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United Nations
International Research and
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Advancement of Women
INSTRAW

WOMEN AND NEW AND RENEWABLE SOURCES OF ENERGY

(1980 - 1987)

Annotated Bibliography of Sources Dealing With
Women and New and Renewable Sources of Energy;
UN Sources and Non-UN Sources

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A. Non-UN Sources

1. Agarwal, Anil, "Introducing New Technologies - Try Asking the Women First", pp. 29-32 & 57-58 in Ecodevelopment News, CIRED-MSH, Paris, No. 21-22, June-Sept 1982. (e)

This short article covers new technologies introduced in rural communities in India to improve health and basic needs: biogas plants, fuelwood plantations, fuel-conserving, smokeless chulhas (woodstoves), latrines, hand-pumps, etc. Explains the failures of such new technologies because the women's perspective is not taken into account. The establishment and maintenance of new technologies are not taught to women. In the case of tree-plantation programmes, few "women's trees" have been found (timber-yielding trees); while "men's trees" such as fruit trees abound because men can sell the fruit as a cash crop. The installation of taps in a community is not always a palliative to curbing hygiene problems as often, the taps are too far away from the dwellings of the people. This means that women have to carry back more water for cooking, washing and bathing, in order to avoid making the journey for water several times a day.

2. Agarwal, Bina, Diffusion of Rural Innovations: Some Analytical Issues and the Case of Wood-burning Stoves". World Development 11, 1983, 359-76. (e)

Demonstrates how the effectiveness of a certain approach in the diffusion of rural innovations can be conditioned by the characteristics of the innovations. Given the technical, economic, and social characteristics of wood-burning stoves, the author argues that a market-oriented approach to diffusion is essential. Stove designers must familiarize themselves with community customs of the area where the stove will be introduced, and must involve local people in the design stage in order to meet their requirements.

3. Agarwal, Bina; "Agricultural Modernisation and Third World Women: Pointers from the Literature and an Empirical Analysis", (ILO, Rural Employment Policy Research Programme, WEP 10/WP 21, 1981), 135 p. (e)

This paper seeks to examine the effects of agricultural modernisation schemes on rural women in the Third World, and spells out why the interests of men and women within a household cannot automatically be assumed to be complementary.

The fact that women have a double workload is emphasized in paragraphs relating to domestic "housework" such as collecting fuel, carrying water etc. The author gives examples of the long hours walked by women to collect fuel by citing different African countries. On page 8, she draws a link between deforestation, the time involved in collecting firewood and declines in nutrition. Yet this task continues to be excluded from the list of "productive" activities in academic studies.

It has been found that men are given priority over women when it comes to food distribution within the family (p. 14) even though several studies point to women's energy needs due to their greater energy expenditure. The involvement of rural women is particularly important, since they are the principle users of household technologies. Shows that the status of women within the household is an important variable in wood-stove adoption.

4. United States Agency for International Development, "Mainstreaming Women: Inclusive Economic Development in the Third World", Report of the Quarterly Meeting, (1984), 70 p. (e)

The September 13-14, 1984 ACVFA (the Advisory Committee on Voluntary Foreign Aid) meeting represented the first AID/PVO (Private Voluntary Organizations) assessment of women in development activities from an agency-wide perspective.

Discussions to implement projects that include women as target beneficiaries in the area of agriculture and reforestation were included. Report includes workshop.

5. United States Agency for International Development, "Women in Development: The First Decade 1975-1984". Prepared by the Office of Women in Development. A Report to Congress by the Agency for International Development, 59 p (e)

This report underlines the responsibilities and workload of women and girls in providing for their households' energy needs. Briefly describes

AID's reforestation projects, fuel-stove projects and other energy-labour-saving projects in Afroca. Points out several precautions to be taken to in order guard against factors that constrain women's incentives to participate.

6. Bowonder, B.; Das Gupta, B.; Gupta, Sanjeev.; Prasad, S.S.R., "Energy Use in Rural Areas: A Study of Ten Villages in India", pp. 389-397 in Natural Resources Forum, (United Nations, New York, 1986), 410 p. (e)

This is a short note at the end of this publication, on fuel use patterns and types of cooking stoves used in India. Surveys indicate that fuel-efficient cooking stoves have not penetrated rural areas, mainly due to a lack of institutional arrangements for manufacturing, distributing and selling of such through a proper marketing network supported by a public-awareness programme.

7. Chenlie, Lio, "Now they're cooking with gas", pp. 94 in The New Look in China's Rural Areas, Great Wall Books, (1983), 110 p. (e)

This is an account of a new source of energy used in China for cooking, made from human and animal wastes to form a light hydrocarbon gas, methane (CH₄). The book demonstrates the advantages of this new cooking fuel on women and on the natural environment.

8. The Christian Science Monitor, "The Neglected Resource, Women in the Developing World", (December 17, 1985, intl. daily newspaper) (e)

Covers women's workload in the developing world and points out to the injustices women suffer. The article shows that, despite the introduction of fuel-efficient stoves in many countries, women still forage for sticks and twigs on land depleted of trees. The nutritional consequences, due to lack of fuel, are explained.

9. Elmahgary, Yehia and Biswas, Asit K., (eds.), Integrated Rural Energy Planning, (Butterworths, 1985, United Nations Environment Programme and the International Society for Ecological Modelling), 200 p. (e)

This book draws a link between environment-energy-development. Through the work of UNEP and discussions at various international fora, one of the most important perceptions that has emerged during the past decade is that environment and development are closely interrelated. One of the causal effects of the vicious social-economic-environment-development

cycle is the scarcity of firewood, the collecting of which is undertaken by women and children. The book comprises case studies with photographs and explanatory diagrams of various non-traditional sources of energy. Energy policies should not be imposed in ignorance of local preferences and customs. Traditional cooking and eating habits, for example, are essential considerations when so much of the fuel produced in rural areas is used for cooking.

10. Environment Liaison Centre, 1985. In special working relationship with UNEP, consultative status with ECOSOC, UNESCO and liaison status with FAO. A/CONF./NGO/40 (e)

The NGO Forum '85 on Women and Energy was held in Nairobi, Kenya, July 1985, and coincided with the United Nations World Conference to Review and Appraise the Achievements of the UN Decade for Women, 15-26 July 1985.

The statement of the women environmentalists who participated in the workshops, underlines the potential of women as a vital contribution to the solution of the environmental crisis, precisely because of their functions as providers, managers and consumers of forest products: fuelwood. The papers presented at this Forum, evoke the intrinsic link between women, environment protection and management, including water and energy management.

Papers presented at above NGO Forum :

11. Elnur, Awatif Mahmoud, "Renewable Options For the Sudanese Women", (1985), (e)

This is an account of the present energy crisis in Sudan, caused by the exhaustion of household fuel, coupled with the shortage and high cost of petroleum products.

The paper describes measures taken by the Sudanese government: introduction of more fuel-efficient stoves. Concludes by stating that the role of women in energy planning is much more important than men's and that integration of women in development efforts is the key to development, as women constitute 50% of the population and play a crucial role in fighting malnutrition and providing adequate light and fuel.

12. Gupta, Vrinda, "Women in the Lead: India and Improved Cookstoves", (1985), (e)

Ms. Gupta gives a background to the energy problems encountered by poor women in India today. Reviews certain methods to relieve women of their drudgery: new kinds of stoves, plantation camps in areas of deforestation etc., measures which were not without handicaps. Mentions a number of appropriate technologies such as biogas and solar energy, which have been introduced to supplement available energy sources.

13. Landazuri, Helena, "Latin American Quest for Low Impact Inputs", (1985) (e)

Designed as an overview of the energy situation in Latin America today, the causes of the scarcity of fuels and the remedies to correct the overall energy crisis are carefully explained. Gives examples of innovative technologies which were not successful mainly because certain cultural factors were not taken into account. States that gradually, women are being included in the implementation of forestry projects, such as wood collection and the planting and care of trees - tasks which have been always been a woman's task.

14. Opole, Monica, "With Culture in Mind: Improved Cookstoves and Kenyan Women", (1985), (e)

This short paper describes what alternative source of fuel Kenyan women have to using the traditional firewood - the Kenya Ceramic Jiko (KCJ Cookstove). Applauds the fact that women were involved at all stages of research and development as the technology has known a 40% rate of adaptation in Nairobi's informal sector. Also emphasizes the link between lack of fuel and malnutrition. Recommends that in order to develop an effective energy-saving programme for women in Africa, it is necessary to increase their consciousness of the energy crisis through interlinking famine and nutrition to fuel availability. Women have to bear the burden of finding fuel for their families, even where it does not exist.

15. Ferchiou, Sophie, Les Femmes dans l'Agriculture Tunisienne, (Edisud/Ceres Productions, 1985), 94 p. (f)

While describing rural development in Tunisia, the book outlines the impact of integrated development on the economic and social conditions of women. It focuses on a joint FAO/SIDA irrigation project and shows how women are excluded from all decision-making, particularly as to housing, types of energy used for cooking. The tasks women do for "free", fetching water and collecting firewood, impedes the development process and the system of profit, as women do not have a say in the domestic expenditures.

16. Frank, Andrea, "Women and Energy - Education Awareness and Training", Solar North Institute, Vermont, USA & Caribbean Solar Group, St. Kitts, (1981), 15 p. (e)

This paper traces the reasons why women have been traditionally excluded

from trade-related, technological industries. Emphasizes that education and sex roles are the predominant factors contributing to this gender problem. The account of women and energy is focused on women and solar energy.

Paper also draws attention to the vast untapped resource of women.

17. García, Martha Olga, "Informe República Dominicana, Mujeres y Energía No Convencional", (Dirección General de Promoción de la Mujer, 1985), 12 p. (s)

This is a report from the Government Agency for the Advancement of Women in the Dominican Republic. The government formed the National Commission on Energy Policy (COENER) at the end of the 1970s to solve the energy problems facing the country.

COENER and Pro-Mujer, with financial aid from USAID, worked together on several projects to train women in the rural communities of border areas with Haiti. Some of these projects included: mini-hydroelectric plants, investigating possibility of establishing an energy farm, developing the Use of new sources of energy (wind, solar-power).

Pro-Mujer set up nutrition programmes and energy conservation programmes with UNICEF.

18. Hemmings-Gapihan, Grace S., "Baseline Study for Socio-Economic Evaluation of Tangaye Solar Site. In Women and Technological Change in Developing Countries. (1981). Edited by Roslyn Dauber and Melinda L. Cain. Boulder, Colorado: Westview Press, p. 139-48. (e)

The author conducted a baseline socio-economic study in a village in eastern Upper Volta (now Burkina Faso) before installation of a solar energy unit. The unit, which uses a battery, was designed to supply energy for a food-grinding mill and a water pump. Hemmings-Gapihan's research focused on the villagers' current usage and need for inexpensive sources of energy and labor-saving devices. Here she presents her findings, as well as recommendations for integrating the solar unit into the village society.

19. Hoskins, Marilyn, "Women in Forestry for Local Community Development: A Programming Guide". Report prepared for U.S. Agency for International Development, Office of Women in Development, (1980), 46 p. (e)

An exploratory work that examines many problems and issues related to women's participation in forestry for local community development.

Points out that women's expertise in forestry and their forestry-related activities are often overlooked by project planners. Discusses the four main constraints to local forestry projects - competition for land, time frame of forestry aspects, spatial considerations, and unfamiliarity with the goals of forestry - and how women's involvement in local projects can ease these constraints. Provides a checklist of indicators for program designers who wish to integrate women into forestry projects.

20. Ki-Zerbo, Jacqueline, Improved Woodstoves: Users' Needs and Expectations in Upper Volta. Arlington, Virginia: Volunteers in Technical Assistance, Inc. 52 p. (e)

This report presents the results of a sociological study undertaken by VITA in 4 regions of Upper Volta (now Burkina Faso). The study examined local eating habits and cooking practices, types of stoves currently used, kind of fuel used, and women's preferences for improved stoves. Annexes provide information on the villages studied and the questionnaires.

21. Leet, Mildred Robbins, "Woman: An Energy Resource for Research, Development, and Demonstration in New and Renewable Sources of Energy". (Document submitted to the United Nations Conference on New and Renewable Sources of Energy, Nairobi, Kenya, August 1981). (International Society for Community Development, New York, 1981), 45 p. (e)

This paper is a plea for the incorporation of women into development planning at all levels for new and renewable sources of energy. Ms. Leet asks how can human, economic and physical energy resources be best developed and used to improve the quality of life. As women are the vital energy resource, it is therefore logical to educate, train and consult with the people directly involved. Nevertheless, the document expresses the negative factors which prevent women from participating in employment and training programmes.

22. National Plan of Action for Women's Development, Women Service Co-Ordination Committee, Nepal, (1982), 38 p. (e)

As part of the national work plan for women's development, forestry was given priority in Nepal. The plan sets out several objectives to associate the female workforce with all aspects of forest management. The government and non-governmental women's associations will be involved in: training programmes in soil conservation, tree-growing, subjects on forest wealth and forest management to be on the curriculum of primary education as part of an effort to acquaint women with forestry training, publicity on smokeless ovens, etc.

23. NGO Working Session, 6-7 October 1984, Arusha, Tanzania,
Pre-Regional Preparatory Meeting, 23 p. (e)

This meeting was convened by the Planning Committee of the Conference of Non-Governmental Organizations (CONGO) in consultative status with the UN Economic and Social Council (ECOSOC). Delegates came from 17 African countries.

The objectives were to review and appraise the achievements of the UN Decade for Women and to discuss arrangements and priorities for the 1985 NGO Forum which will overlap with the Nairobi Intergovernmental Conference.

It was agreed that there is little appreciation of the role of women in science and technology, even though women are most affected by problems of habitat, energy and environment. NGOs were urged to put into effect certain strategies: 1) Use of successful Green Belt Movement; 2) Promotion of energy-saving devices e.g. cookstoves and jikos, sources of energy other than firewood; 3) Prevent soil erosion; 4) Training.

25. Noronha, Raymond and Spears, John S., "Sociological Variables in Forestry Project Design". In Putting People First: Sociological Dimensions in Rural Development Projects. Edited by Michael Cernes. (Washington, D.C.: The World Bank, forthcoming). (e)

"Social" forestry refers to the involvement of local people in a forestry activity that serves their needs. The authors analyze four main socio-cultural elements that should be studied for the design of social forestry projects: population patterns and growth rates; land use and ownership; labor patterns, including sexual division of labor; and social organization. Various issues to be considered when translating sociological information into project design are presented. Among the most important of these issues is the involvement of women in project implementation, as beneficiaries or extension workers.

26. President Nyerere's Speech to the African Regional Preparatory Meeting for the World Conference of the UN Decade for Women,
(Arusha, Tanzania, 8 October 1984), 3 p. (e)

President Nyerere's opening speech to the meeting underlined the role of women as an integral part of economic, social, and political development in Africa. The greatest burden of poverty is carried by women: water, energy, transport and communications etc. Through some examples, he demonstrated how women are left aside in development planning. He urged that women's development be conducted by women.

27. Overholt, Catherine; Anderson, Mary B.; Cloud, Kathleen; Austin, James E.; (eds.), Gender Roles in Development Projects: A Case Book, (1984), 326 p. (e)

This book brings together a number of case studies which demonstrate gender differences in development projects, such as irrigation, energy, agricultural and industrial. Understanding the role played by gender in development can also make a substantial difference as to whether growth-oriented projects succeed or fail. Development practitioners and academics should strengthen their analytical approach to this task.

28. The Peripheral Centre, Swedish Assistance to Africa in relation to women, an assessment, (SIDA, 1985), 202 p. (e)

This book is the first attempt of its kind in Sweden to make an overall assessment of the impact of Swedish assistance to African women. Covers several areas of development affecting women; one such area is energy and forestry. Describes setting up of forestry schools by SIDA and touches on the failure of certain projects designed by planners e.g. stove projects.

29. Progress Report of the UN Decade for Women in Nepal, Women Service Coordination Committee, Nepal, (1985), 54 p. (e)

This report attempts to focus on the progress of women in Nepal from 1975-1985. One of the aspects of women's development highlighted is forestry and energy, which has proved to be positive as women are no longer onlookers but contribute to the planting of seedlings and forest management.

30. Quality of Life, Expectations of Change, and Planning for the Future in an Energy Production Community. The Growth Impact Group, University of Colorado (1982), 265 p. (e)

This is a project on the positive and negative consequences of energy development in two communities selected for survey in Colorado. The positive being mostly beneficial to men whereas women suffer the negative which are of a social nature: excessive alcohol consumption, violence on the family etc. Throughout the questionnaires, women expressed very different opinions to men's, in questions relating to the natural environment, personal safety, entertainment etc.

31. Sen, Gita; Grown, Caren, Development, Crises, and Alternative Visions: Third World Women's Perspectives, (DAWN, 1985), 111 p. (e)

This study emphatically demonstrates that women must be the key potential actors in any resolution, if the international community is to find solutions to the food-water-fuel crises, which are inextricably interdependent. Three NGOs (SIDA, Swedish Red Cross and Earthscan) have collaborated to produce a report which maintains that the so-called "natural disasters" are to an increasing extent structurally caused by humans. It should be recognized that women are the key human elements and active agents in any effort to solve the crises of food-water-fuel.

32. Smith, Kirk R. and Colfer, Carol. "Cooks on the World Stage: The Forgotten Actresses/Actors", Working Paper 83-5, (Honolulu, Hawaii: Resource Systems Institute, 1983), 35 p. (e)

Examines the energy and health implications of cooking in rural areas of developing countries, focusing on traditional biomass fuels. Empirical data on air pollution from biomass combustion are presented, which show that rural women appear to be exposed to dangerously high levels of smoke pollution in the course of their daily cooking. The authors suggest an approach to further research regarding women's involvement in cooking that will be particularly useful for development planners. Rather than focusing research on an energy system, they recommend focusing on a particular human action. They conclude by offering several project considerations.

33. Stuart, Peter C.; "Power in the Kingdom" in The IDRC Reports, Vol. 12, No. 2, July 1983. (e)

This article focuses on Nepal and its total lack of any natural energy resources and explains the problems associated with this problem, i.e. women and children have to travel as much as 100 miles a day to haul wood to their homes.

But there are programmes of forest replenishment and new sources of energy currently being researched and exploited by Asia's Regional Development Bank and the OPEC Fund for International Development.

34. Svob-Djokic, Nada. Mission Report on "International Workshop on the Rural Energy Crisis, Women's Work and Basic Needs", (co-sponsored by ILO and Institute of Social Studies, The Hague, Netherlands, 21-24 April 1986.) (e)

The objectives of this workshop were:

- 1) to review the findings of the ILO/Netherlands' projects on energy and rural women's work;
- 2) to consider the implications of the projects' findings for policies and governmental programmes and donor agencies with a view to bringing relief to rural women and their families.

The need for NRSE is emphasized. Rarely the role of women as users and producers of energy is taken into account in research and development studies.

35. Tinker, Irene "Energy Needs of Poor Households". Working Paper No. 04 (WID), Equity Policy Center, (1982), 30 p. (e)

This paper describes women's role in the energy needs of poor households and gives explanatory tables as to the number of hours spent by women in productive and household tasks as against men's.

The acceptance of new energy technologies requires time and money. Paper outlines some new energy-saving technologies which have hampered women instead of lightening their burden.

36. Tinker, Irene, "Women and Energy: Program Implication". Report prepared for the U.S. Agency for International Development, Office of Women in Development, (1980), 12 p. (e)

Makes a number of policy recommendations for those designing technologies on the subsistence level. Points out that it is important to distinguish substitutable energy (use of machines for human energy, for example) from necessary energy (such as fuel for cooking). Argues that intermediate technologies are often far more accessible, useful, and affordable to the rural poor than the complex technologies often introduced by development planners. As the primary users of subsistence energy, women must be considered when designing interventions to change energy use at the village level.

37. The Women's Dimension in Development Assistance, SIDA's Plan of Action, (SIDA, Office of Women in Development, May 1985), 53p. (e)

This is an overview of SIDA's efforts in finding methods to engage women in energy-saving and forestry programmes. Points out the anomalies of appropriate technology, introduced by UN Voluntary Organizations and national aid organs, through not considering women's basic needs. Points out that women are the main actors in the sphere of rural energy and consequently the main people concerned by the scarcity of bio-energy forms such as wood, charcoal and agricultural waste - the only forms of energy in rural homes.

B. UN Sources

1. United Nations International Research and Training Institute for the Advancement of Women, "Women and Energy in the Implementation of the Nairobi Programme of Action", (1984), 16 p. (e)

This booklet attempts to outline a role for INSTRAW in implementing the Nairobi Plan of Action (NPA), the role of women in the development and use of new and renewable sources of energy.

Description of INSTRAW's proposed activities in this field.

2. United Nations International Research and Training Institute for the Advancement of Women, "Women and New and Renewable Sources of Energy - a TCDC approach", (85-15125 Report of the Meeting, New York, 1985), 55 p. (e)

This Expert Group Meeting on the role of women in NRSE was conceived as a follow-up to the UN Conference on NRSE, held in Nairobi, 1981. Meeting was convened by INSTRAW in co-operation with the Institute for Developing Countries (IDC), Zagreb.

The experts discussed the different forms of energy used by women in developing countries and stressed the need for a transition from hydrocarbons to NRSE. Among the technologies which could be considered for joint action by developing countries, through the role of women in the use of NRSE, are the following: a) large-scale hydropower and small-scale hydropower, b) fuelwood forest management, c) wood gasification, d) charcoal for industry, e) liquid fuels from biomass, f) energy from agricultural wastes, g) energy from urban wastes, h) biogas production, i) solar energy for housing, for agriculture, for industry, for communications, j) geothermal power generation, k) low-enthalpy geothermal applications, l) wind energy for small-scale applications, m) wind energy for large-scale application. INSTRAW will play an important role in the research, training and information to develop guidelines for the development of NRSE.

Background papers presented at the meeting :

3. De Suremain, Dominique, "Women and Domestic Energy - an experimental child centre", in collaboration with Enda America Latina and Fundación Servivienda, (July 1984). Background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985. 128 p. (f, s)

From the range of problems in the study, the most sensitive one was how to obtain fuel for cooking. Description of types of fuel used by families in Bogota, women are responsible for providing fuel for their families.

Emphasis that women must get organized and upgrade their educational level in order to better their financial and social position within society.

4. Hassan, Dr. F., "The Role of Women in Developing New and Renewable Sources of Energy". Background paper presented to the Expert Group Meeting on The Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985. (American University of Cairo, Arab Republic of Egypt, 1985). (e)

Focusing on the Arab Republic of Egypt, this paper outlines their efforts to develop new and renewable sources of energy.

As energy is the basic ingredient for development, and women the main providers and users, their concerns and abilities should be taken into consideration in the field of new technology requirements and training programmes.

5. Miness, Nina. "Statement at the Third Session of the Committee on the Development and Utilization of New and Renewable Sources of Energy", (INSTRAW, New York, 09-13 June 1986), 4 p. (e)

This short statement is a portrayal of INSTRAW's role in the energy sector and briefly describes how it can enhance women's participation and seek ways of alleviating their special burden as producers and users of energy. Describes INSTRAW's designing training modules on "Women and NRSE".

6. O'Lall, Erika, "Women in Alternative Energy". Background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June, 1985. (Caribbean Energy Co. Int. Ltd., 1985). (e)

Summarizes women's role in NRSE in Guyana, using alternative energy sources. Emphasis is placed on incorporating women into all projects, both at the administrative and the technical level and organising training workshops, aimed at motivating women to act as catalytic agents in the development process.

7. Pheline, Jean, "The Role of Women in the Use of New and Renewable Sources of Energy". Background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985. (French Association for the Study and Development of Applications of Solar Energy, 1985). (e)

Briefly outlines the resolutions and recommendations adopted at the UN Conference on NRSE in Nairobi, 1981 and states how France has established a ministerial post with the function of facilitating the training of women in all sectors of activity. In the area of energy, several public institutions have been created to accelerate and supervise women's working conditions.

As women are mainly concerned by the gravity of the energy problem, they have been included in such projects as the improved stove project of the German Forestry Mission in Burkino Faso, with female instructors to extend their use.

8. Nkonoki, Simon R. and Sorensen, Bent in Natural Resources Forum, "A Rural Energy Study in Tanzania. The Case of Bundilya Village", (United Nations, New York, 1984), 12 p. (e)

This article demonstrates, with the aid of explanatory tables, the catastrophic situation of the energy crisis in Tanzania, brought about by the rising costs of fossil fuels and forest depletion. Possibilities for short-term and long-term planning efforts are discussed to overcome the imbalance.

As most fuel used is firewood and is mainly used for cooking, the burden of collecting this vital energy source is left to women. An interesting point is made that because of fuelwood scarcity, a growing proportion of forest products are being sold for cash crops. Thus, this brings the

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women's "free commodity" into the money economy, which means into the men's domain. This also applies to improved cooking devices, which have not been successful due to their cost. Rural populations use a three-stone arrangement as a cooking stove which has a very low efficiency rate in converting wood to useful heat. So, by improving the efficiency of current cooking devices, the immediate problem of forest depletion can be averted and wood can be used in a renewable mode for a decade or two.

9. Woravech, P., Research, Development and Use of Wind Energy in Thailand, background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985. (Energy Development and Dissemination Section, National Energy Administration, Bangkok, Thailand).

Research, development and use of wind energy in Thailand including transfer of energy technology.

10. Begovic, Krunoslav, Approach to the development of small hydro plants, background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985.

This paper presents an approach to the development of small hydro plants.

11. San Miguel, Francisco T., The Dendro Power Development Program of the Philippines, background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985.

Description of the development of the dendro thermal power plant as a substitute for oil.

12. Filipan, Tugomir, The Co-operation of Yugoslavia with Developing Countries in the utilization of bioalcohol as an alternative source of energy, background paper presented to the Expert Group Meeting on the Role of Women in Developing NRSE, INSTRAW, Santo Domingo, June 1985. (Institute for Developing Countries (IDC), Yugoslavia).

The Yugoslav cooperation with developing countries in alleviating the energy crisis through the development of ethanol as a source of energy and using basic raw materials by fermentation in alcohol.

13. Mikulicic, Vladimir, Technical and Social Aspects of Rural Areas - Electrification in Developing Countries based on small-scale hydro-electric power plants and Yugoslav experience.

Summary of problems regarding energy development and suggests the development of small hydropower plants at the national level and rural electrification in the developing countries as a possible solution to the problem.

14. United Nations Department of International Economic and Social Affairs and United Nations Development Fund for Women, Development Co-operation with Women: The Experience and Future Directions of the Fund, (Sales No. E.85.IV.6.), 195 p. (e)

This is a review of the assessment of projects undertaken by the Fund since its operation began in 1978. 3% of the total projects were energy-related: reafforestation, dissemination of fuel-saving cooking stoves and forest industries. The analysis of the projects highlights the strengths and innovative nature of the projects and their value in interfacing women and development.

The Fund's activities in the field of energy conservation were illustrative of the possibilities for decreasing women's workloads, while simultaneously transforming traditional tasks into small industrial and thus remunerative ones.

15. United Nations Department of Public Information, United Nations Forward-Looking Strategies for the Advancement of Women, (1985), 89 p. (e,f,s)

As adopted by the World Conference to Review and Appraise the Achievements of the UN Decade for Women: Equality, Development and Peace, Nairobi, Kenya, 15-26 July 1985, paras. 218-227, pp. 52-54.

A portrayal of the importance of the role of women as producers, users and managers of energy sources, the Forward-Looking Strategies underline the need to involve women at all levels of energy-related decisions. Immediate attention should be directed towards action concerning adapted technologies in order to relieve the drudgery involved in women's workload of collecting fuel. The use of alternative and NRSE should be assessed with due regard to women's needs, they are the principle consumers. The Forward-Looking Strategies advocate the training of women as technicians for the maintenance of new energy-saving technologies.

16. United Nations Development Fund for Women, Farmers, Merchants and Entrepreneurs. A report of the United Nations Development Fund for Women, (1985), 28 p. (e,f,s)

This report demonstrates how the UNDFW, together with FAO and UNICEF, has given direct assistance to women in some of the poorest regions of the world : 1) fish-smoking ovens, 2) solar salt extractors, 3) improved wood-burning stoves.

17. United Nations Development Programme, Participación de la mujer en el desarrollo, Estudio de Evaluación No. 13, (1985), 93 p. (s)

The primary objective of this series of case studies is to evaluate the methods used and efficiency of efforts carried out by the UN system for a more active and deliberate participation of women in development projects during the Decade: 1976-1985.

A brief explanation is given on energy and forestry and recommendations suggested, such as women's participation in afforestation projects and promotion of fuel-saving stoves. Energy projects should be directed to the most poor of rural populations and women should be included in the earliest phases especially concerning projects on combustibles and domestic energy. The most promising source of NRSE seems to be biogas.

18. United Nations Development Programme. Statement by Bruce A. Harland, Deputy Assist. Administrator and Director, Energy Office. Third Session of the Committee on Development and Utilization of New and Renewable Sources of Energy, New York, 09-13 June, 1986. 7 p. (e)

19. Recommendations of the United Nations Economic Commission for Africa/Food and Agricultural Organization. Sub-regional Seminar on Fuelwood and Energy Development for African Women, (18-23 April 1983, Lusaka, Zambia), (e)

The Recommendations of this seminar advocated that women, the main users, be consulted at all levels and be involved in the decision-making process of all programmes related to forestry and new and renewable sources of energy. Among these programmes are: improvement of designs and reducing costs of fuel-saving stoves; alternative sources of energy to fuelwood such as biogas and solar energy; improved marketing and transport of fuelwood and charcoal.

20. United Nations Economic Commission for Africa, "Workshop on Firewood and Energy Development for Rural African Women", Workshop Report Series, (Addis Ababa, 1981), 60 p. (e)

This report covers several African (French-speaking) countries: Republic of Guinea, Burkino Faso, Malo etc. It describes the current energy situation in Africa which has reached alarming proportions due to deforestation. Given that wood and charcoal represent 90% of domestic demand, and that due to the scarcity of this fuel, some families limit themselves to one hot meal a day, the respective governments have taken steps to protect the forests by introducing reafforestation laws, banning bushfires etc.

21. United Nations Environment Programme, "The feasibility of harnessing renewable sources of energy in Indonesia", Energy Report Series ERS-10-84, (Nairobi, February 1984), 57 p. (e)

This report describes the results of a project jointly undertaken by UNEP and the Ministry of Mines and Energy, Indonesia, to harness renewable sources of energy in Indonesia. It included :

- surveys on energy consumption and supply in rural areas, where women spend 60-80% of their time (men 25%) collecting wood and coconut materials for cooking and lighting ;
- testing efficiencies of available fuelwood stoves, with the objective of designing more efficient and environmentally sound ones ;
- demonstrating the feasibility of biogas production and use in Indonesia and promoting development and use of new and renewable sources of energy.

22. United Nations Environment Programme, "The Niaga Wolof Energy Centre, Energy Report Series ERS-12-85, October 1984, 57 p. (e)

This is a report of a joint project between UNEP, the Ministry for Scientific and Technical Research, Rep. of Senegal and l'Agence Francaise pour la Maîtrise de l'Energie (AFME), to harness renewable sources of energy in Senegal. The only renewable sources of energy available are wind and solar energy because biomass (animal waste) is not possible as cattle are left to roam freely, thereby making the collection of manure impossible.

Harnessing NRSE is worthwhile because women and children have the burden of walking about 6 hours a day to collect firewood used for cooking, lighting and refrigeration, or, have to pay dearly for a cartload of wood. (Food is normally cooked 3 times a day).

23. United Nations Questionnaire to Governments, (Cuba, August 1983)
252 p. (s)

Conferencia Mundial para el examen y la evaluacion de los logros del decenio de las Naciones Unidas para la Mujer: Igualdad, Desarrollo y Paz, 1976-1985.

The questionnaire included Women and Energy among its many other themes relating to women and development throughout the UN Decade for Women. Cuba's answers provide an overview of the new energy projects and of the incorporation of women at all stages of their implementation. A descriptive list is given of ways in which programmes/projects were implemented to alleviate women's burden and improve their health and general economic status :

- electrification of rural areas
- increase of cooperatives
- manufacture of improved kerosene stoves
- increase in production of liquid gas
- construction of mini and micro hydro-electric stations
- construction of wind-mills
- dissemination of energy-saving equipment
- plan for creation of an energy culture among women.

24. United Nations University, "Food + Energy = Development", in
Work in Progress Periodical, Vol. 10, No. 1, October 1986. (e)

This issue of "Work in Progress" describes the inter-linkage of food and energy, known as "FEN" - "Food and Energy Nexus". Through case studies on the effect of the energy-food crisis on women, the article emphasizes their role and the positive impact on entire populations if any improvement is made on the work conditions of women.

25. Burley, Jeffrey, "La escasez de leña provoca cambios en el tenor
básico de vida de los campesinos pobres", UNU Newsletter, March
1983, Vol. 7, No. 1, pp. 4 (s)

This article underlines the crucial role firewood plays in the life of many peasants. Scarcity of this important source of energy provokes serious changes in dietary and traditional habits e.g. populations in certain parts of the world are forced to bury their dead instead of the traditional custom of cremation.

Another important point stressed in this article is that those people who are accustomed to having an abundant supply of firewood available "free of charge", fail to comprehend the consequences of its scarcity. As the only "cost" involved is that of collecting firewood; an onerous task performed by women and children.

To conclude, one of the most common errors committed during the identification and planning stages of rural forestry projects at the domestic or communal level, is to ignore the indigenous knowledge and techniques concerning trees. Also, there is an inability to perceive what are the costs and benefits for and the impact on the main people concerned in the use of forest products.

26. United Nations World Survey on the Role of Women in Development. Report of the Secretary-General, 11 December 1984 A/CONF.116/4, 243 p. (e)

Item 7 of the provisional agenda. World Conference to Review and Appraise the Achievements of the UN Decade for Women: Equality, Development and Peace. Nairobi, Kenya, 15-26 July 1985.

Women and Energy figure as an integral part of development in the World Survey. Description of different sources of energy used by women: animate energy, fuelwood, charcoal, kerosene, coal, petroleum and natural gas, nuclear, electricity, liquid fuels, biogas and solar energy. What features here is that women are the main users of energy but excluded from new technologies. In male-dominated energy spheres, women require greater access to education and training.

27. World Conference of the United Nations Decade for Women: Equality, Development and Peace. Copenhagen, Denmark, 14-30 July 1980. (A/CONF.94/19) (e,f,s)

Recommendations relating to women and development emerging from conferences held under the auspices of the United Nations or the specialized agencies. Item (b) of the provisional agenda.

At the request of the United Nations Department of International Economic and Social Affairs, Ingrid Palmer, undertook an assessment of the ways in which women's role in the development process was approached and analysed in 12 World Conferences held during the 1970s.

In the Habitat: United Nations Conference on Human Settlements, Vancouver, 31 May - 11 June 1976, under Recommendation C.5, it was mentioned that energy is to be used efficiently and conserved but it was not pointed out that women's hard work in carrying fuel and water and their labour-intensive cooking and washing methods, are already major sources of "energy" conservation. If intersectoral development is to be harmonious and all resources (including women's time and energy) allocated efficiently, a sophisticated design and allocation of energy points is required.

28. Report of the United Nations Conference on New and Renewable Sources of Energy, Nairobi, 10-21 August 1981, (A/CONF.100/11), (e,f,s)

A major emphasis was placed on the role NRSE could play in replacing the traditional forms of energy during the United Nations conference in 1981. The recognition of the role of women in developing new and renewable energy sources was highlighted throughout its duration. The Nairobi Programme of Action (NPA) indicates inter alia, that women are to be taken into account in every sphere of NRSE activity.

A general conclusion of the conference is that most forms of NRSE have greatest potential for small-scale decentralized use, especially in rural development, every aspect of which involves women.

29. Food and Agricultural Organization, "Current and Planned FAO Activities on New and Renewable Sources of Energy", (FAO, W/Q2380), 17 p. (e)

Prepared for the Meeting of the Intergovernmental Committee on the Development and Utilization of New and Renewable Sources of Energy, New York, 18-29 April 1983.

This is a description of FAO's activities in rural energy resources. It emphasizes that the use of commercial energy in agriculture was at present relatively small but of the utmost importance. The paper details the different new sources of energy and focuses on the training and involvement of women in fuelwood and solar cooking programmes.

30. Food and Agricultural Organization, "FAO's Activities in the Field of New and Renewable Sources of Energy (1984/1985), (FAO, Rome, 1985), 14 p. (e)

This is a report on FAO's mandate and activities in rural energy, within the framework of the Nairobi Programme of Action. They include :

- 1) Rural energy systems including assessment and planning;
- 2) Fuelwood and charcoal;
- 3) Biomass;
- 4) Modernization of draught animal power;
- 5) Solar energy;
- 6) Wind energy;
- 7) Household energy, including involvement of women in rural energy programmes.

The report details the various industrial and domestic uses of energy. Household energy focuses on women's involvement in the design, development and promotion of improved techniques for the utilization of new and renewable sources of energy in rural households; the main aim being to relieve women of time-consuming and arduous household tasks.

31. Food and Agricultural Organization, Forward-Looking Strategies - Women in Agricultural and Rural Development, (July 1984), 65 p. (e)

Mandates and Proposals of FAO for the 1985 World Conference to Review and Appraise the Achievements of the UN Decade for Women.

Inspired by the 1979 World Conference on Agrarian Reform and Rural Development (WCARRD), FAO continues to recognise that women's vital role in the socio-economic life in both agricultural and non-agricultural activities is a pre-requisite for successful rural development policies, planning and programme implementation.

In the area of Women and Forestry/Energy, it is recognised that women are the prime users of forestry products: fuelwood, wild foods and fodder. In fact, it is often only women who are involved in the case of fuelwood and minor forest products.

32. Food and Agricultural Organisation, "Women in Agriculture and Rural Development", Eighteenth FAO Regional Conference for Asia and the Pacific, (Colombo, Sri Lanka, 18-27 July 1986), 75 p, (e)

Despite the fact that there has been a growing awareness that women play a significant role in rural development in general, they are still referred to as the "Forgotten Farmers" by FAO. Reference is made to the difficulties encountered and time spent collecting fuel, whether because of distance or cost, which lead to hygiene and nutrition problems.

As women are the main users and producers of energy, they must participate in the evolution of National Energy Policies, Programmes and Projects.

33. Ahmad, Zubeida; Loutfi, Martha, Women Workers in Rural Development, (ILO, Geneva, 1982), 38 p. (e)

A report on women's work burden as against men's. Warns of the danger for food supplies if land were switched from food to fuel due to decisions of forces outside the control of the poor.

34. Cecelski, Elizabeth, "The Rural Energy Crisis, Women's Work and Family Welfare: Perspectives and Approaches to Action", (ILO, World Employment Programme Working Paper, 1984), 111p. (e)

Comprehensive study of the household energy problem as it relates to rural women's work, household basic needs, and rural development. Part I covers household labor allocation in fuel procurement and the effects of fuel shortages on household health and nutrition. The author points out that fuel shortages have a negative impact on women's ability to earn income, as well as on child care and family nutrition. The last part draws from the earlier findings to make policy recommendations for energy projects. Though long, this is the best document available on household energy.

35. Loutfi, Martha F., Rural Women - Unequal Partners in Development, (ILO, a WEP study, Geneva), 1981), 81 p, (e)

This monograph discusses the urgent need to include women in the development process at all levels. It focuses on several areas of development for women; energy being one. Women are reacting to the rising cost of energy and there is alarming information on nutritional declines as women have to resort to low-energy consuming foods. The study criticizes the futility of projects, all too often geared towards the wrong people.

36. International Labour Organization, Major Stages and Steps in Energy Manpower Analysis: A practical framework. (1986), 80 p. (e)

Describes efforts to promote integrated development in the energy sector in developing countries and points out to the skill restraints in this sector. The guidelines formulated by the ILO in the field of manpower, assessment and planning, would need to be applied, taking into account the specific needs of each country. The manual stresses the special requirements of the household sector and highlights the increasing burden of women in fuel collecting and cooking.

37. Bifani, Patricia; Adagala, Kavetsa; Kariuki, Priscilla W.; The Impact of Development on Women in Kenya: a methodological approach, (UNICEF, 1982), 118 p. (e)

This book constitutes a research project, combining research, action and training elements in a number of areas in Kenya, and is a follow-up to the Expert Meeting on Research and Data Collection on "Women and Development", held in Nairobi, 1978. The research data emphasizes that all problems related to cooking needs, energy, water, are clearly a woman's problem.