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SOLAR ENERGY DEVELOPMENT IN AFRICA



CM-1097

MICROFICHE

Solar Energy Development in Africa

The Inter-African Committee on Solar Energy met in Cairo, Egypt and made the recommendation contained in Annex 1. The Committee requested the Secretary-General of the Organization of African Unity to give all his support to the speedy implementation of the recommendations. This is going with the "Lagos Plan of Action" which was adopted in the First OAU Economic Summit. The Committee also urged OAU member states to provide effective assistance to the OAU to enable her achieve the objectives of the Committee and take all steps required for the speedy implementation of its recommendations.

The OAU/STRC made effort to gather detailed information on activities going on in different Member States in this respect (either in specialized Institutions or Universities or any concerned government agency).

In the African Power Conference (ECA) and in the last OAU Economic Summit there were recommendations in the field of "Solar (Photovoltaic) Power Electric Systems" which is considered ideal for use in rural electrification and pumping of water. This was found to be economical and feasible for semi-arid and rural areas where more development are to be undertaken.

The STRC contacted the ARCO Solar which has begun research and applied work on this kind of production. They began the plan of production of Solar Cells in Africa and are today in application in some OAU Member States. It is decided that they will establish an Industry of this solar panel in Nigeria (Upto 400 mega watts quantity) and in Egypt (Upto 300 mega watts). This will give the opportunity to produce solar cells locally in Africa. This was exhibited in the Third All Africa Trade Fair in Khartoum, it created a good occasion to demonstrate and show the use of solar panels for lighting, heating, cooking, Utilities (Radio, TV) or in water pump

It is recommended that a meeting be organised in co-operation with ECA and other UN bodies working in this field to review what is going on in OAU Member States and to draw up a fixed plan of action for Africa in Solar Energy. The meeting was scheduled for November, 1981.

The First OAU/STRC Inter-African Committee Meeting on Solar EnergyR E C O M M E N D A T I O N S

The Inter-African Committee on Solar Energy having carefully considered that:

1. the OAU/STRC has demonstrated its interest in the rapid promotion of the use of solar energy and other renewable forms of energy which appear to be in good quantity in Africa;
2. the interests of the various Member States of the OAU in the field of solar energy utilization continue to be sustained;
3. the development and judicious utilization of these renewable energy resources demand a continuous and concerted effort on the part of the OAU and its Member States through motivated cooperation among them; such cooperation shall necessarily be based on short-term and long-term plans but with determined commitment for implementation;
4. the enormous hydro-power and fossil-fuel resources of Africa are not inexhaustible;
5. the standard of living of the communities in the rural areas must be improved, so as to slow down, if not arrest, the ever-increasing drift of population from these areas and to accelerate the growth rates in the rural areas;
6. good training plays a vital role in the overall technological development of Africa;
7. The results recorded thus far in the research into, and commercial application of, solar energy and its derivatives look promising for Africa;

8. Solar Energy and its derivatives can play a major role in uplifting the living conditions of the inhabitants of the rural areas, particularly in the following areas:-

- (i) Water Pumping;
- (ii) Preservation of agricultural products through drying and refrigeration;
- (iii) Heating of Air and Water;
- (iv) Production of electrical power for driving machines, operating educational television, telecommunications, etc;
- (v) Exploitation of wind-energy;
- (vi) Exploitation of small-scale hydro-electric schemes;
- (vii) Exploitation of bio-mass sources.

9. The OAU/STRC and its Member States are desirous of deriving appropriate, but African, technology which is better geared to the requirements and conditions prevailing in Africa.

The OAU/STRC Inter-African Committee on Solar Energy hereby makes the following Recommendations:-

RECOMMENDATION I - The Committee supports the idea of Research and Development in the utilization of solar energy for social and economic development in all OAU Member States. It RECOMMENDS that such research and development activities shall be directed at the following areas:-

(a) Short-Term Applications:

- (i) Water supply (pumping)
- (ii) Water distillation (including production of salt)
- (iii) Water and Air heating for domestic and institutional purposes;
- (iv) Drying of agricultural products (including timber).

(b) Long-Term Applications:

- (i) Electricity generation (by photo-voltaic cells)
- (ii) Power generation (by direct thermal applications)
- (iii) Solar refrigeration and air conditioning
- (iv) Solar cooking.

RECOMMENDATION II: The Committee RECOMMENDS further investigation into the following indirect applications of Solar Energy:

- (i) Bio-mass
- (ii) Small scale hydro-power
- (iii) Wind power
- (iv) Geothermal energy

PLAN OF ACTION FOR RECOMMENDATIONS I AND II

Committee of experts to be set up by OAU with the following functions:-

- (i) identification of goals and objectives of various objects
- (ii) methodology for attaining goals;
- (iii) schedule and plan of implementation;
- (iv) schedule of personnel, equipment, materials required;
- (v) suggestions on siting of each project;
- (vi) details of financial implications and suggestions for obtaining the necessary financial backing;
- (vii) preparation of comprehensive report on each project and submission to Committee for review and transmission to OAU/STRC.

RECOMMENDATION III: The Committee recognises the fact that most building forms in Africa have hardly taken into consideration the effect of solar radiation on the comfort level within the building. The Committee, therefore, RECOMMENDS that Architects

be further made to appreciate these effects, not only as they effect comfort but also in the thermal properties of the building materials, water heaters) on buildings.

PLAN OF ACTION

The OAU should organize an International Conference inviting experts (Engineers, Architects and Planners) from both outside and within the OAU Member States to discuss the various aspects of the influence of Solar Energy on building.

Utilization of Natural Resources

African has enough identified natural resources to be self-sufficient in the production of fertilizers for years to come, with the exception of sulfur. Nitrogen (N) and phosphate (P_2O_5) reserves are being brought into production for fertilizer materials. Potash (K_2O) reserves have not been brought into production in a major way. Only the larger of these known resources are being developed and then primarily to serve established export markets as is the case with phosphates. Many additional smaller reserves known to exist and some, especially in isolate areas, have a potential for development, particularly in the case of landlocked areas that are at a disadvantage compared with port countries with easy access to fertilizers on the world market. A centralized organization with a commitment to help develop indigenous materials and associated into greater food production for Africa when a fertilizer industry is developed that will ensure domestic production and consumption.

Training

The success of any organization depends upon the talent of its people, and the development of capable personnel is a key to developing a successful organization and thus an industry. The

fertilizer business must be a key industry in any country attempting to increase the production of food and fiber. Training of personnel in production, distribution, storage, pricing, product use, economic, and related fields has to be given top priority if the fertilizer industry is to grow. Especially designed training curriculum to match employee tasks is required to develop specialized employees needed by the fertilizer industry. Training includes formal university courses, orientation, short courses, workshops and on-the-job training. An African organization is needed to sponsor and conduct training, provide experience for a specific position, and assist in arranging specialized courses at universities, management institutes, and within fertilizer organizations. Training that prepares personnel for advancement within an organization should be encouraged.

Technical Assistance

With the rapid expansion in fertilizer production, marketing, and use in Africa, many new problems and opportunities will arise. It will not always be possible or even feasible for individual organizations to employ highly specialized employees. There should be a means of drawing upon the expertise available in other countries and sharing this with organizations and countries having such a need. An organization is needed to develop a broad base of expertise as well as to develop contacts with other organizations where additional and more specialized expertise may be attained. This organization should be a clearing-house for matching the needs of member countries and organizations with available expertise to assist in resolving problems. The borrowing of specialized personnel will allow countries time to develop the expertise needed on a day-to-day basis and provide a way to draw on more specialized personnel when needed. This flexibility should result in efficiency and increased production for all concerned.

Documentation and Publication

Information available on a continuing basis on all facets of fertilizer production, marketing, and use is essential for an efficient and dynamic national fertilizer industry. Much information now exists among member countries but it is now easily available because of inadequate documentation or limited availability.

Likewise, information from many other countries or organization sources must be freely and generally available. An organization is needed that would be responsible for the cataloguing and dissemination of information in a usable form and language this would include not only published library materials but also useful visuals and instructional books that could assist individuals and groups in the improved performance of their responsibilities. At the present time a country may develop good data on cost of production, agronomic responses to new and improved fertilizers, or on many other topics that have application in an adjoining country with similar conditions. The proposed fertilizer centre could act as a clearing-house and provide an excellent media for letting "others" know of studies and data that may have application in their respective fields of endeavour. The sharing of research results could result in the saving of valuable limited research funds.

Basically, these schemes shall incorporate:-

- (i) Post-graduate training of engineering and scientists to M.Sc or Ph.D level;
- (ii) Practical training of engineers, scientists, technologists and technicians in suitable appointed establishments within and outside Africa;
- (iii) Training of artisans and other technicians;
- (iv) Addition to University and technical college curricula of various aspects of Energy Studies with a particular attention to Solar Energy and its derivatives.

The E & T. Sub-Committee shall include University and Technical College lecturers, research scientists and engineers, practising engineers, architects and planners, industrialists etc.

It is noted here that the National Centre for Solar Energy Laboratory in Cairo has volunteered to take some trainees from other African States

RECOMMENDATION IX: The Committee RECOMMENDS the immediate inclusion of Energy studies in the curricula of Universities and Secondary/Technical Institutions in Africa.

PLAN OF ACTION

In addition to the Education and Training Sub-Committee's recommendations, the Association of African Universities (AAU) and the Ministries of Education of OAU Member States should be informed accordingly.

RECOMMENDATION X: The Committee recognises the need to improve on the exchange of information among African countries, particularly those with similar problems and interests, in order to avoid duplication of efforts.

The Committee therefore, RECOMMENDS more regular communication among workers and Institutions involved in Solar Energy activities in OAU Member States.

The Committee further RECOMMENDS that the report of the fact-finding mission suggested in Recommendation V above, should be distributed among the Member States on governmental and institutional levels. To further enhance this, the Committee RECOMMENDS the inauguration of a quarterly Newsletter on Solar Energy activities within the OAU States.

PLAN OF ACTION

- (i) The OAU/STRC should start the publication of a quarterly Newsletter which shall contain information on Solar Energy activities and workers in the various Member States.
Estimated Cost 5,000 US \$ - 1 year
- (ii) OAU/STRC should organize as a matter of principle, regular conferences, seminars, workshops, symposium, to popularise solar energy utilisation.
General Solar Energy Conference - 1 per year
Seminars/Workshop/Symposium on specialised subjects -
At least 4 in a year.

RECOMMENDATION XI: The Committee, while recognising the various amenities offered by Solar Energy utilisation RECOMMENDS a vigorous promotion of extension activities in the Member States

PLAN OF ACTION

- (i) Public lectures, exhibitions (particularly of working models) to be organised by various workers in the field with active support from OAU/STRC;
- (ii) Lectures in primary and secondary schools coupled with exhibitions of working models, film shows etc.;
- (iii) Encouragement for schools to start small-scale projects on Solar Energy utilization.

RECOMMENDATION XII: The Committee RECOMMENDS that the OAU should urge its Member States to draw up appropriate energy policies for their countries, particularly the determination of the actual energy usage pattern in the respective countries.

RECOMMENDATION XIII: The OAU should seek co-operation with other international bodies such as the UN agencies, EEC, COMECON etc. so as to optimise information dissemination and also to seek financial and manpower support for Research and Development activities on Solar Energy utilization.

RECOMMENDATION XIV: The OAU should co-operate with other bodies in seeking for uniformly-valid standards of performance of various Solar Energy equipment.

RECOMMENDATION XV: The Inter-African Committee on Solar Energy requests the Secretary-General of OAU and the Executive Secretary of the OAU/STRC to give all their support to the speedy implementation of the present recommendations and suggested plans of action. The Committee also urges governments of OAU Member States to provide effective assistance to the OAU and OAU/STRC for the purpose of achieving the objectives enumerated above, and to take all the steps required for the speedy implementation of the afore-mentioned recommendations.



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