

2.3 Urban Forestry



Urban forestry starts in a nursery.

(Picture: René van Veenhuizen)

State-of the Art on Urban Forestry

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1. Concept and Definition

Urban forestry (UF) has at least three roots: (i) urban green management in Europe, (ii) forestry in North America and (iii) urban agriculture in developing countries.

Worldwide, policy decision makers and citizens are increasingly recognizing, articulating and investing in the urban forests as a vital component of the urban landscape, infrastructure and quality of life. Significant progress has been achieved in UF research and development through concerted interdisciplinary efforts in industrialized countries. Multipurpose urban forestry in developing countries is still in its infancy. There is an urgent need to allocate more resources to this area, especially for global, regional and national networking and in particular with a focus on poverty alleviation related UF issues.

Urban forestry, a term used probably for the first time in the 1970s in the United States, is still a developing discipline. UF has at least three roots. The most influential one has been the multidisciplinary approach, developed in North America, but strongly rooted in the European tradition of urban green management. In many European cities, the term UF is still related to urban woodlands only.

Present trends suggest that urban forestry and urban greening approaches are merging worldwide, and the terms are frequently used interchangeably. The latest impetus of UF comes from urban agriculture initiatives in development cooperation. Definitions of urban agriculture include forestry and even all urban vegetation.

In industrialized countries it is common that community and urban forestry are used as a twin terms, whereas community forestry (social forestry) is associated with rural development forestry in development cooperation.

While urban agriculture is still struggling for its identity, especially in conceptualising its distinctive urban (ecosystem) feature, urban forestry has a longer tradition as a holistic, multi- and interdisciplinary approach to urban ecosystem management. This extends beyond traditional boundaries (sectoralism) like single tree management/horticulture (arboriculture) and forestry and management of larger green areas (including parks). Today, specialists from (urban/regional) planning, horticulture, forestry, landscape architecture, (landscape) ecology, plant pathology, sociology, psychology, political sciences, agroforestry, etc. work together within urban forestry.

For the general public it would be best to use the term **urban greening** as a comprehensive term, comprising all urban vegetation management (green spaces or urban vegetated areas) including farming and forestry.

The broadest **urban forestry definitions** regard UF as the entire area influenced by the urban population. The question whether the urban forest should extend beyond the edge of urbanized areas is problematic. There have been liberal interpretations of the distance over which urban activities influence forests, but these do not justify the application of a new label to forests which can be understood and managed using accepted concepts and methods. Therefore, UF has, in a more restricted sense, to focus on planting and management of all sites for urban trees and shrubs and related vegetation. All these woody perennials, and how they are embedded and interact together with the urban ecosystem, form a unified resource, i.e. **the urban forest**. This resource can be broken down into various tree categories including garden and farm trees; street, parks and open space trees; woodlands on vacant and derelict land as well as trees and woodlands along rivers.

Also, regional urban parks and other forest resources within the urban fringe or periurban areas of densely populated areas are an integral part of the urban forest resource. In addition to trees, shrubs and other resources that make up the rural forest, the urban forest also includes many other elements that the forester has to work with, that are not generally encountered in rural forests like utilities, streets, new developments and high population pressure.

UF also addresses the urban-rural interface, i.e. the transitional zone in which land uses begin to change from urban use associated with land development, to more agricultural or rural forestry land uses. In industrialized countries, models for the rural-urban continuum have been worked out. In developing countries there is much conceptual scope for improvement.

In brief: Urban forestry is a modern urban ecosystem approach of urban tree management encompassing long-term planning, interdisciplinary professional coordination and local participation. The aim of UF is to secure the health and vitality of the urban forest resources, and, therefore, the sustained delivery of benefits for both current and future generations of urban dwellers. UF is an approach to make trees compatible and functional in an urban environment (urban ecosystem). Hence, the main focus of UF has to be on the portion of the forest found within the built environment.

In industrialized countries UF has focused on amenities and environmental benefits. In poorer countries there seems to be a consensus among development circles that UF must initially focus on meeting immediate needs for basic necessities and this can be best achieved by multiple resource use.

2. The Urban Forest Resource

Resource base

There is a dearth of information about urban forest resources in developing countries. Even in highly industrialized countries comprehensive information on vegetation in cities is lacking: due to different definitions and mandates only part of the urban forest has been assessed (e.g. street trees, public resources).

The current discussion on criteria and indicators for urban quality and sustainable human settlements pay insufficient attention to urban forests. Vice versa, the development debate on sustainable forest management hardly discusses urban forests. Some models of urban forest

Urban Forestry

sustainability considering vegetation resource, community framework and resource management, have been developed in industrialized countries. For poor neighbourhoods simple and inexpensive indicators still have to be tested.

Benefits

Urban forests can improve the quality of urban life and livelihood in many ways, providing both tangible (e.g. food, energy, timber, fodder) and less tangible environmental and societal benefits and services. Evidence suggests that urban forest resources can play an active role in providing goods and services to alleviate poverty, improve livelihoods, and enhance well-being in developing countries.

Tangible benefits

Many urban trees suitable for resource-poor settlements provide **food**, particularly fruits, but also edible leaves, shoots and even flowers. Urban forestry practices improving food security of poor people include the collection of wild edible plants, planting of low-care fruit bearing street trees, including a gardening component, in multifunctional parks or creating edible public parks, laws enforcing that a proportion of new housing schemes is allocated to fruit trees. Food from trees in private agroforestry gardens or allocated plots in public gardens can contribute significantly to food security in developing countries. Yet it is the least documented. In arid and semi-arid areas, it is a common urban forestry practice to establish windbreaks to protect agricultural land and enhance the productivity of the land.

Many forestry development projects have been dealing with urban **wood energy** (woodfuel) issues. However, supply and demand of wood energy in urban areas is not understood as thoroughly as in rural areas. Intensive research in the 90s showed that woodfuel can be beneficial for the global climate (carbon-neutral); the energy safety net of urban poor is increasingly scarce and worse than rural people; thus they spend a significant proportion of their income or time in securing woodfuel. Inexpensive charcoal is as close as many households in poor neighbourhoods will come to modern fuels. Variation in woodfuel collection depends on forest cover, population density, availability and stability of alternative sources of energy, cash income, etc. With the increase in numbers of urban poor, woodfuel will remain a burning issue.

Good urban practices include **timber** harvesting combined with intensive outdoor recreation activities. Systematic planting of street trees for timber production can offset the costs of tree care through harvesting of trees. Timber production from urban forests has not been optimised due to a mix of ignorance, tenure insecurity and deficits in technical know-how. Periurban (timber) plantations are the most recognized urban forestry practice in development cooperation.

The dependence of people on **non-wood (non-timber) forest products** is also not well understood. Dependence of people in periurban areas and smaller settlements is more obvious.

Shelter

Organic materials are still widely used in urban areas in poor neighbourhoods. Adequate supply of bamboo and other timber seems a problem for a significant and growing number of households. The problem is most severe in arid areas and the vicinity of cities.

Environmental services

Today the main focus of attention in urban forestry is on environmental services. Measuring environmental urban forest benefits and translating these into monetary value in North America has greatly contributed to a situation in which policy makers and citizens appreciate more the value of the urban forest.

Concern about global warming has facilitated the dissemination of in-depth knowledge about the functions of urban trees in microclimates, air quality improvement and carbon dioxide reduction in industrialized countries, especially in North America.

Since urban trees reduce the need to burn fossil energy, they are a more important investment for green house mitigation than rural trees. The energy saving potential (from lower air condition requirements) of an urban tree is up to fifteen times higher than the benefit of a rural tree, although the role in global sequestration is limited. Enhancing carbon sequestration through carbon forests is appreciated by urban initiatives. For instance, ICLEI (The International Centre for Local Environmental Initiatives) is currently recommending "carbon" trading in cities.

Energy conserving landscaping by strategically planting trees can maintain comfort without air conditioning, but has hardly systematically been incorporated in housing projects in resource-poor settlements.

The benefits of urban forests for the protection of urban water supplies, wastewater treatment systems and storm water management is increasingly being articulated, especially in semi-arid and arid zones and periurban areas. Protection of the suburban and rural areas that serve as the source of the cities' water is a traditional urban forestry linkage. Yet there is much scope for integration into urban planning. The link between urban faucets and rural watersheds is increasingly obvious, but few forest services have developed a comprehensive forest plan and compensation or service fees for managing the land for high quality of water and other watershed values.

In many countries it is popular custom to reclaim unused and degraded land and terminated landfill sites through afforestation and to convert these to parks. Basic research on the potential for woodland established on landfill sites demonstrated that trees could be grown successfully on capped landfills without endangering cap integrity, provided that appropriate restoration and silvicultural procedures are adopted.

Urban forests have a vital role in **nature conservation** (e.g. older gardens and parks, periurban agroforests, botanical gardens, wetlands, protected zones). Incorporating urban forests in networks improves biological conservation and biodiversity. Greenbelts and greenways (linear parks) can serve as biological corridors, reconnecting a city to its

surrounding bioregion. Yet, the global discussion on biodiversity and forestry does not have a special urban theme.

Societal benefits

Forest related activities and urban agroforestry practices can be labour intensive and can provide work opportunities. This may be especially important for livelihoods and survival strategies of the very poor. No comprehensive study on work opportunities in developing countries has been conducted. In wealthier countries the green (arboricultural) industry is a well-documented and significant business.

Urban forests are increasingly appreciated in environmental **education** for urban dwellers, and are part of environmental education worldwide.

It is obvious that urban forests greatly enhance outdoor **recreation**. Lower income residents tend to frequent city parks more than wealthier citizens, yet the per capita green area is much lower. Only very few cities have delivered plans to increase green space in low-income quarters. Recreation for poor neighbourhoods must be based on recreation values of the poor, offer affordable access, and combine recreation with other urban functions.

With growing policy attention to the social values of urban trees, more studies aim to identify public values and preferences related to the recreative use of urban forests.

Some research in North America has indicated that public involvement in UF can help strengthen **community cohesion** of neighbourhoods by providing people with an opportunity to work together for the benefit of the local environment. It is also a well-known fact in industrialized and transitional countries that urban forest results in increased property value and can attract new businesses and investors.

Outside North America, only very few studies have investigated the psychological and health aspects of urban forests and trees. Attention to the health values of urban trees has recently increased.

3. Research and Development

Status

Urban forestry research has been advancing rapidly in North America through concerted and coordinated actions, particularly through the efforts of the International Society of Arboriculture, the Society of American Foresters and the USDA Forest Service, and non-profit-organizations.

In Europe, urban forestry research is still very fragmented. The Tree Route Network (TRN) dealing with "Research on Urban Trees in Europe" which aims to establish urban forests and urban trees as a scientific domain in Europe, has facilitated much cooperation and coordination in Europe. In developing countries urban forestry is still in its infancy and is strongly oriented towards the style of industrialized countries.

Urban Forestry

In Europe and developing countries, multiple-country research overviews have mostly been anecdotal or limited in scope, covering for example only parts of the urban forest resource (street trees, urban woodlands) or structural human interference (planning, selection, establishment or management). Traditionally, studies on urban forests are limited to applied, small-scale research at the municipal level.

Coordination at the national level, often enhanced by regular national conferences (e.g. Brazil, Ireland, China, Thailand, United Kingdom and USA) is an exception.

Developing countries: UF-related activities are evolving rapidly in developing countries. However, little technology transfer, research and information exchange occur.

Urban agriculture development initiatives take urban forestry into consideration, particularly with regard to agroforestry activities. Many urban development projects include an urban forestry component, yet forestry is hardly on the urban development agenda.

Among donor agencies the Inter-American Development Bank has made the biggest efforts in the development of integrated urban greening. A few initiatives, such as the TREE CITY Initiative, focus on poor settlements in developing countries. FAO has done pioneer work on UF by launching a program on urban and periurban forestry as long ago as 1993. Some city-to-city cooperation (North-South, South-South) has included urban forestry activities. RUAF (Resource Centre for Urban Agriculture and Forestry), a new urban agricultural resource centre has even the term forestry in its acronym.

Multipurpose urban forestry research is in its infancy in developing countries. Most information on urban forestry in developing countries is very scattered. More information is available on vegetation, rather than on people who might benefit from them. There is a dearth of published quantitative information about the relationship between urban dwellers (particularly the poor) in developing countries and urban forests, on how they value, use or would like to use these areas, and how urban forests affect health and well-being.

A limited number of case studies on UF exist such as the EC financed Forest-City Interface component of APFT (Avenir des Peuples des Forêts Tropicales) in Africa, or the series completed by FAO (11 case studies). The latter documented a wide range of benefits including some products directly useful for people. However, it is not clear if the value of these products exceeds others such as annual cropping. Very little is known about the relationship between urban forestry and livelihood, still less about the livelihood of the poor. The DFID (Department for International Development, UK) which has recently funded case studies on researchable constraints to the use of forest and tree resources by poor urban and periurban households in developing countries, is a very rare exception.

Poverty alleviation

The potential for urban forestry to become more directly instrumental in poverty alleviation initiatives will be debatable as long as it is not better researched. The greatest urban forestry knowledge gap is that the poverty alleviation-urban forestry nexus has not been systematically researched in-depth. The most urgent tasks ahead would include concerted actions to comprehensively assess the role of urban forestry in poverty alleviation and to

prioritise specific UF practices for the poor and very poor in urban and periurban areas, in different ecozones as well as small, medium and large settlements and megacities.

Since foresters are conspicuously absent in urban development initiatives, and since for other specialists trees are not a major concern, it is very unlikely that forestry will appear more visibly on the urban development agenda very soon. However, there are some indications that food security related development activities will pay more attention to the roles of urban trees in future.

There is an obvious need to improve the exchange of experiences, and to synthesise available information in-depth. This includes: (i) approaches and methodologies for planning urban forestry programs; (ii) the relative importance of the environmental and productive functions of urban forests in different ecozones and for different social groups; (iii) building up the technical knowledge base and developing of adequate institutional frameworks to support urban forestry programs.

4. Urban Forestry Practices

Urban forestry practices are increasingly included in best urban practices.

Parks and greenways: Urban parks are traditionally one of the most obvious forms of urban forestry. However, parks have often been the domain of quite different professions, with distinguished approaches and practices, as compared to street trees. In many cities, parks are threatened by buildings, spontaneous settlements, vandalism, environmental stress and restricted government funds. It is more and more acknowledged that many parks can only be preserved and managed through the commitment of residents and innovative management approaches.

The potential of multi-functional park design and management is insufficiently known among urban planners and other stakeholders concerned with the development of low-income communities. Still, there are some cases in which successful innovative multifunctional parks as a component of slum improvement programs (storm water control, wastewater and sewage treatment, recreation and gardening) have been implemented.

Greenways (linear parks) can have multiple uses and functions, such as improving environmental quality, providing recreation, and serving as an alternative transportation route (bicycle and foot paths). They are promising, but have been less promoted than conventional parks.

Public parks are especially important for the urban poor, because they have few affordable options for recreation and thus place a high value on green areas. Lower income residents tend to frequent city parks more than wealthier citizens do because they lack the financial resources and leisure time to reach distant recreation sites.

Street trees, the most obvious urban forestry practices, are often more difficult to establish and maintain than their counterparts in parks. Due to inadequate planting space and the high cost of protecting individual trees, collision and vandalism have destroyed many street trees. Space limits the selection of species and reduces vigour and longevity. On the other hand, sufficient innovative techniques are available that increase the survival rate and longevity of street trees.

Urban Forestry

A disturbing trend in some cities in developing countries is to replace tough, multi-purpose, and native trees with modern ornamentals that have not yet proved themselves. Often, low-care wild edible plants are excellent candidates for use as ornamental street tree plantings. When properly managed, street trees provide significant quantities of fuelwood, poles, fruits or medicine. However, multipurpose street tree research is in its infancy.

The general perception of the exclusive public responsibility for street tree planting has prevented creative public-private partnership in the past. However, entrepreneurs generally prefer to sponsor trees in central locations with high traffic density. These sites are the most challenging ones for good growth conditions, but a good business sponsor can better ensure the survival and vitality of trees. Generally, there is significant evidence that street trees survive and flourish best when people living adjacent to them commit themselves to be responsible for tree care in one form or another.

Trees in urban farming have only recently received more attention under the umbrella of urban agricultural initiatives. Agroforestry gardens are probably the most significant urban green space in tropical developing countries. Some tree species require little space and can be manipulated into shape by training, coppicing, lopping, or pollarding. Climbing woody perennials are very suitable for small gardens. Still, few urban forestry programmes have facilitated the integration of trees into farming.

There is no reason why agroforestry techniques developed in rural areas could not be adopted to the context of urban areas. For instance, Sloping Agricultural Land Technology (SALT) is a diversified system of contour hedgerow inter-cropping in which permanent and non-permanent crops are grown along with the hedgerow. This can be promoted in low-income settlements to improve farming and stabilize sloping land.

In arid and semi-arid areas, it is a common urban forestry practice to establish windbreaks to protect agricultural land and enhance the productivity of the land. Properly managed windbreaks can provide significant quantities of fuel and poles and other tree products without jeopardizing their primary protective function.

Protected areas are natural or reconstructed habitats that receive some level of ecological protection in order to preserve their ecological or biological functions. Generally they tend to be small in urban areas. For instance, greenbelts are basically open space buffers amid the congestion and pollution of most large cities.

Although urban forests may contain less biological diversity than rural woodlands, they still play a significant role in conservation of biodiversity.

Wetlands deserve attention as a priority candidate for protected status. Usually they contain a high level of biodiversity and offer a range of environmental services. Protected key areas and buffer zone concepts developed in rural forestry can be adapted to the urban context.

5. Challenges

The basic challenge for urban forestry is to develop and maintain a sustainable urban forest resource that meets multiple societal and personal demands. This challenge is especially pronounced in developing countries. Without commitment to allocate sufficient resources for

Urban Forestry

research and development of UF networks at national, regional and international levels, progress will be slow.

Challenges to urban forest development in developing countries - and elsewhere - are: (i) little technology transfer, research and information exchange; (ii) inadequate appreciation of the economic value of the urban forest and low comprehensive valuation of multipurpose urban forestry; (iii) insufficient local participation and private-public partnerships; (iv) inappropriate land use policies (access and security of user rights to urban forest); (v) ecological and technical constraints of the urban environment; (vi) sustaining funds for urban forests, and, above all, (vii) integration of forestry into urban planning and development.

Many local forestry-related initiatives and innovative partnership models are evolving rapidly in developing countries and elsewhere. Yet little exchange occurs. Lack of suitable networks to facilitate coordination means there is a high risk of duplicating efforts, and reinventing the wheel. Also, the experience and methodology gained in rural development (social forestry) is not really utilized in urban forestry.

Urban forestry researchers with a focus on poor neighbourhoods in developing countries have no institutional home. Thus the greatest impact of a research project would be to facilitate networking among all scientists working on urban trees in poor neighbourhoods which find themselves underrepresented in the current development initiatives in urban agriculture and sustainable urban development.

Insecure or unclear ownership and/or rights to the use of urban forests can be the most serious obstacle in poor neighbourhoods in developing countries towards urban forests. Participatory planning and management tools can greatly contribute to sustainable urban forest management in poor neighbourhoods.

Over the last decades, many innovations and good practices have become available in industrialised countries for planting and sustaining urban forests. Not all of them are appropriate and relevant for resource-poor people. For instance, in developing countries only a very limited number of species are planted as urban trees. Species richness is not a problem, but for ecological and economic reasons there is an urgent need to increase the number of species which have multiple values. This is a totally new field of action in forestry for community development.

At the urban-rural interface issues such as forest fragmentation, varying land and social values, and numerous landowners, create new challenges in the management of these interface areas. The growing interface and interzone problem of turning rural forests into urban forests poses a great threat to not only the residents but also the environment. For that reason, rural foresters have to take urbanization into account in planning rural forests. They need to develop a better understanding of it, become more involved in the urban planning process and cooperate with urban groups.

With accelerated urbanisation, in order to retain the urban forest resource (thus contributing to functionally healthy urban ecosystems), forestry professionals need a more balanced urban and traditional training, including some demonstrated skills in working with land developers,

Urban Forestry

home builders, municipal governments, planning boards and the urban poor. This would require huge efforts in education and training. Unfortunately, too few education opportunities in developing countries exist as yet.

Ataie, Ahmad Mehdi (1999). **Urban and periurban forestry in the near east: a case study of Iran and its Capital, Tehran.** In: **Urban and periurban forestry: case studies in developing countries / Salah Rouchiche Salah (et al.) (eds), p. 163-194.** Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy. Rome: FAO

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urban forestry

urban forestry; air pollution; environmental degradation; wastewater management; Iran; Tehran

Community mobilization in a coalition of government departments, municipalities, NGOs and community groups resulted in urban and periurban forests in Iran. The forests perform many different functions like to supply wood and pulp industry, stabilization of sand dunes, fuelwood, fodder, wind and dust protection reduction of air pollution. In Tehran planting trees alleviates air pollution while effective waste water and sewage management can provide irrigation water. Among the constraints in urban forestry Tehran faces are technical knowledge, limited availability of suitable spaces, shortage of water and pollution of plants. (NB)

Belgian Urban Forestry Practice and Research Association (1998). BUFPRO Newsletter: an international mouthpiece on urban forestry. Belgian Urban Forestry Practice and Research Association, Vrije Universiteit, Department of Human Ecology, 103 Laarbeeklaan, 1090 Brussels, Belgium

urban forestry

A number of issues on this newsletter on urban forestry have seen the light, providing information both in English and French. (WB)

Bell, Michael (2000). The gardeners guide to growing temperate bamboo. Timber Press 159 pages.

urban forestry

forestry; household gardening; non timber forest products

Bamboo is a particularly productive multiuse urban agriculture crop. This exceptionally clear guide deals with the nitty-gritty of bamboo cultivation and propagation of about 200 varieties suited to temperate climates. (JS)

Benge, Mike (1996). The economic and ecological value of trees in urban environments. 10 p. Agency for International Development (USAID), Washington DC, 20523-1812, USA

urban forestry economic impact

Urban Forestry

United States; urban trees;trees; urban environment; economic aspects; public health

Examines from various angles (urban environment, aesthetics, public health, economics) the role of trees in urban settings, notably in the USA. (WB)

Bergerie Nationale, Département Périurbain (1996). Agriculture et forêt en zones périurbaines : constats et perspectives. (1996). Actes de la Rencontre de la Bergerie Nationale de Rambouillet, 1996. Rambouillet, France: Bergerie Nationale, Département Périurbain. 102 p.

urban forestry

France; periurban agriculture; land use; agricultural preservation; policy

These are the proceedings of a conference held at the Bergerie Nationale, one of France's leading institutions working on periurban agriculture. The meeting resulted from the coming together of a dozen different public and non-profit institutions concerned with the impact of urbanization on agriculture in France. (JN)

Braatz, Susan; Kandiah Arumugam (1996). The use of municipal waste water for forest and tree irrigation. In: Unasyiva 185 (1996) p. 45-51.

urban forestry wastewater reuse

wastewater; municipal management; resources; irrigation

This article discusses some of the experiences to date and various issues related to the use of wastewater for forest and tree irrigation. This combines the goals of managing municipal effluents with those of enhancing forestry practices in periurban areas. (adapted from original by JN)

Carter, Jane E (1995). L'avenir de la foresterie urbaine dans les pays en développement: un document de réflexion. 95 p. Forestry Department, Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy

urban forestry

environmental aspects

Provides a state-of-the-art overview of urban forestry in the framework of a new programme on urban forestry launched by FAO's Forestry Department. (WB)

Carter, Jane E (1995). The potential of urban forestry in developing countries: a concept paper. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy

urban forestry city ecology

environmental aspects

The paper first defines urban forestry and next the changing role of trees in Third

World cities is discussed, with reference to growing environmental concerns. The third section elaborates various locations in which trees may be cultivated after which the benefits and problems associated with urban forestry are discussed. Further key issues like socio-cultural aspects are highlighted in section five. Tree management and tree establishment issues are discussed in section 6 and institutional aspects are reviewed in section seven. The last section deals with topics requiring further investigation and information gaps in developing countries. (NB)

Cline-Cole, Reginald A (1990). The urban fuel plantation in tropical Africa: a case for re-evaluation. In: Land Use Policy vol. 1990 p. 323-336

urban forestry

fuelwood plantations; Africa; humid zones

The potential of fuel plantations for ameliorating urban fuel shortages has been limited, mostly, the author argues, as a consequence of faulty assumptions about the location- and time-specific nature of the dynamics of woodfuel 'crises'. The author critically examines monoculture tree plantations and advances strong arguments for increased use of local plant resources and indigenous ecological knowledge in plantation programmes and projects. This should, ideally, lead to a situation of sustainable woodfuel development. (WB)

Community Resources (1999). Exploring urban non-timber forest products On: <http://www.communityresources.org/ntfp.htm>. 3 p.

urban forestry community development

non-timber forest products; resource management

A brief project outlay of the urban non-timber forest products initiative. The paper explains what are urban non-timber forest products and why it wants to explore the potential of this further. (NB)

El-Lakany, M Hosni (1999). Urban and periurban forestry in the Near East: a case study of Cairo. In: Urban and periurban forestry: case studies in developing countries / Salah Rouchiche Salah (et al.) (eds), p. 131-161. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy. Rome: FAO

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urban forestry

desertification; Egypt;

urban forestry in Cairo presents technical problems and trees need to be tested on their suitability in the unfavourable conditions. Strategies to select appropriate species, planting and windbreak designs are discussed. Institutional aspects of the development of green areas are discussed as well a.o. public participation, legal issues, allocation of responsibilities and coordination of activities in forestry. (NB)

Food and Agriculture Organization (FAO) (1995). An annotated bibliography on urban forestry in developing countries. 100 p. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy

urban forestry

annotated bibliography; periurban forestry

Includes almost 600 entries related to urban and periurban forestry in developing and tropical countries. Some general references, universally relevant, are also included. Four indexes are included to help in the location of reference material: keywords index, geographic index, author and corporate author index and conference index. (from original abstract)

Forrest, F; Konijnendijk, Cecil C; Randrup, TB (ed.) (1999). Research and development in urban forestry in Europe: report of COST Action E12 'urban forests and trees' on the state of the art of urban forestry research and development in Europe. 363 p.

urban forestry

Europe; research projects; development projects; surveys

Reports on research and development in urban forestry in 20 European countries. The survey was carried out by the European Co-operation in the field of Scientific and Technical Research (COST) in the framework of the 'Urban Forest and Trees' programme of the European Commission. In general, current urban forestry research in Europe seems to be very fragmented. Many relevant individual projects are going on, but few are co-ordinated nationally and even fewer internationally. The fact that only a minority of the projects mentions the words 'urban forestry' indicates that the term is rather new at the European level. In the report, urban forestry is interpreted very broadly, including not only research related to trees in the urban environment but also to green structures on a larger scale. (from original abstract)

Haque, Farhana (1987). urban forestry: 13 city profiles. In: Unasylva vol. 39 no. 155 (1987) p. 14-25

urban forestry

case studies; trees; ornamental plants; fuelwood; ecological aspects; tree management

Presents 13 case studies from all over the world. This collection shows the wide array in uses that can be made of trees in city environments. (WB)

Horvath, Ronald J (1968). Addis Ababa's Eucalyptus forest. In: Journal of Ethiopian Studies vol. 6 (1968) p. 13-19

urban forestry

environmental degradation; deforestation; Eucalyptus; fuelwood plantations; Ethiopia; Addis Ababa; tree farming

Urban Forestry

Traces the history and describes the tree farming system of Addis Ababa's Eucalyptus forest, as a fuelwood tree for Addis Ababa, but also to provide building materials. Eucalyptus was brought in after all indigenous fuelwood trees around the capital had been exhausted, at the beginning of the 20th century. This publication was written at a moment when negative effects of Eucalyptus plantations were still little researched. (WB)

Konijnendijk, Cecil C. Causes of conflicts affecting urban forest policy-making: a theoretical approach. In: Conflict management and public participation in land management, p. 133-147. Wageningen Agricultural University, The Netherlands
urban forestry R&D methodology
forest policy analysis; social conflicts; environmental psychology

In highly urbanised societies urban forests are essential for recreational and environmental purposes. Policy makers, planners and managers these days have to respond to higher, more varied and better expressed demand for urban forest functions while pressures increase. In order to gain insight in the resulting conflicts an analysis was made from an environmental and psychological perspective. Subsequently, a theoretical framework is presented. With this theoretical approach the frequency and intensity of social urban forest conflicts can be partly explained. Better insights are believed to assist policy-makers in future conflict prevention and resolution. (NB - abstract adapted from original)

Konijnendijk, Cecil C (1997). A short history of urban forestry in Europe. In: Journal of Arboriculture vol. 23 no. 1 (january 1997) p. 31-39. Department of Forestry, Wageningen Agricultural University, PO Box 342, 6700 AH Wageningen, Netherlands; European Forest Institute, Torikatu 34, 80100 Joensuu, Finland
urban forestry
history; Europe

The term 'urban forests' is often applied to forests under strong urban influence rather than to urban green space at large. This article presents a history of urban forest policy-making, against a background of social conflicts over these urban forests. The author concludes that urban forestry policy-making processes have become complex, involving a larger number of people. (WB)

Konijnendijk, Cecil C (1997). Urban forests: benefits and functions: overview of contemporary research in the Netherlands. 31 p. Subdepartment of Forestry, Wageningen Agricultural University; European Forest Institute, Torikatu 34, FIN-80100 Joensuu, Finland
urban forestry R&D methodology
research projects; Netherlands

Gives an overview of Dutch research in the field of urban forestry policies over the

period until 1997, focusing on the 1990s in particular. Addresses of research organisations and key references are included. (WB)

Konijnendijk, Cecil C (1997). urban forestry in the Netherlands: lessons from the past

urban forestry

Netherlands; historic overview; recreational uses; forestry planning

Draws a picture of the development of forests near cities in the Netherlands. The establishment of these forests closely reflects the social history of the Netherlands as regards planning, responsibility and uses of the forests. The author argues that when planning and establishing new forests, policy makers and planners might benefit from historical insights in terms of finding alternative sources of financing, and taking into account local public commitment. (WB)

Kuchelmeister, Guido (1989). Hedges for Resource-Poor Land Users in Developing Countries. Eschborn, Germany: GTZ. 256 p.

urban forestry city ecology

hedges; resources; crop selection; crop management

This is a thorough evaluation (including technical assessment) of the use of hedges in developing countries. While not specifically focused on urban areas, the document emphasizes the use of hedges where land availability is constrained. (JN)

Kuchelmeister, Guido (1991). Urban and periurban multipurpose development cooperation: experience, deficits and recommendations. 158 p.

urban forestry

agroforestry; periurban forestry; tree plantations; parks; development co-operation

A major study providing an overview of multipurpose urban and periurban forestry. It documents the state of knowledge with regard to the potential of forestry as an instrument in development co-operation. It examines and evaluates key issues on different elements of urban forestry and indicates the range of possible successful approaches to tree planting projects in cities and the urban fringe. There are detailed analyses of various urban forestry and agroforestry practices including planting along roads, railways and waterways; periurban plantations with special references to fuelwood production; parkland management; urban trees in between places; soil and water conservation measures; and gardening. Finally, the essential experience, deficits and recommendations for project development are summarised. Contains project descriptions, addresses and an annotated bibliography. An important overview of urban forestry. (WB - adapted from original abstract)

Kuchelmeister, Guido (1997). Urban trees in arid landscapes: multipurpose urban forestry for local needs in developing countries. Arid Lands Newsletter no. 42

(fall/winter 1997). 9 p.

urban forestry

forestry fuel; microclimate; multiple resource use; economic aspects

Provides an overview of urban agriculture and its importance. Described are tangible benefits such as contribution to urban food requirements, biomass for fuel and construction material. Furthermore, environmental benefits, like micro climate enhancement and social benefits such as income generation are discussed. Challenges facing urban agriculture are local participation, valuation of forests, land and tree tenure, institutional capabilities, and technical constraints. It is concluded that urban trees should be viewed as an integral part of the urban infrastructure and an asset in arid settlements. To develop and sustain urban forests in developing countries, one can best focus on fulfilling immediate requirements for basic products through multiple resource use as advocated in the article. (NB)

Kuchelmeister, G. and S. Braatz (2002) The Overstory #87 - Urban Forestry.

Permanent Agriculture Resources (PAR). Holualoa, Hawaii: Permanent Agriculture Resources. In: *The Overstory*, no. 87,

Supplier: PAR, P.O. Box 428, Holualoa, Hawaii 96725 USA. also available from:

www.agroforester.com/overstory/overstory87.html.

urban forestry

urban areas; forestry

Although trees have been an important part of human settlements throughout history, only recently has their full value to urban dwellers been recognised. Trees and green spaces play an important role in improving city living conditions. In the past, urban forestry in developed countries was considered almost exclusively on the basis of its aesthetic merits. Now, a closer look is being given to the environmental benefits they provide. This article discusses the role of trees in and around densely populated areas.

Kuiler, Esther (1998). Toekomstperspectieven voor biologische stadslandbouw in

Nederland: stadslandbouw als onderdeel van de urbane bosbouw. AV no. 98-07. 72 p. Departement Omgevingswetenschappen, Sectie Bosbouw, Agricultural University Wageningen, The Netherlands

horticulture urban forestry rural-urban linkages

landscape design; urban livelihoods; biological agriculture; home gardening; Netherlands

Looks at urban agriculture from the livelihood point of view and examines its contribution to creating an attractive urban landscape in the setting of The Netherlands. In Dutch. (WB)

Marulanda L. (2000) Ahmedabad Green Partnership Project. In: *Urban Agriculture Magazine*, no 1, Maiden Issue, July 2000, RUAF, Leusden The Netherlands.

urban forestry community development

India; partnerships; private sector;

urban forestry programmes and projects need longer time to show results. Trees are long-term products and to make an urban forestry programme a success, the project partners need to keep a constant dialogue and a long-term commitment to make it happen. The author illustrates this in a description of the Ahmedabad Green Partnership Project, which is an effort between the Ahmedabad Municipal Corporation (AMC) and the Private Sector towards increasing the green cover and improving the environmental quality of the city of Ahmedabad in India.

Murray, Sharon (1996) Managing forest influences in urban and periurban areas. In: Unasylva No. 185 (1996) p. 38-44.

urban forestry

environmental benefits; urban impacts; air pollution

This paper considers the opportunities for and challenges to the management of trees and forests in urban and periurban areas of developing countries, with the goal of gaining positive environmental impacts. (adapted from original by JN)

Murray, Sharon (1997). Urban and periurban forestry in Quito, Ecuador: a case study. FAO, Rome, 104 p.

urban forestry

urbanisation; environment; Latin America; ecology; land use

This report evaluates the current biophysical and social aspects of urban forest ecosystems in the Quito metropolitan area. It explores the potential for beneficial forestry activities and who the beneficiaries may be. It describes, in some detail, the past and present pattern of human, economic, political interventions affecting the forest ecosystem. In conclusion it suggests a strategic approach to achieve better results stressing the linkages to other urban systems. (JS)

Murray, Sharon (1999). Urban and periurban forestry in Latin America: a case study of Quito. In: Urban and periurban forestry: case studies in developing countries / Salah Rouchiche Salah (et al.) (eds), p. 75-106. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy. Rome: FAO.

Supplier: FAO Food and Agriculture Organization of the United Nations.

urban forestry

land tenure; forest management; urban planning; Ecuador;

This publication is the first of six case studies commissioned to document work in urban and periurban forestry in the different developing regions of the world. This study on Quito illustrates to those unfamiliar with the field and to those working on urban and periurban forestry programmes the issues faced by different civil groups, NGOs, public and private institutions. It presents the approaches these groups adopted to integrate trees and forests to improve the lives of urban dwellers and enhance the urban environment. Some of the issues presented are landslides and

Urban Forestry

watershed management, land use changes and markets, and the needs for green recreational areas, creation of productive activities and employment. It is a complex and fascinating subject, an area of forestry where social and ecological concerns are most closely intertwined. (original abstract)

Pastuk, Marília (1999). Urban and periurban forestry in Latin America: a case study of Rio de Janeiro Metropolitan region. In: Urban and periurban forestry: case studies in developing countries / Salah Rouchiche Salah (et al.) (eds), p. 107-129. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy. Rome: FAO

Supplier: FAO Food and Agriculture Organization of the United Nations
urban forestry

community reforestation; emergency mitigation; Brazil; Rio de Janeiro

Five cases are presented which in are responses to emergencies caused by severe floods in the lowlands of the city and mudslides on the slopes. Examples are provided of low cost techniques and participatory approaches in reforestation programmes, policy and planning issues are in order to promote integration of environmental policies in urban planning and reforestation as employment and income generating activity. (NB)

Rouchiche, Salah (et al.) (1999). Urban and periurban forestry: case studies in developing countries. 194 p. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy

Supplier: FAO Food and Agriculture Organization of the United Nations
urban forestry

environmental degradation; emergency mitigation; desertification; air pollution; urban planning; case studies

With the occurring demographic shifts, causing rapid and uncontrolled urbanization in many parts of the developing world, the issue of urban development is likely to become a focal one in the coming decade. urban forestry has an important potential role in meeting the needs of the urban population and in addressing the social and environmental problems that arise from urbanization. This is the subject of the six case studies that review the present and potential role of urban forestry in the Sahel (Dakar, Niamey, Nouakchott and Ouagadougou); Hong Kong, Kuala Lumpur and Singapore; Quito; Rio de Janeiro Metropolitan Region; Cairo; and Iran and its capital, Tehran. Among the issues addressed are the extent to which urban forestry can provide goods and services, and the role of forestry in environmental protection and enhancement of living conditions. The case studies address issues related to planning, coordination, management and people's participation, and suggest recommendations for the specific cities which could also be adapted to other cities. (original abstract)

Sorensen, Mark (1997). Good practices for urban greening. Washington, D.C.: Inter-American Development Bank, Social Programs and Sustainable Development Department, Environment Division. 84 p.

city ecology urban forestry

ecology; urban planning; land tenure; gender; legislation; financing; Latin America

This report was prepared in two drafts, preceding and following a conference in Mexico City, with participants from 23 countries. It is divided into five parts: (i) problems of rapid urban growth, (ii) the benefits of urban greening (particularly social), (iii) the challenges to establishing a greening program, (iv) the requirements of such a program, and (v) the elements of a greening program (including urban agriculture and finance). It includes a useful directory of projects. It is one of the more comprehensive brief reports on urban forestry and agro-forestry. (JS)

Trans Rural Initiatives (1996). Agriculture et forêt périurbaines sortent de l'ombre. Special issue, supplement to No. 75 (1996). 24 p.

city ecology urban forestry land use planning

France; periurban agriculture; policy

This supplement to a French periodical contains several syntheses of actions on the preservation of urban (particularly periurban) agriculture in France. These range from agricultural policies of small towns such as Aubagne to the key principles of Paris' "Green Plan". (JN)

Webb, Richard (1999). Urban and periurban forestry in Asia: a case study of Hongkong, Kuala Lumpur and Singapore. In: Urban and periurban forestry: case studies in developing countries / Salah Rouchiche Salah (et al.) (eds), p. 29-74. Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy. Rome: FAO

Supplier: FAO Food and Agriculture Organization of the United Nations

urban forestry

urban greening; urban planning

Examples of cities in which urban development has included important social forestry activities. The studies provide general information on location population density and physical features. Also the historic development of the cities and urban forestry within the respective territories is described. Technical issues like selection of species are also included. (NB)