

PART III – City cases study report

Figure 3. The WECA region 23 countries and the six cases studies.

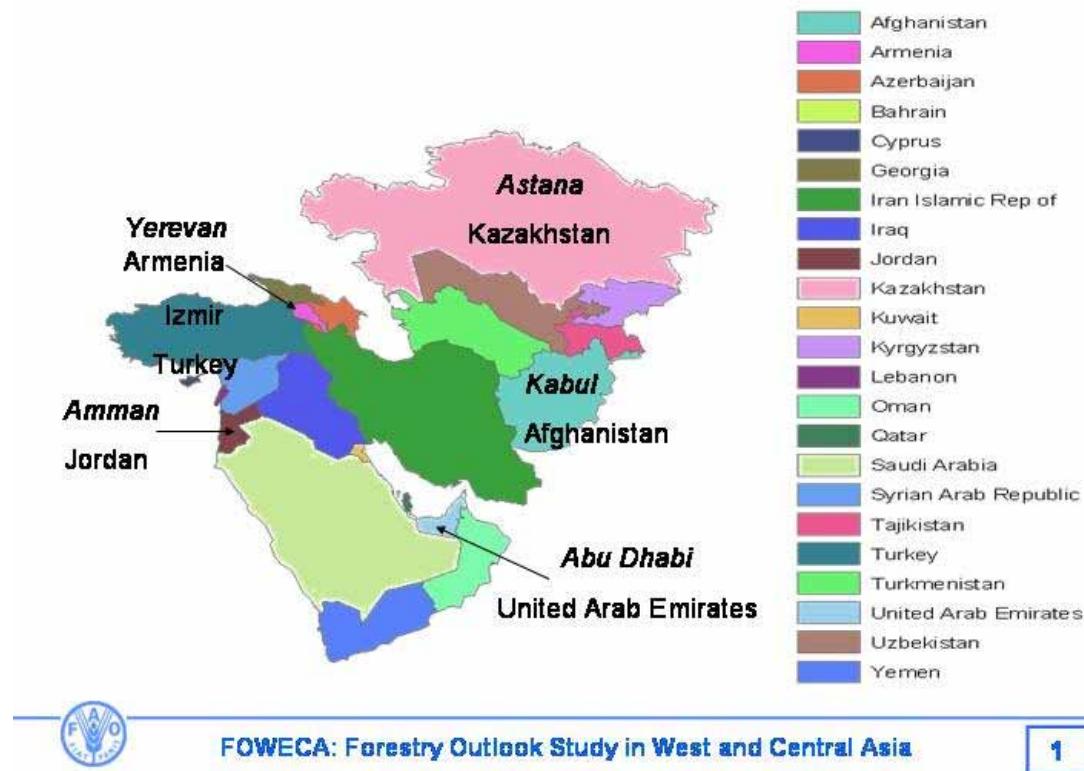


Figure 4. The natural conditions in the WECA region



A) Abu Dhabi, United Arab Emirates

By: Abdul-Sattar S. Al-Mashhadani³, Mohamed Rasheed⁴ & Joseph Mark Corbin⁵



Introduction

The United Arab Emirates lies in Southwest Asia, bordering the Gulf of Oman and the Arab Gulf, between Oman and Saudi Arabia. It is located between an altitude of 51 and 56 degree Eastern and latitude of 20.5 to 26 degree Northern along the south – at the eastern tip of the Arabian Peninsula. The UAE extends for about 420 km from north to south.

Photo 1: An ornamental landscaping in the urban zone of Abu Dhabi

The United Arab Emirates (UAE) federation was founded on 2 December 1971 and is composed of seven members. In size the UAE is comparable to Austria. The seven emirates (Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Qiwain, Ras al Khaimah and Fujairah) of the UAE enclose a total area of about 83,600 km² (including the islands). Abu Dhabi is the largest of the seven Emirates that comprise the United Arab Emirates. Abu Dhabi is also a city of the same name within the Emirate that is the Capital of the country, located in the north central UAE. The city lies on a T-shaped island jutting into the Arab Gulf from the central western coast. Its strategic location along southern approaches to the Strait of Hormuz makes it a vital transit point for world crude oil.

The Emirates are a flat, barren coastal plain merging into rolling sand dunes of vast desert wasteland, with mountains in the east. Most of the country is desert, with a flat coastal plain consisting mostly of tidal salt flats. The land slopes down from the mountains in the country's north-eastern extremity to an elevated desert plateau. The plateau then slopes gently northward to the coast and westward to the Sabkhat Matti, a huge salt flat that spreads into Saudi Arabia. Because of the country's sandy soil, only one percent of its land is cultivated.

The issue of desertification is a priority in UAE due to the fact that there are vast areas of desert land. An early interest in the desertification issue was reflected at all levels through forestation and reclamation of large areas of land as well as distribution of reclaimed land to UAE nationals for agricultural purposes and adoption of the best methods of irrigation.

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1. Urbanization processes

The demographic structure of UAE society has been altered considerably by the sharp rise in population since the foundation of the state. Population grows by 75% over last 10 years. According to a 2004 census the UAE population is 4,104,695 of which 20.1 per cent are UAE Nationals. This may be compared with a total population of 2,411,041 in the last census conducted in 1995. This rapid growth is attributed to an improvement in life expectancy, a sharp cut in infant mortality and a steady influx of expatriate workers. Almost the entire population of the UAE is urbanized.

The UAE's population consists of over 3.23 millions non nationals. Religious beliefs are mostly Muslim (Islam is the state religion). However, there are sizable minorities of Christians, Hindus and other faiths. Arabic is the country's official language and is used in the government and bureaucracy, while English is increasingly important commercially and as the *lingua franca* for non-Arab expatriates. Around 90% of the population can read and write (2005 estimate).

The rapid growth in population coupled with the demands of modern living has necessitated government intervention at the federal level to ensure that housing needs of nationals are met throughout the Federation. Applications for housing are expected to rise to an estimated 33,000 by the year 2005. In 2004, Dh 640 million (US\$ 175 mill.) was allocated to the Sheikh Zayed Housing Project to facilitate the process.

The concentrated development of the towns has led to a socio-cultural discrepancy between town and country. Urban occupations and urban life enjoy high status among the population of the rural farming area; agriculture and life on the land on the other hand have low esteem. The abandonment of farms and a flight from the land are the result. In order to realize its agricultural and political goals, the federal government attempts to improve the standard of living on the land and the conditions for agricultural production. Streets, schools, medical centres, businesses, and new settlements, in which the dwellings (low-cost housing) are granted to the population free of charge, are being built; supply systems for electricity and water are being constructed.

2. Planning and Management of the Urban Green Resource

Besides the greening of the cities and towns there has also been a massive programme in the desert and it is here that most trees have been planted. The United Arab Emirates has seen the transformation of significant areas of the country's desert environment into green landscapes, with enormous resources devoted to agricultural development, park landscaping and nature reserves. In addition, recent years have also seen the creation of a number of social institutions dealing with environmental issues.

The UAE was never purely and simply a desert. Today it has become a place where greenery can be seen in both urban and rural areas. Twenty years of dedicated commitment have made the point that the process of desertification is reversible. And given time and money, that is exactly what has happened and is

continuing to happen.

The UAE's unique experience in forestry and greening of rural and city areas have been well received and appreciated by its local and expatriate populations and by regional and international organizations. This is primarily because of the high success of plant growth despite harsh environmental factors.

*“...Give me cultivation (agriculture)
and I'll warrant you a civilization...”*

The Emirate's efforts may have never succeeded without a special attention and unconditional support of the Late President H.H. Sheikh Zayed Bin Sultan Al Nahayan. He was a role model as a human and ruler, keen to preserve and sustain the environment and natural resources.



Photo 2: The semi-arid area surrounding Abu Dhabi

His view is very well reflected in his sayings:

“...Our interests in environmental protection, plant and animal conservation are not delivered at this hour. It is our deep rooted interest that we called and applied before any such international interest had begun.”

Ancient people that contributed the early 'seeding' of environmental developments very well substantiate this when we think about the greening in several oases in deserts and the utilization of 'Falaj' systems.

Sheikh Zayed's life long dedication to improving the environment in the UAE has its roots in the country's Bedouin tradition of living in balance with nature. Long before conservation was a buzzword in the West, it was a fundamental part of Arabia.

The majority of achievements in the field of afforestation and greening are results of works and plans of many sections of the Abu Dhabi Municipality including:

- Well drillings
- Extending of water distribution pipes
- Construction of water reservoirs
- Sand levelling & Earthworks
- Construction of latest irrigation systems
- And many other architectural and planning works in urban landscape

3. Policy, legislation and institutional frameworks

With the growing importance of urban landscape and greening, the Abu Dhabi government has, after a recent restructure of government set up a specialized Directorate, The Public Gardens Directorate, to govern all activities related to landscape works in Abu Dhabi. The Public Gardens Directorate is placed within the Abu Dhabi Department of Municipalities & Agriculture. However, to a certain extent, greening still remains within three areas of this department and consolidation of resources and outsourcing plans are continuing.

A. The Public Gardens Directorate

Recently formed (2005) incorporating the former Agriculture Section and Irrigation & Landscape Sections of Sewerage Directorate

The Directorate covers the Abu Dhabi Island, Mainland and Western region managing all:

- Public Gardens
- Urban Landscape
- Roadside Forestry Belts
- Selected larger Forest areas i.e. Baynoona Forest.

B. The Forestry Section

Managing the remaining afforestation

C. The Agricultural Guidance Section

Managing Farms and Livestock

The Public Garden Directorate has set about outsourcing and privatizing its entire day-to-day works as apposed to financing its own workforce. The urban landscape has “tired” in recent years and requires rejuvenation via redevelopment and implementation of modern irrigation delivery and monitoring systems.

The Abu Dhabi Government has furthermore co-operation with its brotherly Arab and Gulf countries such as Qatar, Saudi Arabia, Bahrain, Kuwait and Egypt in greenery and landscape developments.

The Government has also taken part in several International and Regional Exhibitions (Japan, U.K, France, Morocco, Syria, and Egypt) and won many coveted prizes. One of the most outstanding achievements was winning the overall first prize as well as twenty other medals including four gold medals in Osaka International Exhibition for Agriculture and Afforestation in 1990.

Sheikh Zayed’s exhibit entitled ‘Hortus Conclusus’ was awarded a gold medal and chosen as the Best Show Garden at the 2004 Chelsea Flower Show in London. Designed by Christopher Bradley-Hole, this was a contemporary work inspired by the traditional enclosed Islamic gardens that brought order and serenity to an otherwise barren environment.

4. Financial Mechanisms to support UPFG

Development in the oil-rich Emirates of Abu Dhabi and Dubai is financed to a large extent by their own budgets, and their own governments determine the organization and operations. However, in the other emirates socio-economic developments are financed through the federal budget, 90 per cent of which is supplied by Abu Dhabi and responsibility rests with the federal government.

The UAE economy continued to grow rapidly, due to both high oil prices and to the success of other sectors, including manufacturing, other industries and tourism. The UAE's wealth is largely based on oil and gas output, some 33% of GDP. In recent years the government has sought to diversify its sources of income and lessen its dependence on finite oil reserves. One result of these efforts is a steadily developing tourism industry, centred on coastal, desert and sporting resorts and infrastructure.

Abu Dhabi municipality has completed several prestigious projects in urban landscape development. Most recently completed projects are the expanded Corniche development and the Emirates Palace. These projects are equipped with state of the art landscape materials, irrigation and control systems and some additional horticultural diversity reflecting modern practices.

Furthermore, a number of projects are currently in the pipeline: The Emirates Pearl is an ambitious project on the way in Abu Dhabi. A massive residential and tourist city, Emirates Pearl will have luxury hotels, hospitals, and university and family entertainment facilities within a modern city managed by the latest technologies, some of which would be used for the first time in the UAE.

Very recently Abu Dhabi has witnessed the launching of ‘Shams Abu Dhabi’ property development

project, a modern and independent town, where all amenities of life like hospitals, schools, shopping malls, hotels, entertainment centres and mosques are all available to the 100,000 residents.

These proposed mega projects and many others supported by landscaping designs harmonize their architectural styles and could raise the Abu Dhabi capital to one of the most modern cities in the world.

5. Recommendations for the future

The main target of the following recommendations and suggestions are to maintain and develop the successful achievements in the fields of forestry and greenery. Creating the best measures to manage and orient the overall natural processes for flora and fauna can be beneficial. These have an exchangeable effect on the elements of environment such as climate, soil, water, bio-organisms etc.

Some of our recommendations include the following:

- A. Applying and creating standard methods in dealing with the sandy soil of the Emirate according to its specific characteristics so as to attain an ideal planting medium depending upon the agricultural processes.
- B. Adopt the most common improvement measures for poorly drained areas such as coastal areas, interior saline areas and in afforested areas with high ground water (Natural level or affected level due to over-irrigation). It is necessary to confirm and control the follow up for annual maintenance for irrigation systems from the point of origin (resource) to the feeding points with high accuracy. Such measures oriented for the following targets.
 - Increase soil aeration and its thermo systems which could help stimulation and activation of micro organisms (helps in decomposing the organic materials);
 - Improving the soil water system by soil washing with drainage systems (open & closed) that assist in improving the growth conditions at site reflected in an increase in qualitative and quantitative plant production;
 - Adopting more dry and saline tolerant plants.
- C. It is necessary to execute experiments that can create the ideal mix of species to design and construct suitable forest shelter belts in different locations according to the species appraisal, their functions and their specificity of micro-environmental conditions such as coastal areas, saline, high water table areas, plain lands around farms and fields, desert areas and urban areas. (gardens and public amenities)
- D. Establishing future integrated projects to utilize the secondary products of the forest shelterbelts such as honey, medicinal plants, forage etc. and other traditional flora and fauna delicacies.
- E. To adopt study and field survey for all plant species tolerance and adaptability to local severe

conditions (temperature and salinity) and eventually establish programs for breeding and propagation methods.

- F. Conduct serious studies based on biotic and abiotic local environment outputs for large-scale projects by establishing a large reserve in a suitable environment beside other conditional factors. This could include all the native and exotic species (trees, shrubs, herbs etc.) which is adapted and tolerated to the local conditions for different wild life animals. This reserve should be adopted as Biotic Establishment for collecting the genetic banks for both flora and fauna in the region.
- G. Studying the effect of seedling ages of different selected species on their survival percentage on plantations to decrease the cost of production and replanting assuming that other required measures are well prepared and followed. This could make the determination of production for each species easier according to prepared plans.
- H. Under the conditions of poor soil it is vital to adopt scientific experiments which are dealing with the use of nitrogen fixing forest species to improve the soil fertility.
- I. With the expansion in forest area it is necessary to make proper rules and legislations that regulates and protect the periodical risks of forests, reserves, plantations etc. (Felling, Forest fires, Uncontrolled grazing, Hunting etc.)
- J. Prepare and develop employee's training programs to help them improve their job skills.
- K. It is advisable to restrict the usage of plant protection chemicals and recommended to adopt integrated plant protection programs against the pests according to environmental guidelines.
- L. Support the role of agricultural extension activities by the use of the media to make farmers aware of the scientific approach for better agricultural management practices. Also it is highly recommended to encourage the social role of the educational institutions to include the importance of environmental issues in the study syllabus.
- M. Enhance the awareness of the public of the importance and value of greening, its great role in minimizing the severity of local environmental conditions and how it could create a protective habitat for an individual, society and all other living organisms in general.

6. SWOT

Strengths

- High technical standards, e.g. for establishment and irrigation systems
- Use of new materials and techniques to help overcome problems
- One Organization responsible for management and planning of all green resources in and around

Abu Dhabi

Weaknesses

- Relatively short tradition for greening
- Long-term sustainability of established green areas not always clear

Opportunities

- Clear policy focus for greening the country and city
- Available budget for greening activities
- Available technical knowledge

Threats

- Difficult climatic conditions and need for permanent irrigation
- Balancing act between establishment of new areas and long-term management of existing areas



Photo 3: The Abu Dhabi city centre on the coast of the Persian Gulf.

B) Amman, Jordan

By: Eng. Hesham Omari⁶

Introduction

Amman – the capital of Jordan is a Middle Eastern country located in the south-western part of Asia. Jordan lies between the longitude 29°- 33° to the north and the latitude 34°-39° to the east. Amman stands in the middle of the astronomical-location between latitude 53.58° to the east of Greenwich and longitude 31.58° to the north. Amman is located 100 km to the south of the southern of Ramtha which lies at the Northern borders of Jordan, and is 350 km to the north of Aqaba which stands at the southern borders of Jordan. Amman lies in a hilly area, and has an annual rainfall average of 275mm. In general, the climate influencing Jordan is a Mediterranean climate characterized by rainy winters and long dry summers.

Jordan is divided into four climatic areas as follows:

1. Semi-wet Mediterranean climate (covers 1.1% of the total area.)
2. Semi-dry Mediterranean climate (covers 8.3% of the total area.)
3. Dry Mediterranean climate (covers 19% of the total area.)
4. Desert Mediterranean climate (covers 71.5% of the total area.)

The rainfall drops off from west to east and from north to south; and ranges from around 600 mm at the north-western hilly areas to 25 mm at the southern desert areas. The temperature differs from an area to another referring to the topography. The average high temperature is 31°C in July at the Jordan Valley and Aqaba; the highest average is 39°C. Whereas, the average low temperature is 7°C in January at the heights; and the average lowest is 3-4°C.

The local definition of the urban area in Jordan includes localities of (>5000) person or more living in a locality as were defined in 2004. Total area in the country is (89,342 km²) to be distributed as follows: Main land (88,778 km²), Central Region (14,399 km²), North Region (28,943 km²), South Region (45,436 km²), Territorial Water (540 km²); Dead Sea (446 km²) and Gulf of Aqaba (94 km²).

⁶ Hesham Mostafa Ali Omari, Greater Amman Municipality, Amman, Jordan.



Photo 4: Agriculture in a peri-urban area of Amman, Jordan



Photo 5: The city of Amman, Jordan

The following climatic conditions are affecting Amman:

- The Mediterranean warm climate with rainy winter and moderate summer which covers the western part of Greater Amman.
- North / southern cold climate and semi-dry area which cover a narrow area to of the eastern part of Amman.

The temperature varies from summer to winter in Amman and also varies from day to night also. Warm and wet western wind is noticeable round the year. Dry and warm eastern wind that carries desert soil cold too noticed in autumn and spring and affects the eastern part of the urban area.

Being on the edge of the desert, Amman is affected of the desert climate. Also, being a hilly area with some valleys among, affects the climate of Amman; and being apart of Jordan, Amman is affected by the cold fronts coming from Europe and Siberia in winter.

Annual Rainfall average in Amman is 275 mm mostly in winter which is sufficient for rain planting and for feeding the aqua tanks. 65 % of the annual rainfall is concentrated during the months of December, January and February; 22.6 % is in spring - March, April and May; the remaining 12.4 % is in Autumn-September, October, and November. The annual rainfall varies every year in Amman. Summer is a dry season.

Humidity in Amman is not high because it stands away from the sea. The annual relative humidity is about 51 % which is acceptable when accompanied with annual temperature average of 17 C. Humidity rises in January to 70 % and drops to 36 % in June.

1. Urbanization processes

The Population Density in Jordan is 61.7/km². The total population of Jordan is 5,350,000 people. The number of people living in cities is 4,404,300 persons representing 82.3 % of the total population, and the number living in rural areas is 943,700 persons representing 17.7 %.

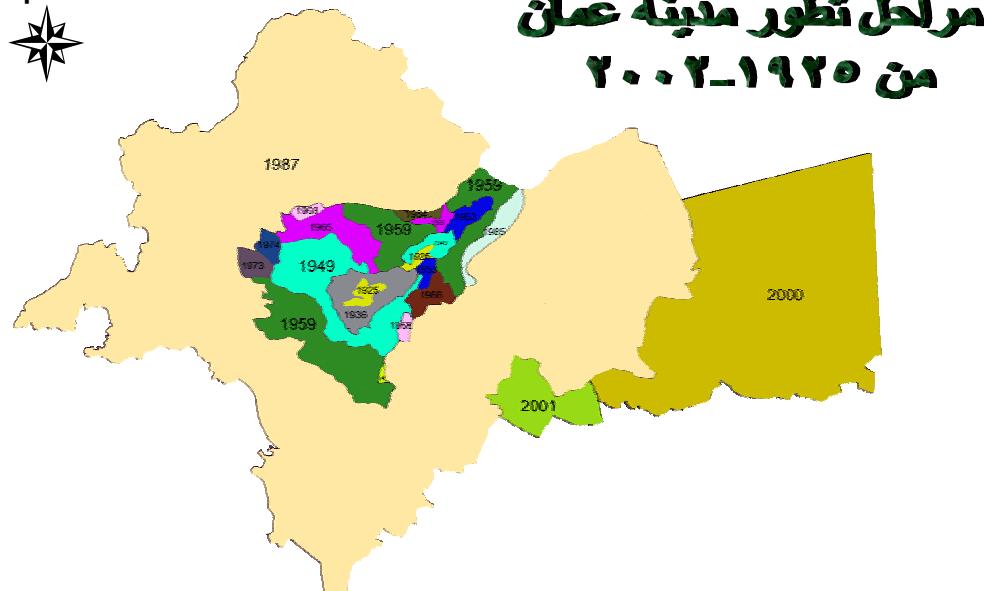
Amman witnessed much development in area and population since 1946. Two large migrations in 1948 and 1967 contributed to this development, and the national war in Lebanon 1975-1985 and the two Gulf wars also created additional migration of refugees. At the same time new work opportunities and the development of universities created more voluntary migration.

The main driving forces for urbanization in Jordan and for Amman in particular, are the optional and compulsory migration due to wars and conflicts, the availability of job opportunities in the city, and the availability of the basic services and infra-structure.

Many challenges related to urbanization in Amman are due to the strong increase in population and the related construction of buildings in the city. The most important challenges are:

- A. Random construction on agricultural land which led to an increase on the pressure on natural resources.
- B. For a sufficient water supply in the city it is essential to import water from neighbouring resources such as the Azraq and King Abdullah water canal. Priority to drinking water is given, resulting in lack of water for agricultural irrigation.
- C. Insufficient human resources in the field of agriculture due to the low wages.
- D. Increased land prices have made it difficult for low-income inhabitants to buy land for their own housing.
- E. Water and air pollution caused by phosphates released by factories and stone crushers in the Amman area, along with the dense traffic related to these activities.

Historical development of Amman municipality border shown by the year of expansion



source: - Municipality Of Greater Amman,2002

2. Planning and Management of the Urban Green Resource

Studies show that the Amman area was covered by forests in the past and that most of that cover was removed during the 18th and 19th century. The National Forestry department was established to compensate for the loss of trees.

Studies show that Amman was covered by forest trees in the past and that most of that cover was wiped out through the second and third centuries up to date. Jordan in general, was also covered with more than 150,000 hectare of forests 100 years ago and declined to 50,000 recently. Forestry department was established to compensate the loss of trees cut or damaged.

The recent status of forests around the city is considerably good because of the laws set by the ministry of agriculture forbidding removal or cut of the trees at the same direction the (MOA) and greater Amman Municipality (GAM) are working to gather and working action regarding planting new areas of forests through projects in different areas in and around the City of Amman. One of these projects is al Hussein national parks.

The green area around the city is decreasing due to the drastic increase of land price in and around the city. However, the recent status of forests around the city is quite good because of the laws set by the ministry of agriculture forbidding removal or cutting of the trees. The Ministry of Agriculture (MOA) and Greater

Amman Municipality (GAM) are working together in the region regarding planting new areas of forests through fostering projects in different areas in and around the City of Amman. One of these projects is al Hussein National Park. However, the green area around the city is still decreasing due to the drastic increase of land prices in and around the city.

To compensate for the destruction of trees and gardens, Greater Amman Municipality is planting trees on roadsides and constructing new gardens inside the city. In the past 50 years the area of old forests was reduced by about 12%, but the area of gardens increased from 13.7 to 205.1 hectares. Furthermore, in the light of the desertification program more than 500 hectare of new forest parks were established.

Expected changes in green areas in the coming 20 years are based on a plan which is set to plant about:

- 50 hectares annually according to desertification program, which means that 1,000 hectares is expected in the year 2025.
- 40 hectares of gardens annually, leading to 800 hectares in 2025.
- 5 hectares of squares and side of roads annually, leading to 100 hectares in 2025.
- The expected total green area in 2025 is 1900 hectares.

3. Policy, legislation and institutional framework

A visible degree of cooperation can be noticed among different sectors regarding expanding the green area and forests in Amman. The Ministry of Agriculture, Greater Amman Municipality and University of Jordan are the main sponsors of such activities. Greater Amman Municipality coordinates activities together with public and private institutions to promote the national slogan "Towards a Green Jordan", for example through celebrating the "Day of the Tree" every year.

Institutions involved in urban forestry and greening in Amman are:

- Greater Amman Municipality: Through land use planning and forestry and greening activities.
- Ministry of Agriculture (MoA): Through Forest laws and regulation.
- Ministry of Environment (MoE): Through policies and legislation.
- Universities: Through Agriculture faculties and research centres.
- Ministry of Education: Through activities related to 'The Day of the Tree'.
- Armed forces: Through related to 'The Day of the Tree'.
- Banks and Private corporations: Voluntary and limited activities.

As other stakeholders, the private sector and NGO's are actively contributing to increasing the green areas in and around the city and also in maintaining the existing ones. For example through planting trees on different occasions including the "Day of the Tree". Involvement is also sought through publications aiming to increase citizens' awareness of the importance of green areas and forests for ecological and environmental reasons, and for their role in food security. Also, the sector donates to greening projects provided by the ministry or the municipality. The NGO's efforts have contributed to establishing conservators, in many areas in Jordan and in the city itself.

Having these other stakeholders involved is good because it increases the possibilities for more and/or larger actions to promote and improve green space, as well as that they have the ability of obtaining financial support from international organizations to contribute to greening and forestry projects. Furthermore, they have the ability of being closer to the public in order to convince them of protecting and maintaining green spaces. However, decisions taken by these stakeholders are not obligatory and it is often not possible to maintain a constant financial support for their activities.

The regulations generated by the legislative entities in the country grant the protection of trees against destruction, alternative land use and taxation. They also provide a legal, policy and institutional framework for UPFG in Jordan. The framework is set to maintain green areas through the agriculture law and the newly set building regulations within the municipality borders which "demands and forces the land owners to plant at least 15% of the constructed area with trees." No construction permission is given without being conform to the regulations.

4. Financial Mechanisms to support UPFG

The Greater Amman municipality is considered as the main Supporter for greening in Amman City, a part of the greater Amman municipality budget is specialized for increasing the green areas through a number of specialized departments. The most important department is the Department of Gardens and Parks and the Agricultural Sections in the districts.

In addition, the Ministry of Agriculture is a main supporter for the forests in Amman City and Jordan's regions. Through the Agriculture Law, the Ministry of Agriculture plays a major role to safe keeping trees and to secure plantings it in the various districts of Jordan.

The Ministry of Environment always secures the support from its specialized budgets or from international support.

5. Recommendations for the future

There is a need for legislation specifying land use. Also, there is a need to:

- Enlighten focus on green areas through the various media e.g., TV, Radio, Workshops, and brochures.
- Focus on research in order to develop green areas by plating the various kinds of plants and transplants which are suitable to the weather and the environment.
- To increase the financial support.
- To develop irrigation systems, maximize the penitent of the water use.
- To increase community participation.

6. SWOT

Strengths

- Cross departmental and cross stakeholder cooperation, especially for large events such as 'Day of the tree' and 'Towards a green Jordan'.
- Active planting programme (desertification projects) and aim to increase the number and size green space annually

Weaknesses

- Insufficient financial support for greening and forestry projects
- Regulations are not satisfactory regarding greening and forests
- Geographical nature of some areas esp. the eastern areas, is hard to be planted

Opportunities

- Active NGO's and private sector contributing to greening

Threats

- Difficult climatic conditions and need for irrigation
- Continued urbanisation and city expansion leading to reduction of existing green areas

C) Astana, Kazakhstan

By: Victor Lomov⁷

Introduction

The capital of Kazakhstan, Astana is located in the centre of the republic between an altitude of 51 and 11 degree and latitude of 71 to 26 degree. Astana is situated in the southern sub-zone of dry feather-grass steppe with sharp continental climate. The average annual temperature is 1.4°C, with long cold winters and hot summers. The territory of Astana is 710.2 km², of which the peri-urban zone forms 614.3 thousand hectares, and the urban area 189.3 thousand hectares.

The city was founded in 1830 as Akmolinsk as a military city. In 1861, after rapid growth and development the city has got the name Celinograd. After taking independence, in 1991 the city was named as Akmola. In 1998 when the capital of the republic moved from Almaty to Akmola, the new capital of Kazakhstan was renamed as Astana.



Photo 6: Astana is the new and developing capital of Kazakhstan

1. Urbanization processes

In 1997 the population of Astana city was 326,000 people. In the beginning of 2005 the population was 529,300 persons, i.e. the population increased with about 200,000 people in less than 10 years. In 2005 the population density was 745.5 persons per square km.

⁷ Mr. Lomov is expert of urban forestry in Astana.

The population changes in the last 50 years happened particularly in two periods, during the period of reclaiming new agricultural lands (1954-1990), and the years after independence of the Republic of Kazakhstan (1991-2005).

Urbanization of Astana in the modern period is happening because of the relocation of the capital to Astana and the associated moving of state governmental bodies and institutions. New work places at constructions sites and service expansion attracted workers and building constructors as well as other private firms. At the same time, the shift to a more market oriented economy increased unemployment in rural settlements. Also the creation of a new green zone in Astana and other greening measures lead to thousand of work places which attracted workers from the countryside.

2. Planning and Management of the Urban Green Resource

There are three periods of forestry and greening development in the city and its surrounding territories. The first period begins with the start of 'Steppe forestry' and establishment of the first nursery in 1899 in "Krasniy yar".

Forester A.L. Adamovich writes in his official letter to Akmolinsk district revolutionary committee about the condition of Steppe forestry in December of 1919: "...The value of forest materials in Steppe forestry district is so great and each branch of a little plant is as valuable as gold.... The experiments of planting forests in "Krasniy yar" gave positive results, and that is the reason why forestry in the south steppes is really possible. As the first emigrants (Ukrainians), planted gardens with different types of trees (e.g., apple and cherry-trees) near their houses, we can assume that it was possible to plant in this territory. Noting the above, I found it useful to create large forestry nurseries on the territory of Steppe forestry which in the future could give the needed amount of plant material for both private consumers and social and state needs..."

In 1893 the first city park was founded, and some of its trees are still alive. In the period after the war, from 1948 till 1997, the area covered by forest grew to 2,880 hectares as forest was systematically planted. The basis of the forest plantings was the "big bread" programme, taking virgin lands into production for forestry or grain-cultures. It was decided to create a green zone in the suburbs of the city in order to protect it from dust storms. The volume of tree planting on city territory was slowly raised from 10,000 saplings to 100,000 annually. New park zones, squares, boulevards and avenues were created too.

The third stage of modern development of urban and peri-urban forestry and greening processes in Astana is connected with the movement of the capital in 1997. In the same year, the 'Presidential commission on the development of Astana' began creating sanitary and protective green zones in Astana. In 1997, the 5 main areas of new city greening were:

- City park – 104 hectares of area;

- Anniversary Park for 150 year of city – 12 hectares;
- Machinostroitel square – 1.0 hectares;
- Square near the Republic palace – 2.2 hectares;
- Square near the Finance ministry – 2.0 hectares.

The main aim of city greening is to decrease the negative impacts on nature, provide symbiosis of the urban process with nature and create a satisfactory city environment. More new parks, “Zhar uyuk”, “Manas”, “Seasons”, “Lovers” are being created near the borders of the old city and it is planned to create a Central, Presidential, River and Sport park respectively.

In Astana there are several hundred enterprises contributing to atmospheric pollution. Private heating systems and cars are the other two main contributors to the increasing air pollution. Especially the rapid increase of private cars has resulted in traffic causing almost 40% of all air pollution in the city.

The planting of trees and establishment of parks and gardens is a major factor in improving the city environment and it plays a key role in the creation of an architectural and tasteful appearance of the city. Because of that, the following issues will be taken into consideration during the creation of additional green space:

- termination of the construction of the protected zone around the city;
- creation of “green” micro zones inside the city by the increasing number of parks, public gardens, flower-beds, grass-plots;
- implementation of a green network in small housing areas;
- creation of landscape planting within the country-side zone along the arterial roads and main railroad lines;

4. Policy, legislation and institutional framework

The existing policy and national legislation is based on the Constitution of the Republic of Kazakhstan, the Land code, the Forestry Code, The Water code, the law on specially protected natural habitants and the Tax code. The administrative responsibility is defined by the Administrative code. The pattern of confiscation and purchasing of land is carried out according to a resolution on ‘the pattern of confiscation and purchasing land plots for national needs’.

Granting of land plots for afforestation in the region is carried out according to a resolution of a local governmental unit. The State forest guard ensures the afforestation protection.

The municipal department "Astana ormany" guarantees the further treatment of plantings inside the city. There were transferred forest plantings covering more than 8,600 hectare into the property of the municipality. The ecological policy and the Department of Enterprise Protection secure preservation of planted regions, parks, streets etc. within the city, according to the national legislation and resolutions of local governments.

To implement control over the planting inside the city, the state municipal enterprise "Zelenstroy" was created and authorized by the Department of Municipal Services of Astana.

"Zelenstroy" is a specialized organization carrying out gardening, treatment and maintenance of plantings on public lands (parks, public gardens, grass plots, etc.). The main directions of its activity are as follows:

- replacement of old trees with young ones
- laying out of new parks and public gardens
- Taking care and applying appropriate treatment for the trees, including sanitary cutting, design of flower beds, lawns etc.

Also a few private firms are registered to be dealing with planting, such as Open Company 'Verstke', Open Company Al-Kar, etc.

4. Financial Mechanisms to support UPFG

The new forestry management system provides two major sources of forestry financing – national and local budgets. Besides this, an additional source of financing is defined at a legislative level, which means that forestry institutions and specially protected natural habitats with the status of legal entity can acquire funding by rendering paid services.

The financing of works intended to create a green zone around Astana, implemented by the State enterprise 'Zhasyl Aimak', is supplied by the national (republican) budget. The funding of appropriate treatment of the forests inside the city, carried out by the state municipal enterprise 'Astana Ormany', is supplied by the local budget of Astana.

The works directed to plant within Astana city, is carried out by the state municipal enterprise 'Zelenstroy', and is financed by the local budget of the city of Astana. The financing of private construction objects is coming from private capital investments.

Furthermore, there are annual payments to the local budget as payment for causing environment pollution or as penalties for infringement of the nature protection legislation. Analysis show that the volume of inflow is increasing. Approximately 50% of the money is used for nature protection actions.

5. Recommendations for the future

There is a need to update the economic aspects of current legislation according to the changing realities in market relations in Kazakhstan for detailed development of the forest sector. It is necessary to economically involve other institutions “working on the earth” for future creation of private forests.

Therefore, the VAT (Value Added Tax) should be decreased and free economic zones in relation to ecological disasters (e.g., large forest fires) should be created. To resolve social problems there should be established new workplaces. Furthermore, private nurseries for cultivation of a planting material should be established to advance the private sector’s performance related to the state order on afforestation treatment, watering, recycling of collateral forest wastes. The conditions for opening of private enterprises should be simplified in order to make it attractive for small and medium sized business’ to be involved in the planning and management of urban green areas.

6. SWOT

Strengths

- Environmental programme to improve green space quality and quantity
- Decades of tradition for strategic green space planning

Weaknesses

- Pollution, especially air-pollution, due to the increased number of private cars, and a number of polluting industries
- Green space development ambitions were not always followed by sufficient budget

Opportunities

- Clear policy aim to improve the current green status by extensive planting and establishment programmes
- Scientific support available for e.g. species selection

Threats

- City development pressure
- Illegal harvesting
- Harsh climate with long cold winters and dry summers



Photo 7: A recent high density residential development by the river in Astana

D) Izmir, Turkey

By: Prof. Dr. Umit ERDEM

Introduction

Izmir is located in the Aegean region and is surrounded with Balikesir on the north, Manisa on the east, Aydin on the south and Aegean Sea on the west. The actual area of Izmir is 12,012 km². The area of the metropolitan administration (Izmir Municipality) covers about 140,000 ha. The region of Izmir has, due to its well-situated transport connections to central Anatolia and its economic relations to Europe, become a core area for the Turkish economy.

The region around Izmir has a typical Mediterranean climate. Consequently, the average daily temperature from mid-April to mid-September is over 20°C, the average maximum temperature rises over 30°C. The summer heat is rarely interrupted by rain. The typical Mediterranean climate has humid winters that are relatively warm with an average temperature minimum of over 5°C. Frost occurs only a few days in winter, and snowfalls are very seldom. Even the average temperature does not fall below 13°C.



Photo 8: Flood in urban area of Turkey

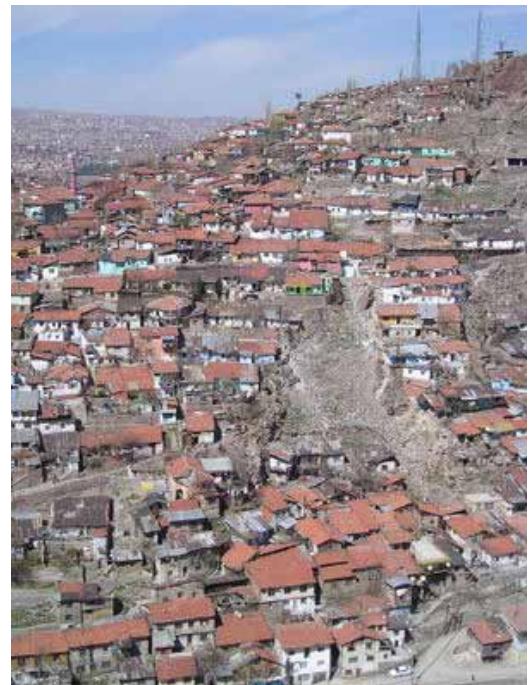


Photo 9: Gecekondus areas, Izmir

1. Urbanization processes

The urban population of Izmir increased from 227,000 to 2,700,000 between 1950 and 2000. The share of the urban population as part of the total population increased in the same period from 22% to 81%. The development of urban infrastructure was unable to cope with this large population growth. Immigrants created temporary accommodation and settlements on the city peripheries, so-called Gecekondu “built overnight” areas, which only have the most basic infrastructure. Today 35% of the population of Izmir still lives in Gecekondu areas.

In 1953, the local development plan estimated a population of 400,000 by the year 2000. However, by 1970 the population number had already exceeded 500,000; urban planning was outstripped by development.

In the 1980s the Gecekondu areas experienced an increase in value that was seen as a political success. All election campaigns since 1980 have raised the issues of legalization, entry of property into the land register and the granting of building permission for the Gecekondu areas.

The new Building Law of 1985 extended the authority of local administrations to grant permission for local development plans and simultaneously with the drawing up of renewal plans (Building Reclamation Plan) the Gecekondu areas were legalized by registering the owners of property in the Land Register.

The rapid population growth caused a considerable demand for apartments. The attempt was made to meet this demand with high-density housing. These projects came under the control of the metropolitan administration and are supported by cooperatives, banks and private enterprises. The aim is to make affordable accommodation available to population groups with low incomes and thus prevent illegal building such as the Gecekondu developments. However, through amendments and by raising the number of occupancies in the newly planned housing areas, as well as in the Gecekondu areas, this has led to “concrete deserts” that are distinguished by a lack of technical and social infrastructure. Their monotonous architecture and dim apartments are results of planning that does not respect the needs and the individuality of human.

Despite these large housing projects, the demand for housing will not decrease in the future. The prognosis of the Chamber of Industry and Commerce in Izmir forecasts that 354,053 apartments should be built between 2000 and 2010.

In spite of these projects, the development of unplanned Gecekondu areas continues and the legalization of older Gecekondu areas incites speculators to develop new Gecekondus.

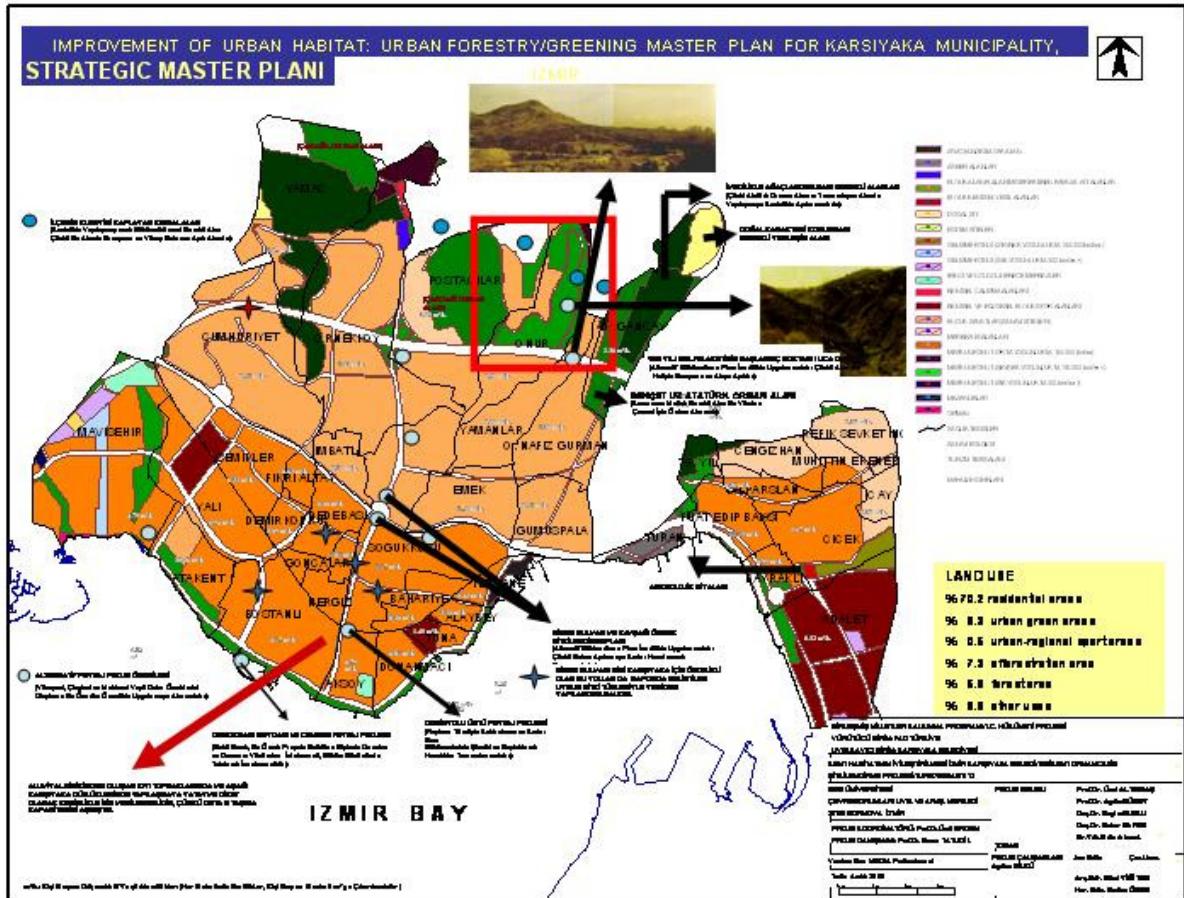
2. Planning and Management of the Urban Green Resource

With available land being scarce and very expensive, many planned green areas are likely to be

converted into build areas during the development of cities in Turkey. As a result the green areas in the urban centres are small and often lacking high quality content.

As a result of the unstructured city development, green buffers between the different neighbourhoods and industrial areas have been lost. Izmir has lost its gardening houses, vegetable gardens, agriculture fields and forests at the edge of the city and instead has gotten apartments, shanties and concrete buildings.

Figure 6. Master plan for UPFG in the Municipality of Karsiyaka, Turkey



Urban green areas within the municipal borders of Izmir are not distributed equally, but the public green areas scattered over 9 districts cover 4,892,304m², 12% of the total land cover. The ratio of urban green areas is 2.15m² per person while the ratio of forest is 5.5m² per person.

“Urban Forestry” has already been developed in Izmir. The first study about urban forestry titled “Improvement of Urban Habitat: Urban Forestry /Greening Master Plan for Karsiyaka Municipality, Izmir” was carried out in 2001, supported by UNDP and FAO. Following that the “Izmir Urban Forest” has been established in Bornova District in 2004. The work on urban forest activities have been going on since.

3. Policy, legislation and institutional frameworks

Between 1933 and 1956, the building and planning regulations in Turkey stipulated that there should be 65m² city area for each person and that there should be 4m² open space, consisting of small woodlands, grass, lakes and playgrounds, per person. However, in 1956 a new law was adopted where this specific clause was omitted and planners were left to make their own plans and standards. Fortunately, in 1985 a standard of 7m² per person for green areas was once again introduced in the construction law. In 1999 this standard was raised to 10m² per person in the city, and when including the accessible green areas around the city, 14m² per person should be available. Unfortunately there is no regulation for distribution, planning and content of urban green space.

The Turkish Forest Law is quite specific in its legal definition of a forest, and urban green areas with trees, such as parks or graveyards, are not covered by this definition, and thus the Forest Law does not apply to them, nor does it offer any protection from development of these areas. Within the Forest Law different types of forest are distinguished based on their function, but the ‘city forest’ or ‘recreational forest’ is not among the defined forest types.

No other legislation is specifically addressing urban woodlands and other green areas, but the regulations for afforestation stipulate the compulsory participation of public institutions in realising planned new forest areas, e.g. municipalities are responsible for new Municipality Forests, the Ministry of Education is responsible for new School Forests, etc. However, no real coordination between the afforestation actions of these institutions exists.

It is obvious that most of the forests listed above could be located within the city limits and consequently could provide benefits to the city and its citizens, and as such that this legal regulation reflects the idea of a “City Forest” in an indirect way.

The only known legal regulation including the term “City Forest” is a Ministry of Forestry circular of 1996 about Afforestation and Control of Erosion. The circular states that: “Within those areas that are not specifically aiming at the protection and development of the present genetic formation, recreation, erosion control or commercial afforestation, methods of afforestation and tree types which minimise the noise of the city, air pollution and development of shanties will be selected.”

The Laws and the authorized institutes indicated above are directly effective in the constitution of green zone tissue. The different public institutions have to produce policies on constitution, development and protection of the green tissue of the city. Especially since the 1990’s the NGO’s are in a great accession and they have been undertaking effective indirect functions about the green zone tissue and as a result, projects are on the agenda which were gained by the international relations like lots of Municipality Projects and Karsiyaka Green Zone Project

Turkey’s approach to the European Union has also had an effect on urban green space planning and policy. Beginning with the first steps of approaching the EU, studies into how to reach the European

Standards for the city green have taken place. The first establishment of a local Agenda 21 group took place in Izmir and urban green space has been one of its main agenda items.

Different bodies in the environmental planning and urban planning can be found at the central, provincial, metropolitan and municipal level. The State Planning Organization (DPT), Ministry of Building and Housing Development, Ministry of Environment and Forestry, Ministry of Culture and Tourism, Ministry of Health and Social Affairs, Ministry of Energy and Natural Resources, Office for Special Protection Areas are all involved at the central level. The Provincial Bank, the Provincial Department of Environment and Local Environmental Committee are involved at the provincial level and Metropolitan Administrations and Municipal administrations direct actions at the metropolitan and municipal level. Apart from these official institutions, various civil society organizations working with urban green space have been established in recent years.



Photo 10: Deforested peri-urban area close to Izmir, Turkey.

In Izmir, both in the city and nearby the city, the efforts to meet the recreational needs of the citizens have picked up speed in order to provide green areas for a more liveable city. One of the first steps is the project “Improvement of Urban Forestry / Greening Master Plan for Karsiyaka Municipality, Izmir” which was supported by UNDP and FAO. In the framework of this plan 150,000 young trees were planted. At the same time, areas have been taken into Landscape projects, such as parks, roads, green corridors etc. Afforestation took place on the slopes in the mountainous area of Karsiyaka in order to prevent illegal

housing. A city forest in Bornova, with an area of 1,226 hectares, is one of the places that contribute with ecological benefits as well as helping to meet the recreational needs of the residents.

4. Financial Mechanisms to support UPFG

In Turkey, support for UPFG activities comes from National governmental facilities, local governments and Non-governmental Organizations (NGO).

Afforestation is administrated by The Ministry of Environment and Forest, one of the organizations which have a special budget for Urban Forestry. For example, the project “Urban Forest of Izmir” in Ciceklikoy has been supported by The Ministry of Environment and Forest. The Department for Management of Parks and Gardens of the local Administration is responsible for the local urban forestry efforts.

Furthermore, NGOs play an increasingly important role in financing UPFG projects. For example, the Turkish Foundation for Combating Soil Erosion, Reforestation and the Protection of Natural Habitat (TEMA), The Foundation for the Promotion and Protection of the Environment and Cultural Heritage (CEKUL), support afforestation, with donations and assistances they gathered. Also, local Trade Associations, Chamber of Commerce and other associations are reserving resources for UPFG projects. In Balcova Teleferik, the Izmir Chamber of Commerce (ITO) afforested a “Memorial Forest”.

5. Recommendations for the future

Young people comprise two thirds of the total population in Turkey, being both a weakness and strength for any future development. Not all government policies are sufficiently addressing young people's needs, which might cause problems in the future. Rapid population changes, and urbanisation, have a large effect on Turkey's population, both in the country-side as well as in the cities, causing a large pressure on the natural resources in and around Turkish cities.

Changes in many Turkish planning and environmental policies are underway at the moment as Turkey is coming closer in fulfilling the EU demands for membership negotiations. International Agreements find their way into Turkish policy and planning, and NGOs have taken an increasing stand on environmental matters over the recent years.

Although improvements have been made in the past decade, urban green space is still underdeveloped in Turkey compared to EU and other international standards. The following recommendations could help to improve this situation:

- A. public awareness about the importance of urban green space needs to be improved;
- B. increasing the awareness among especially the younger population will help to protect the environment;
- C. tourism is of growing economic importance for Turkey, and focusing more on sustainable tourism facilities, conserving the natural character that is one of the attractions for tourists, could increase the long term benefits of tourism;
- D. reaching EU standards for urban green space, both in terms of protection, planning and size, should be an important aim for Turkey. This aim should be supported (financially) by the EU;
- E. more research and collection of good practices within UPFG in Turkey is needed.

6. SWOT

Strengths

- experiences with UPFG gained in the Karsiyaka project can be used in new projects

Weaknesses

- unclear responsibilities for planning and management of UPFG
- forested land is ‘given away’ for other ‘public’ functions
- unclear funding situation for UPFG

Opportunities

- involvement of NGOs and other local interest groups in future UPFG projects

Threats

- continued rapid urbanisation

E) Kabul, Afghanistan

By: Abdul Ghani Ghuriani

Introduction

Kabul is located between Latitude 34-31' North and Longitude 69-12' East at an altitude of 1,800 m (6,000 feet) above sea level. Kabul has a mainly dry, continental climate. The temperature variation between day and night is very large. The climate is temperate, the four seasons are clearly marked and annual precipitation is around 400 mm. The average temperature during the warmest month is 30°C while it falls to -20°C in the coldest month. The vegetation is mostly typical of semi deserts and steppes.

In the past decades Kabul City was home to around 1,000,000 people (1973 census). During the internal war and collapse of security, the movement from rural to urban areas took new trends (1979) and population changes have been high due to frequent migration and internal displacement. According to some sources, the population increase has been high in recent years (2002 to present). However there is no data to confirm the current population in the city, which is estimated to a minimum of 3 millions.

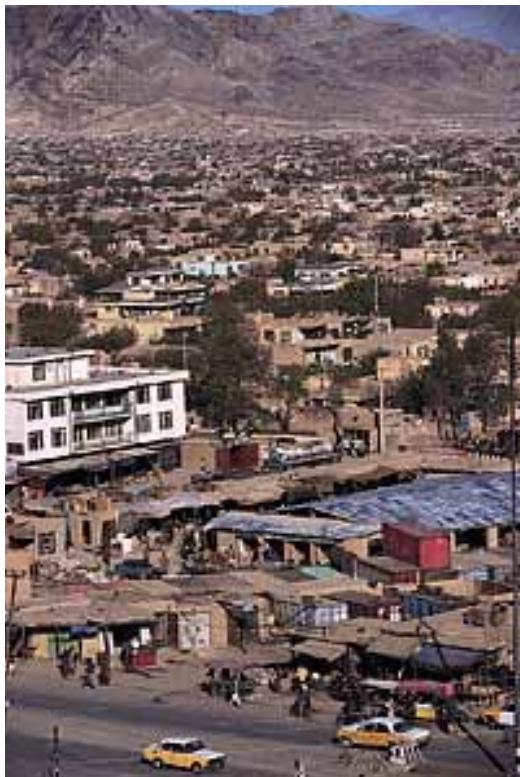


Photo 11: The extended habitated zone of Kabul



Photo 12: Citizens participation for plantation of trees in the peri-urban zone of Kabul, Afghanistan.

1. Urbanization processes

Kabul has become the most populous city in the country. The environmental consequence of a rapid population increase is pervasive. The sub-division of agricultural land holdings, the migration of people from rural areas, the increase in demands for forest goods and services and the consequent denudation of forested hillsides have become common.

Since the country has been the scene of conflicts stemming from struggle for control over the city, outbreaks of violence became increasingly common. A flow of people from rural areas to the city enforced the political affairs to extend the city on to many green and agricultural fields. Consequently, most of the urban forests and green areas were converted to residential areas that created further pressure on the remaining forest.

The main driving force for urbanization in Kabul has been the overall conflict in the country and population movement from rural to urban areas. Unemployment opportunities can be another issue forcing the community to urban areas. Recently the flow of repatriation and settling in the city comes as new crisis and the pressure on natural resources and standing trees. In the last 25 years, movement of passive actors and professional bodies from urban areas to neighbouring countries, Europe and America has resulted in an overall brain drain.

2. Planning and Management of the Urban Green Resource

Going through the history of greenery in the city, many hills around the city were covered by different varieties of forest. The establishment of parks, and green grounds with specific landscapes was started in the 16th century by emperor Mohd Zaheeruddin Babur, and continued in the 19th and 20th century. In the Soviet period the greenery system was further developed and many parks and tree plantations around main roads and boulevards were added.

In 1960s, comprehensive planning strategies for urban and peri-urban greenery have been made. This planning collapsed because of limitation of concerned departments' achievements due to lack of resources and flee of brains. The strategies covered the following areas:

- Establishing green spots in the central part of the city
- Greening the government's and public compounds
- Voluntarily tree plantation campaign through students and the government staffs
- Developing recreational place for civilians

- Tracing the hilly sides in various parts of the city
- Green belt forestry complex
- Greenery education
- Media motivation on greenery issues
- Annual greenery campaign

During the last 25 years, 65% of hillsides that were identified for green belt and enforcement of the existing trees were altered to muddy residential areas. This has been a challenge to the urban forestry actors. The specific impact on land used for UPFG are the increased movement of population especially the mountainous residents.



Photo 13: Plantation of evergreen trees in the peri-urban area

Kabul City has been destroyed during the last 15 years and the fragile environment has gone from bad to worse. The quality of air and the atmosphere is tangibly low. The population here suffer of prevail disease especially respiratory disease and water born disease. Lack of health services has made it worse. The issue of low literacy rate, lack of awareness and education sources have also been issues of concern.

Forest's economic service is dependent on the imported timbers from surroundings, which has depleted most of the district greenery. The traditional culture of tree plantation among the citizens is low and those with limited traditional sense of tree plantation and economic values are sustained with the problems of irrigation because of broken water supply systems and a low water table in the city. 60% of the population in the city has no accesses to hydropower and are dependent on liquid and solid fuel. Fuel wood and deforestation is the only alternative. Such deforestation and cut of private and state's forest have had a very

negative impact on the environment. Deforestation and loss of vegetation covers has caused small to large flood flows and soil erosion. Since some rocky mountains covered most of the Kabul City, land slides have not been a serious problem yet.

In recent years, considerable concerns have been voiced over the state of the forest in general, and in urban forestry in particular. Moreover, there are increasing conflicts between the population and the remnant trees. During the coldest months thousands of trees are cut for fuel. Various other factors have been held responsible for this alarming situation, ranging from the lack of awareness in the society, to increased poverty over the past years, and a lack of maintenance.

3. Policy, legislation and institutional frameworks

Soil and water conservation in hillside areas has been a serious problem. Recommendations on watershed management have emerged as an integral component of forest policies since 1945. With this plan, moderate scale afforestation, planting of fruits and non fruit trees, soil and water conservation measure such as check dams, gully plugging, proper water disposal from agricultural fields and terracing of fields have been major recommendations. The policies also recommended incentives for farmers and subsidies to plant trees.

Another pressing problem in urban forestry in the city is unavailability of habitat alternative that evolves lack of clear policies in urban development's master plan.

The Department of Forestry and Range has been in charge for natural forest and urban forestry programs in Afghanistan. Identification and mapping of major denuded areas has been one of the priorities to be considered at the time of inception.

The conflicts in 1992-1996 resulted in the areas becoming deforested because of interventions of different fighting parties. The forest here has been destroyed attributed by the fighters and common people living around. According to evidences, they cut off branches in the first year, cut them down in the second and pulled up the roots in the third in order to meet their fuel wood needs.

Within the current period of peace and stability in the country, urban forestry and greenery entered into a new phase. The international community has been committed to assist relevant departments in establishing forestry programs in Kabul City and in the surrounding districts. The Asian Development Bank and FAO assisted the Forest Department in developing strategies, physical reforestation programs, education and introduction of new technologies. But this cooperation and assistance is not (yet) committed to middle and long term urban reforestation programs. It is hoped that this commitment to urban reforestation becomes stronger in the future.

Presently, the Department of Forestry and Range is responsible for tree regeneration, tree plantation

and maintenance of most hill-side forests. The greenery department of Kabul Municipality is in charge of the management of parks, inner recreation sites, boulevards, government orchards and roadsides. Lack of professionals and foresters has been one of the main challenges for the departments. There is poor coordination between the two government departments, which has resulted in the fact that most of the newly planted saplings die.

Based on inputs received during a national conference held in January 2005, the Minister of Agriculture advised to attract more support for reforestation from National and International Organizations, and to reactivate the prior Forestation Committee. The Forestation Committee is composed of representatives from different ministries, local authorities as well as international Organizations. The Committee was ordered to prepare a national, and local, plantation plan.

Based on previous bad experiences with importing plant material, it was decided to strictly avoid the import of sapling from outside the region. The capacity of Forest Department nurseries, municipality nurseries, NGOs nurseries and private farmer's nurseries should be traced and surveyed for the exact number of suitable planting stock available inside the country. The nurseries under the Forest Department were not in the position to fulfil this requirement, therefore it was decided and agreed in the meeting to procure and purchase the needed saplings from the NGO's or private nursery owners.

USAID and UNOPS / ACC provided 160,000 US\$ respectively to support the implementation of programs regarding the provision of man power, water tankers, small hand tools etc. for the duration of 40 days. The program was implemented in Maranjan Hill, Paghman Hill, Badam Bagh, Qurgha Hill, and Bagh e Bala, of the forest department and 3 municipal sites in Kabul City (roadsides, city parks and Bibi Mahroo Hill). 175,000 saplings of different forestry species have been planted.

At the same time when the urban developing process begun, the government assumed to demand greater participation of civilians in the management of forests in and around the city. The rights of citizens to manage the community based forests became a key focus for many communities living around. The Government itself developed reforestation plans and criteria for protection of existing and new seedlings.

Depending on the legal status of the forest, there can be several stakeholders. Forest greenery areas were identified decades ago on the basis of a government plan, with the private and government stakeholders of the time. However, in the past decade much has changed and at the moment there are the following stakeholders:

- A. Local people: for many communities, forest goods and services are critical for subsistence livelihood and greening of the disposed areas. In the city, there are certain communities in which timber is a significant basis for cash income.
- B. Government institutions: historically, the government through its related departments has wielded considerable influence in defining the policy agenda, maintaining liaison with citizens, and enforcing the urban forestry regulations. Several rules were enforced to ban logging and motivated the community to take part in greenery of the city. Among government offices, the

Department of Forestry and Range of the Ministry of Agriculture and the Greenery Department of Kabul Municipality have been the most active.

- C. Private sector and NGOs; the NGO community is a new initiative in Afghanistan. At the moment around 2000 National and International NGOs are registered with the government. Most of them are engaged in relief and rehabilitation as well as charitable activities. At the moment a small number of NGOs are involved in forestry rehabilitation. Beside government nurseries, a number of seedling production nurseries are established by the NGOs that supports the greenery of the city in some means.
- D. The Department of Forestry and Rangelands (DoFR), which is responsible for the management, utilization, protection and regeneration of the country's natural forests, manmade forests, rangelands, national parks and wildlife resources. DoFR has approximately 66 technical staff of various background and 1,215 administrative and supporting staff all over the country. The staffs are highly motivated, but are working under difficult conditions, with very limited budgets and possibilities and with little access to practical training in modern forestry

The responsibilities for planning and development at the city level forestry rest to two main government departments: 1) Forestry and Range Management Department (DoFR) and 2) Greenery Department of Kabul City.

In contrast to traditional forest management planning as learned by the DoFR staff in college, planning for forestry projects that include new dimensions and apply a set of newly developed skills seems like a complex component, especially in a society that lack environmental and social knowledge. However, things are beginning to change. The DoFR has established a centre which is mandated to prepare working plans using participatory approaches and reflecting environmental conditions and demands. The centre has also the task to prepare management plans for selected forests, coordinate preparation of working plans, and undertake basic forest research. Though, despite low skills and knowledge, the centre would become an active player in policy, legal and institutional reform in the future, if the continued assistance of international institutions flows.

4. Financial Mechanisms to support UPFG

Centralized financial mechanism has been common in all sectors and the urban forestry programs. Many urban forestry programs come in the form of projects, to be proposed by the responsible institutions, with clear justification for the budgeted costs. Financial planning, management and maintenance of the urban greenery are handled by the responsible office. A rather complex regulatory system for approval of these projects exists, going all the way up to the ministry of finance. The long and complicated process has been a

barrier for many projects.

The urban greenery department of the municipality is achieving most of the maintenance and irrigation of the forests around the city. The financial means derive from the municipality budget. Special funding for the greenery and maintenance is offered in the inception of fiscal years.

5. Recommendations for the future

Centralized decision making and financial issues have been one of the main constraints in urban greenery. Tree plantation in Kabul has been seasonal and the process to sustain funding for the future has been difficult. Recently, the small but effective international partnership has eased the process but the already inherited bureaucracy has slowed the process. However, participation of the local community in tree planting campaigns is amongst the strengths. But, due to the slow processing of the government, such participatory systems approaches have weaknesses as well.

At the moment, mass media is very active and this could be a possible opportunity to make an overall campaign to enforce the urban greenery programs. Such a campaign could contribute immensely to the reforestation of the country.



Photo 14: Citizen participation to tree plantation in the peri-urban area of Kabul

The forestry strategy and master plans for the next 10 years open ways to follow the program in the long run. The focus of the forestry education program at Kabul University has been to train foresters to meet the staffing needs of the forestry services. A need has been felt for a long time to introduce new topics and specializations in forestry education, and the previous policy of the government made recommendation to this effect. More than 2000 graduates have received diploma in forestry since the inception of the program. At the moment a number of these graduates are engaged in forestry services, but the demands for refreshing and modernising the education is felt. Also, the curriculum in the department does not offer major issues that exist elsewhere. Except for sponsored training and education abroad under the bilateral and multi-lateral assistance, there is no in-country arrangement for in-service training. The 2002 policy recommended provision of this facility within Afghanistan in general and in Kabul in particular.

Recently, inclusion of skills for modern forestry programs with sponsorship assistance from the community has been possible tools. However, these could not offer as many technical issues as required. The master plan currently under process, for MAAHF (Ministry of Agriculture, Animal Husbandry and Food) will hopefully cover the urban and rural forestry. Recently a number of staffs in the responsible departments have been upgraded that could be useful for greenery programs in urban areas.

Most urban forest policies in Kabul have followed a normative-autocratic approach that is conditioned by colonial traditions of government and forest management. During the formulation of the policies, experts were drawn from different fields, but the consultation process remained confined to those in professional circles, who generally considered local people to be a main source of forest problems. The policies consequently comprised technical solutions with varying degrees of prohibition of rights and or uses. Indeed, some policies recommended the acquiring of legitimate rights of people by the government, the use of strict penalties under the law, and conferring greater power on the forest and range department to enforce the law. They lacked the local knowledge and imaginative flexibility to make them work in complex real-life situations.

Since Kabul has a small wood resource base, most policies have focussed on maximization of green spots and woodlands through minor incentives and sustainable management of forest that is inherited historically. It is evident that successive policies have not been established yet to handle issues which would entail changes to the institutional structure, better relations with related departments, and finally an urban forest management at all. The new restructuring and general forest strategy may be a tool to come with a successful management plan covering urban and semi-urban reforestation.

The best that can be stated about the urban reforestation approaches is that tree plantation campaigns can be organized followed with though security standings. It is indeed catastrophic, that the annual tree plantation campaigns remain failures because of a lack of management and coordination.

Furthermore, the policies were/are not based on reliable, accurate data that could project the future needs of forest and forestry services. Data sources still continue to be the old records that may not be in a position to overcome the current deforestation trends in the city. Modern techniques such as GIS are only

now being a hand tool, but with very limited knowledge and acceptance, because it demands an information sharing culture to be effective. This culture is very weak at the moment.

Most of the plantation program is supported by donors, which is not sustainable in the long-term, and the project implemented was of short duration. After the completion of the project, the Forestry and Range Department was not able to maintain and continue the program. There is not enough coordination between stakeholders causing overlaps between projects, the Forestry and Range Department budget is limited and does not cover the needed reforestation activities, the system of administration is old and the department depends on the administration department of the Ministry, thus all operations and plantation programs are facing problems due to more processes within the administration system, and lack of development budgets.

Enforcement of the mandated centre for urban forestry is a key issue to combat the increasingly trend of deforestation. This could be possible through developing and intensifying forestry education centre.

It is important to understand the challenges we face in the forestry sector. Only a small percent of the total land mass is under some kind of urban forest cover and most of it is located in the central part of the city. Involving all stakeholders and civilians in greenery campaign would help to create a green city.

6. SWOT

Strengths

- Long history for green space planning (especially in the post WO2 Soviet period)
- International funding agreements for tree planting in place.
- Proper justification for proposed greenery projects submitted for funding
- Interest of government authorities and their support
- Environmental act approved by the government and the parliament
- Forest act has been drafted.
- Forestry policy and strategies, that has developed within the last four years

Weaknesses

- Unclear central decision making/responsibility for urban green
- Lack of capacity and upgrade staffs in the framework of responsible department
- Lack of motivation amongst the private sector and the citizens
- Lack of maintenance and irrigation systems

- Negligence of technologies that can promote urban greenery programs
- Lack of citizens mobilization in greenery programs
- No researches on indigenous varieties of trees
- Ignorance of regular coordination and cooperation between stakeholders

Opportunities

- Afforestation projects supported by international Organizations, involving local (commercial) nurseries and NGO's
- Local and international press attention for tree planting
- Employment opportunities to local citizens in forest production
- Foreign technical consultants in the issue

Threats

- High level of poverty, other priorities are more important
- Deforestation due to high demand for fire- and construction wood
- Continued urbanisation
- Shortage of energy for lighting, heating and cooking
- Lack of awareness programs

F) Yerevan, Armenia

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Introduction

Armenia is a typical mountainous country and is characterized with complex relief, limited land, water and forest resources, and high seismic activity. The geographic coordinates of the capital Yerevan are 40°15' north latitude and 62° eastern longitudes. The climate is continental and the difference between mean winter and mean summer temperatures is more than 30°C. The difference between absolute minimum and maximum temperatures is close to 71°C (-30°C in January and 41°C in July). The amount of annual precipitation in Yerevan is 300-350mm (in most humid years it is 465mm), which is un-satisfactory to irrigate capital's and surrounding's lands as sum of evaporation is about 1300mm.

The Republic of Armenia (RA) was formed after declaration of Independence in 1991 following the collapse of the former Soviet Union. The area of the country constitutes 2,974,000 km² and has a population of about 3.0 million (Census 2001). The country is a republic with 10 provinces and the capital Yerevan which has the same status as the provinces. The capital Yerevan has a population of 1,091,230 people.



Photo 15: Overview of the city and region of Yerevan, Armenia

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The decade of the 1990s was harsh and turbulent in Armenia. In 1991 Armenia got its independence from the former USSR. During the following year the country experienced political violence and several economic shocks. The separation from the USSR combined with the effects of a devastating earthquake in 1988, and the 1988-1994 war with the neighbouring Republic of Azerbaijan created transportation, economic and energy blockade. This situation put a tremendous pressure on forests as source of fuel wood. It was estimated that during the 1990s nearly 50% of the energy consumed in households near to forested areas came from fuel-wood (Thuresson *et al.* 1999).

1. Urbanization processes

Population is distributed among 57 towns (66,5%) and in 930 village communities. As a necessary prediction for sustainable development of settlements, the modern plans and projects on urban development are under preparation in the Republic. These plans are aimed to provide the vitality and sustainable development of settlements and consider the ecological and social demands. According to a country profile (2002), provision of appropriate accommodation for the population is one of the main problems for Armenia.

The main driving forces for urbanization in Armenia are:

- Programs and projects to provide complex reconstruction and development plans on the base of newly drafted maps, pilot project of two-stage zoning, continuous activities within the framework of the National Plan of the Sustainable Development of the Human Settlements and the Habitat, anti-landslides activities (2002-2004) and reconstruction of exploiting bridges.
- Capacity building, education, research, technologies and awareness-raising to provide possibilities and facilities for training of corresponding specialists. Armenia has a sufficient number of specialists in this field. However, the majority of local bodies have no skilled specialists for the implementation of their duties. The training of necessary specialists for the system is realized by Yerevan State Architecture and Construction Universities and Yerevan State Architectural College. Population should be informed about the situation and ongoing programs through television/radio broadcasts, mass media, press and outreach companies, and exhibitions.
- An effective information management to analyse and systemize information from local communities and separate organizations and to create databases. Currently, within State Committee of the Real property Cadastre the activities are implemented in the field of creation and centralization of information on cadastre, topographic surveys, digital maps, etc.
- Cooperation and experience exchange. The cooperation partners currently include international and various national and non-governmental organizations. This should be enriched, extended and all resources effectively used.

2. Planning and Management of the Urban Green Resource

In Yerevan and especially in its centre, the urban building process has caused serious anxiety in recent years. Today, anxiety turns into indignation among experts as well as wide sections of the public. It is a question of violations of the General Plan of Yerevan occurring without public discussion, illegal allocation of land, neglect of existing projects for completion and area reclamation, infringement of copyright, illegal construction of unapproved and even rejected projects, etc.

Incorrect use of topography, inappropriate construction in green areas, violation of the long-term plan for tree planting in the capital, approved in 1974, and infringement of the landscape planning project for Yerevan territory have turned the capital into a dusty, dark, choking city. What occurs in the areas around the Opera and Ballet Theatre, Circular Boulevard, ravine of the Hrazdan River, and Victory Park has no relation either to professionalism or to ordered processes. Today, more than 50% of green areas are built-up in Yerevan.



Photo 16: A principal street with trees in Yerevan

It is accepted to separate three functional types of green areas in Yerevan city: 1) general purpose or use (public parks and gardens, small parks and other publicity accessible green areas), 2) limited use (in the backyards or surroundings of different state or private institutions or factories) and 3) special use (green areas at graveyards, along streets, around waterways and water reservoirs).

The energy crises in 1990s in the country caused massive, non-licensed cutting of trees and shrubs (more intensive in 1993-1996) in Yerevan city green areas, as a result of which per capita provision of green

area has decreased abruptly. Mostly damaged were green areas with special use and general use. Green areas with limited use were less affected, as they were under more direct control and protection of juridical and physical personnel.

In relation with agricultural land privatization within the city administrative boundary, land users somehow changed the functional meaning of previous kolkhoz-sovkhoz fruit and grape orchards (special use green plantings). As a result of economic crises a part of the fruit and grape orchards were cut.

The green areas of limited use have increased in the 1990s as a result of the extension of the city's boundary's, which lead to inclusion of many previously non-registered areas and greening around summer houses, planting actions, as well as thanks to areas which changed their functional meaning (previously special meaning or general use). The huge damage to the city's plantings also caused a very poor state of irrigation systems.

As a result of infrastructure development, including areas of general use, green plantings decreased. Essential parts of parks, and other green areas were rented out to private entrepreneurs, who also influenced the surrounding green areas. In the last decade no kind of inventory activity took place in Yerevan city. Green areas and the following presented figures are based on visual observations and experts' assessments.

It is evident that in 1990-2003 the area of general use and special meaning green zones have decreased substantially. In this period the total loss of green area surface constituted 1,216.6 ha, and the total balance of green area surface shows, thanks to an increase of limited use green area, a loss of 660.5 ha. General use and special use green areas were reduced by 42% and 36.3% respectively.

Studies show that as a result of planting between 1928 and 1988, 1,930 hectares of Yerevan were covered in trees. Green zones made up 11.4% of city land. In 1990-1995, during the energy crisis, 470 hectares of trees were cut down in Yerevan, bringing the area covered by trees down to 7.3%. The energy crisis was overcome, but surprisingly, the deforestation has picked up speed. Between 1995 and 2000, an additional 700 hectares of trees were cut down for construction purposes. By 1998 the green zones had fallen to 3.4%. And today, the mayor keeps giving away parkland.

The land allocations for the cafés were conducted in violation of ecological and city planning standards. According to the Yerevan Mayor's Office, if the size of a plot to be allocated does not exceed 20 square meters, it does not have to be put up for public auction. This has given officials from the Mayor's Office free rein to dismantle the park the way they have. They can sign away a 20-square-meter plot, and then expand it later as much as they wish.

Both Armenia Tree Project (ATP) and Armenian Forests NGOs have undertaken projects to restore Tsitsernakaberd Park in Yerevan, using a system known as coppicing. The result of these efforts is a 100 percent survival rate.

In 2005 the ATP has started with 90,000 trees planting symbolizing the 90 years of the first genocide of the new history of an old culture. The fruit trees – apple, peach, apricot, mulberry and decorative

evergreens will open their branches as a silent embrace for victims of terror. Sponsored by local and Diaspora Armenians, the project will plant 53 different varieties across the republic this year.

To publicize the unique meaning and the idea of the tree planting the ATP has launched a large-scale propaganda. It includes printed materials, direct correspondence, satellite television broadcasting, local radio, as well as information on a website.

3. Policy, legislation and institutional frameworks

The conceptual and legal framework for local government was established in Armenia just four years ago. After more than three generations of tight central government control under the Soviet system, the fact that there is local government here at all is a substantial accomplishment. While much work has been done to implement a comprehensive agenda of government decentralization and reform, there are a number of areas that need significant improvement before true self-government based on democratic principles can flourish here:

- Government Decentralization, which includes Administrative and Fiscal Issues (Local governmental unions have limited political, legal and administrative autonomy, no ability to allocate and manage resources, generate and manage revenue from local sources)
- Service Delivery (effective public service provision, etc.),
- Citizen Participation

All these issues interrelate to create what can be seen as a vicious circle that impedes development of an effective system of local governance. Local Government Unions (LGUs) have insufficient power and revenue to provide adequate services. Citizens recognize the severe limitations on local government autonomy and the incapacity of LGUs to delivery services, and therefore have little interest in participating in local government activities and decision making. They correctly perceive that under present circumstances, local governments can do little to improve the quality of their lives. To complete the circle: without meaningful and broad based citizen involvement, local governments are less unlikely to have the political power to persuade the state government to devolve additional administrative and revenue generating powers to the local level.

The Agency of Nature Protection of Yerevan Municipality is responsible for management of green zones in Yerevan. The Agency of Nature Protection of Yerevan Municipality only has, according to "Law on Ecological Control", a control function. There is rather poor cooperation with Ministry of Nature Protection as a result of which protection of green areas is ineffective. The most optimal solution would be if the

Municipality will have chance not only to control, but also apply administrative sanctions in the case of violations.

The other big change and chance to improve the situation in green areas is a planned change of status of the capital Yerevan. The new law on the status of Yerevan should be accepted in 2005, according of that law the Municipality will have a separate budget. “The protection of green zones in Yerevan” is a non-completed document which was initiated by the Nature Protection Agency of Yerevan Municipality, which entirely and directly will deal with UPFG in Yerevan city and peri-urban areas.

Urban green areas have a protected status in both the acting forest code (from 1994) and proposed new forest law (currently is in discussion stage). The forest law states that:

- urban forests are in the first place used for recreation for the whole population.
- cuttings of the main forest use, production of the secondary forest products (stumps) as well as forest by-use and grazing in the urban forests are prohibited.

4. Financial Mechanisms to support UPFG

In June 10, 2004 the Reforestation and Forest Development Fund (RFDF) was established. AMD20.5 mln-worth of reforestation work was carried out on 34 hectares of the Nork Forest in Yerevan. In accordance with another agreement, an irrigation network rehabilitation program was implemented on an area of 40 ha of the Nork forest in Yerevan to a total budget of AMD21 mln.

In 2005 the Armenian Government, taking into account the poor conditions in green zones of Yerevan city, allocated funds to restore irrigation networks in green areas, and considerably increase green areas of general use within the coming 15 years. It is planned to plant 260 ha of forest in Yerevan City in the coming 3 years. Only in autumn, 2005 more than 15,000 plantings have been planted in the areas where irrigation networks already functioned.

‘The polluter pays’ principle was introduced after the political changes. Yearly charges have to be paid by the operators of air pollution sources (mobile as well as stationary), depending on the amount and kind of the pollutants. A system of penalties for violation of the legislation and non-compliance with the applicable emission limit values has been introduced as well. These payments are guided to a separate account. There was an intention to use those resources as a base for an Environmental Fund. This fund should be used to finance different environment conservation activities. However, at present this account is an integral part of the state budget. Under existing legislation, expenditure for environmental conservation may be deducted from profit before taxation.

5. Recommendations for the future

For the sustainable development of the Yerevan City greening system it is necessary to process and implement a complex action program, which will include the following:

- The creation of a specialized government body to coordinate activities,
- Rehabilitation works and preparation of clear projects for the new greening areas through provision of irrigation, care and protection,
- Creation of corresponding nurseries and green-houses, proved selection of planting materials,
- Construction of well-managed irrigation networks,
- Implementation of new technologies and scientific achievements.

To realize a higher percentage of green in Yerevan, reconstruction and creation of new green areas is needed. It is therefore proposed to rebuild and establish a number of nurseries to provide planting material for the increased number of plantings needed.

The perspective greening plans are rather realistic, but require programmed phase implementation and large-scale financial investments. According to accountings for the establishment of 2,072 ha general use green areas there would be required 27.7 mln \$, including 8.4 mln \$ to construct irrigation networks.

Yerevan is a highly urbanized city and has unfavourable pollution levels and an un-healthy environment. For this reason it is recommended to conduct the following general activities:

For residential zones it is recommended to:

- prohibit the construction of new residential areas without information indicating a decrease in environmental pollution levels;
- ensure development and application of special building and green planting techniques that enhance the environment (fountains and water bodies, aeration corridors, special types, mixtures and planning methods for yards and mall green areas).

For construction on public territory:

- prohibit the construction of large new commercial facilities (supermarkets, shopping centres, show-rooms and fair-rooms, big institutions of cultural-domestic service etc.);
- reduce the pressure of existing large commercial facilities on open spaces (markets, goods fairs, sport complexes);
- equip existing large facilities with ventilation systems to clean the air;

- apply technological and planning methods that reduce the negative impacts of environmental pollution on the population (noise-gas-dust protective walls, “green” pedestrian corridors, planning with ventilation etc.).

For green zones:

- Process and accept Yerevan City green zones management and protection law,
- Put responsibility for Yerevan City green areas governance on Yerevan Municipality together with rights to use sanctions in the case of violations,
- For reconstruction and new development of green areas, use materials with enhanced pollution reduction functions (for noise, gas and dust) and ensure the consideration of health aspects in planning, with a view towards improving environmental quality,
- Increase general use green areas in Yerevan City from 540,3 ha (2005) to 2,382.3 ha (2020), meaning per capita change from 4.9 m²/person to 19.85 m²/person;
- Increase limited use green areas in Yerevan City from 2,951.3 ha (2005) to 3,245.3 ha (2020), meaning per capita change from 26.7 m²/person to 27.4 m²/person;
- Increase special meaning green areas in Yerevan City from 1,460.1 ha (2005) to 3,770.1 ha (2020), meaning per capita change from 13.2 m²/person to 31.41 m²/person.

From the effective local governance point of view the following recommendations should be given (based on (Doane *et al.* 2000)):

Government Decentralization, which includes Administrative and Fiscal Issues:

- transforming Yerevan into a unified City with an elected Mayor and Council,
- providing for direct local government units control over public service delivery enterprises,
- encouraging State Government institutions, such as the Ministry of Urban Development to become advocates for local government units and improved local government,
- empowering local government units to effectively manage all local public services,
- enhancing the effectiveness of municipal and professional associations,
- enhancing the capacity of local government units to increase revenue from local sources,
- strengthening the capacity of financial officers to enhance the budget and capital planning processes,

Service Delivery:

- strengthening the capacity of local government units that are too small to be fiscally and administratively able to provide local public services,
- enhancing the ability and capacity of local government units to take direct or effective control over the delivery of local public services,

Citizen Participation:

- increasing citizen understanding into the Armenian government at all levels, in order to facilitate meaningful public participation and democratic decision making;
- strengthening the capacity for community based organizations to lobby for change;
- improving access to and dissemination of public information;
- creating and using structures to facilitate public participation, such as advertised public hearings, press releases and pamphlets, published agendas for scheduled public meetings, etc.;
- promoting the effectiveness of condominium associations.

6. SWOT

Strengths

- long history for green space planning
- active local NGO's that work for improvement and protection of urban green spaces

Weaknesses

- existing guidelines and standards for urban green space are not enforced

Opportunities

- many guidelines and standards are in place already
- funds allocated for restoration of irrigation systems
- tree planting started (fall 2005)

Threats

- uncontrolled city development due to high pressure for more housing
- existence of corruption among city politicians and officials
- difficult climatic conditions, topography and a high level of pollution

- vegetation can only flourish if supported by extensive irrigation



Photo 17: Yerevan city and the region surround