

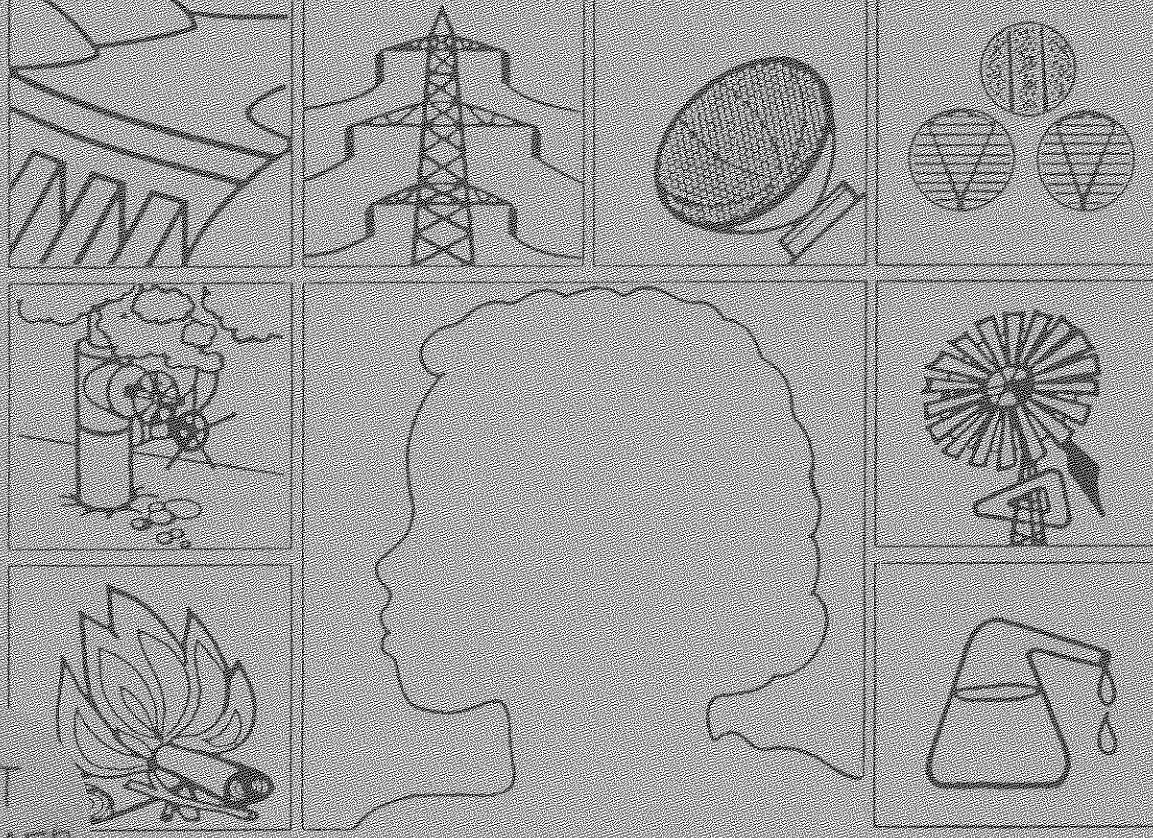
INSTRAW



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

REGIONAL TRAINING WORKSHOP ON "WOMEN AND RENEWABLE ENERGY SOURCES"

Tripoli, Libya
1-8 December 1990



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Regional Training Workshop on
"Women and Renewable Energy Sources"

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Organized by

The International Energy Foundation,
African Regional Centre for Solar Energy and
the United Nations International Research and
Training Institute for the Advancement of Women
INSTRAW

in co-operation with

United Nations Development Programme

INTRODUCTION

The regional training workshop on 'Women and Renewable Energy Sources' was held in Tripoli, the Great Socialist People's Libyan Arab Jamahiriya, from 1 to 8 December, 1990 at the General People's Committee for Scientific Research.

The seminar was organized by the International Energy Foundation (IEF), African Regional Centre for Solar Energy (ARCSE), the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW) in co-operation with the United Nations Development Programme (UNDP).

The seminar was attended by more than 100 participants from Ministries, universities, public institutions, women's organization and representatives from the United Nations organization (See Annex I).

The aim of the workshop was to apply a multi-media training package on "Women and New and Renewable Sources of Energy" for Arabic African countries. The training package was jointly prepared by INSTRAW and ILO/TURIN Centre which was translated into Arabic by the International Energy Foundation.

I. ORGANIZATION OF THE WORKSHOP

A. Opening Addresses

The opening statement was made by Dr. Awni Shaker Al Any, the United Nations Resident Co-ordinator of the United Nations activities and the UNDP Resident Representative in Tripoli.

He pointed out that the various United Nations organizations and specialized agencies and bodies have pursued the policy of supporting and sponsoring women in development issues for the purpose of assisting them to play an effective role at all stages of developmental activities. This was done with the conviction that there is no development without women's contribution. Since energy is one of the main factors for development and societal progress, it was important and indeed a duty to study the position of women in their relation with energy as producers on the one hand and consumers on the other. This would be done, he explained, for the purpose of strengthening such position and supporting it for improving productivity through rational use of energy and reducing production cost. In this context he attached great importance to this workshop and wished it all success. He offered his thanks to all those who had contributed to convening and organizing the workshop wishing them all success. He concluded, by confirming that it was worth noting that this workshop is being convened in a country which is recognized for having given equal rights to women.

Dr. Muntasser, President of International Energy Foundation, started his presentation by stating that energy has a great importance in human life and the activities performed daily. For example, he said energy has enabled people to: shorten distances between world continents, discover sea and space mysteries and devote facilities (potentials) of nature to serve them. Only through the use of energy can life and motion exist.

He pointed out that as a result of the merits achieved from using various energy sources, individual and group efforts were directed towards developing energy sources and technologies in a way that enables the continuation of the existing merits and benefits. The United Nations, governmental and non-governmental institutions have emerged to focus their efforts on various energy sources; through strategies, programmes, projects, scientific forums for the sake of securing energy supply and use in all sectors.

Among these efforts, Dr. Muntasser said that the International Energy Foundation (IEF) has emerged to work within all energy aspects, jointly with international experts. It came as a result of Energex 88 held in Tripoli in 1988 which recommended the creation of a body to: look after different energy affairs, follow-up and support efforts of scientists and scientific research and to act as a bridge for transferring new efforts and findings in energy between concerned people, regardless of national boundaries. Libya has adopted and carried that recommendation, and the People's Committee issued a decree in February 1989 to host the IEF, and declared in a Press Conference on the 25th of March 1989, its birthday.

Mr. Muntasser said that the IEF has started Programmes for many scientific activities such as: assisting scientific research through constructing a data bank which will be involved in the exchange of scientific views and new findings in energy between concerned bodies; conducting studies and data collection on energy sources. The scientific committees and work groups were constituted to carry out the above functions. In the framework of developing energy technologies, the IEF is holding conferences, seminars and expositions and is organizing the Mediterranean Offshore Conference in February 1992 and Scientific Seminars on Energy and Pollution and Renewable Energy, Energy and Sweet Water to be held during 1991.

Dr. Muntasser pointed out that another area of IEF's programmes is oriented towards training and improving the skills of those who deal with energy and energy technologies. The present regional training workshop on "Women and Renewable Energy Sources" is one of the IEF's activities. He said that the training seminar is of great significance as it deal with renewable energy sources and the role of women. It will focus on applications of different energy sources from household level to industrial level. He stated that the role of women is important as they are the main users of energy at the household level and are actively involved in the various industrial sectors.

Dr. Muntasser pointed out that this seminar was prepared in co-operation with the Regional African Center for Solar Energy, the United Nations International Research and Training Institute for the Advancement of Women, the United Nations Development Programme in Tripoli, General Union for Women Societies and the Solar Energy Research Centre in Libya.

Dr. Muntasser said that, on this occasion it gave him pleasure to present his thanks and respects to all individuals and institutions that have contributed in bringing this programme into existence, especially the preparing Committee headed by Dr. Mohamed Fathi Bara and his assistants from the Scientific Research Secretariate, General Union for Women Societies, Solar Energy Studies Center, and the IEF Staff. Thanks were also directed to Dr. Essam Mitwally, Executive Director of the African Centre for Solar Energy, who shared with him the process of organizing this training workshop; Dr. Awni Shakir, United Nations Programmes Co-ordinator; Dr. Mohamed Dori, Executive Director of United Nations Organization Socio-Economic Training and Qualifying Center, Mrs. Dina Fairnashik, ex-President for UNCTRO.

He concluded his statement by expressing a hope for fruitful discussion and action orientated recommendations from the participants and wished to all guests a happy stay in Libya.

The representative of INSTRAW, Ms Borjana Bulajich, welcomed all the participants and expressed INSTRAW's gratitude to the organizers of the training seminar: International Energy Foundation; UNDP in Tripoli; African Regional Centre for Solar Energy; the Centre on Solar Energy Studies in Tripoli and the Government of the Great Socialist People's Libyan Arab Jamahiriya. She said that within the scope of the present training seminar, INSTRAW-ILO/TURIN Centre multi-media training package on "Women and New and Renewable Sources of Energy" will be presented, which was produced with the financial support of the Government of Italy and translated into Arabic by the International Energy Foundation.

Ms Bulajich said that the major aim of the training seminar and the modules is to contribute to a new approach in the organization and management of NRSE systems through the integration of women's needs, as well as their participation in planning, technical operations and maintenance, assessment and implementation of NRSE programmes and projects.

She pointed out that one of the major initiatives of the United Nations system in the field of energy began in August 1981, with the United Nations Conference on New and Renewable Sources of Energy in Nairobi, Kenya and the Nairobi Plan of Action was adopted for the development and utilization of NRSE. In 1990, she stressed, INSTRAW was given the mandate by the Inter Agency Action Committee on Co-ordination (UN/ACC) to be the lead agency for "Women, New and Renewable Sources of Energy" within the United Nations System and she explained INSTRAW's activities in this field.

Ms Bulajich said that the development of energy sources for agriculture, household, industry and transportation has become a major area of concern in all countries today. Like all development problems, the issue of energy is multidimensional and lies not only within the socio-economic field but also in others, including the technical, scientific, as well as the environmental sphere. Moreover, all these areas are interconnected, a problem that exists in one will very often influence the situation in the others. Therefore, she stressed, the question was how to develop a new approach to energy planning and policy formation - an approach which takes into account the external environmental and social costs of energy, and which considers the full energy system from fuel source to end-users and at the same time enhances economic and human resource development, particularly that of women.

In developing countries, she said, women have a small share in the modern production and distribution of energy. Notwithstanding the basic fact that women are the main users and producers of energy in most developing countries, their needs have been overlooked in energy planning and by energy policies. Therefore, Ms Bulajich said there is need for training of experts in this field in order to contribute to more effective energy programmes and the elaboration of policies consistent with women's needs.

Ms Bulajich concluded by stating that she is looking forward to a fruitful exchange of experience which should result in action orientated recommendations on how to promote the involvement of women in the planning and implementation of project in NRSE and in the development of technologies in this area. She reiterated sincere thanks on behalf of INSTRAW to all present at the training seminar.

In his statement, Dr. Essam Mitwally, the Executive Director of the African Regional Centre for Solar Energy, drew the attention of the audience to the fact that this workshop must not be viewed as an end in itself but rather the beginning of a fruitful activity leading to rendering a balance between what is right for women to be involved in and what is right for men to stay out of. He added, that in no way should this workshop be viewed as a competition between men and women nor was it an attempt by women to preempt men. The way he saw it was different, and it could be simply put in general, as two-fold: reducing the waste and improving the quality of life. Reducing the waste, he explained would be in energy resources, in human resource training, in time and in the final product or end-use. Improving the quality of life, he added was by resorting to cleaner energy by reducing the production of gases which are harmful to the health and to the environment. He mentioned that the gases produced from the use of fossil fuels, be it oil, coal or gas, tend to raise the temperature of the atmosphere, a problem which is now referred to as "Global Warming". This phenomenon, he elaborated, will cause the masses of ice at the North and South poles to melt raising the sea level by as much as one meter within the next 25 years. This one meter, was reported, may cause complete submerging of entire coastal areas. In Bangladesh, it was estimated that this would cause a loss of 65% of its arable land which is currently inhabited by 80% of its people.

He expressed his thanks, on behalf of the African Regional Centre for Solar Energy, firstly, to the United Nations International Training and Research Institute for the Advancement of Women (INSTRAW) for responding to their request by supplying the training material in the form of five modules and audio-visuals and for sharing this event with them. Secondly to the United Nations Development Programme in Tripoli, for co-sponsoring the Workshop. Thirdly, to the International Energy Foundation (IEF), for accepting to host, translate the Modules into Arabic and to share this responsibility with them. And finally, to the Secretariat of The General People's Committee for Scientific Research and to the Centre for Solar Energy Studies for offering their excellent premises as the venue for the Workshop. The participation of the Municipality of Tripoli as indicated by the presence of His Excellency, Eng. Faisal Al Ogab, he added, testified to the importance the Municipality attached to this event. He expressed his delight to see the involvement of the Libyan General Union of Women's Associations from the outset of the preparation for the Workshop. Their efforts, he added, combined with those of the women staff members of the Centre for Solar Energy Studies under the framework established by IEF had given an impulse and certainly a flavour that could not be missed to the efforts given by the other sponsors. He offered a warning that it was women "who would be responsible from then on to carry the banner for and the burden of the involvement of women with renewable energy in Libya". He concluded his statement by thanking also the speakers from the various UN Agencies and to the participants by saying that the Workshop was in their hands and they alone could make the difference between success and otherwise.

B. Adoption of the Programme of Work

The programme of work of the workshop was then adopted by the participants (See Annex II).

C. Adoption of the Report

After the presentation of all modules and working group discussions, the report of the workshop, including all recommendations made at the workshop were adopted by consensus. The report was presented by Ms Françoise Wega, the representative of the United Nations Economic Commission for Africa (UN/ECA).

D. Closing of the Workshop

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

Dr. Essam Mitwally, on behalf of African Regional Centre for Solar Energy, thanked the International Energy Foundation for having organized the seminar; INSTRAW for providing training modules and substantive inputs made by the representative during the workshop; UNDP for co-operation given

during the seminar and the General People's Committee for Scientific Research and the Centre for Solar Energy Studies for providing the conference facilities. He said that the workshop represented a concrete effort in promoting the development and utilization of renewable energy sources and emphasizing the crucial role of women. He also thanked the resource persons and participants for their valuable contributions made during the seminar. He concluded by stating that he looked forward to the implementation of the recommendations of the seminar.

Mr. Ercan Murat, on behalf of UNDP, expressed the thanks to the organizers of the training seminar, resource persons and participants for their active role in the workshop and for sharing their valuable experience in the field of women and renewable energy sources. He stressed the priority that UNDP has given to women and development issues and pointed out that this seminar represents one of the activities in this direction.

Ms Borjana Bulajich, on behalf of INSTRAW, expressed her heartfelt gratitude to the Government of the Great Socialist People's Libyan Arab Jamahiriya for hosting the training seminar; she thanked the International Energy Foundation, African Regional Centre for Solar Energy and UNDP for organizing the seminar jointly with INSTRAW. She also thanked the General People's Committee for Scientific Research and to the Centre for Solar Energy Studies for providing conference services as well as the Municipality of Tripoli for its kind hospitality and to the Libyan General Union of Women's Associations for their active participation. She expressed gratitude to the resource people for their presentations, the secretaries, interpreters and support staff for their invaluable technical assistance.

Ms Bulajich expressed the hope that participants would consider conducting national seminars using the modules. She stressed INSTRAW's interest in following up on the results of the regional training seminar and ensuring a multiplier effect.

Finally, Dr. Muntasser, on behalf of IEF thanked all the co-organizers of the seminar, resource persons, participants and support staff for making this seminar a successful one. He pointed out that this seminar should be just a beginning for promoting and utilizing renewable energy sources and emphasizing the important role women have in this crucial area of development. He concluded by stating that adopted recommendations should be put into action immediately.

II. PRESENTATION OF THE UNITED NATIONS ACTIVITIES

Ms Borjana Bulajich representative of the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW), explained the United Nations activities in the field of New and Renewable Sources of Energy. She said that one of the major initiatives of the United Nations System began in August 1981 with the United Nations Conference on New and Renewable Sources of Energy (UNCNRSE) convened in Nairobi, Kenya. The Nairobi Programme of Action (NPA) was adopted for the development and utilization of New and Renewable Sources of Energy.

The Nairobi Programme of Action (NPA), which represents a basic framework for action in this area, states that while each country has primary responsibility for promoting the development and utilization of its domestic new and renewable sources of energy, international co-operation is indispensable to assist and support national efforts. It was agreed that the implementation of the Nairobi Programme of Action was to be carried out in a decentralized manner and that it required the participation of all concerned. With respect to concerted international action, the Programme defined the following areas:

- a) Energy assessment and planning;
- b) Research, development and demonstration;
- c) Transfer, adaption and application of mature technologies;
- d) Information flow (and public information);
- e) Education and training.

The organizations and bodies of the United Nations System were called upon to contribute to the implementation of the Programme within their respective areas of activity .

Within the United Nations System, she said, an Intergovernmental Committee on the Development and Utilization of New and Renewable Sources of Energy was formed. The responsibilities of the Committee are to promote international co-operation, short and long-term strategies, to review the work of the United Nations system with respect to energy and to mobilise financial resources.

Ms Bulajich explained that the office of the Director-General for Development and International Economic Co-operation (DIEC) is responsible for overall co-ordination in the United Nations System in the implementation of the NPA and a Special Co-ordinator has been designated. To promote co-ordination within the United Nations system the Special Co-ordinator convenes meetings of the Inter-agency Working Group on NRSE, attended by representatives of relevant entities within the United Nations system, including the regional commissions and regional institutes. Projects are submitted to the Interagency Working Group, which exists within the framework of the Administrative Committee on Co-ordination (ACC).

Ms Bulajich then explained the activities of various United Nations bodies, specialized agencies and regional commissions involved in NRSE projects and programmes.

She furthermore explained that INSTRAW is an autonomous institution within the framework of the United Nations, to serve as a vehicle at the international level with the purpose of undertaking research and establishing training programmes to contribute to the integration of women in development, and the collection and dissemination of information for the advancement of women. In support of the global work of the United Nations to meet with those requirements, INSTRAW has developed innovative training materials and modules; unique approaches to research analysis and data

collection; and methodological breakthroughs for the measurement of women's economic contribution to development. Its mode of operation is based on networking and co-operative arrangements with organizations both within and outside the United Nations system, governmental, non-governmental, and academic institutions involved in issues related to women and development. The Institute has a Board of Trustees elected by the Economic and Social Council. In order to have a greater outreach of its work, INSTRAW has focal points at the national level.

Ms Bulajich stated that INSTRAW assists in ensuring that United Nations Agencies consider the impact their energy programmes and policy statements have on the status of women by improving the data base which the agencies may use and documents projects in which an effort has been made realistically to assess the position of women in the target community. INSTRAW provides as well an important service by collecting existing information on how to involve women more effectively in NRSE projects, programmes and policies, analyses it and makes it available to all interested parties. This information is used as material in modular training programmes.

There are several areas in which INSTRAW plays a major role to assist in the implementation of the NPA:

1. INSTRAW collects, analyses and disseminates information worldwide concerning women and energy to be used by United Nations specialized agencies, bilateral assistance agencies, governments and non-governmental organizations.
2. INSTRAW helps to identify areas where research and training can make a critical difference in the field of women and energy as well as provide a link between experts and sources of funding in order to facilitate such research and training.
3. INSTRAW provides, upon request, assistance to United Nations specialized agencies and organizations, bilateral assistance agencies, governments and non-governmental organizations in integrating issues of relevance to women into energy policies, programmes and projects. This can be done through consultations, dissemination of information, seminars and workshops.

Ms Bulajich explained the various activities INSTRAW has undertaken in this area, such as: production of multi-media training package on "Women, New and Renewable Sources of Energy"; organizing and conducting training seminars at national, regional and international levels similar to the present one; establishing an international network of contacts to promote the TCDC concept and the incorporation of women into activities to implement the Nairobi Programme of Action; preparing articles for periodicals and public information materials.

Ms Bulajich also explained the objectives and activities of UN/DTCD in the field of renewable energy.

The representative of the United Nations Economic Commission for Africa/African Training and Research Centre for Women (UNECA/ATRCW), Ms Francoise Wege, extended best wishes to the participants on behalf of the UN Under-Secretary-General and the Executive Secretary of UNECA, Professor Adebayo Adedeji.

She gave an overview of the difficult economic conditions of African countries as reported by ECA, FAO and the World Bank. In the light of this crisis situation, she stressed the need to mobilize all indigenous resources for the revitalizing and transformation of these economies. She emphasized the importance of stimulating developmental research and scientific and technological innovations for long-lasting solutions to the situation in accordance with the African Alternative Framework for Structural Adjustment Programmes.

Ms Wege further stated that the ECA focal point on women issues is ATRCW, whose primary objectives are to assist member states in improving the socio-economic conditions of African women and enhancing women's contribution to development.

Talking about the role of ATRCW, the ECA representative pointed out that ATRCW's activities were mainly to carry out overall and sectoral analysis of emerging socio-economic trends with the view to limiting any negative impact on women; to monitor changes in the life of women to ensure that women's needs and interests are addressed adequately, and are reflected in major strategies and policies adopted in the region and also to ensure circulation of information on issues of interest to African women.

Ms Wege elaborated on ATRCW's programme of appropriate technology which started in the late 70's with the purpose of enhancing women's production and productivity, particularly in the field of agriculture and food production. The action in this field, she said, concentrated on three areas:

- (i) promotion and strategies in favour of women. In this regard she indicated that the recommendations of the Arusha Strategies for the Advancement of Women, as adopted in 1984 in Arusha, Tanzania, were very specific on the issue of energy while the Abuja declaration adopted in 1989 in Abuja, Nigeria had set specific targets for women in technological fields. These two documents were major references for global strategies, regional and national plans of action as far as African women are concerned.
- (ii) development and implementation of action orientated programmes: a number of projects has been implemented with emphasis being put on the participations of women at all stages of development and life of the projects. New projects included promotion of women in technical and scientific fields - roster of African Women experts was also set up as an important tool for technical co-operation among developing countries and participants were invited to be included in the roster.

(iii) monitoring and follow-up was another key element as there is often a gap between what is intended and what actually happens. ATRCW encourages the use of participatory methods for programme monitoring and evaluation.

The ECA Representative finally explained that experience has shown that:

1. there is a need to synchronise efforts of researchers and promoters of technology for a greater impact;
2. lessons learnt should be communicated to the end-users of the technologies, particularly women at grassroot level through training and/or information sessions at local level;
3. technology projects/programmes should have a credit component or scheme which would permit to acquire the technologies;
4. technology projects should be designed on a large scale community level so that their costs on individual basis are minimized;
5. there is also need to develop indicators which could be used to measure economic and social benefits and the impact of technologies on women;
6. sub-regional and regional workshops are very important in building self-confidence as they offer opportunities to learn from the efforts made by each other and how some constraints can be overcome.

She concluded by saying that the issue of women in technology in general and particularly in renewable energy should be looked at in three dimensions: the economic, socio-cultural and technical aspects. The technology programmes for African women must always take into account the questions of sustainability, possibilities of local maintenance, the cost that women can afford and the socio-cultural acceptability.

Dr. Essam Mitwally, Executive Director of the African Regional Centre for Solar Energy gave a background on the creation of the Centre by saying that it was established by decision of African Heads of State in Lagos in 1980. It was only in January 1989, he added, that the Centre started its operation due to the long time that it took for the member states to select its Headquarters in Bujumbura, Republic of Burundi. He then explained the reason for creating the Centre in order to assist member states to diversify their sources of energy with maximum reliance on renewable sources of energy.

Dr. Mitwally explained that the Centre's policy and programming is reviewed regularly by an Executive Board chaired by the Executive Secretary of the United Nations Economic Commission for Africa. This Board then reports to the Council of Ministers of Energy of member states.

Considering the short time that the Centre had been in existence, it has managed to be recognized in different parts of the World. It has two types of memberships; a regular one limited only for member state governments, and the other, an affiliate membership which is open for any government, institution or group of individuals.

He described in short the current work programme of the Centre covering the biennium 1990/91 which responds to requests by member states, on one hand, and implementing projects of common interest to most of its member states as proposed by the Centre, on the other hand. Most of these projects emphasize the end-use rather than the source of energy. Such projects vary from training, like this workshop, and training for African women on general hygiene, family planning, and combating AIDS to using solar and/or wind energy resources in desalination and banana peelings for producing biogas. He gave a list of the services that the Centre could offer to its member states and explained that the Centre has the mandate to engage into consulting assignment and income generating activities.

Dr. Mitwally then talked about the funding of the Centre's activities by explaining that the Centre's budget is normally provided through assessed contributions by member states. He added, however, that these contributions were not forthcoming bringing the Centre's activities to a halt. He offered some remedial action on the part of the African member states and regional organizations as well as on the part of the international community. He then made an appeal to all those who can help to extend their helping hands to the Centre because it was created to help the needy Africans who are suffering on all levels.

III. PRESENTATION AND DISCUSSION OF THE MODULES AND OTHER ISSUES

"Women's Need in Africa and their Link with Renewable Sources of Energy", was presented by Dr. Essam Mitwally, Executive Director of the African Regional Centre for Solar Energy

Dr. Mitwally started his presentation by recounting that despite early efforts by the various United Nations agencies in dealing with NRSE, it appeared that something was missing when it came to applying the technologies, particularly in cases where women should have been involved.

Careful study of these efforts in retrospect, he added, as well as their recommended course of action revealed that, among other things, the involvement of women was minimum, if any. Therefore, it was accepted that the chances for the future success of these efforts might be enhanced if women were involved at all levels starting from policy making, energy planning and management, technology selection and designing training programmes.

He gave some examples for the failure and/or success of previous attempts to implement NRSE projects. He recalled, for instance, that solar cooking could not be used in countries where women are accustomed to cook

in the evening while photovoltaic powered pumping systems were acceptable due to their ease of operation as opposed to pumping systems using solar thermal conversion. He recalled the experience in Egypt where relatively expensive vaccine refrigerators were employed in areas infested with scorpions and vicious snakes and where strategic mining operations were underway. In such cases, the social benefits together with avoiding any loss of production outweighed the initial costs of the systems. He also told of the unacceptability of using biogas for cooking in countries where the cooked food lacked an aroma germane to using animal dung cake for cooking. While human waste was an accepted feed stock to the biogas digesters in China, this would be objectionable in other countries on religious grounds. He cited the example of the unsuccessful application of wind pumpers in Egypt in the sixties to settle the nomadic bedouins in the Western Sahara who move around seeking water points. These wind pumpers were not designed properly and continued lifting water as long as wind was blowing. This resulted in overpumping which rendered some of the well waters turning brackish once the top layers of trapped rain waters were already lifted. Moreover, there were no facilities for maintenance and repairs and these systems required above-average operating skills.

On other social points, he recalled that during a previous similar seminar, a participant from East Africa selected wind as her preferred source of energy despite the fact that abundant animal dung was available for producing biogas in a simpler way and with less cost. He gave the reason that for her to use the family cow dung required the approval of her husband as compared to harnessing the wind power which was free for all to use.

He therefore emphasized careful selection of any NRSE technology before implementation. The selection should be made, he noted, after a study was made of where it was destined to be used, meaning during the day or the night and what value of end product was expected. He indicated that studies of the needs of the end-users was important prior to technology selection. He enumerated such needs in the household, in the field for smaller communities as well as the needs for establishing small-scale income generating activities and cottage industries. Mr. Mitwally raised the question on what would be the source of the selected technology, would it be imported? Would it need adaptation to local conditions, who would be paying for the technology, would it be the State, the private sector or part of a bilateral or multilateral assistance programme?

He gave a short overview of the available technologies and their combinations and pointed out that more detailed presentations would be given during the workshop on each specific technology. He told the participants that he expected some recommendations emanating from their deliberations which would help to answer the above questions.

"Wind Energy Conversion Systems" was presented by Dr. Mohamed A. Muntasser, President International Energy Foundation"

Dr. Muntasser started his presentation by explaining the theory of wind formation due to unbalanced heating of the earth and the atmosphere in

contact with its surface. He explained the principle of wind energy conversion and how this energy is trapped by wind turbine. He gave an overview of the wind technology and drew the attention of the audience to the necessity for the proper selection of the site where the wind machines may be installed due to the fact that power generated would be proportional due to the curb of the wind speed and the square of the rotor diameter. Dr. Muntasser explained the various types of wind turbines as far as configuration and sizes is concerned and elaborated on the different applications like pumping, desalination, heating, cooling and power generation. He differentiated between stand alone and grid-connected systems and indicated that wind farms represent the recent trend in wind energy conversion. Furthermore, he explained the techno-economic aspects of wind energy applications and pointed out that there is a limitation on the size of such applications due to the constraints on the height of the tower and the area of the site. He concluded by stating that wind systems could be part of an integral scheme utilizing solar system and diesel generators in hybrid mode.

"Biogas Production and Applications" was presented by Dr. Bechir Ben Rajab, Assistant Professor Department of Petroleum, Nasser University

Dr. Ben Rajab started his presentation by stating that biogas was one of the recognized sources of renewable energy as per the classification of the UNCNRSE which was held in Nairobi in 1981. He elaborated on its formation through the biodegradation of the complex organic compounds in a digester by two kinds of bacteria living in anaerobic environment and that the main components produced are methane and carbon dioxide. He explained that the feedstock to the digester could be one or a combination of the following:

- crops and agricultural wastes
- cereals husks and straw
- animal and poultry wastes (cattle manure, etc.)
- human waste
- municipal waste

He further stated that digesters were classified according to size, method of storage, construction material and type of feeding the digester (continuous or batch types). The outlet gas could be used for a variety of applications like lighting, heating, cooking, refrigeration and power generation. The solid liquid by-product mixture which is left in the digester, he added, is a potent fertilizer which could be stored or dried for final use for agricultural purposes.

He concluded by saying that biogas could represent a very important source of energy, especially in rural regions which cannot be linked to the general electric but enough feedstock would be necessary to sustain a continuous operation.

"Education and Training in NRSE Projects and Programmes", was presented by Ms Borjana Bulajich, INSTRAW representative

Ms Bulajich started her presentation by explaining the position of women within the context of national energy systems; the present problems they face and the possible solutions. She said that one of the most important lessons learnt in the energy sector is the need for an inter-sectoral and inter-disciplinary approach to energy issues. Education and training needs for new and renewable sources of energy cannot be considered independently from other needs since the most valuable asset and natural resources of any nation is its people.

She stressed that energy-related training must be carefully planned in order to ensure that trainees, both men and women, are actually able to use their newly acquired skills within the energy sector. Therefore, the objective for training programmes must be the productive employment and engagement of the trainees and not simply the completion of another training course.

Ms Bulajich explained that the participation of women in the field of energy could be greatly increased through education, training and participation in NRSE projects. Furthermore, she said that the analysis of human resources and training needs in the energy sector is a complex undertaking since it involves not only the supply of trained human resources for a given utility, but also an analysis of an overall energy and development plan, as well as, an analysis of the national sources from which training may be available.

She pointed out that in preparing training programmes/seminars, training needs should determine whether or not to undertake training action. Without an assessment of needs, training can become detached from real needs with the consequence that the training programme will not achieve the desired objective. Decision on the adoption of a training programme and the type of scheme to be employed should be through cost-benefit and cost-effectiveness techniques.

She explained INSTRAW-ILO/TURIN Centre innovative multi-media modular training methodology which had been developed to meet the needs of developing countries. The training methodology is based on flexible participatory approach and is suitable for any target group and various subject matters. She stressed that INSTRAW produced training packages on "Women, Water Supply and Sanitation" and "Women, New and Renewable Sources of Energy" which have been successfully applied in a number of developing countries. The basic aim of the modules is to be used by national experts who can further adapt the modules for community needs in a self-reliant manner. She also pointed out that the modules consist of training text, user's guide, trainer's guide, checklists for group-work, additional reading, bibliography and are supplemented with audio-visual aids such as sound-slide packages, transparencies, flip-charts, video's etc.

Ms Bulajich elaborated on training analysis and each step of a training programme. She pointed out that special efforts need to be made to identify women's needs and potentials to train them accordingly in technical and management skills regarding project development, operation and maintenance. The training methodologies should be applicable to the situation in each country taking into account socio-economic, cultural, religious and technical aspects.

Furthermore, she explained that motivation and education on NRSE should be made through schools and other programmes prior to, or along with the installation of new technologies. Whether formal or informal education, programmes and training seminars should reach both men and women to heighten community awareness of energy needs and related social development issues.

She concluded, by pointing out that serious efforts are required to prepare and disseminate training materials/programmes that are linguistically and culturally suitable and which, from the standpoint of content, are tailored to the needs of the country and its population.

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

In his opening presentation Mr. Campagna stressed the need to improve access of population to new and renewable energy sources who need to raise their living conditions. This may require special development efforts and projects. However, any success of development programmes and projects depends mainly on the quality of their design and implementation.

The objective of this presentation he said was to provide the participants with guidance for improving their skills in the formulation and implementation of NRSE projects with due consideration on gender issues.

Mr. Campagna presented the fundamental concepts of project formulation which begins with the analysis of development problems from the macro to the micro level. The analysis of causes and effects of problems can be illustrated graphically in the form of a network diagram resulting in a "problem tree". By inverting the negative statements contained in the "problem tree" into positive statements, the network diagram can be converted into an "objective tree".

Depending on the size and complexity of the "objective tree" the network may appear as a large development programme which can be divided into a number of inter-related sectorial development projects. The implementation of each project may be considered in taking into account priorities and the availability of internal and external development resources. This example also served to illustrate the conceptual difference between development programmes and projects and introduced the participants to the programme approach in development planning.

Following the above needs assessment methodology, Mr. Campagna explained the project cycle and its components:

- project identification
- project formulation and appraisal
- project implementation and monitoring
- project evaluation and impact assessment.

It was highlighted that the success of a project depends on the quality of each single component of the cycle. For example, there are cases where projects were well formulated and well implemented but based on an inconsistent need assessment. These projects did not contribute to development and some were even harmful.

Participants were introduced to the core elements of project formulation starting from the definition of development objective to immediate objectives, outputs, activities and ending with the assessment of required resources (inputs). The vertical progression of project execution was also explained starting from how input resources are translated into outputs by means of a programmed set of project activities. As well, how the required outputs lead to the achievement of the immediate project objectives during the project and how these contribute towards the accomplishment of the broader development objective in the longer term were also pointed out.

Particular emphasis was given in making a clear distinction between the definition of target beneficiaries and direct recipients of an institutional building project.

Finally, Mr. Campagna introduced the concept of gender analysis applied to target beneficiaries and personnel involved in project activities. Project formulation should include a gender analysis of activities performed and the time allocated for such activities by the target groups. For this purpose it is necessary to differentiate between productive activities and activities related to the reproduction and maintenance of human resources mainly, but not exclusively carried out by women.

The importance of access and control by women beneficiaries over benefits from the project was highlighted. Participants were also encouraged to analyse women's access and control over resources required for undertaking project activities.

Mr. Campagna concluded the presentation by raising participants awareness in identifying specific factors at the project design stage which could influence favourably productive and reproductive activities of women and their access and control over resources and benefits of the project.

"New and Renewable Sources of Energy in Angola" was presented by Miss Luzia Antonio Filipe de Conceicao, Department of New and Renewable Sources of Energy Ministry of Petroleum and Energy, Angola

Miss Conceicao gave a brief description of the history of establishing the present Department of New and Renewable Sources of Energy (DNRSE) which followed the recommendations of the UNCNRSE held in Nairobi in 1981. She elaborated on its current activities in solar, wind and biomass energy.

She said that DNRSE is responsible for co-ordinating and promoting research and development on new and renewable energy sources and integrating them into the national energy economy. The principal activities of DNRSE are:

- to supply drinking water for domestic and agricultural use
- to provide energy to meet the needs for lighting, health care and food production
- to assist with land resettlement
- to replace the forest cover
- to provide training, in particular for mid-level technicians working on the installation and maintenance of renewable energy systems.

The objectives of DNRSE are:

- to extend and improve the network of sites in Angola where parameters of interest are studied especially where there is a plan to implement energy projects;
- to install monitoring equipment on these sites that is modern, easy to use, needs little maintenance, can be operated by just anybody (data loggers) and has already proven effective and in line with the needs.

She explained that the main users of solar energy are the people in rural areas where conventional energy supplies are not available yet or where it is unlikely for this type of energy to be available in the short or medium term. These rural areas are the most remote areas, where there is a need of water supply for irrigation, sanitation and livestock; refrigeration for storage of medicine and vaccine, and lighting and energy for audio-visual education.

The main users of wind technology, she added, are the rural inhabitants of the 5th region in the South where there are many existing wind pumps in place ever since colonial times.

The DNRSE has, she added, also carried out applied research by installing and rehabilitating the existing wind pumps in Angola and this has enabled us to test their performance and see how well they fit into the economic and social context.

On biomass energy use, she said, there was not much data available on fuelwood in Angola. Official statistics reflect only licensed cutting of wood and drastically underestimates its use. There is almost no data from rural areas and only anecdotal and spotty field data from urban areas.

In urban areas, she noted, charcoal was the main household fuel while some households use liquified petroleum gas (LPG) and Kerosene. An estimated 6 - 7 million tons of wood were used in Angola in 1986-87. Over half of all the wood burned for fuel was converted to charcoal before final use. Fuelwood is generally collected by users from farms or any open land and not from dense forest unless there is severe scarcity. Normally people collect fuelwood that is within easy reach.

The DNRSE, she elaborated, is currently carrying out in this area the following projects:

1. Improved wood and charcoal stoves, the objectives of which are to
 - survey the different types and cooking utensils
 - determine the thermal efficiency of each type of stove used
 - study how to improve the thermal efficiency of the most popular wood and charcoal stoves using local resources as much as possible
 - investigate mass production of selected stove prototypes either industrially or with the informal sector.
2. Improved carbonization techniques and re-afforestation.
3. Luanda wood fuel project. The objectives are to:
 - establish a wood fuel plantation in Luanda Province
 - increase food and fodder production for Luanda through agro-forestry
 - improve people's standards of living especially women's by creating new jobs
 - minimize ongoing environmental degradation around Luanda city, mainly soil erosion due to loss of vegetation cover.

On the social aspects of life, the Centre, through it's own internal efforts has been able to organize a kindergarten supervised by a sociologist of the DNRSE which caters for the children of personnel stationed at the Centre as well as those of the surrounding villages. Women at both the Centre and these villages have been organized into handicraft groups, their products are sold to generate income to assist their programmes. In fact, the surrounding villages are heavily dependent on the Centre for both water supply and health care. The Centre has a small health clinic manned by a nurse.

The Department, she added, is working closely with the Angola Women's Organization, and is one of the most important non-governmental organizations.

"Renewable Energy for Water Pumping" was presented by Eng. Bernard McNelis, representative of IT Power, U.K.

Mr. McNelis started his presentation by reporting that everyday many millions of women spend a lot of time and energy collecting and carrying water. This represents valuable time and expensive human energy which would be used on income-generating activities.

He pointed out that over the past 15 years solar pumps have been developed, and interest in windpumps has revived. In his presentation Mr. McNelis made extensive reference to the global project to field test and demonstrate small solar water pump, which was launched by the UNDP and the World Bank in 1978. In the first stages of the project there was a lot of interest in solar-thermodynamic (heat engine) systems, but these failed to operate reliably, and have been largely abandoned in favour of a solar-photovoltaic systems. He said that photovoltaic modules convert sunlight directly into electricity by a solid-state process and the electricity provided drives a more-or-less conventional electric motor/pump. Early photovoltaic pumps were very expensive and some were not technically reliable, but today there are well proven products available from the leading manufactures. He pointed out that the UNDP/World Bank installed pumps in Egypt, Sudan, Mali and Philippines. There are about 10,000 photovoltaic pumps installed in the World.

Mr. McNelis explained that the price of a solar pump today is about \$10/Wp. added to that a typical system rated at 1kw, will cost around \$10,000. This will deliver for example 30 cu.m of water per day, through a total head of 20m. which is sufficient for a village of around 1000 people. The cost of water delivered is about the same as using a diesel pump, but reliability is higher. Solar pumps which include purification of polluted water were also described, using a case study from Indonesia.

Mr. McNelis also described windpumps, in particular a modern, light-weight design which is now in commercial production in Kenya, Nigeria, Zimbabwe and Pakistan. If the design-month average windspeed is more than 3.5 m/s, then windpumps will usually be cheaper than solar pumps. Also mentioned were water powered and biogas powered pumps.

Mr. McNelis concluded by pointing out that it is most important that water requirements are assessed first, and then the best energy source selected to power the pump.

Participants visited Al Zawia projects where they saw practical implementation of solar and wind energies (courtesy Eng. Abdel Wahab Nassrat); greenhouses and electronics factory, and paid a visit to Al-Nasser Gardens which was organized by the Municipality of Tripoli.

Working Group Sessions

The participants divided into two working groups. Group I dealt with the issue of how to include women in the solar energy projects. Group II dealt with the issue of how to include women in the wind energy projects. The assignment contained a set of questions to guide participants in the analysis of energy requirements and problems of populations living in remote areas and in formulating recommendations for the promotion of NRSE to meet their energy demand. After lively discussion the two groups reached the following conclusions. Both groups answered the following questions:

1. What is the energy requirement of people living in very remote areas?
 - for productive purposes/
 - for households.
2. If this population lives in very remote areas not connected to the national electricity grid what problems do the people face concerning their energy requirement specified above?
3. How do these problems affect the life of women, men, children and elderly people?
4. Compared with other solutions, how could new and renewable energy sources help to solve these problems.
5. What recommendations could be put forward to make the solution of the above problems a reality?
6. What strategies and practical measures would you suggest as a follow-up to this workshop to sustain these measures and to promote:
 - a) the creation of the demand of solar and wind energy technologies
 - b) local manufacturing and marketing of solar wind energy appliances to meet this demand.

Report of Group I

The participants pointed out that in certain villages in the remote areas people have access to electricity. However, they stated that electricity is an expensive energy source and as an alternative women use charcoal which is health hazardous, and caused a few incidents of suffocation. The participants explained that solar energy could be an alternative source as in their countries they have sun during the whole year.

On the first question participants explained that solar energy for productive purposes/activities in remote areas could be used for

desalination; generating electricity; drying crops; food production; green-houses; agriculture; industrial purposes; pumping purposes and chicken brouder houses. For the household activities they said that solar energy could be used for heating the house; water heating; cooking; cleaning; drying clothes; communication purposes; ventilation and other related activities.

On the second question the participants pointed out that with the lack of electricity in remote areas people would face the following problems: lack of water supply and adequate sanitation, which would increase water related diseases; lack of communication means; difficulties in raising children; maintaining household; lighting for educational purposes and security.

On the third question "how do these problems affect the life of the family", the participants replied that there would be no washing; no cleaning; no cooking; which would put extra burden on women and affect work; affect work in agriculture; unavailability of water pumping. In relation to man, he would have to spend more time in agricultural activities or other income-generating activities which would affect the economic aspect of the family and his free time in the household. In certain cases men would have to migrate to city and women would to take all responsibilities. It would also influence the social problems of society; industry, production and health related problems.

On question four "how could NRSE help to solve the problems", the participants agreed that it would ensure storing of energy; desalination of water; improve the household activities; enable water pumping; heating; increase production; and improve agricultural productivity. Furthermore, they stated that renewable energy could be used for generating power in schools; for audio visual materials and TV; for operating household utensils and greenhouses operation; for space heating and cooling; ensuring cleaner environment and safety for the users.

Questions 5 and 6, addressed "what recommendations could be put forward to make the solution of the above problems a reality and what strategies and practical measures would be suggested as a follow-up". The participants recommended that:

1. Architectural specifications for buildings should be revised to include passive solar designs.
2. Further training is needed at all levels for women and creating awareness for use and applications of new and renewable energy sources.
3. Training of policy makers, particularly those involved in NRSE related matters, in order to make use of them.
4. To develop curricula for educational purposes at all school levels.

5. To develop training programmes on operation and maintenance of NRSE technologies where appropriate.
6. To carry out field studies in remote areas emphasizing the social impact of using NRSE.
7. To select a village to be made a model for using NRSE in order to achieve self-sufficiency, food and energy.
8. To encourage youth clubs to include NRSE activities in their programmes.
9. To create awareness among women in order to rationalise the use of conventional energy sources.
10. To foster exchange of study tours to the countries where NRSE has been successfully applied.
11. To encourage the specialized United Nations agencies and international organizations to supply training materials, as was done in this case by ARCSE and INSTRAW, to continue the training process.
12. To encourage the producers of electricity and/or conventional fields of energy in funding NRSE projects.
13. To encourage establishing incentives for the use of NRSE and disincentives for the use of competing technologies.
14. To encourage linking science and technology for NRSE applications.
15. To encourage local manufacturers to produce NRSE related technologies, particularly through the private sector.
16. To encourage funding of NRSE activities through the revolving funds and special agencies which could be funded by the state.
17. To organize a training seminar on "Energy Conservation and Management".
18. To organize training seminars on "Water Supply and Sanitation" similar to the present one.
19. To organize a national follow-up Committee comprised of entrusted Ministries, General Union of Women's Associations and with advisory assistance from present organizers and other invited entities.
20. To organize national and local training seminars using INSTRAW's training material for further training in the use of NRSE and 'Water Supply and Sanitation' in Libya.

Report of Group II

Question 1. What are the energy requirements of people living in very remote areas?

Energy requirements for production activities:

Electrical energy should provide the power for lighting the workplace and for operation of power tools and small equipment.

Heat energy is required for drying fibres for example and for forging, welding etc.

Mechanical energy is required for soil tillage in agriculture, water pumping and irrigation, milling of grain or maize and for transportation of goods and persons.

Energy requirements for households:

Electrical energy should provide the power for light, for operating a radio, television set, a telephone and for a refrigerator, if available.

Heat energy is required for cooking, warm water supply and for heating premises if necessary.

Mechanical energy is required for water pumping and for transportation.

Question 2. If the population lives in very remote areas not connected to the national electricity grid, what problems do the people face concerning their energy requirements specified above?

Question 3. How do these problems affect the life of women, men, children and elderly people?

Problem concerning production activities: Affected Target Population:

The lack of <u>electrical energy</u> for lighting....	Men and Women:
the workplace limits working hours to day	less working hours,
time. If other light sources are used	less income; insufficient
such as oil and kerosene lamp, the quality	light may harm eyesight
of light might not be appropriate to	and cause accidents
certain workplaces.	at work.

Electrical power tools and equipment cannot....	Men and women are less
be used to improve production and to save	productive resulting in
time.	less income. Manual
	operations increase
	fatigue/stress.

Production processes requiring heat energy might not be affected by the absence of electrical power if other sources of energy are available such as fuelwood or petroleum based fuel.

Some agricultural production processes such.... as soil tillage, irrigation, harvesting, threshing and milling cannot be improved through mechanisation if appropriate mechanical energy is not available

Men (sometimes also animals) are mainly affected by manual heavy agricultural labour, fatigue, low productivity resulting in lower income.

Problems affecting households:

Affected Target Population

Absence of adequate light/may limit household and social activities, the study of schoolchildren in dark hours.

Men, women, children, elderly people.

Communication through media such as radio,..... TV and telephone may be seriously limited.

Mainly adult family members lack of information necessary for their development and may not be able to communicate adequately with others.

Cooking, heating of water and premises.... might not be affected by lack of electrical energy if other sources of energy are available.

Mainly women and children may be affected, if obliged in time-consuming fuel wood collection.

Ecological problems may arise.....

Whole community and animals

Lack of adequate energy may affect household water supply which may require handpumping and/or carrying heavy water jars over long distance.

Mainly women, often also children bear extreme physical burdens resulting sometime in health problems.

Question 4: Compared with other solutions, how could NRSE help to overcome the problems stated above?

The group discussed the possibility of using wind energy. It appeared however that the use of wind energy for production activities would require large wind generators while for domestic use, small individual low cost units for each household would be adequate. Large wind generators are expensive and therefore before deciding such an investment an opportunity study should be made concerning the development/expansion of the production capacity of enterprises in the region and the power requirement.

The appropriateness of wind energy technology should be weighted against alternative technologies such as diesel generators, mini-hydro generators or expansion of the electricity grid to the area.

Question 5: What recommendations could be put forward to make the solution of the above problem a reality?

The question how and who should take the initiative for action was discussed and the group suggested that the concerned community representatives in the local government should raise the issue.

Local government initiatives should lead universities to undertake required feasibility studies described earlier in co-operation with industries and communities who should benefit from the NRSE technology.

Women as major energy users must be involved in the feasibility studies.

The study should aim at developing a model village equipped with a balanced mix of NRSE technologies which could serve as a living and productive example.

Question 6: What strategies and practical measures would you suggest as a follow up of this workshop to promote and sustain:

A) The demand of solar and wind technologies?

The group unanimously felt that there is an urgent need to sensitize people at policy level as well as at the community level through information campaigns. Participants of the workshop should take initiatives to spread information using all possible means such as:

- organization of informal and formal information meetings;
- training the teachers in this subject;
- introducing the subject into the school curricula so that children can inform their parents;
- training the trainers of rural education programmes and introducing the subject in these programmes;
- promoting information campaign in the press, radio and TV;
- promoting exhibitions of NRSE technology;
- demonstrating pilot installations to teachers, scholars, press and media operators, politicians, industrial entrepreneurs, etc.

B) Promote local manufacturing and marketing of solar and wind energy appliances.

Entrepreneurs may launch themselves into the production of such appliances and to take the commercial risk only if there is a demand and a market for it. It may be necessary to establish incentives for entrepreneurs who want to produce such appliances. Incentives could

consist in creating favourable loan and credit schemes for manufacturers wanting to invest in the production of NRSE appliances. Other incentives could consist in providing Libyan entrepreneurs with:

- free training and technical guidance by universities or research institutions which have conducted feasibility studies and produced pilot plants.
- advice for co-operation with foreign manufacturers;
- information on NRSE exhibitions, products, new developments, market studies etc.
- import facilities for importing and marketing NRSE appliances.

Another strategy could be to promote the production of NRSE appliances by a public enterprise and marketing it at a subsidized price.

ANNEX I

LIST OF PARTICIPANTS

Ms Assia Al-Sadeg Abel-Al
University Staff
(21) 609394
P.O. Box 252
Tripoli, Libya

Mr. Mohammed Mouftah Abu-Aisha
Correspondant
Jamahiriya News Agency
(21) 30100
Tripoli, Libya

Ms Lutfia Abdallah Ahmed Abuazoum
Aviation Engineer
Tripoli Airport
Libya

Ms. Zuhur Mohammed Adam
Union Women of Eritrean
Tel. 227367
P.O. Box 2914
Damascus
Syria

Ms Sania Mohamed Ahssan
Civial Aviation
(21) 43228
Tripoli, Libya

Mr. Faisal Ali-Agab
Employee
Secretariat of Vocational Training
(021) 904855
Tripoli, Lybia

Ms Fawzia Ramadan Al-Ahmar
Assistant Researcher
Oil Research Centre
(21) 833011 - 13
Tripoli, Libya

Ms Mabrouka Ali-Al-Jilani
Employee
Libyan Women Association Sebha
tel 26085
Sebha
Libya

Ms Wedad Juma Al-Aradi
University Staff
Faculty of Language
P.O. Box 2519
Tripoli, Libya

Ms Fatma Al-Banouni
Teacher
Libyan Women Association Ijdabia
P.O. Box 20777
Ijdabia
Libya

Ms Moufidah Al-Essawi
Student
Faculty of Agriculture
(21) 608640
Tripoli, Libya

Ms Khaoulah Ussef Al-Ezabi
University Staff
Faculty of Agriculture
Al-Fateh University
Tripoli, Libya

Ms Fatma Omran Al-Fituri
Nurse
Libyan Women Association in Mousrata
Mousrata
Libya

Ms Khadija Moussa Al-Gadaffi
Agriculture Engineer
Secretariat of Agriculture
(21) 39141/9
Tripoli, Libya

Ms Amal Mohamed Al-Gadi
Agriculture Engineer
Urban Planning Office
(21) 40530
Tripoli, Libya

Ms Fatma Mansour Al-Gannae
Chief of University Staff
Faculty of Engineer
University of Al-Fateh
(021) 38926
Tripoli, Libya

Mr. Sabri Ottman Gashout
Student
P.O. Box 9247
Tripoli, Libya

Mr. Al-Hadi Al-Gashoutt
Geophysicist
Secretariat of Research Centre
(21) 607005
Tripoli, Libya

Ms Moufida Mohammed Al-Gerbi
Employee
Libya Insurance Company
(21) 30047
Tripoli, Libya

Ms Fatma Mustafa Al-Goubtane
Agriculture Engineer
Agriculture Research Centre
(21) 603865
P.O. Box 2055
Tripoli, Libya

Ms Maha Ahmed Al-Gouneim
Librarian
(21) 46181
Tripoli, Libya

Ms Mariam Al-Hadad
Nurse
Jadouh Hospital
(44) 2054
Tripoli, Libya

Ms Fouzia Essa Masoud Al-Hadad
Employee
Derna Clothes Factory
Tripoli, Libya

Ms Salamah Al-Hadad
Teacher
Al-Jabel Al-Garbi
(044) 2054
Tripoli, Libya

Ms Embarka Ibrahim Mohammed Al-Halow
Teacher
Houn High School
(57) 2059
Tripoli, Libya

Ms Hamidah Al-Hamaly
Employee
National Oil Corporation
(21) 37158
Tripoli, Libya

Ms Hawa Hussine Al-Hassi
Employee
Al-Marje
Libya

Ms Zahra Abdel-Khader Al-Harati
Teacher Supervisor
Municipality Congress
Benghazi
Libya

Ms Mariam Mohammed Al-Khadeh
Civil Aviation
(21) 43228
Tripoli, Libya

Ms Zayneb Khalifa Al-Kmeshi
Teacher
(21) 606474
P.O. Box 1936
Tripoli, Libya

Ms Tajdida Musbah Al-Jalab
Teacher
Al-Karamah School
Mousratah
Libya

Ms Al-Zadmah Oun Al-Journi
Employee
International Islamic Association
(21) 45458 - 45011
Tripoli, Libya

Ms Samar Al-Kalass
Researcher
National Committee of Scientific Research
(21) 35731
Tripoli, Libya

Ms Aziza Bel Hassan Ali
Employee
Libyan Women Association Al-Marj
Tel 22823
Al-Marj
Libya

Ms Salmah Ahmed Mohammed Ali
Nurse
Libyan Women Association in Kofra
Libya

Mr. Salah Ahmed Al-Majdaly
Translator
(21) 691068
Tripoli, Libya

Mr. Khaled Al-Zaroug Al-Mazawigi
Speaker
Jamahiriya Radio and TV
(21) 603191
Tripoli, Libya

Ms Ibtissam Milad Al-Mouslati
Agriculture Engineer
Secretariat of Agriculture
(21) 39141
Tripoli, Libya

Ms Zahra Faraj Al-Mousrati
Employee
Libyan Women Association Tripoli
(21) 45200
Tripoli, Libya

Ms Ayeisha Mohammed Al-Moutmati
Teacher
Bab Ben Gashir
(021) 45200
Libya

Ms Salima Ahmed Al-Natouh
Engineer
Nuclear Research Centre
Tripoli, Libya

Ms Nabilah Mustafa Al-Ostah
Electronic Engineer
General Company of Computers
(21) 44544
Tripoli, Libya

Ms Suad Al-Ostta
P.O. Box 3968
(21) 37234
Tripoli, Libya

Ms Amal Saleh Al-Ragayeg
Social worker
Urban Planning Office
(21) 40530
Tripoli, Libya

Ms Kamilah Mohammed Al-Sabri
Under Secretary
People's Committee of Zawia Municipality
(023)21006/7
Tripoli, Libya

Ms Najwa Mohammed Al-Sartawi
Teacher
(21) 40405
P.O. Box 10892
• Tripoli, Libya

Ms Najia Mohammed Al-Sayed
University Staff
Faculty of Engineer
(21) 48986
P.O. Box 2256
Tripoli, Libya

Ms Aml Mohammed Al-Shahawi
Student
Faculty of Agriculture
Tripoli, Libya

Ms Rabia Ahmed Al-Shakshouki
Teacher
(21) 35773
Tripoli, Libya

Ms Mariam Al-Sharkassi
Libyan Jihad Centre
(21) 33996/608681
P.O. Box 2557
Tripoli, Libya

Ms Najat Mohammed Al-Sharif
Agriculture Engineer
Al-Fateh University (Faculty of Agriculture)
(21) 605129
P.O. Box 3152
Tripoli, Libya

Mr. Ahmed Mohammed Al-Sowei Al-Shatter
Jamahiriya News Agency
Al-Elam Al-Thawri
(21) 46101
Tripoli, Libya

Ms Mouhibah Abdel Rahman Al-Shelly
Social Specialist
(21) 75038
P.O. Box 1997
Tripoli, Libya

Ms Mariam Abdellah Al-Shilly
Under-Secretary
Secretariat of Light Industry
(21) 45428/36644
Tripoli, Libya

Ms. Suad Abdelah Al-Shilly
First Secretary
Secretariat of People's Committee for Foreign
Liaison and International Co-operation
(21) 34069 - 34061
Tripoli, Libya

Ms Boutaina Abdel-Latif Al-Wefaty
Accountant
National Oil Corporation
(21) 46181
Tripoli, Libya

Ms Mounira Ali Al-Zayani
Employee
Nuclear Research Centre
Tripoli, Libya

Ms Fozia Mousa Al-Zwai
Secretary
Libyan Women Association in Kofra
Kofra, Libya

Ms Mabrouka Moussa Al-Zwai
Nurse
Libyan Women Association in Kofra
Kofra, Libya

Ms Fawzia Amar Attia
University Staff
(21) 832585
P.O. Box 3685
Tripoli, Libya

Ms Nadia Otman Bakush
Assistant Researcher
Oil Research Centre
Tripoli, Libya

Ms Eftayem Al-Sadeq Bel-Ashher
Chemist
Industrial Research Centre
(21) 691512/8
Tripoli, Libya

Ms Aziza Bourwei
Teacher
Libyan Women Association Benghazi
(061) 23431
Benghazi
Libya

Ms Jamilah Al-Boukari Bushaa
Agriculture Engineer
Agriculture Research Centre
(21) 802083
Sidi Al-Masri
Libya

Ms. Luzia De Couceicai
Ministry of Energy and Petroleum
Department of New and Renewable Source of Energy
Telex 3300 MINPET AN
Tel. 390385/7
Angola

Ms Maglia Fadel Embarek
Employee
Libyan Women Association Al-Marj
Tel 22823
Al-Marj
Libya

Mrs. Nadhira Errais
Tunisian Company for Electricity and Gaz
341311
Tunis, Tunis

Ms Fawzia Farass
Housewife
Tripoli, Libya

Mr. Fawzi Bashir Faress
Assistant Photographer
(21) 602149
Tripoli, Libya

Mr. Naceur Hammami
Chief, Biogas Production and Applications
Energy Control Agency
P.O. Box 213
Tunis, Tunis

Mr. Marklouf Ramadan Idriss
(21) 607002-8
P.O. Box 397
Tripoli, Libya

Ms Afaf Nouri Al-Sadeg Ben Ismail
University Staff
Faculty of Agriculture
(21) 42516
P.O. Box 4775
Tripoli, Libya

Ms Ayesha Salem Jaballah
Libyan Women Association Sirt
(51) 22566
Mousrata
Libya

Mr. Housame Edin Jabriel
Speaker
Jamahiriya News Agency
(21) 602465
Tripoli, Libya

Ms Touraya Mohammed Saad Jabriel
Employee
National Oil Company
(21) 623096
Tripoli, Libya

Ms Najia Mohammed Jahour
Economist
Urban Planning Office
(21) 4053
Tripoli, Libya

Ms Aisha Abu Kateer
Electronic Engineer
General Company of Computers
(21) 44544
Tripoli, Libya

Mr. Shaban Al-Sadeq Khalfouni
Journalist Photographer
Jamahiriya Radio and TV
(21) 602149
Tripoli, Libya

Ms Fatma Faraj Bu-Khatalah
Librian
Tarek Ben Zaid School
Benghazi
Libya

Ms Leila Abu-Kithir
Engineer
General Electricity Company
(21) 45866
Tripoli, Libya

Ms Suad Kouseibatt
University Staff
Al-Goutss University
(51) 20347
Misrata
Libya

Ms Mahboubah Mahmoud Layass
University Staff
(21) 74703
P.O. Box 13106
Tripoli, Libya

Mr. Ibrahim Riyad Mansour
University Staff
Faculty of Engineer
Al-Fateh University
Tripoli, Libya

Mrs. Nachida Kasbadi Merzouk
Researcher
Development Centre for Renewable Energy
B.P. 62 Bouzareah
Alger, Algeria

Ms Sharazad Salem El-Moghrabi
Economist
Zweitina Oil Company
(21) 40956 - 38011/8
Tripoli, Libyan

Ms Fowzia Ahmed Mohammed
Nurse
Libyan Women Association Al-Kofra
tel 2596
Al-Kofra
Libya

Ms Moufida Khaled Mustafa
Employee
Secretariat of Education
(21) 41215
Tripoli, Libya

Ms Fathia Ben-Nasser
Assistant Researcher
National Committee for Culture, Education
and Scientific
(21) 41572
Tripoli, Libya

Mr. Abdel Wahab Hussen Nasrat
Engineer
(023) 22792
P.O. Box 8380
Tripoli, Libya

Ms. Magdalene K. Ngaiza
Senior Lecturer
University of Dar-Es-Salaam
Institute of Development Studies
P.O. Box 35169
Dar-Es-Salaam
Tanzania

Ms Mabrouka Mohammed Al-Obeidi
Pharmacists
Chest Disease Hospital
(061) 23441
Benghazi
Libya

Ms Ftetmah Al-arifi Osman
Teacher
(21) 37315
P.O. Box 6024
Tripoli, Libya

Mr. Bashir Ben-Rajab
Professor
Al-Nasser University
P.O. Box 13270
Tripoli, Libya

Ms Hnye Hassan Ben Ramadan
Engineer
P.O. Box 4755
Tripoli

Ms Mabsouta Yunes Saad
Chief of Department Women's Training
Municipality of Al-Jabel Al-Akdhar
Al-Jabel Al-Akdar
Libya

Ms Syham Salam Saber
Employee
Electrical Construction Company
P.O. Box 5309 Tripoli
Libya

Ms Mounira Mohammed Abdel-Salam
Chemical Engineer
Oil Research Centre
(21) 833011
Tripoli, Libya

Ms Suad Bashir Saleh
Member
General Committee for Information
(21) 40405
Tripoli, Libya

Ms Zinoubah Abu Baker Shaban
Research
(21) 48566
P.O. Box 4926,
Tripoli, Libya

Ms Galia Abu Baker Ben Shabban
University Staff
Fateh University
(21) 604183
P.O. Box 4926
Tripoli, Libya

Mr. Ahmed Mohammed Shambash
Director of National Standards Centre
Secretariat of Planning
(21) 46937
Tripoli, Libya

Ms Amal Ali Soukni
Electronic Engineer
Electronic General Company
(21) 30600
Tripoli, Libya

Mr. Aby Grarah Rajab Swaissi
Translator
Al-Fateh University
(21) 605441
Tripoli, Libya

Ms Fatma Yussef Waffa
University Staff
(21) 622571
Tripoli, Libya

Ms Wasila Yahya
Employee
National Oil Corporation
(21) 46181
Tripoli, Libya

Mr. Ali Mohmound Zaan
Researcher
Scientific Research Centre
Tripoli, Libya

ORGANIZERS

International Energy Foundation

Mr. Mohamed Muntasser
President
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Dr. Mohamed Fathi Bara
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Mr. Abdel Nasser Shkehi
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Mr. Adel Juma Muntasser
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Mr. Saleh Sahboun
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Mr. Mohammed Abu Al-Hassan
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Ms. Entisar Al-Assfar
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Ms. Mouna Shabana
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

Ms. Jane Saggars
P.O. Box 83617
Tripoli, Libyan Arab Jamahiriya

African Regional Centre for Solar Energy

Dr. Essam Mitwally
Executive Director
P.O. Box 1950
Bujumbura, Burundi

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

Ms Borjana Bulajich
Social Affairs Officer
P.O. Box 21797
Cesar Nicolás Penson No. 102-A
Santo Domingo, Dominican Republic

United Nations Development Programme

Dr. Awni Shaker Al-Ani
Resident Co-ordinator of
UN Activities and UNDP Resident Representative
P.O. Box 358
Tripoli, Libya

Mr. Ercan Murat
Deputy Resident Representative
P.O. Box 358
Tripoli, Libya

Miss Amal El-Moghrabi
Programme Assistant and
WID Focal Point
P.O. Box 358
Tripoli, Libya

United Nations
International Labour Organization-International
Centre for Advanced Technical and Vocational
Training-Turin

Mr. Francesco Campagna
Co-ordinator
UNDP/UN Agencies Activities
125 Corso Unita d'Italia
10127 Turin
Italy

United Nations Economic Commission for Africa

Mrs. Françoise Wege
Social Affairs Officer
African Training and
Research Centre for Women
P.O. Box 3005
Addis Ababa
Ethiopia

Other Organizations

I.T. Power Ltd. (U.K.)

Mr. Bernard McNelis
Managing Director
The Warren
Bramshill Road, Eversley, Hants,
RG27 OPR
United Kingdom

Centre for Solar Energy Studies

Dr. Wedad Al-Osta
Director of Wind Energy Directorate
P.O. Box 12932
Tripoli, Libya

Eng. Fahima Al-Shakshouki
Head of Data and Computer Department
P.O. Box 12932
Tripoli, Libya

Ms. Leila Al-Obeidi
P.O. Box 12932
Tripoli, Libya

Ms. Fawzia Al-Hanashi
P.O. Box 12932
Tripoli, Libya

Ms. Sawsen Hassen Bek
P.O. Box 12932
Tripoli, Libya

Ms. Naima Swaissi
P.O. Box 12932
Tripoli, Libya

Ms. Samir Al-Awrflī
P.O. Box 12932
Tripoli, Libya

Ms. Mohammed Wanis
P.O. Box 12932
Tripoli, Libya

Ms. Abdel Atti Sebta
P.O. Box 12932
Tripoli, Libya

Ms. Fathia Abdel Jawad
P.O. Box 12932
Tripoli, Libya

Ms. Shawgui Al-Tarzi
P.O. Box 12932
Tripoli, Libya

Mr. Salah Kanaa
P.O. Box 12932
Tripoli, Libya

LGUWA

Ms Fawzia Sektah

Ms Miludah Ben Hamed

Ms Fawzia Fatehallah

ANNEX II

PROGRAMME OF WORK

SATURDAY 1 DECEMBER

- 08.00 - 10.00 h. Registration
- 10.00 - 11.00 h. Opening of the Workshop
- 11.00 - 11.30 h. Break
- 11.30 - 13.30 h. Presentation of the United Nations Activities in the field of NRSE (INSTRAW, UN/DTCD, UN/ECA, ARCSE)

SUNDAY 2 DECEMBER

- 09.00 - 10.00 h. Women's Needs in Africa and their Link with NRSE-Dr. Essam Mitwally, Executive Director of ARCSE
- 10.00 - 10.30 h. Solar Thermal Energy Conversion-Dr. Gibril S. El Jrushi, SHI, Musrata
- 10.30 - 11.00 h. Solar Electric Energy Conversion-Dr. Ibrahim Riyad, Al Fateh University Tripoli
- 11.00 - 11.30 h. Break
- 11.30 - 12.00 h. Wind Energy Conversion Systems-Dr. Mohamed Muntasser, President of IEF
- 12.00 - 12.30 h. Desalination using NRSE-Dr. Sasi Zineni/Eng. Sami Al Moussa, Al Fateh University, Tripoli
- 12.30 - 13.15 h. Biogas Production and Applications-Dr. Bachir Ben Rajab, Al Nasr University, Tripoli.
- 16.00 - 18.30 h. Reception hosted by: Women's Associations of GSPLAJ

MONDAY 3 DECEMBER

- 09.00 - 10.00 h. Education and training Activities in NRSE Projects and Programmes-Ms Borjana Bulajich, Social Affairs Officer, INSTRAW
- 10.00 - 11.00 h. NRSE Projects and Programmes: Design and Implementation-Mr. Francesco Campagna, Programme Manager, ILO/TURIN Training Centre, Italy
- 11.00 - 11.30 h. Break
- 11.30 - 13.30h. Group Work (Applied Projects) Co-ordinators-Ms Borjana Bulajich, Mr. Francesco Campagna,

TUESDAY 4 DECEMBER

09.00 - 13.00 h. Visits to Al Zawia Projects Area: Solar and Wind Energy Projects (Courtesy Eng. Abdel Wahab Nassrat); Green Houses; Electronics factory

WEDNESDAY 5 DECEMBER

09.00 - 10.00 h. Women and Energy - The Libyan Experience-Dr. Wedad Al Osta, SERC, Tripoli

10.00 - 11.00 h. Wood and Improved Stoves: The Tunisian Experience-Eng. Naceur Al Hammamy - AME, Tunisia.
New and Renewable Sources of Energy in Angola-Miss Luzia de Couceicai, Ministry of Petroleum and Energy, Angola

11.00 - 11.30 h. Break

11.30 - 13.30 h. Group Work: Discussion of Selected Projects Co-ordinators - Ms Borjana Bulajich, Mr. Francesco Campagna, Dr. Essam Mitwally

14.30 - 17.00 h. Visit to Al Nasr Gardens (Hosted by the Municipality of Tripoli)

THURSDAY 6 DECEMBER

09.00 - 11.00 h. World-wide Experience on NRSE-Projects-Mr. Bernard McNelis, I T Power Ltd., UK

11.00 - 11.30 h. Break

11.30 - 12.00 h. Presentation of Group Work

18.00 - 19.00 h. Presentation and Discussion of Report

19.00 - 19.30 h. Closing of the Workshop

INSTRAW



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

P.O. Box 21747
Santo Domingo, Dominican Republic
telephone (809) 685-2111
facsimile (809) 685-2117
telex (326) 4280 WRA SD

Printed in Santo Domingo, Dominican Republic, 1990
English-500-INSTRAW/SER.A/27