the reasons for little progress in the implementation of the Nairobi Programme of Action were: lowering of petroleum prices; lack of a technological basis for most of the African countries to spread the technological innovations needed for most of the NRSE; failure to involve sufficiently the main target group in the field of NRSE, namely, women; and, of course, lack of financial resources.

He told the participants that despite the relatively little progress achieved so far in the implementation of the Nairobi Programme of Action in Africa, the need for development of NRSE is as valid today as it was in 1981 and that the outlook for most renewable energy technologies was still very promising. Therefore, the seminar should, inter alia, aim at assisting the African governments to re-dedicate themselves to the development of these energy sources.

Expressing his delight for ECA being associated with the seminar, he informed the participants that in its work ECA collects, analyses, stores and disseminates information on NRSE in Africa to be used by Member States, UN agencies, bilateral assistance agencies and NGOs; it assists in identifying the areas where research and training can make a significant contribution to the development of NRSE as well as in providing a link between the Government and funding agencies in order to facilitate such research and training; it provides, upon request, assistance to the African Member States in the development and utilization of NRSE, including integration of energy policy and planning into overall national socio-economic development policy and planning. ECA also organizes from time to time, regional consultative meetings to mobilize financial resources for the development of NRSE in Africa; ECA is the sponsoring organization of the African Regional Centre for Solar Energy (ARCSE) now fully operational whose headquarters are in Bujumbura, Burundi. The ARCSE, which is supported by the African Member States, is to be the main agency in Africa for the development of NRSE.

Finally, he wished the seminar success in its endeavours and thanked INSTRAW for collaborating with ECA in organizing it. He thanked the representatives of all United Nations and participants from various organizations for participating in and contributing to the success of the seminar.

Mr. Mwanza then introduced the representative of the Government of Italy, Mr. Arturo Luzzi.

Mr. Luzzi welcomed all the participants and said that the Government of Italy in the framework of its development co-operation activities, pays special attention to the women's issues. He pointed out that the Italian law on co-operation with developing countries included among its priority fields of activity the improvement of the position of women. The law also established a special office for women in development within the Italian Ministry of Foreign Affairs Directorate for Development Co-operation. He concluded by stating that his Government was pleased to have provided funds for the seminar, which represented a concrete expression of the will to help women overcome the constraints which hinder their advancement.

Mr. Mwanza introduced Ms Daniela Colombo, Member of the Board of Trustees of INSTRAW, who, on behalf of the Director of the Institute, Ms Dunja Pastizzi-Ferencic and the Board of Trustees addressed the participants. She thanked the Government of the People's Democratic Republic of Ethiopia for hosting the seminar and expressed gratitude to the Government of Italy for its financial support and to ECA for the assistance given in organizing the seminar.

She informed the participants on the objectives and activities of INSTRAW, especially with respect to its work on:

- 1) improving statistics and indicators on women;
- 2) issues relevant for policy design, such as monitoring and evaluation methodologies for programmes and projects for WID;
- 3) sectoral issues such as women, water supply and sanitation, women and energy, women as entrepreneurs and managers in industry;
- 4) developing innovative training methodologies on WID, which include the production of multi-media training packages, such as the one on "Women and Water Supply and Sanitation" and "Women and Development" and "Women and New and Renewable Sources of Energy".

Ms Colombo elaborated on the various activities of INSTRAW in the field of NRSE, with special reference to the Expert Group Meeting on the role of 'Women and NRSE', held at Headquarters in 1985 and the recommendations, guidelines and project profiles developed at the meeting.

She mentioned the production of a manual on stoves and then introduced the INSTRAW project for the development of multi-media training modules on women and NRSE, developed in co-operation with the ILO Turin Centre, of which the regional seminar is a component. Referring to the objectives of the training package she stressed that it was produced in order to secure:

- a) the involvement of women in projects based on the exploitation of NRSE in all stages, from identification to evaluation;
- b) the involvement of women in the choice and adaptation of technologies appropriate to socio-economic conditions; and
- c) the incorporation into projects of appropriate training programmes particularly targeted to women in the crucial stages of project implementation.

Ms Colombo concluded her intervention expressing to participants, resource persons and observers her best wishes for a fruitful and successful seminar, thanking them in advance for their contributions, and declared the seminar officially opened.

B. Adoption of the Programme of Work and Election of Rapporteur

The Programme of Work of the seminar was then adopted by the participants (see Annex III).

The participants designated Ms H.N. Gava, the representative of Uganda, as rapporteur.

C. Adoption of the report

After the presentation of all modules and both general and working group discussions, the report of the seminar, including all recommendations made at the seminar, was adopted by consensus. The report was presented by the Rapporteur of the meeting.

D. Closing of the Seminar

Following the adoption of the report, a closing ceremony was held. Concluding remarks were made as follows.

Mr. Peter N. Mwanza, on behalf of ECA and of the participants, thanked INSTRAW for having organized the seminar, which, he said, represented a concrete effort in promoting the development and utilization of NRSE and to ameliorate women's condition. He also thanked the co-ordinator and the resource persons for their constructive contributions in the organization of the seminar. He concluded by stating that he looked forward to the implementation of the recommendations of the seminar.

Ms Daniela Colombo, on behalf of INSTRAW, expressed her gratitude to ECA for its valuable support in organizing the seminar and to the Government of Italy for having provided funds for the project in the framework of which the seminar was organized. She also thanked participants for their active role in the seminar's work and for sharing their valuable experience in the field of NRSE.

Finally she expressed the hope that the seminar will prove a fruitful experience for all participants and will contribute to promote the advancement of women.



### III. PRESENTATION OF THE STRUCTURE AND METHODOLOGY OF THE MULTIMEDIA TRAINING PACKAGE

The representative of INSTRAW and co-ordinator of the seminar Ms Marina Vaccari briefly illustrated the content of the pilot test edition of the training package on "Women and New and Renewable Sources of Energy", jointly developed by INSTRAW and the ILO Turin Centre in 1989.

She said that the training package consisted of five modules, which can be used together, in a pre-determined sequence for the implementation of a one week seminar, or separately.

She explained the methodology used in preparing the modules, based on a participatory approach, and pointed out that they are conceived as a package containing: trainer's guide, text, additional reading, bibliography, audiovisual materials and evaluation questionnaires for trainees and trainers. The modules, she said, addressed two target groups: development planners and senior officers of the management of energy programmes; senior officials of women's organizations and institutions at the national, regional and international levels.

The purpose of the seminar, she explained, was to test the pilot test edition of the training package, which will subsequently be revised on the basis of comments and reactions from participants.

### IV. PRESENTATION AND DISCUSSION OF THE MODULES

Module I "An Overview of The United Nations Activities in the Field of New and Renewable Sources of Energy" was presented by the INSTRAW project co-ordinator, Ms Marina Vaccari.

In her presentation Ms Vaccari noted that one of the basic purposes of the United Nations was to promote economic and social development and that an adequate supply of energy is a prerequisite for development. This was the reason, she said, for the attention the United Nations have always paid to energy issues, and especially to the development and utilization of new and renewable sources of energy, in view of the prominent role they play in the energy supply of developing countries.

She recalled that the dramatic rise in oil prices which took place in the mid 1970's was at the basis of the decision of the United Nations to convene the 'Conference on the Development and Utilization of NRSE', which took place in Nairobi, Kenya, in 1981. The Conference approved the Nairobi Plan of Action, which called for the transition from an economy based on hydrocarbons to one in which new and renewable sources of energy played a major role. The Conference adopted the Nairobi Programme of Action (NPA)

which still represents the basic framework for the United Nations activities in NRSE. The NPA called for concerted international co-operation and identified the main areas for action to promote the development and utilization of NRSE.

In 1987, she said, the United Nations convened a high-level meeting of experts to review and assess the implementation of the NPA. The experts recognized that the pace of implementation of the NPA was slower than anticipated, mainly because as the price of oil went down, interest in the development of NRSE decreased. Other constraints were identified in difficulties in promoting dissemination and inadequate attention to cultural, social and institutional aspects of energy development, including the insufficient involvement of women in the planning and implementation of NRSE projects and programmes.

Ms Vaccari noted that there is renewed interest in NRSE because of the growing concern for the detrimental effects of deforestation and excessive combustion of hydrocarbons on the ecological balance of many regions of the world and of the entire planet.

She briefly illustrated the respective roles and activities of the United Nations organizations and bodies in the field of NRSE. She mentioned that an Intergovernmental Committee on the Development and Utilization of NRSE, and an Inter-Agency Group on NRSE were created following the Nairobi Conference. A Special Co-ordinator on NRSE was appointed in the Office of the Director-General for Development and International Economic Co-operation of the United Nations.

She pointed out that women as agents in and beneficiaries of the development and utilization of NRSE must be fully integrated in the implementation of all activities in this field, within the United Nations System. The Nairobi Programme of Action, she said, recognized the special role women play in NRSE and that every effort should be made to ensure that actions in this field involve and benefit men and women equally.

Ms Vaccari said that the United Nations, convened in 1985 in Nairobi a World Conference to Review and Appraise the Achievements of the United Nations Decade on Women, which adopted the "Forward-looking Strategies for the Advancement of Women to the Year 2000". The Strategies, she pointed out, recognized that energy is a priority area for action to promote the advancement of women, and made recommendations on specific measures to be taken.

In the discussion which followed, the representative from UNCHS brought to the attention of participants the problems connected with the exploitation of forestry resources and the need to protect the environment.

A debate followed on this important issue, particularly on the role of women as users of biomass resources. It was pointed out that women are often blamed for deforestation although this problem should be considered with multi-dimensional approach.

The representative of UNEP gave a brief overview of UNEP activities as they relate to NRSE and particularly to their application to benefit women. She pointed out that UNEP is particularly concerned with the promotion of environmentally sustainable development.

The representative of UNDP/World Bank-ESMAP said that the Energy Sector Management Assessment Programme (ESMAP)- a joint UNDP- World Bank Programme- has recently launched a new policy and action programme which will be implemented in short-term, medium-term and long-term phases. Its main objective will be to improve the integration of women in all aspects of its energy activities. This programme will be implemented with the assistance of a Women and Energy Co-ordinator who is being recruited.

The representative of UNCHS added a brief presentation on the main activities of the organization related to the utilization of NRSE in human and rural areas, particularly with regard to the problems of the use of energy and energy conservation in human settlements. He said UNCHS has issued several technical publications on the use of NRSE which include topics related to their utilization to meet women's needs.

The participant from Sudan raised the issue of co-ordination among the different United Nations bodies and organizations active in the field of NRSE.

The representative of INSTRAW reiterated that appropriate institutional measures had been taken within the United Nations System to ensure co-ordination: an Inter-Agency Working Group on NRSE was established, the Office of the Director-General for Development and International Economic Co-operation is responsible for overall co-ordination in the United Nations System in the implementation of NPA, and a Special Co-ordinator on NRSE was designated.

Module 2 "The Role of Women in the Development, Management and Utilization of NRSE" was presented by INSTRAW project co-ordinator, Ms Marina Vaccari.

Ms Vaccari pointed out the fact that in most developing countries women are the main users, suppliers and managers of energy resources. She said that this is apparent if one considers that in the developing world household energy consumption is estimated to account for 45 per cent of the total, and in addition women are the users and providers of energy required for many other tasks such as traditional agriculture and food processing.

She then examined the role of women as suppliers of NRSE and pointed out that they have a prominent role in fuelwood collection and commercialization, as well as in forestry.

Women, she said, are also the main collectors and processors of agricultural residues, and of dung, manure and other biomass resources, which represent energy sources with multiple applications, especially in the developing world.

In addition, she said, women, in the performance of their multiple roles, contributed their human labour as a source of mechanical energy. The development and dissemination of appropriate energy technology, may help alleviate the drudgery and reduce the time necessary to perform many women's tasks, leaving them time for more productive activities.

She then examined the needs of women which can be met with the utilization of NRSE, at the household level, such as cooking, lighting, heating, supplying water, food processing and for income generating activities. In this respect, she pointed out that many typical women activities such as food processing and pottery-making are energy-intensive and that the development of relevant appropriate technology may not only benefit women but contribute to energy saving at the community and national levels.

Women's needs, she noted, have been overlooked in energy planning and by energy policies. The main constraints, she said, can be identified in the lack of data and information on women's role, insufficient concern for women's needs, insufficient participation of women in the decision-making process.

Energy-consuming tasks, she pointed out, should be clearly identified by type, quantity of energy consumed, time spent and performer's gender, in order to match appropriate technology and energy sources to specific end-uses, thus obtaining the best results. Little or no attention has been paid to design or adapt energy devices to the gender of the end-users. Even technologies designed to perform household tasks often do not properly take into account women's needs and preferences and they are often developed without their participation. This has been the reason, for instance, for the failure of many improved stove projects.

The following four key issues for discussion were then brought to the attention of the participants:

- I. How can the participation of women in the development, management and utilization of NRSE be improved?
- II. What are the major constraints to the integration of women's needs in energy planning and energy policies?
- III. Identify areas where research and development on NRSE technologies can make a critical impact on women.
- IV. Identify pilot projects which may promote a better integration of women in the development, management and utilization of NRSE.

The participants then divided into three working groups. The first group consisted of french speaking participants, who chose to examine the following issue: "How can the participation of women in the development, management and utilization of NRSE be improved".

The second group discussed the issue "What are the major constraints to the integration of women's needs in energy planning and energy policies".

The third group chose to deal with the four issues.

#### REPORT OF GROUP I

"How can the participation of women in development, management and utilization of NRSE be improved?"

The participants in the group agreed that the removal of the major constraints (as set out in question 2) would contribute to improving women's participation. It was also agreed that: the introduction of NRSE must concern urban as well as rural areas; NRSE technologies must respond to five criteria if they are to be used by women: safety/adaptability (appropriate technology) simplicity/easy maintenance/affordability; and that education and information directed at women as users and managers of energy resources should be at the core of any effort to improve their participation.

The group made the following recommendations:

For the design of energy plans and elaboration of energy policies:

1. A national political recognition (both in terms of policy and investment programming) on the role(s) of women in NRSE. It is essential to improve their participation.
2. Projects that aim at addressing women's participation in NRSE must be integral to the overall energy strategy, planning and programme development and not in parallel or as an addition to on going projects.
3. Women's views must be solicited at all phases of improvements of appropriate technologies to ensure that their needs are met at affordable costs.
4. Ensure that the socio-economic and cultural aspects of the country context as they relate to women's participation are accounted for at all stages of the project and fundings be provided for such surveys.
5. Set in motion international financing mechanisms e.g. revolving funds and credit programmes for proven technologies that have been tested in pilot operations and are now ready for mass dissemination which would enhance women's participation in NRSE.

For the preparation and execution of projects:

1. Each new project should have as a part of its preparatory phase, the drafting of a document by a national constitutional group describing and analyzing women's status; their cultural, economic, technical needs and aspirations, etc. This baseline document on women should be financed by the donor agencies and should be distributed to the consultant (external/national) team at the start-up of any activity.
2. To the possible extent, encourage the recruitment of women as national project directors and chief technical advisors in every project.
3. Ensure that women's (beneficiaries) views on important decisions in project execution are communicated to project management and taken into account at all stages of the project cycle.
4. Build in measures (e.g. seminars, on the job-training) to introduce qualified women to project management techniques; supervision, monitoring and evaluation of projects.

#### REPORT OF GROUP II

"What are the major constraints to the integration of women's needs in energy planning and energy policies?"

##### Household and Community Level

1. Too many household chores and responsibilities which prevent women from having adequate time for thinking about participating in energy planning and policy making.
2. Culture inhibits women in decision making in households as women are not accepted to take decisions at home. Women are relegated to a lower status in society.
3. The majority of African women are illiterate and therefore cannot participate significantly in household decision-making, and especially in energy planning and policy making.
4. Tradition and customary laws usually discriminate against women in property ownership and inheritance. This deprives them of having a say in planning and decision-making on resources.
5. The man controls the income of the household. He owns the land, markets goods, what the wife has produced, and keeps the money, which weakens even further the position of women.



6. Weak marriage bonds allows a husband to send the wife away very easily, making woman always insecure and hesitating in taking decisions in the house.

#### Project and National level

1. The society is not encouraging women to take active part in the energy sector. This starts from childhood at home where boys are encouraged to do better at school, more than the girls. Preference is given to boys in schooling by parents. At the educational and employment levels, boys are encouraged more than the girls to take up science subjects.
2. Too many responsibilities for African women as housewives and this leads to their retiring early and not continuing in the service. Very few women reach high posts and take high responsibilities.
3. Women are physically weaker than men and generally not willing to take risks, which reduces their participation in fields such as engineering etc. Therefore they do not take up high positions.
4. Preference in promotion is given to men although women have credits equivalent to those held by men.

#### Recommendations

1. Since education plays an important role in the life of people in the world at large, great emphasis must be given especially to the rural women in Africa; so that education faces the basic problems of women such as religion, law and the system itself.
2. Priority must be given to training women according to their needs and interests and to come closer to the life of rural women.
3. Incentives must be given for the trainers to motivate rural women.
4. To ease the burden of rural women, child care centres, water supply and health centres must be seriously thought over, to facilitate the life of women and the family.
5. More involvement of women in extension work.

### Report of Group III

How can the participation of women in the development, management and utilization of NRSE be improved?

1. Examining the national policies oriented to women.
2. Utilizing the potential human resources in each country at different levels so that involvement in NRSE-oriented research and project design may be promoted.
3. Involving women at the inception of the project especially at the rural level and training them in maintaining and repairing simple machines, and also providing them with some incentives.
4. Women's organizations should take on the role of mobilizing women towards management of NRSE projects, besides serving as the focal point of the government for the elaboration of new strategies in NRSE.
5. Training for development and management in NRSE project should be well-tailored, addressing the most common problems in a particular locality. It should be done only after introducing all possibilities for its viability, feasibility and acceptability established by relevant research.
6. Only those projects which have been tested and prove to be feasible, viable and acceptable should be promoted in a given community, in terms of affordability and ability to maintain them after withdrawal of foreign or high-level technical personnel.
7. Only those projects, whose source of local and external funding is established, should be initiated, taking into consideration the fact that most of the inputs be generated locally within the community itself.
8. Improving the regular exchange of ideas and experiences on NRSE projects at regional/national/local levels.

II. What are the major constraints to the integration of women's needs in NRSE energy planning and energy policies?

1. Inadequate appraisal of factors which are crucial for the integration of women, including training/education, technical and scientific information, motivation, identification of priority types of NRSE to be established in a given locality as well as support provided to them, whether financial, technical or moral.
2. Cultural factors which hinder the acceptance of NRSE initiatives such as improved stoves and biogas digesters.



3. Women's lack of access to resources such as crop residues, animal wastes, agro-industrial wastes, etc.
4. Lack of women specialists in energy-related issues to oversee the implementation of NRSE projects.
5. Lack of support and motivation by local governments and national/international agencies for women in order to build up their self-confidence.
6. Lack of women's authority to participate in policy and decision-making in NRSE at all levels.

**III. Identify areas where research and development on NRSE technologies can make a critical impact on women.**

Research can be carried out at the country/regional/district/community levels. However the areas for research and development will depend on:

1. Identification of priority needs
2. Identification of research gaps pertaining to NRSE.
3. Availability of trained women to apply results of the research in the field.
4. Research programme in aspects of NRSE to be undertaken by the "AMCEN Network on Renewable Energy" as well as those of other energy-related research institutions.

**IV. Identify projects which may promote a better integration of women in development, management and utilization of NRSE.**

1. NRSE projects which are economically feasible, environmentally sound, socially acceptable, and do not pose any health hazards.
2. Involvement of women in NRSE projects aimed at attaining self-sufficiency in fuel and food requirements (income generating activities).

A discussion on the conclusions of the Working Groups followed.

Several participants raised the issue of the need for political will to involve women in NRSE planning and policies. It was also pointed out that the importance of education and training is crucial, in order to enhance the participation of women in planning, development and utilization of NRSE at all levels. It was also stressed that more attention should be paid to train the end-users, who in rural areas are mostly women; to train the trainers, and extension workers.

A question was raised on the possibility of receiving more information and data on NRSE including experts in the energy field.

Module 4. "Relevant NRSE Systems: Characteristics and Technologies", was presented by the Executive Director of the African Regional Centre for Solar Energy, Dr. Essam Mitwally.

He started his presentation by addressing the question of "what was the ultimate goal of holding the present seminar?" He answered it by stating that generally the use of new and renewable sources of energy (NRSE) is intended to raise the standard of living of the end-users, be it men or women.

He proposed a methodology to achieve this goal. Mr. Mitwally listed the most common technical terminologies which would be used during the presentation and classified the various types of NRSE including the recently recognized "conservation energy". Further he itemized the possible needs of women at the household and community levels and gave a partial list of women's income-generating activities. He described each NRSE technology citing the latest technological developments and the on-going trends in the world emphasizing that technologies which are manufactured in industrialized countries would need to be adapted for use under the prevailing conditions in Africa. Mr. Mitwally focussed on the training needs for operating the equipment and stressed the need for selecting appropriate technologies. He suggested to participants that the proper selection of equipment should be based only on final merit, disregarding whether the equipment was given free of charge.

He stressed the necessity of matching one or more NRSE technologies to meet the needs of the target group emphasizing the site-specific nature of NRSE. He elaborated on the socio economic impacts of utilizing these technologies and asserted that social barriers are sometimes the real reason for lack of wider acceptability in certain countries where women adhere to customs and long-inherited traditions which may not allow successful applications of NRSE-based technologies. He gave specific examples of countries and technologies where such success was limited.

Mr. Mitwally explained that the major obstacle to successful and complete diffusion of NRSE technologies is still the initial relatively high capital cost of the equipment which goes beyond the financial capabilities of the African family and suggested that applications on community scale or for a group of villages may prove to be the most appropriate at this stage. However, he stressed the need for evaluating projects taking into consideration not only economic but also social benefits, particularly those relating to improving the quality of life, e.g. providing clean drinkable water and preserving vaccines and serum. He also indicated that a wider awareness-arousing campaign is necessary particularly among decision-makers.

Further, he gave a summary of project implementation in countries such as Egypt, Sudan, Pakistan, China and Mali with an account of the experiences gained and lessons learned. He highlighted the fact that every country must have a national plan or strategy for the utilization of its indigenous NRSE. Finally, he proposed a project for utilizing solar mobile systems in rural Africa for training African women on family planning, hygiene and general health and showed the participants video presentations on projects in Egypt and Jordan.

The participants asked various questions which were satisfactorily answered.

Mr. Niyimbona Pancrace, representative of ECA, presented an elaborate overview of NRSE applications in the African Regions.

He started his presentation by pointing out that the United Nations Conference on NRSE listed 10 NRSE sources, namely: biomass, including fuelwood and charcoal, draught animal power, solar energy, wind energy, hydropower, geothermal energy, peat, oil shale and sands, energy from the seas including tidal wave and ocean thermal energy. Due to lack of human and financial resources and low technological capability, the African countries have not yet tried to develop and utilize some of the energy resources listed above such as energy from the seas, oil shale and tar sands, manufacturing photovoltaic cells or production of electricity from peat-fired thermal plants.

Mr. Pancrace said that, biomass, is the most utilized source of energy: it accounts for 70 to more than 90 per cent of the total energy consumption in sub-saharan African countries. Biomass energy resources take the form of wood fuel, crop residues, animal wastes and agro-industrial wastes. He explained that programmes to develop and utilize biomass energy resources are as follows: efficient utilization of the resource through improved stoves and kilns with higher output for the production of charcoal; valorization of crop residues through ethanol production from molasses of sugar mills and production of fuel briquettes, production of electricity with producer gas, biogas production from animal wastes and afforestation projects.

Furthermore, he pointed out that draught animal power has been used as an important source of energy since it exists in the sectors of agriculture, transport and food processing. In many sub-saharan African countries, women can be considered as providers of that form of energy and all the activities of research and development in the area of new and renewable sources of energy are aimed at alleviating the burden of women.

Mr. Pancrace, said that there are many activities in the area of research, development, and demonstration for the utilization of solar energy in most African countries. Those activities cover the utilization for the production of industrial process heat, irrigation pumping by thermal conversion or photovoltaic systems, desalination of water, heating

swimming pools, water heating, cooking meals, drying crops, etc. No African country has the facilities to produce photovoltaic cells, but PV systems are utilized for refrigeration of vaccine in rural health centers, for telecommunications, for lighting, rural communication and rural TV/Radio.

Wind energy, he pointed out, has been utilized in Northern, Western and Eastern African countries. There are many windmill installations in operation for pumping water and some countries such as Kenya or Tanzania are manufacturing locally windmill systems. Wind energy can be utilized for the desalination of water and electricity generation in countries with high potential such as Somalia, Sudan and on the West Coast of Africa.

With regard to hydropower, Mr. Pancrace said that it has been developed in many countries after the Nairobi Conference and some of the larger plants have been built on a regional co-operation basis: Nangbeto for Benin/Togo, Manatali for Mauritania/Mali/Senegal, Ruzizi II for the CEPGL countries. Hydraulic rams can help to supply water in rural areas of hilly regions and there is a firm in Kenya that manufactures such systems locally.

Geothermal energy potential is concentrated in Eastern Africa along the Rift Valley. Kenya is the most advanced African country in developing its geothermal resources, with 45 MW installed capacity and 2 x 30 MW under preparation in the OLLKABIA field. A feasibility study, partially financed by the World Bank, is underway in Djibouti for the construction of a 10 MW geothermal plant in the area of Lake Assal. In most of the other countries, geothermal energy is utilized for direct heat applications.

He pointed out that there are substantial peat resources in some African countries and surveys have been carried out in Burundi, Rwanda and Senegal. Burundi is producing 15,000 tons of dried peat annually but has an output capacity of 50,000 tons/year; the peat produced is used for replacing woodfuel and charcoal for cooking. In Rwanda, peat is used for raising steam in a small pyrethrum industry.

He concluded by pointing out that the institutional arrangements for developing and utilizing NRSE in Africa at the regional and sub-regional levels are the following: ECA, which can assist all the African countries; ARCSE with 21 Member States, CRES-Bamako with 11 Member States and EGL for the CEPGL countries.

A representative of the Secretariat of ECA Multinational Programming and Operational Centre reported on activities undertaken from 1981 to 1988 in member countries of the Economic Community of Great Lakes Countries (CEPGL) in the field of NRSE.

He said that the objectives of the Nairobi Programme of Action of the United Nations Conference on NRSE, held in Nairobi in 1981, have considered and identified areas for concerted actions which include research and development planning, evaluation, transfer and adaptation of technologies, education and training. He also said that several initiatives were undertaken.

The participant from Senegal presented an overview of the activities undertaken by CERER (Centre d'Etudes et de Recherche sur les Energies Renouvelables). He reported that research and development activities were implemented on solar fish driers, crop driers, biogas plants and improved stoves. He stressed that CERER's approach is to use local low cost materials and simple techniques.

He pointed out that the Government of Senegal has launched a national programme for the dissemination of improved stoves, and that CERER has developed different models made of scrap metal and is involved in the training of trainers to ensure large-scale dissemination. He supplemented his presentation with slides.

Other participants and observers joined in the discussion which followed.

**Module 5. Education and Training Activities in NRSE Projects, was presented by INSTRAW Social Affairs Officer, Ms Borjana Bulajich**

Ms Bulajich started her presentation by pointing out that education and training needs for NRSE cannot be considered independently from other needs, but must be approached in an inter-sectoral and inter-disciplinary approach. She explained INSTRAW's training programmes and innovative multi-media modular training methodologies. Education and training have to be seen as one element in an integrated programme for NRSE development and use. The energy-related training must be carefully planned in order to ensure that trainers, both women and men, are actually able to use their newly-acquired skills within the energy sector. The objective for training programmes must be the productive employment and engagement of the trainees and not simply the completion of another training course.

She stressed that the participation of women in the field of energy could be greatly increased through education, training and participation in NRSE projects. One of the most critically important factors affecting women's status is inadequate or non-existent education and training.

Furthermore, she elaborated on general guidelines and activities for training women in NRSE. She underlined that special efforts need to be made to:

1. identify women's needs and potential to train them accordingly, particularly in technical and managerial skills regarding project development, operation and maintenance;

2. encourage women's participation in post-graduate studies and training as engineers, scientific research workers and energy planners.

She pointed out that assessment and planning of training should be carried out in view of needs assessment which would include women's needs, and presented various training methodologies and approaches such as: training in situ; training of trainers; modular approach; learned-centred methods; mass media; traditional women's role as trainers; and training of extension workers. She presented an example of a training programme which could be used for different target groups, various training needs and different subject-matters, and adapted to different regions.

The representative of INSTRAW concluded by emphasizing the importance of monitoring and evaluation of training programmes and training methodologies. She underlined that different evaluation methodologies have been established for different forms of evaluation, but each methodology has two distinct phases: the evaluation of the training process, and the evaluation of results on the impact of training on the acceptance level, and of the efficiency and effectiveness of the NRSE projects and programmes.

Several questions were asked, especially on the methodology for evaluation of training projects and programmes. The participants divided into two working groups: english-speaking group and french-speaking group. The following issues were discussed:

I. Which constraints prevent participation of women in training and education programmes for NRSE projects and programmes?

II. What do you suggest to overcome the constraints women are facing to participate in regular education programmes; various training seminars on energy?

III. What elements would you include in designing a training programme for energy projects aimed for women in rural areas?

### Report of English-speaking Group

#### (1) Constraints

##### Rural level.

- (a) Time constraint - women have a heavy burden of work on the household level. They consequently have less time for other activities.
- (b) Lack of information - awareness of the technologies
- (c) Socio-cultural factors - including linguistic problems
- (d) Lack of incentives - lack of motivation



- (e) Malnutrition and poor health conditions
- (f) Logistic problems such as transport.
- (2) Suggestions to overcome constraints
  - (a) Provision of incentives
  - (b) Provision of childcare facilities
  - (c) Holding seminars and training -conducted by women- within the localities.
  - (d) Providing relevant educational programmes to overcome cultural barriers.
- (3) Constraints
  - Higher level.
  - (a) Less participation of women in the field of science and technology.
  - (b) Women get less chance of attending high level education.
- (4) Suggestions to overcome the constraints
  - (a) Giving priority to women in the training so that they could participate in the planning and decision making activities, i.e., positive discrimination in the form of specific study grants, scholarships.

### Report of French-speaking Group

#### I) Constraints

1. Women do not have time to attend the training programmes because they have too many responsibilities at home.
2. The weight of socio-cultural constraints caused by the mentality of women and men and the lack of low degree of instruction.
3. The institutional framework is not well defined and this is reflected by:
  - a poor co-ordination of different training programmes
  - an inadequate training programme resulting in the lack of interest of women.

4. Lack of information, poor communications or circulations leading to misinterpretation of available informations.

5. Lack of motivation, as women's priority is to improve their family's well-being by increasing their income rather than participating in training programmes.

## II. Recommendations concerning the overcoming of constraints

1. In view of ameliorating the training activities, the programmes should be well adapted to the needs of women.
2. To enable women to attend training programmes, they have to be partially relieved from their domestic tasks by either a better distribution of the housework among all members of the family or by raising their socio-economic status.
3. To motivate women's interest in attending training programmes:
  - a) financial assistance for acquiring adequate equipment for training.
  - b) facilities for access to the training programme, e.g. per diem, or providing funds for the trips.
  - c) decentralization of training programmes.
4. Literacy aspects have to be introduced as a core of each training programme.

## III. Recommendations concerning new and renewable energy

1. Emphasize technologies that contribute in alleviating the heavy burden of women's work.
2. To promote exchanges on proven technologies, whether by documentation exchange or "study trips".
3. Carrying out case studies aimed at target groups with exchange of experiences at regional and international levels, e.g. case study of the energy waste.
4. Critical evaluation of training programmes in NRSE, enabling a better and regular adaptation.

In the discussion that followed, several participants pointed out that, in order to involve more women in training and education programmes, it will be necessary to change the cultural attitudes of men so that they share in family work.



Some participants expressed the opinion that this change in attitude can be achieved through the introduction of new technologies. Others pointed out that the introduction of a new technology may sometimes have a negative impact on women, since they may be displaced from their work.

In addition, it was pointed out that there are cases in which a new technology is introduced in order to benefit women and it turns out that it is used by men for other purposes. An example was mentioned of donkey carts introduced in rural areas to alleviate women's work in carrying wood for household needs, which were used by men to take the wood to urban areas to sell it.

It was pointed out by some participants that in order to overcome these difficulties there is a need to encourage the setting up of women's groups, and to have training programmes specifically designed to meet their needs, organized locally, in the local language, taking into account socio-cultural constraints.

It was also pointed out by participants that the attitude of men towards women's participation in training education courses and in access to technologies can be changed, if it is made apparent that women's participation is for the betterment of the family and community at large.

The need to have more women at a high level of policy making was stressed as one of the pre-requisites for the successful implementation of development programmes and projects, particularly aimed at women.

Module 3. NRSE Projects and Programmes: Design and Implementation  
was presented by ILO-TURIN representative, Mr. Franco Campagna.

Mr. Campagna illustrated the project cycle in all its stages, from identification to project formulation, implementation, monitoring and evaluation. He presented the project cycle within a framework which emphasized the application of gender analysis in project design.

He pointed out that the weaknesses in project formulation may lead to reduced benefits for women and their contribution in the development process. He further noted that gender roles in project formulation focus on how the benefits of development are shared between men and women and how the role and responsibilities in the development process are shared between genders.

Mr. Campagna pointed out that project design in all sectors should include the 4 steps of gender analysis, namely:

Step 1. Activity Analysis

Assess the interaction between men's and women's activities within the project context: What do they do?

a) Production of goods and services

b) Reproduction and maintenance of human resources

Failure to consider the interface of the project with these most important activities, carried out by women, in addition to their contribution in the production of goods and services, can lead to faulty project design and subsequent difficulties in project implementation.

Step 2 ACCESS AND CONTROL ANALYSIS

Input resources are required to undertake project activities which will in turn produce outputs or benefits.

This step analyses gender access and control of human resources and other resources for the project. It also assesses gender control over project activities and over the outputs and benefits generated by the project.

Step 3 ANALYSIS OF FACTORS INFLUENCING ACTIVITIES, ACCESS, CONTROL

These factors may focus on:

- economic conditions of women and men
- institutional structures (women's access to training, management)
- demographic and cultural conditions
- legal and political parameters

Step 4 DESIGN OF PROJECT TAKING INTO CONSIDERATION THE FOREGOING RESULTS OF THE ANALYSIS

The presentation was supported by the use of audiovisual aids, and provoked a lively discussion amongst participants. The presentation was followed by a case study, which consisted in assessing the situation of a rural village where the community decided to undertake a project to improve the water supply, in order to increase production and improve living conditions.

The participants were divided by gender into groups. This method aimed to highlight the differences in the approaches of men and women in expressing their needs within a project context.

The tasks assigned to the working group were as follows:

- 1) to select the most urgent need which the project should satisfy;

- 2) to justify their choice of the most urgent need;
- 3) to select the most convenient technology for satisfying the priority need;
- 4) to identify what are the required inputs, activities and their outputs;
- 5) to identify who controls activities;
- 6) to identify who controls resources (inputs) and decision power;
- 7) to identify who controls the outputs (benefits).

The reports of the working groups were as follows:

#### MEN'S GROUP

1. Irrigation for crop
2. (a) Improving crop yield  
(b) 1. Increase our income (direct)  
2. Improve the standard of living (indirect)  
(c) 1. Young women and children (direct)  
2. Men: children educated by women saving time
3. Wind Energy Pumping
  - Technically feasible, reliable and efficient
  - It is economical in capital cost and almost without running cost.  
It implies saving in foreign currency
  - Credit from "Credit bank" or donor
4. A.1. Procurement of equipment: men/credit for the village  
A.2. Installation and training: men/external  
A.3. Preparation of the land: men/women and men  
A.4. Operation and maintenance: men/men
5. A.1. Men  
A.2. External  
A.3. Men  
A.4. Men
6. Men (benefits: women)
7. Men (more than 50%)/Women (direct)  
National economy (indirect)

## WOMEN'S GROUP

1. Water supply for the household
2. Justification

### Productive family activities:

Saving of energy and time: saving time for collecting water enables women to participate in activities which could increase their income like trade, handicraft etc.

Appropriate technology can be used.

Water would be used for gardening, given to animals, for house constructions, etc.

### Reproduction and family maintenance activities

If there is sufficient water, women's activities are easier: cleaning children, washing, drinking, cooking and cleaning the house for health reasons.

### Direct benefits

The whole family will enjoy direct benefits such as: saving time, saving energy, improving health.

### Indirect benefits

Appropriate technologies can be used, not only by the family, but also by the village for community projects.

Women can save time for their self-development: for training, increasing their income doing handicrafts or by having social interaction.

By improving women's conditions of work the entire family's well-being will improve and this is a contribution to the national development.

3. Select the most convenient technology.

Solar or wind technology for pumping water Comment and question: The problem here is the cost. Why don't governments accept to invest for a durable and sure solution for a basic and priority need such as water?

4. What are the activities required?

- A: Feasibility study
- B: Appraisal
- C: Implementation
- D: First evaluation

- E. Training for operation and maintenance
- F. Operation
- G. Final Evaluation
- H. Maintenance

5. Who controls activities?

- A: Technical expert in collaboration with women
- B: Expert
- C: Engineers and women
- D: Expert and women
- E: Trainers
- F: Trained people
- G: Expert, women
- H: Trained team, women

6. Who controls resources (inputs) decision power?

- A: Expert, women
- B: Women, expert
- C:
- D:
- E: Women
- F: Women
- G: Women
- H: Women

7. Who controls the outputs?

- A: Women
- B: Women
- C: Women
- D: Women
- E: Women
- F: Women
- G: Women
- H: Women

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## ANNEX III

### PROGRAMME OF WORK

1. Opening of the Seminar
2. Adoption of the Programme of Work and Election of Rapporteur
3. Module I: "An Overview of the UN Activities in the Field of New and Renewable Source of Energy".
4. Module II: "The Role of Women in the Development, Management and Utilization of NRSE"
5. Module IV: "Relevant NRSE Systems: Characteristics and Technologies".
6. Module V: "Education and Training Activities in NRSE Projects and Programmes".
7. Module III: "NRSE Projects and Programmes: Design and Implementation".
8. Adoption of the report
9. Closing of the Seminar.

# **INSTRAW**



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