



REGIONAL WOOD ENERGY DEVELOPMENT PROGRAMME IN ASIA
GCP/RAS/154/NET



**PROCEEDINGS OF
THE NATIONAL WORKSHOP ON
WOOD-BASED ENERGY SYSTEMS
FOR RURAL INDUSTRIES
AND VILLAGE APPLICATIONS**

PESHAWAR, PAKISTAN

3-5 March 1996



**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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FOREWORD

Numerous rural industries in Asia use wood or other biomass as their main fuel. The same applies to various small-scale processing activities in villages. These industries and village applications play an important role in terms of local employment, provision of goods and services, and balanced rural development. For both economic and social reasons, the use of wood/biomass fuels cannot and will not change for many years to come, even when fossil fuels are gradually penetrating in rural centres. At the same time, it has been observed that many of these industries and applications face problems in making optimal use of their fuel resources. This situation holds true in Pakistan as much as in most other countries which are members of the Regional Wood Energy Development Programme in Asia.

Jointly with its member-countries, RWEDP has embarked upon a programme of identifying and assisting major traditionally woodfuel-using industries. Part of this programme is a series of national workshops on wood/biomass-based energy systems for rural industries and village applications. A national workshop was conducted in Peshawar, Pakistan on 3-5 March 1996, of which the present report gives an account.

RWEDP enjoys a long-standing cooperation with the Pakistan Council of Appropriate Technology, which took care of organizing the national workshop. Expert advice and inputs during the workshop were provided by Mr Auke Koopmans, Wood Energy Conservation Specialist of RWEDP. The workshop also benefited from presentations by experts and officials from national organizations in Pakistan.

The workshop has led to a number of important recommendations, which are included in the report. It is hoped that the results of the national workshop will help the actors concerned to further develop wood energy for the benefit of the many people who rely on it in Pakistan.

Dr W S Hulscher,
Chief Technical Adviser,
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Dr Shehryar Khan of PCAT (left) delivers his welcome address to the participants. Next to him are Prof. Farzand Ali Durrani of Peshawar University (centre) and Mr Auke Koopmans of the RWEDP



Participants in the national workshop, during the inaugural session

1. INTRODUCTION

1.1 Background

It is increasingly being recognized that in many parts of Asia, woodfuels, besides their widespread use in domestic cooking, space heating etc., are vital resources for numerous small-scale rural enterprises, village industries and other applications based in the village.

Despite their clear economic and socio-economic importance - they provide a good deal of employment in remote areas as well as supplementing unpredictable agricultural incomes - many of these rural industries and other activities are currently facing various constraints, such as inefficient process technologies, lack of raw materials, lack of investment capital, poor management and labour skills, etc. Shortages of wood and other biomass fuels, often compounded by the use of poor energy-conversion devices, can also have a serious impact, particularly in areas where switching to alternative fuels is not a viable option.

The regional consultation on biomass energy-based rural industries held in Hat Yai, Thailand in March 1990 recommended that a series of national workshops was needed in order to bring these critical issues to the attention of policy makers and national planners in the relevant fields, as well as to rural and agricultural development authorities and rural finance institutions. These workshops were to discuss issues related to biomass-based rural industries in the host country, and explore how to overcome problems at the country level.

The National Workshop on Wood-based Energy Systems for Rural Industries and Village Applications, in Peshawar, Pakistan on 3-5 March 1996, was the third of these workshops. Jointly organized by the Pakistan Council of Appropriate Technology and the Regional Wood Energy Development Programme (RWEDP) of the United Nations Food and Agriculture Organization, the workshop brought together 20 specialists in relevant fields from Pakistani governmental, non-governmental and academic organizations, along with Mr Auke Koopmans, the RWEDP's wood energy conservation specialist.

1.2 Structure of the Workshop

Participants in the workshop were registered on the morning of 3 March. After registration, the participants were welcomed to the workshop by Mr Shehryar Khan, the chairman of the Pakistan Council of Appropriate Technology. In his welcoming speech, Mr Khan highlighted the fact that woodfuel users in Pakistan were in a particularly vulnerable position, as the country had only five per cent forest cover, the smallest amount of forest cover in proportion to total land area of any country in the whole of South Asia. He added that population growth had put increased pressure on land and fuel resources, so worsening the problem. On the positive side, Mr Khan spoke of the various tree-planting and fuel-saving technology programmes launched in Pakistan in recent years, the latter by PCAT. PCAT's work could only succeed with the active involvement of specialists from other agencies and in a variety of fields, he said, and the present workshop was a means of achieving this cooperation.

The inaugural address was delivered by Prof. Farzand Ali Durrani, Vice-chancellor of Peshawar University. In his speech, Prof. Durrani pointed out that Pakistan's fuel resources were failing to meet ever-growing demand. He also spoke of the environmental destruction caused by the unbalanced and unsustainable harvesting of wood for fuel, including the severe impact on soil productivity. He



Mr Auke Koopmans of the RWEDP addresses the workshop

expressed confidence that the workshop would yield concrete suggestions to overcome the various problems of the fuel crisis and its effects on rural industries and village applications. He then declared the workshop open.

Prof. Durrani's speech was followed by the keynote address, delivered by Auke Koopmans of the FAO-RWEDP. Mr Koopmans observed that despite development efforts in many countries, including Pakistan, the rural poor in these countries often face increasing difficulties, which lead to large-scale migrations to urban areas. It has been acknowledged in

Pakistan's neighbour India that providing better income-generating opportunities in rural areas is cheaper than accommodating an influx of migrant workers in the cities. Improvements in the circumstances of rural industries would have the added benefit of contributing to increased employment opportunities in rural areas. They could also help farmers to obtain more income from their crops (through agroprocessing) and facilitate rural development through the production of building materials etc.

Mr Koopmans identified five important sectors which could usefully address the issues covered by the workshop: small industry, agriculture (as a possible provider of non-wood biomass fuels and beneficiary through agro-processing), energy (to provide a sustainable, environmentally friendly energy supply for these industries and applications), forestry (to provide a sustainable supply of forest products, particularly for use as fuel), and finance, both public and private (in order to provide capital and favourable financial environments for rural industries etc.). He called for attention to be paid to the development of inter-sectoral linkages, particularly involving the public sector. He also called for greater research into the use of what he called 'energy for now' - i.e. the traditional fuels that still account for over 50 per cent of total energy use in Pakistan - with a view to adjusting policy and possibly achieving greater balance in government investment, which is now heavily weighted towards the 'modern' energy sector. He acknowledged that Pakistan had a good database on this topic, from the 1991-92 Household Energy Strategy Study, but warned that this would need to be kept up to date as the situation was bound to change over time.

The RWEDP was pleased to note that the forestry sector in Pakistan had been emphasizing agro-forestry as a way of addressing several of the problems involved, particularly regarding supply, Mr Koopmans said. He added that an understanding of the mechanisms and systems involved in getting the fuelwood to the users was, however, equally important, highlighting the value of the woodfuel trade in economic and employment terms. Woodfuel-based industries consume less woodfuel than the domestic sector, but can still be considered major woodfuel consumers, he said. Mr Koopmans also pointed out that official figures for industrial fuelwood and other biomass consumption in Pakistan cover only the formal sector, but a broad-based study by Dr I A Qazi had estimated that the consumption figures were perhaps as much as three times higher.

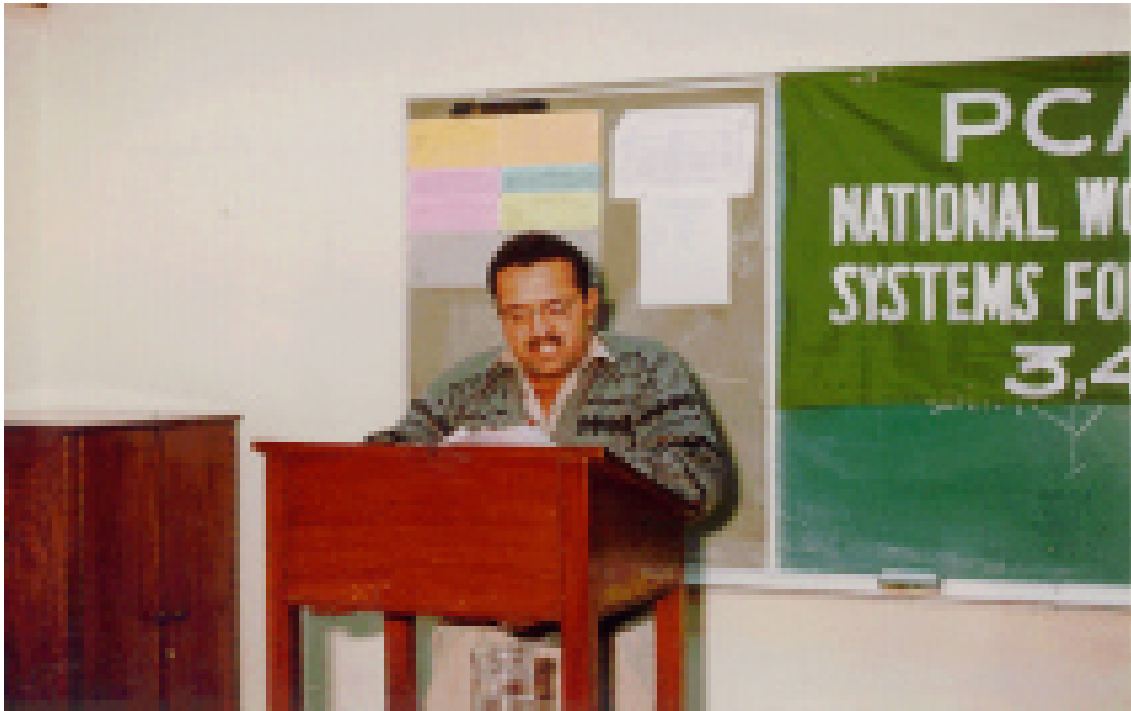
Finally, he gave two main questions identified by an earlier regional meeting on the same topic as the current workshop: what data does the government need in order to justify and then formulate policies and programmes for the development of wood energy in rural industries? and what policies and programmes should then be developed and how can this be achieved?



Participants in the Peshawar workshop



Dr K M Siddiqi of the Pakistan Forest Institute, Peshawar directs the concluding session of the workshop



Dr Habib Gul (above) and Dr M Jamil Mehar (below) present their papers to the workshop



After a vote of thanks, the first session, chaired by Mr Abdul Rashid Khan of the Ministry of Science and Technology, got underway. Prof. M Nawab Khan presented an overview of the fuelwood situation in Pakistan. This was followed by a paper on 'Wood Energy Economy and Resource Development', delivered by Dr M Jalil Mehar, and a presentation on the design and dissemination of economical wood-burning stoves by Prof I H Shah.

Session II, chaired by Prof Shah, started after lunch, and saw another three papers being presented: 'The Role of Wood/biomass Energy-based Rural Industries in the National Economy', by Dr M Khalid Farooq; 'Wood Energy and Resource Development', by Arbab Abdul Wakil; and 'Forests and Wood/biomass Energy-based Rural Industries in the North West Frontier Province (NWFP) of Pakistan', by Dr Habib Gul. The workshop was then adjourned until the following day.

Session III, taking up the morning of March 4, was chaired by Dr K M Siddiqui. Three papers were presented: 'Technology Transfer and Dissemination of Information for Promoting Wood-based Energy Systems for Rural Industries and Village Applications', by Hasan Mehdi Naqvi; 'Supply and Demand of Fuelwood', by Rauf Ahmed; and 'Wood Energy Planning and Resource Development', by Ghulam Umar Sarhandi. These were followed by a video presentation by Mr Pasha Mir on the SUNGI Development Foundation. The afternoon was taken up with general discussions of various topics related to wood energy in Pakistan.

The morning of the third day, March 5, was spent drafting and finalizing the workshop's conclusions and recommendations, after which the workshop was officially closed. In the afternoon, the participants visited the Pakistan Forest Institute.

2. OUTCOMES

2.1 Major Biomass Using Industries and Activities

During the three days of deliberations, and realizing the importance of wood-based energy systems to local as well as national economies, the participants of the workshop identified the following rural industries and village applications which constitute a major share of wood/biomass energy demand:

Rural Industries

1. Tobacco curing;
2. Gur making;
3. Blacksmithing;
4. Lime manufacture;
5. Pottery;
6. Small-scale brick kilns;
7. *Khoya* (milk product) production;
8. Dying of wool yarn carpet, and clothes and washing;
9. Road tarring;
10. Rural bakeries;

Village Applications

11. Animal fat processing;
12. Date processing;
13. Popcorn making;
14. *Masjid hamam* (baths);
15. *Hamam* in barber shops;
16. Village hotels and restaurants;
17. Social ceremonies such as marriage feasts;
18. Sweetmeat preparation;
19. Timber curing;
20. Household food processing;

However, in view of a lack of sufficient data on the number, size and location of the industries and village applications, rather than on specific energy consumption, it was difficult to establish the total amount of wood/biomass energy consumed and the location of demand.

2.2 Issues

The issues/problems identified can be broadly categorized as follows:

Social

- Collection of wood and participation of women and children;
- Ownership rights in community (also known as *guzara* or *shamalat*) forests;
- Lack of information on wood marketing and trade, including the rates charged by the middlemen; and
- Involvement of communities/NGOs/CBOs in protection of forests.

Institutional

- Insufficient availability of reliable data base;
- Lack of adequate interaction among the relevant institutions/organizations;
- Lack of dissemination strategy;
- Lack of trained/skilled manpower;
- Lack of information on wood marketing and trade, including the role of the middle man; and
- Lack of coordination between the private sector and government agencies.

Technological

- Inadequate availability of modern technologies for wood-based energy systems, i.e. low conversion efficiency of appliances/processes;
- Lack of information on existing technologies; and
- Lack of accessibility for industries to new technologies and agencies involved.

Environmental

- Emission of smoke and related health hazards; and
- Working conditions.

Financial

- Lack of awareness among financial institutions/credit agencies to support tree-growing activities/programmes;
- Lack of justification for financial resources being spent on development of wood and wood-based energy systems in the Public-sector Development Programme/Social Action Programme of the federal/local governments for tree-growing activities; and
- Lack of incentivization by governments (federal/provincial/local) to encourage efficient utilization of wood and wood-based rural energy systems.

2.3 Supply of Wood/biomass Sources of Energy

From the papers presented during the workshop, and the discussions held, the sources of supply of wood and biomass in Pakistan can be broadly attributed to the following sources:

Supply

- Private forests and farmland;
- Community forests (this includes those lands which have been earmarked as a common resource/endowment for use by the inhabitants of those specific areas but not for commercial timber forestry);
- Government forests; and
- Biomass and agro/forest residues.

Although once again reliable data are lacking, it appears that government forests supply about 10 per cent of all woodfuels consumed in the country, and the rest are obtained from other sources.

2.4 Recommendations

1. There is insufficient reliable data available with regard to rural energy industries and village applications. Measures need to be taken for collection of data on the subject, with the participation of GOs, NGOs and CBOs.
2. There is no coordination on wood-based energy systems and technologies between different government agencies or between government agencies and the private sector. There should be an organization which acts as a catalyst among the above agencies to establish close collaboration.
3. Availability of modern technologies for wood-based energy systems is inadequate. The relevant R&D agencies should be provided with sufficient funds for making modifications in existing practices with regard to efficient collection and use of wood fuels.
4. The role of the middleman in the fuelwood marketing process should be eliminated or reduced so as to provide an opportunity for the wood collector to get a better price for his product.
5. The Government should pay proper attention to arranging alternative sources of energy and substitute fuels, such as solar and microhydro power.
6. There is a need to raise awareness among the people with regard to the effects of smoke and consequent health hazards caused by inefficient use of fuel devices. The Government should make use of the mass media to improve the situation.
7. The Government should advise financial institutions and credit agencies to support rural wood-based industries by providing credit facilities on soft terms.
8. The *Energy Yearbook* published annually by the Ministry of Petroleum and Natural Resources has stopped including wood energy sources/biofuel among the other energy resources such as fossil and mineral fuels. The concerned agencies may be directed to obtain necessary data on wood/biomass energy supplies and consumption from the Ministry of Environment and Urban Affairs for inclusion in the *Yearbook*, as a large part of energy demand is met by woodfuels.

9. The data collected about wood energy-based industries and village applications by Mr I A Kazi (Chief Conservator of Forests, Punjab, retd) in 1989 needs to be updated. There is also a need to arrange a survey of rural wood energy-based industries and village applications. In this regard, the Government of Pakistan and international agencies such the FAO/RWEDP should provide financial and technical support.



A woodfuel depot in Peshawar



A wood-fired brick kiln near Peshawar

LIST OF PAPERS PRESENTED

'Wood Energy Economy and Resource Development', by M. Jamil Mehar, PCAT, Islamabad

'Fuelwood Conservation: The Economical Wood-burning Stove, Its Design and Dissemination', by Prof I H Shah, retired professor of mechanical engineering, NFWP University of Engineering and Technology, Peshawar

'Forests and Wood/Biomass Energy-based Rural Industries of Northwest Frontier Province (NWFP) of Pakistan', by Dr Habib Gul, PCAT, Islamabad

'An Overview of the Fuelwood Energy Crisis in Pakistan', by Professor Mohammad Nawab Khan, NWFP University of Agriculture, Peshawar

'Supply and Demand of Fuelwood', by Rauf Ahmad, PCAT, Islamabad

'The Role of Wood/Biomass Energy-based Rural Industries in National Economy', by Dr M Khalid Farooq, PCSIR Laboratory Complex, Lahore

'Technology Transfer and Dissemination of Information for Promoting Wood-based Energy Systems for Rural Industries and Village Applications', by Hasan Mehdi Naqvi, Pakistan Academy for Rural Development, Peshawar

'Wood Energy Planning and Resource Development', by Ghulam Umar Sarhandi, PCAT, Islamabad

'Wood Energy Economy and Resources Development', by Arbab Aabdul Wakil, Principal Technical Officer, PCSIR Laboratories, Peshawar

Full texts of these papers can be obtained on request from the RWEDP.

LIST OF PARTICIPANTS

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PROGRAMME OF THE WORKSHOP

3 March

- 09.00-10.00 Registration
- 10.00-10.15 Welcome Address, by Mr Shehryar Khan, Chairman, Pakistan Council of Appropriate Technology (PACT)
- 10.15-10.30 Inaugural Address, by Dr Farzand Ali Durrani, Vice Chancellor, Peshawar University, on behalf of Dr S M Qureshi, Secretary, Ministry of Science and Technology, Government of Pakistan
- 10.30-10.45 Keynote Address, by Mr Auke Koopmans, Wood Energy Conservation Specialist, FAO-Regional Wood Energy Development Programme, Bangkok
- 10.45-10.50 Vote of Thanks
- 10.50-11.15 Refreshments
- 11.15-13.00 Session I. Chairman: Mr Abdul Rashid, Ministry of Science and Technology
- 'An Overview of the Fuelwood Energy Crisis in Pakistan', Prof. M Nawab Khan
- 'Wood Energy Economy and Resource Development', Dr M Jalil Mehar
- 'Fuelwood Conservation: Economical Wood-burning Stoves: Their Design and Dissemination', Prof. I H Shah
- 13.00-14.00 Lunch
- 14.00-16.00 Session II. Chairman: Prof. I H Shah
- 'Role of Wood/biomass Energy-based Rural Industries in the National Economy', Dr M Khalid Farooq
- 'Wood Energy and Resource Development', Arbab Abdul Wakil
- 'Forests and Wood/biomass Energy-based Rural Industries of North-west Frontier Province (NWFP) of Pakistan', Dr Habib Gul

4 March

- 09.30-11.00 Session III. Chairman: Dr K M Siddiqui
- 'Technology Transfer and Dissemination of Information from Promoting Wood-based Energy Systems for Rural Industries and Village Applications', Mr Hasan Mehdi Naqvi
- 'Supply and Demand of Fuelwood', Mr Rauf Ahmad

- 11.00-11.30 Tea break
- 11.30-13.00 Session III continued
- 'Wood Energy Planning and Resource Development', Mr G U Sarhandi
- Video presentation on the SUNGI Development Foundation, Mr Pasha Mir
- 13.00-14.00 Lunch
- 14.00-16.00 General discussions

5 March

- 09.00-11.00 Drafting of conclusions and recommendations
- 11.00-11.15 Tea break
- 11.15-12.30 Adjustment of conclusions and recommendations
- 12.30-13.00 Closing
- 13.00-14.00 Lunch
- 14.00-16.00 Field Visit to the Pakistan Forest Institute, Peshawar.

