

PART I

**OVERVIEW OF URBAN AND PERI-URBAN FORESTRY
AND WOOD ENERGY IN DEVELOPING COUNTRIES**

1 Introduction

1.1 BACKGROUND

The new millennium has been defined as the "urban millennium" (Box 1). The rapid growth in urban development is slowing down in the industrialized countries of North America, Europe and Oceania while there is a contemporary tremendous increase in the urban population of developing countries and countries in transition in Latin America, Africa and Asia (Figure 2).

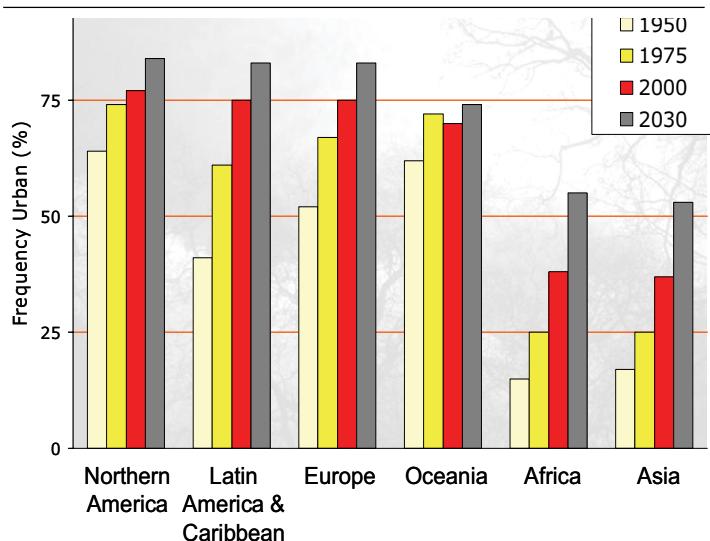
The origin of the new urbanized society is often linked to a desperate search for a basic livelihood by people coming from poverty conditions, who frequently lose the sense of "dwellership and social identity" in the harsh and inhospitable conditions of the growing cities. To date, urbanization and poverty have often been twinned words: over the last 20 years the world population living below the poverty line in urban areas has increased from 47 to 64 percent. Access to food and fuelwood for basic survival is increasingly becoming a prior concern for the governance of future cities and particularly in peripheral zones or neglected centres where the concentration of poverty is higher.

Woodfuel consumption statistics provide an indication, if not evidence, of the growth of urban woodfuel demand, especially charcoal, associated with rapid urbanization, as compared with a general decrease in the use of fuelwood. The *Global Forest Products Outlook Study* (GFPOS) (FAO, 2001a), estimated that globally, the total woodfuel consumption of charcoal increased from 9 percent in 1980 to 15 percent in 2000 and is expected to increase further to 23 percent in 2030. In Africa, where the link between urbanization and the shift from fuelwood to charcoal is greater, charcoal consumption increased from 18 percent in 1980 to 24 percent in 2000 and will increase to 34 percent in 2030. This is a substantial increase, considering that fuelwood consumption is estimated to grow as well, although at a slower rate. The shift from fuelwood to charcoal consumption, which is probably the most relevant change resulting from the process of urbanization in tropical developing countries, brings significant risks but also promising opportunities for the environment and for the sustainable development of the regions and communities involved in charcoal production. It implies a greater impact on supply sources as a result of the energy lost in the carbonization process and the fact that charcoal is produced almost exclusively from natural forests and woodlands, while fuelwood is often a by-product of farming systems. It offers opportunities of income and employment to communities involved in the production of charcoal located far upstream.

Urban forestry has often been seen as an important opportunity to better the quality of life of urban dwellers by providing a wide set of social, economic, ecological, health and psychological benefits. According to the definition given by Miller (1997), the urban forest can be intended as "the sum of all woody and associated vegetation in and around dense human settlements, ranging from small communities in rural settings to metropolitan regions". Urban forestry is the whole of disciplines, styles and techniques dealing with the sustainable management, design and planning of urban forests and trees. It includes the ecological, social and economic aspects characterizing cities and their ecosystems, and also concerns the impact generated by urban societies on trees and forests.

The consumption of woodfuels (fuelwood and charcoal) by growing cities in many developing countries has

FIGURE 2
Percentage of urban dwellers in the total population from 1950 to those forecasted in 2030 (source: UN)



an impact on land much further away from the city borders, influencing the type of use and management of wood resources. This impact concerns trees and forests that are sources of woodfuels as well as communities directly or indirectly involved in woodfuel production, whose economic, social and behavioural character is often shaped and affected by urban influence.

BOX 1

The urban revolution

The city is a great success of human beings: it comprehends the highest knowledge in a physical landscape having an extraordinary complexity, power and splendour and, in parallel, summarizes social forces carrying the capacity of the most amazing sociotechnological and political innovation. But the city is also the place of the squalid existential failure, lightning rod of desperate dissatisfaction, arena of political and social conflicts (Harvey, 1989). As quoted by Ponting, 1991 (in Konijnendijk *et al.*, 1993), Thoreau considered cities to be places where "millions of people are feeling lonely together", while others have praised cities as centres of better life innovation and learning, transmitting accumulated knowledge on which future achievements can be built (Girardet, 1992).

In geographic and economic terms, the concept of "city" refers to a place of relatively dense settlement – so dense that city residents cannot grow their own food or provide entirely for their requirements in resources and facilities. In ecological terms, it is not a self-sufficient system and is highly dominated, in space and time, by the human population. A city population, therefore, is always dependent upon its "hinterlands" to provide it with food and resources: the external energy supply is a key factor in the survival and development of the city.

At the turn of the millennium more than half of the world's population lives in cities and towns, or in growing dense settlements, and are thus classified as "urbanized"; and this figure is increasing rapidly.

During the 1990s, despite a reduced growth in metropolitan areas in developed countries, it appeared dramatically clear that urbanization had become a worldwide phenomenon, particularly with regard to traditionally rural societies. The concentration of people in urban settings reached extremely high percentages in the second half of the twentieth century: by 1950, more than 50 percent of the population of northern America, Europe and Oceania were urban and in 2000 this figure had reached about 75 percent of the total population (Figure 2). But the rapid growth in urban development is slowing down in these parts of the world, while there is a contemporary tremendous increase in the urban population of developing countries and countries in transition. The implications of global urban development are much more than a simple concentration of people in cities. Urbanization is a process that has physical and geographic implications, as well as social, cultural, behavioural and psychological impacts. Urbanization of consciousness and lifestyle is foreseen as a keystone of the urban millennium (Kuchelmeister, 1998).

Urbanized settings in developing countries are expected to represent at least 90 percent of forecasted world population growth according to projections towards 2030. The most explosive urban growth is expected in Africa and Asia; the latter will have the largest urban population in the world (UN, 2004).

1.1.1 Urban wood energy in the international agenda

Many factors converge in making sustainable and affordable energy a key component and a viable opportunity in the struggle towards the achievement of the Millennium Development Goals (MDGs). Although the sustainable access to energy is not treated as a priority in itself in the MDGs, most of them have a direct energy implication, particularly Goal 1 (Eradicate extreme poverty and hunger) and Goal 7 (Ensure environmental sustainability) (Box 2).

Specific reference to bioenergy was made at the 2002 World Summit on Sustainable Development (WSSD), where energy was high on the agenda. According to the WSSD Johannesburg Declaration, energy must be considered a human need on a par with other basic needs (clean water, sanitation, shelter, health care, food security and biodiversity) (Box 3).

There is a deeply rooted interrelation between poverty, access to energy and environmental sustainability.

Urban wood energy is a key aspect also for the United Nations Human Settlement Programme (UN-Habitat). Specific initiatives that may benefit from the implementation of in-depth studies on sustainable urban wood energy systems are the following.

BOX 2

Millennium Development Goals

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

- The Sustainable Cities Programme (SCP), which is a joint UN-Habitat/United Nations Environment Programme (UNEP) facility established in the early 1990s to build capacities in urban environmental planning and management. The programme targets urban local authorities and their partners. It is founded on broad-based stakeholder participatory approaches.
- Local Agenda 21, which is a capacity-building programme that started in 1995 as a response to Chapter 28 of Agenda 21 whereby local authorities are called upon to undertake participatory processes to develop and implement "Local Agendas 21" for and with their communities. The Programme offers multiyear support to local authorities and their partners to undertake Local Agenda 21 processes in order to contribute locally to the implementation of Agenda 21 and the Habitat Agenda. Programme support specifically targets secondary cities that often lack capacities and are usually forgotten by international support programmes.

BOX 3

WSSD Plan of Implementation

The World Summit on Sustainable Development (WSSD) in Johannesburg specifically addressed the wood energy issue in several parts of the WSSD Plan of Implementation (PI), emphasizing that "access to energy facilitates the eradication of poverty". The pertinent PI paragraphs are the following.

Chapter II (Poverty eradication)

Para. 9(b) Improve accesses to modern biomass technologies and fuelwood sources and supplies and commercialize biomass operations, including the use of agricultural residues, in rural areas and where such practices are sustainable.

Para. 9(c) Promote a sustainable use of biomass and, as appropriate, other renewable energies through improvement of current patterns of use, such as management of resources, more efficient use of fuelwood and new or improved products and technologies.

Para. 20(g) Develop and utilize indigenous energy sources and infrastructures for various local uses and promote rural community participation.

Chapter IV (Protecting and managing the natural resource base of economic and social development)

Para. 45 "Forests and trees cover nearly one-third of the Earth's surface. Sustainable forest management of both natural and planted forests and for timber and non-timber products is essential to achieving sustainable development as well as a critical means to eradicate poverty, significantly reduce deforestation, halt the loss of forest biodiversity and land and resource degradation and improve food security and access to safe drinking-water and affordable energy."

Avoiding deforestation and forest degradation derived from unsustainable woodfuel production, promoting renewable energy systems and reducing fossil fuels share are all effects of sustainable urban wood energy systems that contribute to the reduction of greenhouse gas emission and to climate change mitigation measures. As such, they actively contribute to the achievement of the objectives of the United Nations Framework Convention on Climate Change (UNFCCC).

1.2 RATIONALE AND OBJECTIVES

In countries where the use of woodfuels remains an important source of household energy for poor urban dwellers, it is essential to develop information bases and planning tools adapted to the sustainable management of urban woody biomass demand and supply. The issues at stake are numerous and include the following.

- A growing number of poor urban and peri-urban dwellers need access to basic energy services (and there is often no short-term alternative to traditional biofuels).
- The proper valuation of woody biomass resources economically accessible to urban markets can offer viable alternatives for sustainable resource management and clean and affordable energy options. It can also benefit poor upstream communities with employment and income.
- Appropriate land management can play a significant role in the urban wood energy issue in terms of woodfuel production, social consciousness and institutional and community capacity building.
- Policy-makers need well-adapted information bases and planning tools for the definition of possible policy alternatives.
- Analytical and planning tools exist for specific energy, forestry or urban planning aspects but methodologies integrating all these aspects are rare. The WISDOM methodology, which combines

forestry and energy aspects, may effectively support urban wood energy planning, if suitably reviewed and adapted to the urban perspective.

The WISDOM methodology has been applied to date in national and subregional contexts (Mexico, Slovenia and Senegal; in East-Central Africa and Southeast Asia), proving its adaptability to diverse data and policy priorities. In the Southeast Asian study the analysis included poverty indicators, which enabled priority areas to be identified and communities to be targeted with regard to woodfuel scarcity and poverty. Follow-up actions to the WISDOM case studies are summarized in Box 4. The WISDOM approach, based on the spatial and statistical data already produced, can be further refined to focus on the urban wood energy demand and its influence (negative and positive) on communities and land resources within its supply area.

BOX 4

Follow-up actions to WISDOM case studies

Mexico. The results of the Mexico study – in terms of the identification of priority areas or fuelwood “hot spots” – have been incorporated into the projects of the National Forestry Commission, which plans to launch a programme of efficient wood stoves and multipurpose energy plantations directed at those areas.

Slovenia. Follow-up actions included i) the development of a tailored WISDOM analysis for five municipalities interested in developing pellet production and district heating systems in their territory; ii) the definition of a proposed national wood energy strategy in the context of the National Forestry Programme and the National Programme for Rural Development; and iii) the preparation of the Slovenian Wood Biomass internet portal to guarantee easy access to state-of-the-art information on all aspects of wood energy in the country.

Senegal. In the framework of the “Systèmes d’information énergétiques – SIE-Afrique” project, supported by the Institute de l’energie et de l’environnement de la francophonie, the case study contributed to an analysis of the wood energy component for Senegal. An updated WISDOM analysis for the country is foreseen as soon as the ongoing consumption survey is completed.

The recent WISDOM studies for East Africa (2005) and Southeast Asia (2006) contributed to regional biomass assessment and wood energy outlook and to the Poverty Mapping Project. The analysis of urban woodsheds presented in Chapter 4 may be considered the first follow-up to these studies.

The general objective of this paper is to contribute to the identification and development of tools and analytical methods supporting policy-makers and planners in the formulation of urban wood energy strategies and operational planning. Primarily, the analytical approach is focused on methods to assess the relationship between wood energy (needs, consumption and supply) and the management of forest and tree cover in and around cities, with attention to poverty alleviation in the urban and rural context. The aim is also to reduce the negative effects of irrational fuelwood and charcoal production around cities.

The major immediate objectives of this paper are i) to review and adapt the WISDOM methodology to in-depth studies aiming at supporting woodfuel management in the urban forestry context and poverty alleviation initiatives; and ii) to conduct preliminary analyses in selected locations in East-Central Africa and Southeast Asia.

A correlated objective is to highlight the potential contribution of urban and peri-urban forestry, as a multisectoral and transdisciplinary approach, to wood energy issues in cities.