

Part 5

Urban and Cultural Heritage

The Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area in the Syrian Arab Republic

Final Report

Volume 4 Sector Report

Part 5 Urban and Cultural Heritage

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Chapter 1 Historical Development

Damascus is a large geographical region, containing mountain ranges, green plains, known as Ghouta and barren land leading to the desert. It is considered as a rich oasis with moderate climate, penetrated by a great river, called Barada.

This region is the third region in the Levant (Bilad Al Sham), which observed the oldest human settlement in the Modern Stone Age that dates back at least to the Neanderthal era. This fact is proved by the archaeological discoveries in caves of Yabroud, Al Qalamoun mountains, Qassyoun, Al Mazzeh and others.

In the 9th and 8th millennium BC (Neolith era), the first forms of urban structure and planning, the social and economical impacts appeared by changing the house projection from circle to square or rectangular. Since that era, the harmony and interaction between man and his environment appeared in the use of traditional construction materials (stone, mud and wood) for the public and private architecture, as this region was very rich in these materials, which helped to enhance the human life in the region. Since then until this day, life did not stop in the Damascus region, and excavation almost any where revealed evidences of human existence in this region.

comparison



Zukak al Sachr
Twenty Century

Source: Damascus governorate

Figure 1.1 Zuqaq al Sakher in the Twentieth Century



Tal Sakka
1800-1500 BC

Source: Damascus governorate

Figure 1.2 Tal Sakka, 1800-1500 BC



Source: Damascus governorate

Figure 1.3 Al Amwi Mosque



Source: Damascus governorate

Figure 1.4 Turbet Assayar(ayyubi)



Source: Damascus governorate

Figure 1.5 Hajj Caravan

The strategic location of the region, connecting the coast with the central area and north with south, made it a center for the commercial roads and accordingly made it the political and economical capital of the Levant region. This was clear in the first, second and third millennium BC. This region continued having strategic importance throughout the classical ages till the Arab Muslims liberated it and Damascus became the capital of the Arab Umayyad state. During this era Damascus witnessed a comprehensive urban prosperity symbolized the great Umayyad mosque that became the urban model for the rest of mosques in the Arab world. In the 8th - 12th century Damascus lost its urban importance, but it regained it in the period of Nour Eddin Al Zinki in the middle of 12th century, when Damascus was once more the base and capital of the Levant region. During the conflict with European crusades, which invaded the Levant in the late 11th century and during Nourian and Ayyoubid periods, the religious and military architecture flourished in Damascus, and during the Mamlouki period (13th - 16th century), it witnessed economic prosperity and stability. In the period of Ottoman sultans starting (1516) Damascus gained a special attention because it was the center and starting point of the Hajj caravans, coming from Asia.

With the beginning of the western interference in the internal Arab affairs, Damascus started to lose its economic importance, where many handicrafts exterminated. French occupation for Syria lasted from 1920 till 1946, when Syria gained independency as the first Arab country to be free from the foreign occupation.

After independency Syria was unstable because of many military coups and from 1958 - 1963 Damascus witnessed remarkable urban development, and after the 8th March revolution in 1963 Damascus witnessed development in laws and regulations for the benefit of labors and farmers. The war of 1967 had a great impact on Damascus due to the large number of emigrants from Golan Heights, which was occupied by Israel in 1967. During the period President Hafez Al Assad, 1970 - 2000, there was a remarkable development, where new quarters and projects were established (service, water and electricity).

Through out its history, Damascus witnessed several earthquakes, the biggest of which was in 1759. This earthquake caused a great damage to the residential and historical urban structure, such as the Umayyad mosque, the citadel and Asa`ad Pacha Khan. Before that, Damascus tolerated strong earthquakes in the 12th century and to almost total destruction the Mongolian Timor Lank in the beginning of the 5th century.

In 1860 the quarter of Bab Touma was destroyed and burned during the sectarian disorders, and during the 1925 revolution, the French army destroyed the residential quarter in Damascus, such as Al Midan, Al Shaghour and Sidi Meqdad, which was re-planed as Al Hariqa quarter.



Source: Damascus governorate

**Figure 1.6 Al-Hariqa Area - Sidi Amud
(recent)**

Figure 1.7 Sidi Amud (1918)

Damascus is historically a compound city, that the historical eras are represented in its urban structure and there exists an architectural evidence for each period and era. The main characteristic of Damascus urban structure is that it is an environmental urban structure reflecting the relationship between man and his environment. Damascus was food and industry self sufficient through the interrelation between the urban city and the agricultural countryside, in addition to desert (pastures), and it used to produce all its needs with exporting them, but Damascus lost this advantage after middle of the 9th century, when it was invade by the European products.

Chapter 2 Cultural Structure of the Damascus City

The Damascus region, like other regions in the Levant (Bilad Al Sham), had cultural and religious unit since the Neolith age. Archaeological evidences, especially architecture, show that Arab people that inhabited this region had one (unified) culture, and if Damascus architecture is compared it with other Arab regions, the basic unified characteristics are based on one culture and belief, (monotheism).

The most important characteristic is the unity of projection, material, color, shape, symbolism and environmental and climatic conformity. Damascus was subjected to many invasions and occupations for a total period of 2,000 years, these invasions however could not cancel or eliminate the culture and religion of this region and the strength of its civilization and culture constantly overcome the civilization and culture of the invasions and occupations.,

Damascus has preserved its Arab civilization and characteristics throughout the Greek, Roman and Persian eras, or during the domination of foreign rulers, such as Turkish, Circassian, Kurdish or Ottoman rulers. The main ethnics in Damascus are the Arabs, who have three religions: Jewish, Christianity and Islam, in addition to other ethnics settled in Damascus for religious and political reasons.

Figure 2.1 shows the distribution of peoples of various backgrounds in Damascus in 1937.

2.1 Kurds

They settled in Damascus since the middle ages in the 12th century, and formed their own communities, like Al Akrad and Sarouja areas. They came as Muslims to participate in the crusade wars and they were very effective in Hittin battle and in liberating Jerusalem. They merged culturally and linguistically, with the Arab culture.

2.2 Circassians

They came from the Caucasian mountains. They are known historically as Mamlouks, and in the modern age, first quarter of the 20th century, many of them migrated from their country during the socialism domination in the previous Soviet Union, because of religious persecution, and like Kurds, they formed their own communities.

2.3 Armenians

Due to the religious persecution, massacres and ethnic elimination to Armenian people by Turkey, large number of them migrated to the Levant and part of them settled in Damascus, especially in Bab Touma area.

2.4 Palestinian Refugees

Large number of them came after the Israeli occupation of Palestine. Most of them Muslims and some Christians, and the majority are Arab in addition to some Circassians, Armenians and Kurds.

2.5 Moroccans

They are Arab and Berbers and all of them are Muslims. Part of them came during the Crusade Wars in the 12th century and the other part after the French occupation to Algeria in 1832. They established several communities in Al Swaiqa and Zuqzq Al Naqeeb.

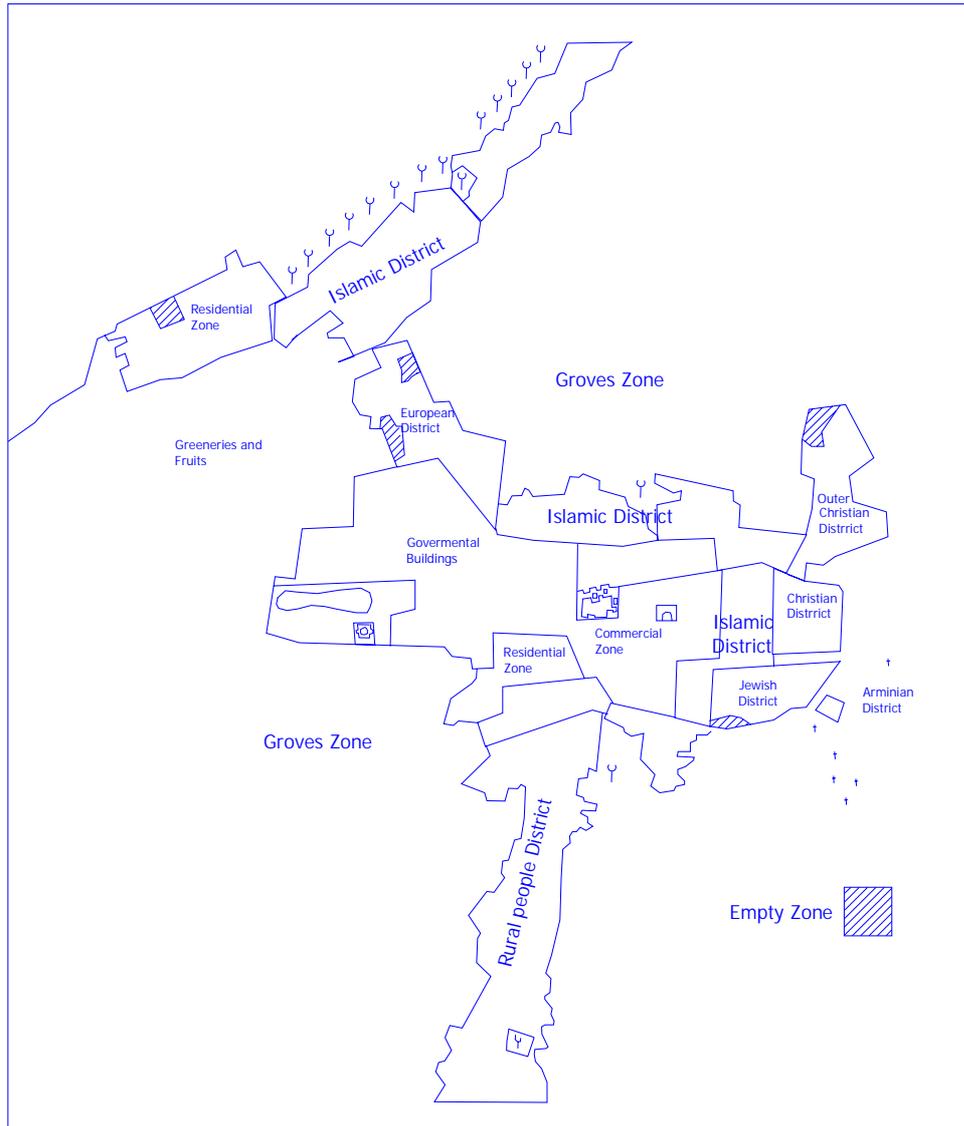
2.6 Turks

They are Muslims, settled in Damascus during the Ottoman occupation in 1516 and they do not have their own communities, although Al Swaiqa area was considered “small Istanbul”.

2.7 Minorities and Others

There are ethnic minorities, who came to Damascus individually or as groups from the Islamic world, such as Bosnia, Albania, and Soviet Union countries, Afghanistan, India, Pakistan and Iran

In Addition to these ethnics, there is the internal migration from other governorates to Damascus, especially the Kurds in Syria, who came from Al Hassakeh, Qamishli and Aleppo and settled in Dummar (in Bustan Al Riz) area). It is important to mention that the constitution is civilian, all citizens are equal regardless their ethnics, religion or belief.



Source: Damascus governorate

Figure 2.1 Distribution of Peoples of Various Backgrounds in Damascus in 1937

Chapter 3 Historical Areas in the Damascus City

3.1 Walled Old City

Damascus was established on four hills, and archaeological excavations proved the urban existence that goes back to the 3rd millennium BC. The urban heritage is almost concentrated in the old city, consisting of historical residential and military constructions such as the Damascus citadel, the wall, towers and a number of unique religious architecture, the most important of which are the Umayyad mosque and the religious schools, such as Al Adliyah, Al Ayyoubiyeh, Al Zahiriyeh and many others, in addition to Khans (Khan Asa`ad Pasha), historical souks (Souk Al Hamidiyah) and many historical houses (Al A`azem, A`anbar, Al Na`assan. etc.). In addition to its distinguished architecture, it has a distinguished social characteristic, which gave constant life to the city from the day of its establishment until now. The city experience many natural risks (earthquakes, fires and epidemics) and human risks (wars, battles, destruction), yet it kept its unique urban structure, which reflects the close relationship between the Damascenes and their society and environment.

The panoramic view of Damascus is presented in Figure 3.1.



Source: Google Earth

Figure 3.1 Panoramic View of Damascus

3.2 Al Salihiyeh

When the Palestinian refugees came from Jerusalem and other cities, escaping from the Crusades massacres in late 11th century, the Sultan Nour Eddin Zinki ordered to accommodate them at the foot of the Qassyoun mountains, where they settled and established several mosques, and this area was called Al Salihiyeh. This area is very important because it consists of several historical architecture from the Ayyoubid, Mamlouk and Ottoman periods (900 years ago), and the road, which penetrates this area from north to west has historical urban importance, because it includes religious schools, mosques, almshouses, cemeteries and bimaristans (hospitals).

3.3 Swaiqet Sarouja

This quarter used to be un-walled small city for the high rank people from the Mamlouk and Ottoman period. It is penetrated by a main road that branches into small allies, and the area contains important monuments, such as Al Shamiyeh School, Al Ward mosque, Al Jozeh Hammam (bath).

3.4 Al Midan Quarter

It was historically known as Al Qubaibat. This area was religiously, economically and commercially important (because of the Hajj caravans) and contains historical monuments from the Mamlouk and Ottoman periods, in addition to several churches.

3.5 Qaser Al Hajjaj Quarter and Al Qanawat

They are located at the south-west part out of the wall of the old city, and both of them are located on the path of the Hajj caravan and they have same urban structure of others.

3.6 Al Uqaibeh

The name comes from the Aqabeh (obstacle) because of the topographical relieves in the area. It locates at the northern edge of the Barada river. This area goes back to middle ages and expanded around Al Tawbeh mosque.

The common characteristics of the urban structures outside of the wall are that they were established in the middle ages and the unified Arab planning. The protection wall was replaced by the huge gates, which were closed at night during war time. All these structures contain a main large mosque, a main street, souk (marketplace) and narrow streets with dead end allies, in addition to service and commercial facilities, such as khans, hammams, public fountains, religion schools, almshouses and cemeteries.

All house projections are same, but social differences can be noticed by the space of the house, number of sky opening, quality of the material, decoration and wooden finishing and

furniture.

The establishment of this type of urban structure was related to the population increase and expansion limitation within the walled city, expanded outside the wall, surrounding the city as a bracelet. The expansion zones were subjected to regular destruction since the early 20th century and constructions laws during the French period encouraged this destruction by using cement (concrete) instead of the traditional materials. Only very lately, it was realized that it would be necessary to protect this unique urban structure, and the historical monuments were registered in the world heritage list. Yet the heritage destruction has still occurred through the illegal constructions and the unscientific restoration processes, and the current laws and regulations are unable to protect these historical areas and zones.

Chapter 4 Heritage in Rural Damascus

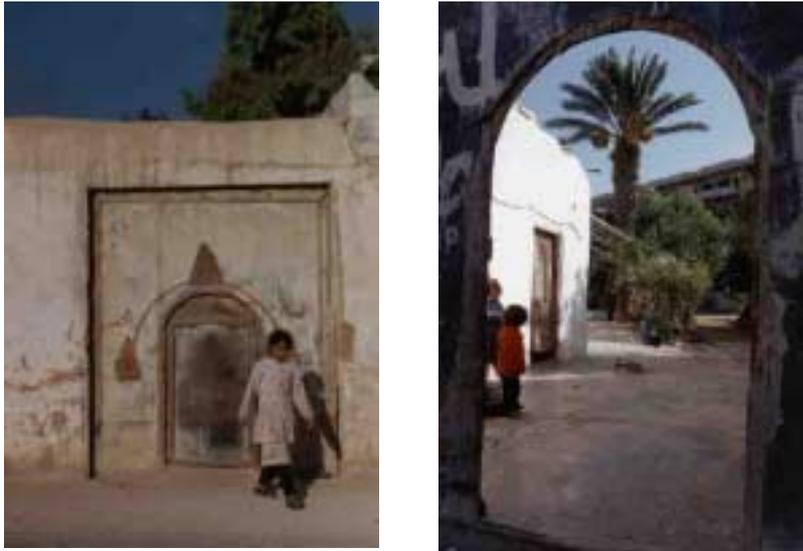
The eastern and western Ghouta areas, penetrated by the Barada river and its tributary Al A`awaj, form the productive Rural Damascus. Al Ghouta means planted area, or vegetated place. It contains about 44 villages and the names of these villages show that they go back to the Aramaic and Amorian periods, which means that human existence in rural Damascus is as old as Damascus itself. As for its urban construction in it, the historian Shaikh Al Rabweh, in 8th century, said “If the urban constructions in it (palaces, halls, barns, mills, hammams, marketplaces, schools, mosques and cemeteries) are collected all together, it would have been a grand city”. He also said: “If it was not for Al Ghouta, Damascus would not be one of the most beautiful cities in the whole world”. Historically, people of Al Ghouta get together every day in marketplace of vegetables and fruits and in the animal market. Al Ghouta contained historical, religious and urban monuments, such as mosques, palaces and others.



Source: Damascus governorate

Figure 4.1 Typical Traditional Houses in Rural Damascus

- It is noticed that the houses in Al Ghouta are built from traditional materials (stone, mud and wood), and the eastern Ghouta is rich with poplar wood, which was used for construction since the Modern Stone Age (Neolith). This wood environmentally conforms to the climate of Damascus; it's flexible, easy to cut and twist and has high resistance to earthquakes.
- **A typical rural house** in Rural Damascus differs a little bit from Damascus house because of its different function; the open space contains the furnace place, the barn, the hen house and the pigeon house.



Source: Damascus governorate

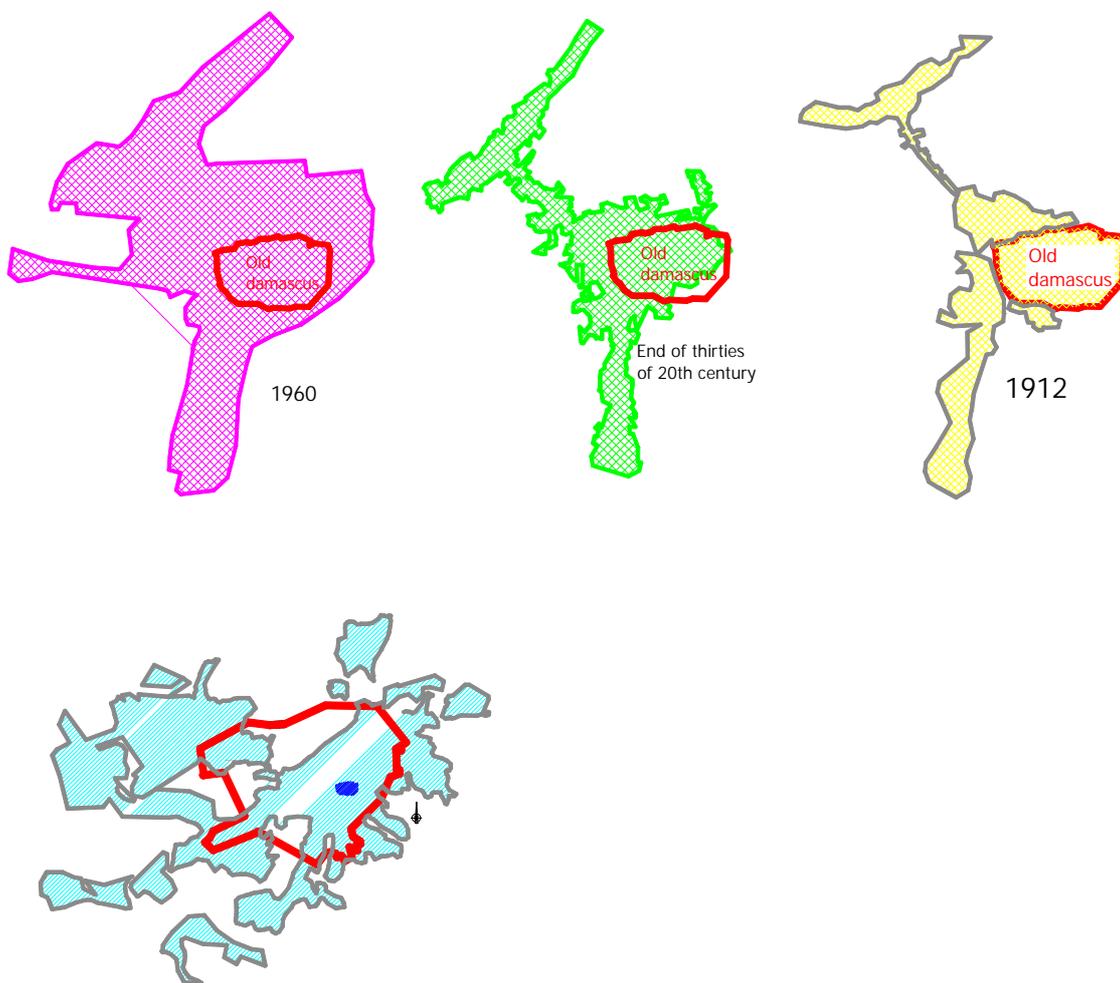
Figure 4.2 Typical Traditional Houses in Rural Damascus

Unfortunately, the modern urban architecture invaded Al Ghouta (several floors buildings) and the number of traditional house decreased and the modern constructions occupy large spaces of the agricultural land of Ghouta, so that great part of its vegetation, trees in particular, has disappeared.

Chapter 5 Planning for Developing and Preserving Heritage

5.1 Impact of Master Plans on Urban Heritage in Damascus:

The first master plan for Damascus was established in 1937, by the French architectures Ecochar and Danjei. They adopted city planning of the beginning of the 20th century (main road network connecting different geometrical shape squares and sub-road network). This style was applied, in the past, to the French cities and known by “the beautiful city movement”. This planning style was a reaction of the narrow serpentine streets and allies existed in that period. The mentioned French architectures applied this planning style not only to Damascus, but to several other Syrian cities.



Source: Damascus governorate

Figure 5.1 Urbanized Area in Damascus since 1912 till Now

Some mistakes resulted from that planning, such as the disrespect of the traditional urban structure that prevailed at that time, considering it as disorderly structure that needs radical change. The traditional materials also were disrespected, and the factory cement was established and the use of traditional materials was prohibited in the construction code.

Actually, the problem is not only demolishing the traditional structure and replacing it with modern one, but also, the disrespect of the old city planning considering that there is no plan, but merely narrow twisted allies that need to be replaced by wide streets . Any study of the characteristics and components of the existing planning reveals the result of thousands of years of urban development. It is true that the qualitative changes occurred during the beginning of 20th century (electricity, car, telephone, concrete. etc.) should be considered in the planning process, but yet the characteristics of each city should not be neglected.

At the end of World War II and after independency, Damascus realized that its master plan did not fulfill the needs of development any more so that consequent additions and modifications were made on its master plan. Each area was studied separately and the urgent need for new master plan appeared. Therefore, a contract was made with the architects Ecochar and Banshoya in 1963 to conduct the master plan for Damascus in four years.

Although the new master plan observed the expansion to be in the barren areas, maintaining the green area, and cared about preserving the historical feature of the city, yet the preservation concept was the same as applied nowadays.

Several international conventions on maintaining traditional urban heritage and preserving them as integrated areas, not isolated from the urban surroundings, were issued. These conventions, in addition to the Syrian Archaeological Law, which registers archeological monuments and put them under protection, contribute to giving this heritage its true value.

The committee of studying the Ecochar - Banshoya master plan adopted the list of archaeological monuments provided by the representative of antiquities department in that committee. These monuments were maintained, isolating them from their urban surroundings.

5.2 Impact of Ecoschar – Banshoya Master Plan on Archaeological Aspects of Damascus

5.2.1 The old city within the wall

Ecoschar - Banshoya considered car transport as a very important element that should enter the old city to serve the commercial area and warehouses. The area surrounding the Umayyad mosque was emptied to show the mosque as an important monument within a square as the case of monuments in Europe and the important urban structure was interpenetrated by wide streets. Fortunately, however, this master plan was suspended by a presidential decree and the old city within the wall was registered and a special construction code (No. 826 of 1996) was applied. Subsequently, it was registered in the world heritage list.

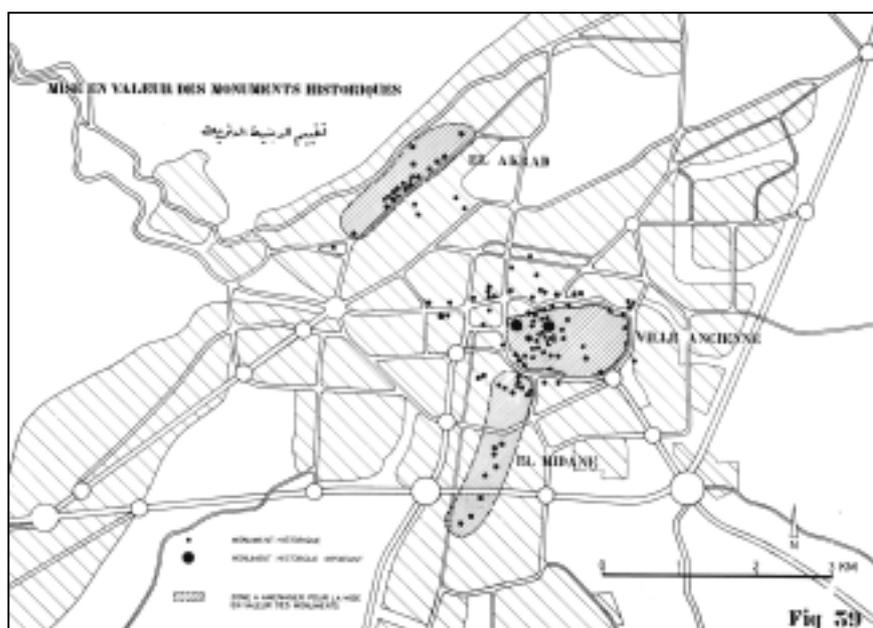


Source: Damascus governorate

Figure 5.2 Echochar - Banshoya Plan

Source: Damascus governorate

Figure 5.3 Old Damascus within the Wall



Source: Damascus governorate

Figure 5.4 Distribution of Historic Building

5.2.2 Outside the wall

The historical monuments, which are archaeologically registered, were maintained, but, the archaeological area was badly organized, especially in the Sarouja area, where voices became very loud requesting to preserve its remaining distinguished archaeological fabric. Arguments in this concern lasted for many years, and eventually the Supreme Council of Archaeology decided to register the area in addition to other areas in Al Midan and Al Qanawat as shown in Table 1.1.

Table 1.1 Historical Protected Zones in Damascus

| Zone name | Affiliation | No. and date of decision | Organization |
|--|--|--------------------------|----------------------------|
| Al Midan | Midan | 1/145, 1988 | Directorate of Antiquities |
| Al Qanawat | Qanawat Jaddeh | 430, 1996 | Directorate of Antiquities |
| Al Midan | Midan Mousilli | 1/158, 2004 | Ministry of Culture |
| Qaser Hajjaj - Bab Al Srijeh - Tayrouzi Hammam and mosque | Bab Al Jabiyeh - Qaber A`atkeh - Birket Hattab - Bab Srijeh - Swaiqa | 361, 2006 | Ministry of Culture |
| Al Qanawat | Qanawat Jaddeh | 1/159, 2004 | Ministry of Culture |
| Flous mosque and the neighboring area | Midan | 2005 | Ministry of Culture |
| Al Midan | Souk Al Midan | 1/157, 2004 | Ministry of Culture |

The archaeologically monuments registered by a decision of the Minister of Culture are as follows: 271 monuments within the administrative borders of Damascus and 38 sites, 41 tells (hills), and 43 sites under construction in Rural Damascus. There is no urban zone registered in Rural Damascus.

5.3 Objectives and Recommendations for Heritage Preservation

To include laws and regulation for protecting and developing the ancient urban areas in the planning systems is a new trend. In the UK, for instance, this trend was not adopted till 1969. In the Vines Convention in 1964, the recommendations mentioned “The concept of historical monument does not include the urban construction itself only, but it includes the frame that this monument exists within, and it can not be separated from its function and from the history represented by this monument”. These recommendations were emphasized by the Washington Convention in 1987, which confirmed the protection of the historical characteristic of the city, along with the spiritual and material elements that express this characteristic, especially the relationship between the historical city and its natural or man made environment, and emphasized maintaining the cultural characteristics of the society, no matter how little they are, because they represent the human history. It also mentioned that when the urban or regional master plan of an area includes constructing main streets for cars, these streets should

not penetrate the historical city or the protected urban area, but rather to facilitate accessing to these areas. Actually, the aim of this report is not merely preserving the historical sites in the city, but to confirm adopting the **bases of Arab city planning** during the planning process for the Damascus metropolitan area.

Obviously, there is an essential difference between the modern western planning, which adopts the concept of defining the use of each area, and the Arab planning which adopts the idea of dividing the city into integrated and connected quarters. The Arab city functions as one unit having one center that connects all main streets. This kind of division fulfills human, safety and practical needs; the socially and economically integrated quarter is the self sufficient cell of the city, in which simple human life concept is realized. Nevertheless, new elements such as car and the modern technical tools and materials of construction should be considered also, although the modern techniques of construction contributed in making the great cities in the world similar in planning and constructing.

In the current planning, car traffic was given the first priority in planning, so the Arab city lost its human characteristic and aspects, and became unable to provide movement facilities for the pedestrians, and houses became distant from each other to leave space for cars, and the ratio of road width and building height differed and accordingly, and shadows that protect pedestrian disappeared. Balance should be realized in order to maintain the identity of the city. This could be realized by defining the role of cars as a service tool, not impinging on social aspect and priority should be given to pedestrian movement. Also, integrated quarters should be established within the urban extension areas, where residents can provide all their needs walking. The western way of planning, which defines residential areas as first degree, second and public one, should be put away, because one of the bases of Arab city is integration between all society classes and economical levels. Commercial centers should be connected to the residential areas, because there is integration between social and commercial life in Arab cities. Probably, one of the reasons why a whole residential streets turn to commercial ones in Damascus, such as Barzeh, Al Yarmouk, Hay Tishreen and others.

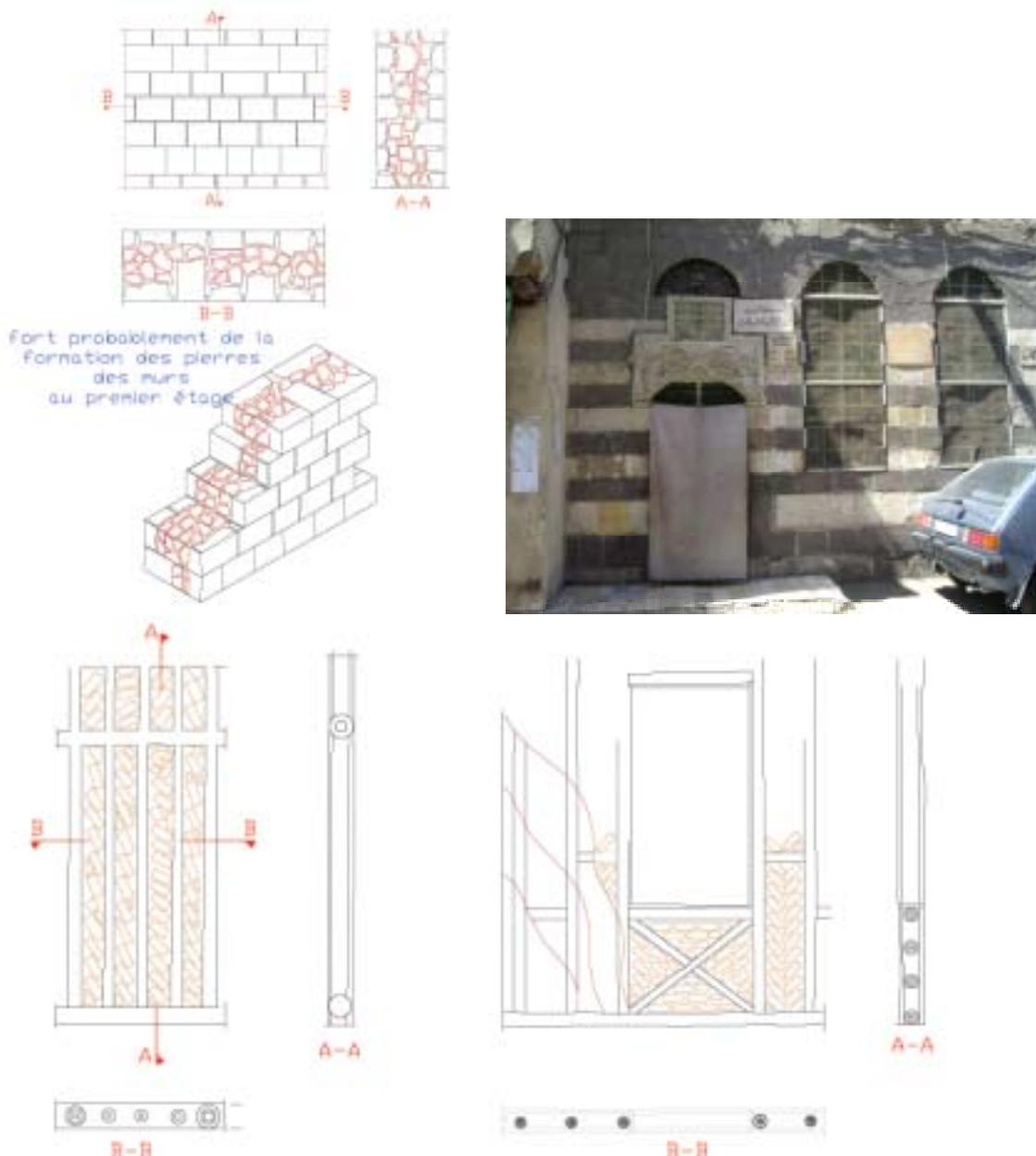
The visits to other governorates confirmed the similarity between cities (same buildings, squares etc.), with no distinguishing characteristics. This is applied to Rural Damascus as well, where the traditional urban fabric disappeared and expansions were made on the agricultural lands. Master plans and thoughts are unified. It is a pity that the Directorate of Antiquities does not register residential zones, or at least document them as the Washington Convention recommended by saying “Protection plan should define the buildings that could be dispensable in exceptional circumstances, and prior to making any procedure, **the existing cases in the area should be totally documented.**”

Annex: General Construction Methods and Materials Restoration of Old Buildings in DMA

(1) Method of construction

Usually, the foundations are constructed in raw stone with Kteifani stone and Bassimi that are comparatively strong of the known stones. It is possible to use the basalt and the Mazzi as well.

The walls of ground floor are constructed of rows of basalt and chalky. Sometimes, modest houses are constructed in raw stone. The walls of the first floor are constructed of cob (soil) with wood.

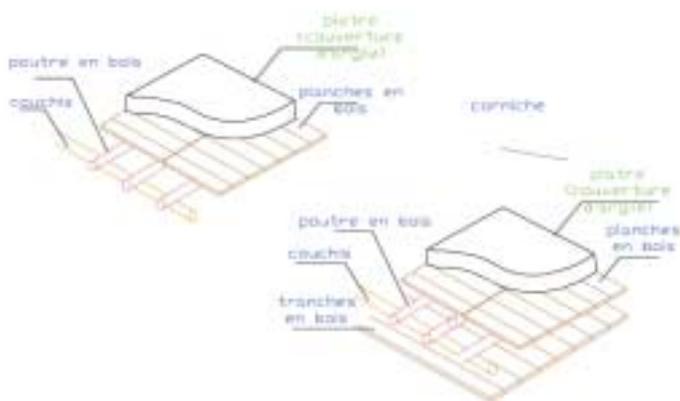
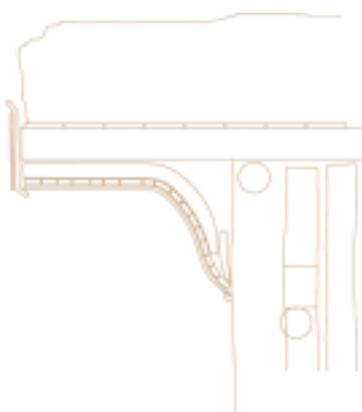




Straw is kneaded with cob and water added, and then dried in the sun and air. In the studio 1034, the surface of façade left for a long time without maintenance is ruined and consequently the units of clay and stone are exposed to rain, making the link mortar used between the units and stones crumble.

The roof is made of wooden pegs supported by cushions on walls in stone or in clay, and has a surface layer, which sometimes is replaced by a layer made of concrete.

The end of roof is finished with decoration that also works as protection of wall from water of rain.



(2) Construction materials for old houses



Clay is mixed on the ground with straw and fired under the sun. The cob is composed of organic products, and straw plays the role of arming.

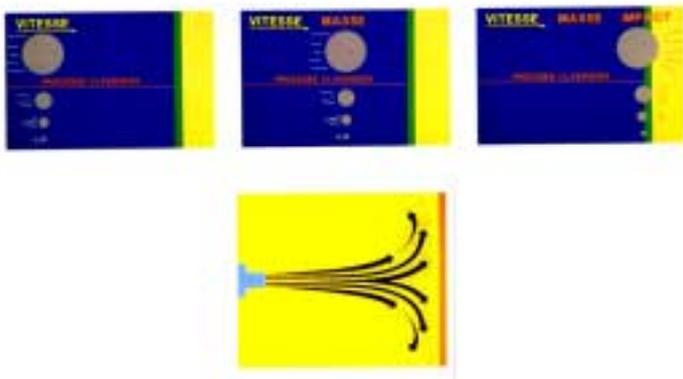




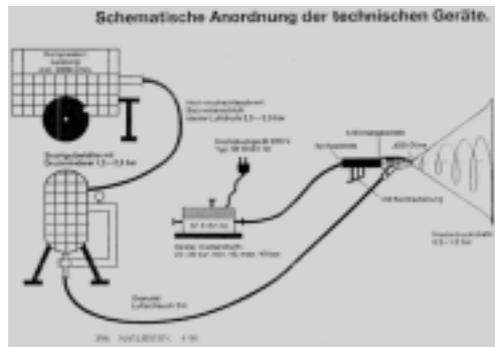
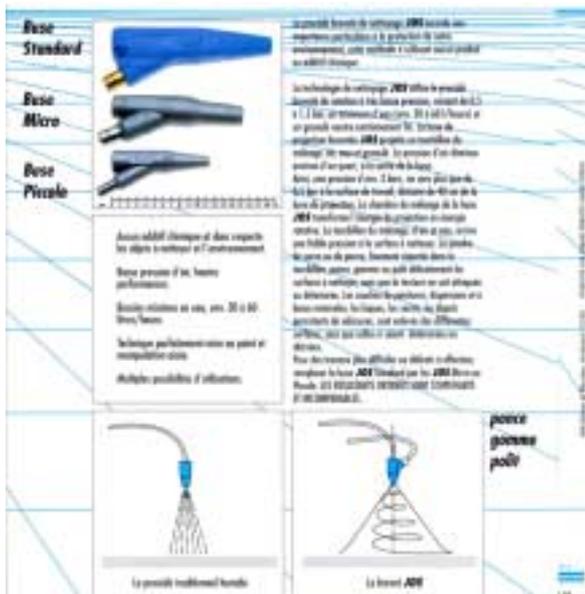
(3) Method of façade washing

Methods of façade washing are illustrated.

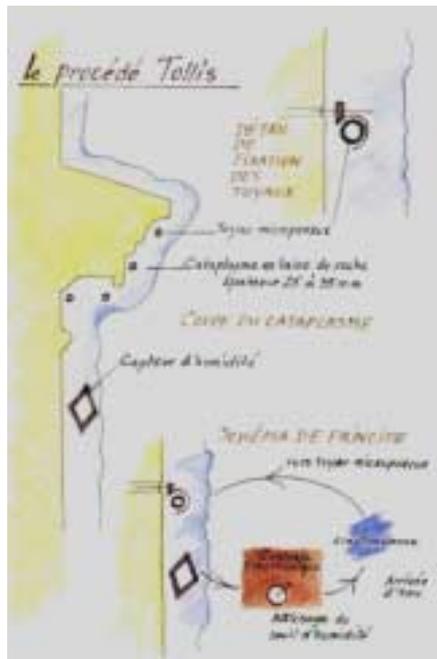
(a) Method of splashing sand particles



Different size sand particles used for various surfaces depending on materials and surface conditions



(b) Method of applying compressed water



Part 6

Urban Planning Institutions

**The Study on Urban Planning for Sustainable Development of
Damascus Metropolitan Area in the Syrian Arab Republic**

**Final Report
Volume 4 Sector Report
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Chapter 1 Overview of Urban Planning Institutions

1.1 Laws and Decrees Related to Urban Planning

The urban planning for the DMA is prescribed by the existing laws and decrees as listed in Table 1.1.

Table 1.1 Laws and Decrees Related to Urban Planning in Syria

| Law/decreed | Main functions |
|----------------------|--|
| Decree No.5 of 1982 | Prescribes the procedure for master plan preparation |
| Decree No.20 of 1983 | Allows municipalities/administrative units to acquire land for public projects |
| Law No.20 of 1983 | Modified Decree No. 5 elaborating the master plan preparation procedure |
| Law No.9 of 1974 | Prescribes methods for organizing urbanization of cities through land subdivision |
| Law No.60 of 1979 | Allows central cities to acquire land to implement their master plans |
| Law No.26 of 2000 | Modified Law No.60 preventing illegal land sales to avoid land acquisition at arbitrarily low prices evaluated by the Government |
| Law No.44 of 1960 | Regulate illegal housing |
| Law No.1 of 2003 | Modified Law No.44 establishing criteria for demolition of illegal buildings in view of the Building Code |
| Law No.14 of 1974 | Applies to three cities of Homs, Aleppo and Damascus to expedite the land development |

1.2 Organizations Involved in Urban Planning

Two most important organizations involved in urban planning in Syria are MLAE and the Ministry of Housing and Construction (MoHC). MLAE supervises the preparation of all the master plans either directly by its Directorate of Urban Planning and Development or through the Urban Planning Section of Service Departments of governorates. At the national level, MLAE conducts urban studies for specific urban projects such as the MAM and disaster prevention.

MoHC conducts studies and prepares strategic programs and plans by mobilizing as necessary the General Company for Engineering and Consulting (GCEC). At the national level, the State Planning Committee (SPC) prepares five year plans in cooperation with related Government organizations. At the local level, each municipality prepares its urban plan under the guidance of MLAE. The plan is implemented by the respective municipalities through their Technical Services Department, under the supervision of the relevant governorate.

The existing urban planning institutions are summarized in Table 1.2. In the table, the functions related to urban planning, development and control are given at the macro, mezzo and micro levels, and related institutions are summarized.

Table 1.2 Summary of Urban Planning Institutions in Syria

| Authority | | | Legal background | | | Plan type | | | Level |
|--|-----------------------------|---|---|--------------------|--|------------------|--|---|---------|
| Duties | Function | Name | Main subject | Date | Name | scale | Main components | Name | |
| Preparing the general plan of the state | | S.P.C | - Urban planning plan - Topographical plan - Acquiring plan | Every five year | The five-year plan (MLAE for urban plan and topo dept.) | | | | Macro-1 |
| Preparing urban studies (MAM project and the comprehensive project for reducing disasters) | Implementation | MoLAE | | | | | | | |
| - Preparing strategies program - Preparing regional plans | Preparing plans and studies | MoHC (General Co. for Engineering studies and consulting) | - Study aim - Defining the study and supervision committee | | Decision from Minister of Local Administration & Environment | 1/5,000 | - current situation plan - current statistics - future land use plan | Regional studies and plans (regional plan for Wadi Barada - general master plan for Damascus) | Mezo-2 |
| - Supervising and following up - Approving plans | Supervision | MoLAE (Urban Planning Dept.) | | | | | | | |
| - Preparing plan and approving it | Implementation | Technical services dept. | Preparing the master plans and implementation pressures | 1982 | Decree No. (5) | 1/5,000, 1/2,000 | a) housing units, b) current and future road network. | Framework plan | Micro-3 |
| - Preparing plan and approving it | Implementation | MoLAE (Urban Planning Dept.) | | | | | | | |
| - Supervising and following up - Approving plans | Supervision | | | | | | | | |
| - Preparing the plans | Implementation | Related municipalities | Building licenses authorizing in the urban areas without master plan and doesn't belong to any municipality | 2nd November, 2003 | Circulation No. (13/63/1/D) of MoLAE and MoHC | 1/5,000 | - Roads network - Public facilities on stat . properties | Guidance plan | |
| - Preparing the plans | Implementation | Technical services dept. | | | | | | | |
| - Supervising and following up - Approving plans | Supervision | Governorate | | | | | | | |

Organizational structure involved in preparing master plans is shown in Figure 1.1.

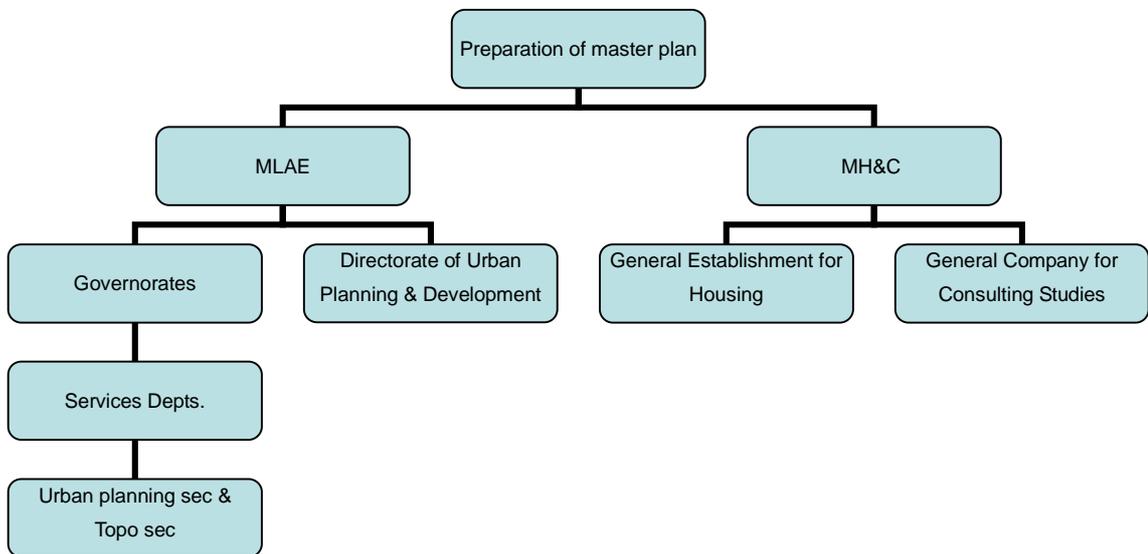


Figure 1.1 Organizational Structure for Preparing Maser Plans

Chapter 2 Types of Master and Other Plans

Types of master and other plans prescribed in the related laws and decrees are described below.

2.1 Master Plan

For any residential community having population over 500 persons, a master plan needs to be prepared. For communities where 75-80% of the existing master plans have been implemented, new master plans should be prepared. In both cases, the master plans are prepared on the basis of topographic surveys. The following procedures are taken in the master plan preparation:

- 1) The current situations are studied covering population, economic, social and other aspects, base maps prepared for land use, road network and others, and planning criteria defined such as housing area, public facilities and services in accordance with standards;
- 2) The implementation program is established based on expected population for the planning period, usually 20 years, based on the current population and anticipated growth, and the planning criteria;
- 3) The framework plan is prepared, including the number of housing units, and future road network; and
- 4) The general master plan is prepared.

The flow of general master plan preparation is shown in Figure 2.1.

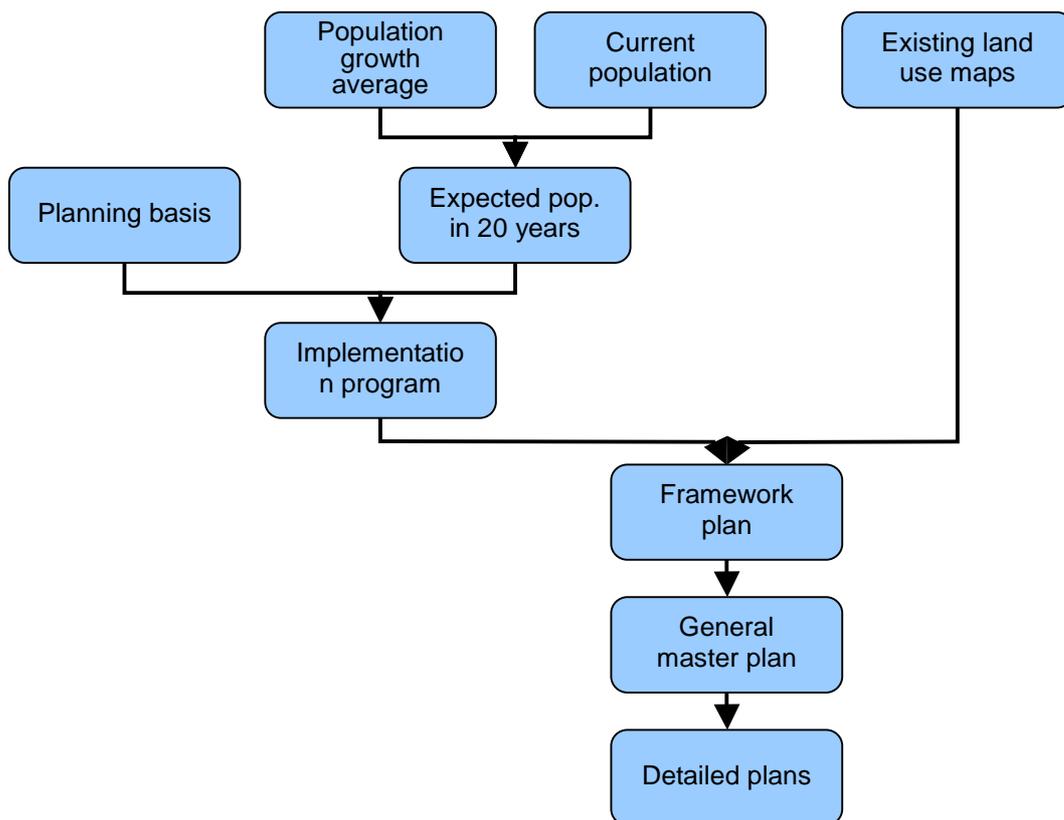


Figure 2.1 Flow of General Master Plan Preparation

2.2 Other Plans

(1) Detailed plan

Based on the general master plan prepared by the procedure outlined above, the detailed plan may be prepared if necessary.

(2) Regional plan

The regional plan is prepared for some important areas such as the Barada basin and the Ma'aloula area.

(3) Plan for urban belt

This plan is prepared for villages and communities not belonging to any municipalities and without a master plan. The plan prepared for a service department of any governorate is approved by the Executive Bureau of the governorate. This type of plans were used in 1976 for several villages and communities based on military topographic and cadastre maps in order to transfer state properties to municipalities.

(4) Guidance plan

It is a base for the master plan for villages and communities not belonging to any municipalities. This plan specifies the main road network and residential areas as well as public facilities to be constructed on state property. A building code is attached to the plan. This type of plan to be prepared by service department is also approved by the Executive Bureau of the relevant governorate to guide the licensing process.

(5) Master plan for emergency cases

This type of master plans have been prepared in response to emergency events such as the following:

- 1) Villages of Sahel Al Ghab after drying up of the Orontes river in 1977 for the villages of Zaizon, Shatha and Ain Al Bared,
- 2) Golan villages to bring people back to their liberated lands such as Al Baa'ath city in Al Quneitra, and
- 3) Areas to accommodate emigrants during the war such as Mukhayam, Jaramana and Mukhayam Al Wafideen.

2.3 Property Types

The following property types are identified in urban planning, development and control.

- Public properties: for people, such as parks, streets and rivers,
- State properties: for the Syrian Arab Republic, and they are prohibited for construction and are managed by Ministry of Agriculture, representing the state,
- Municipality properties: they are either state properties located within master plan or acquired lands, and
- Endowment properties: for certain religious sect, managed by Ministry of Endowment.
- Private properties.

Chapter 3 Problems and Priority with the Current Urban Planning

3.1 Problems

The following problems may be pointed out related to the current urban planning practices.

- (1) Absence of regional planning to provide the framework for urban planning,
- (2) Lack of comprehensive studies to reflect specific characteristics of each community into its plan, resulting into planned urban extension inconsistent with spontaneous extension desired by people, inadequate road standards not reflecting real needs etc.,
- (3) Outdated planning criteria not reflecting the needs of people often applied without flexibility (e.g. resulting in an industrial area larger than necessary etc.), except some rare cases such as the master plan for Yabroud,
- (4) Informal housing not controlled due to the delay in urban studies and planning (e.g. delay in acquiring the land for master plan implementation in Homs resulting in the rise of informal quarter in Al Shammas),
- (5) Inadequate planning and construction laws and regulations such as those applying unfair land valuation, encouraging consequently informal construction (e.g. Al Waleed quarter in Homs),
- (6) Wide variance in actual population density in different residential areas with the planned density ranging in 20/ha in Al Zabadani and 800/ha in Douma, and
- (7) Existence of restrictions in land use due to military bases such as the one along the urban development axis in Al Kissweh where the best expansion areas are under the military control.

3.2 Priority

Given the problems as identified above, the following are considered the priority for improving the urban planning practices in Syria.

- (1) Adoption of comprehensive regional planning principle for more rational urban planning coordinating various ongoing and planned activities,
- (2) Constant updating of the topographic and other planning bases for urban planning to cope with continual changes in development needs,
- (3) Development of urban planning capacity based on modern techniques and tools through communicating with most recent urban planning and implementation practices in the world, and
- (4) Decentralization of the urban planning practices and procedures.

Part 7

Environmental Baseline Survey

The Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area in the Syrian Arab Republic

Final Report Volume 4 Sector Report Part 7 Environmental Baseline Survey

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Chapter 1 Environmental Administration

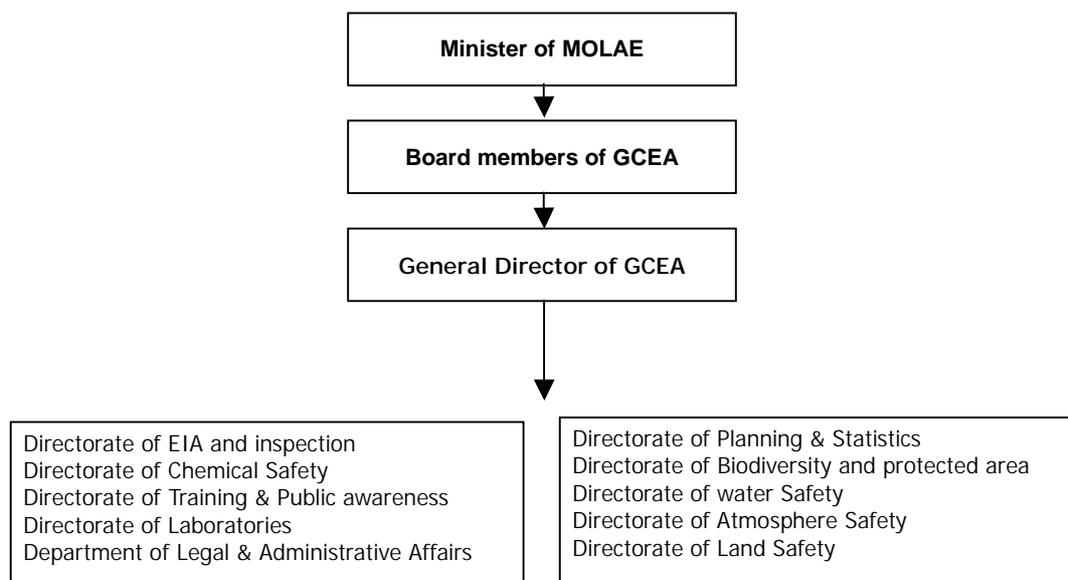
1.1 Background

The Ministry of State for Environmental Affairs (MOE) was established in 1991 by the Presidential Decree No. 1, which describes the functions and roles of the Ministry as well as the establishment of the General Commission for Environmental Affairs (GCEA). The authority of both MOE and GCEA was constrained by the absence of an environmental law which gives the power to the staff. The Law of the Environment Protection was issued in 2002 through the Presidential Decree No. 50.

The law includes the issues on environment protection, the roles of MOE and GCEA, and gives the authority to the Minister to issue the bylaws and regulations which usually follow the issuance of a law. MOE was merged with the Ministry of Local Administration to become the Ministry of Local Administration and Environment (MOLAE) later in August 2003. In this regard the roles of GCEA and the Directorates for Environmental Affairs (DFEAs), which are GCEA's branch organizations located in the respective Governorates in Syria, have been increased and deepened to ensure the control for environment protection. GCEA started to issue the bylaws of the Environmental Protection Law.

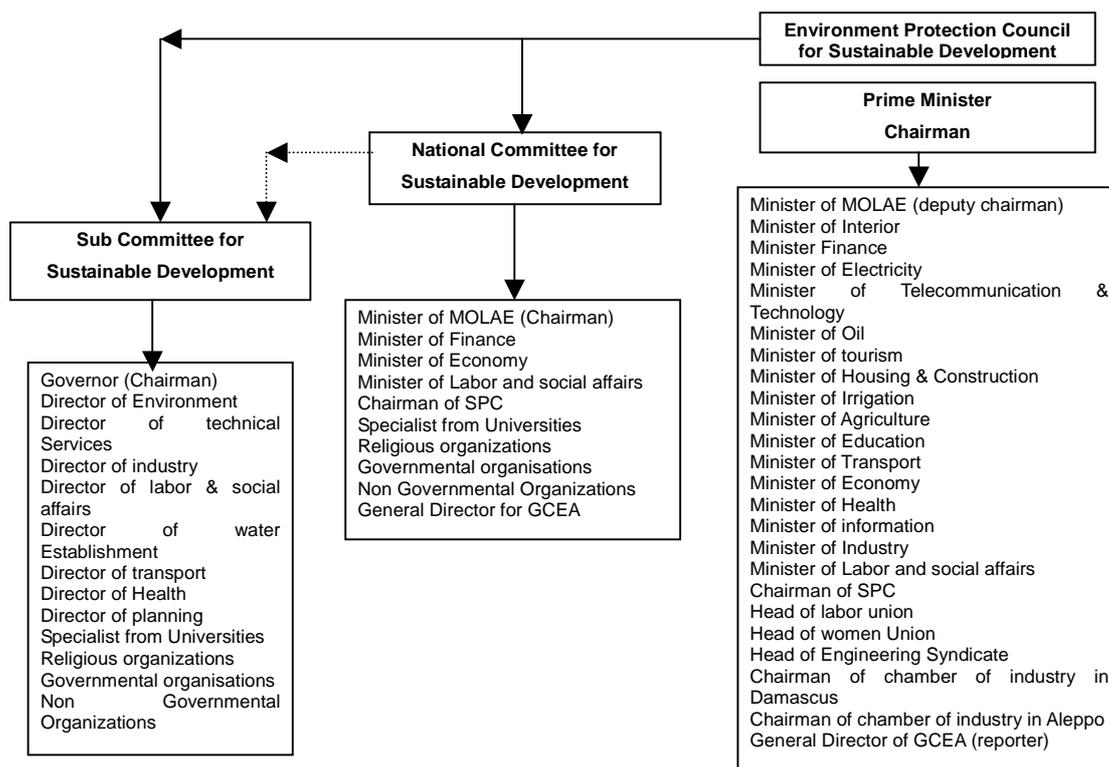
1.2 Organization of Environmental Bodies and Regulations

Organizations of GCEA and other related environmental bodies are shown in Figure 1.1 and Figure 1.2.



Source: GCEA

Figure 1.1 Organization of GCEA



Source: GCEA

Figure 1.2 Organization of Other Related Environmental Bodies

The Environmental Protection Council recently issued regulations for environment protection, bylaws for the Environmental Protection Law. They cover the following:

- Noise criteria,
- Executive annex for chemical safety,
- Guideline of the hazardous waste administration,
- Adopted pollutants ratio,
- Maximum limits of pollution parameters to be discharged into the water environment,
- Maximum limits of pollution parameters for treated industrial water to be discharged into the sewerage,
- Maximum limits of pollution parameters for treated waste water to be used for irrigation, and
- Specification of waste water resulting from various activities.

The following strategies and plan have also been established:

- Desertification Combat Strategy,
- Biodiversity Strategy, and
- National Environmental Action Plan.

The Environmental Protection Council is supposed to ratify the draft of the following by laws soon.

- Technical Guidelines of the Landfills,
- List of Authorized Environmental Laboratories,
- National Criteria for Air Quality,
- Classification of the Hazardous Wastes,
- Guidelines of the Environmental Monitoring,
- Environmental License System, and
- EIA procedures.

1.3 EIA Procedures

GCEA has drafted the executive procedures for Environmental Impact Assessment (EIA) and raise it to the Environmental Protection Council to be ratified. The procedure is summarized below, and is illustrated in Figure 1.3.

- 1) An investor applies for a license to the concerned agencies at the preparation stage with a report including:
 - Project description,
 - Proposed locations of the project and alternatives,
 - Full information for the site planning of the project,
 - Project suitability with the national development plan,
 - All required information for the project properties, Environmental impacts and required information resources of the project,
 - Project components and environment that should be concentrated on, and
 - Description of the available data, plan to collect the information and sharing the information with the public.
- 2) The license granting agency, composed of the members from MOLAE, GCEA and DFEA, makes its decision within one month maximally to approve or reject with clarified reasons.
- 3) The investor applies for the study of EIA within one year of the approval of the license.
- 4) The investor prepares an EIA report including:
 - Description of the project activities,
 - Studying the environmental situation at site and the expected results of the project activities (water pollution, air pollution, etc.),
 - Description of the site and the alternatives taking in consideration the best alternative from the environmental point of view,
 - Identification of the environmental impact expected to the environment, public

- hygiene, ownership, wild life, soil, metrology, heritage, etc.,
 - Assessment of the environmental impacts expected from the project activities and describing the expected procedures to avoid them,
 - Evaluation the efficiency of using the natural resources,
 - Proposals for environmental monitoring and auditing, and
 - Executive summary of the EIA results.
- 5) The agency concerned decides whether the EIA report is acceptable or not within one month maximally.
 - 6) If approved, the investor organizes a seminar in cooperation with the license granting agency to inform the public about the activities of the project.
 - 7) The license granting agency prepares a report containing:
 - Evaluation of EIA study,
 - Efficiency of the EIA study,
 - Summery of the monitoring activities,
 - Ways of reporting of the monitoring activities, and
 - Others.
 - 8) GCEA and DFEAs conduct auditing and monitoring of the project implementation.

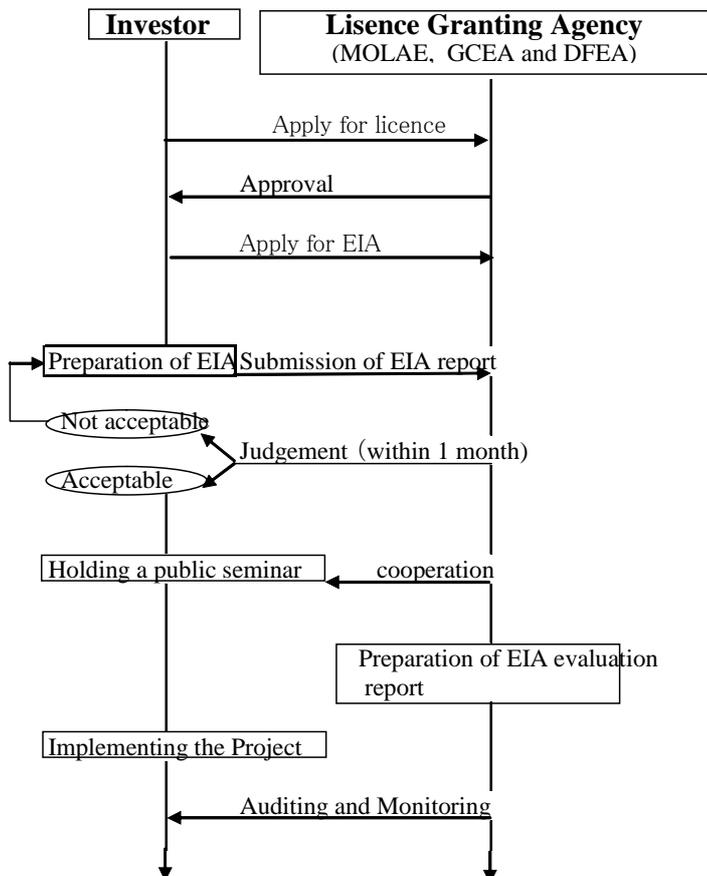


Figure 1.3 Outline of the EIA Procedure

1.4 Policy and Strategy

1.4.1 National Environmental Action Plan (NEAP)

The National Environmental Action Plan (NEAP) was prepared, supported by the World Bank and UNDP, and was later approved by the Environmental Protection Council to be adopted in 2003. The contents of NEAP are summarized below.

(1) Environmental priority plan

There are a number of causes for each of the identified environmental problems. These causes overlap between each other and cut across several sectors. Table 1.1 shows the environmental priority problems, effects and causes.

Table 1.1 Environmental Priority Problems, Effects and Causes

| Problem | Major effects | Direct causes |
|---|---|---|
| 1. Depletion of water resources | Decrease in agricultural productivity | Use of flood irrigation techniques |
| | Difficulty in meeting potable water requirements | Over-pumping of groundwater in response to population growth and economic development |
| | Drying-out of major spring sources | |
| 2. Contamination of water resources | Increase in the number of water-borne diseases | Lack of sewerage networks for the discharge of domestic wastewater in population centers |
| | Increase in the costs of water piping networks | Lack of wastewater treatment plants or safe discharge practices of domestic wastewater |
| | Risk of infection in non-communicable diseases (poisoning, cancers) | Illegal discharge of industrial wastewater, and inappropriate use of fertilizers and pesticides |
| 3. Land degradation | Reduction in agricultural productivity | Use of inappropriate agricultural techniques |
| | Increase in desertification | Soil salination due to use of inappropriate irrigation techniques |
| | | Overgrazing |
| Loss of cultural heritage | - Cultivation of unsuitable lands - Forest fires - Water and wind erosion | |
| 4. Air pollution | Increased illnesses and early deaths from respiratory diseases | Inadequate regulations for land use |
| | | Traffic congestion |
| | | Old transport fleet |
| | | Fuel quality |
| | | Heavy industrial emissions to air |
| 5. Inappropriate practices in solid waste disposal | Public nuisance (odors, smoke, litter) | Low-efficiency domestic heaters |
| | | Lack of sanitary landfills |
| | Risk to public health | Lack of hazardous waste treatment facilities |
| 6. Growth in illegal areas (residential and industrial) | Poor living conditions in illegal housing and environmental pollution | Inappropriate locations for waste management and disposal |
| | | Inadequate urban planning |
| | Loss of cultural heritage | Rural migration to urban centers |
| | | Inadequate regulations for land use |

Source: National Environmental Action Plan (NEAP)

(2) Environmental strategies

The strategic objective of the NEAP is: incorporating environmental aspects in policies,

plans and national programs, and protecting natural resources, biodiversity, cultural heritage, public health, and promoting the use of clean and renewable energies in the framework of sustainable development. In order to achieve this objective, an action plan has been put in place. Table 1.2 provides the list of strategic objectives to be achieved by 2015.

Environmental priorities were classified within four strategic groups.

1) Sustainable use of water resources

The unsustainable use of water resources is considered to be one of the major environmental problems. It is recommended that policies be revised, and activities causing the depletion of water resources are managed so as to achieve sustainable use of water resources.

(2 Sustainable use of land resources

Major effects for land degradation include contamination of agricultural soil, erosion leading to loss of vegetative cover, salinization, degradation of natural pasture lands, and loss of forests. These lead to increased economic pressures and desertification. It is recommended that agricultural policies be revised so as to achieve sustainable use of land resources.

(3 Improvement in services and infrastructure of urban centers

Environmental pollution, particularly domestic and industrial discharges, in addition to emissions from motor vehicles result in significant health impacts. There is a great need to implement environmental control measures, and to invest in waste treatment plants. In addition, it is important to enforce environmental standards, and discharge limits in order to protect the public and reduce the levels of diseases caused by environmental degradation to acceptable limits. These actions have been envisaged in the Environmental Protection Law, No.50, 2002.

Furthermore, population migration from rural areas to urban centers is the main cause behind the development of illegal housing. As a result, the urban population finds itself today living in a deteriorated urban environment. Pressures on urban centers may be reduced by developing rural areas.

(4 Sustainable development of natural resources and cultural heritage

The biodiversity, characterized by the wide range of animal and plant species encountered in Syria, is considered one of its most important natural resources, and is of particular significance to the entire world as well. The cultural heritage in Syria is also one of the oldest in human history. The unsustainable growth of economic activities in all sectors is causing the deterioration of these resources, and consequently the loss of an important source of national income. It is important to develop the potentials of tourism and recreation of these resources,

while protecting and preserving them for future generations. Table 1.2 includes a list of strategic objectives to be achieved by 2015. The table also includes performance indicators which can be used to measure the progress being made towards achieving the objectives; hence, the effective implementation of the measures proposed in the national environmental action plan.

Table 1.2 Strategic Objectives for the National Environmental Action Plan

| Strategic Objective | Measures | Performance Indicator |
|--|---|--|
| Implementation of integrated management of water and land resources | • Complete the integrated water resource management study | • Publishing date |
| | • Develop plans that account for the sustainability of available water resources | • Completion of plans |
| | • Implement the national strategy for combating desertification | • Percentage implemented |
| Reduction of pollutants' impacts on public health to acceptable levels | • Provide rural areas with safe drinking water | • Percentage of population provided with water |
| | • Reduce the contamination of water resources from domestic and industrial wastewater discharges | • Number of yearly cases |
| | • Improve management practices of solid wastes | • Number of yearly cases |
| | • Reduce pollutants' emissions to the atmosphere | • Number of yearly cases |
| | • Reduce exposure to chemicals and pesticides | • Number of yearly cases |
| Development of urban plans and organizing illegal areas (residential and industrial) | • Control illegal areas | • Hectares/population size |
| | • Establish and manage industrial zones | • Percentage of industrial establishments in the organized areas |
| Incorporating environmental aspects in the policies of sectional ministries, and developing laws and legislation | • Complete the legislative requirements for the environmental law | • Date for completion |
| | • Establish environmental units within the sectional ministries | • Number of units |
| Protection of biodiversity and natural and cultural resources | • Implement the national strategy for biodiversity | • Number of protected areas |
| | • Halt the continued deterioration of well-known archeological sites; prevent relatively unknown sites from deterioration; and protect completely unknown sites | • Number of sites |
| | • Develop laws and legislation for coastal areas planning and protection | • Number of developed laws |
| Utilization of clean and renewable energy resources | • Increase the production of natural gas by developing available local resources | • Number of essential facilities utilizing natural gas |
| | • Increase the contribution of clean and renewable energy sources | • Number of essential services dependent on clean and renewable energy sources |

Source: National Environmental Action Plan (NEAP)

1.4.2 10th Five-year Plan (2006-2010)

The objectives of the 10th Five-year Plan are shown below.

- 1) Setting national integrated policies to control all kinds of pollution and desertification and

enriching the biodiversity, and adopting planning based on the concept of sustaining the resources,

- 2) Focusing on sustainable development in rural area and applicable local environmental work,
- 3) Joining management and planning between environment production and service sectors of the national economy, to ensure environment protection and sustainable development, and
- 4) Raising the public awareness on environment, building the institutional, individual and organizational capacities to work in environment sections, and contributing in introducing the economical tools in environmental planning.

The Plan has 11 strategies as shown below, out of which main strategies are explained in Table 1.3.

- 1) Setting national plans and policies to deal with environmental emergencies and to control pollution, and setting a schedule for implementing the national environmental plans,
- 2) Adopting the environmental evaluation and checking,
- 3) Adopting the decentralization principle to activate the environmental work at the local level,
- 4) Adopting the policy of small scale projects, which need few costs and high environmental income at the local level, and to benefit from the experience of other countries in this field,
- 5) Setting new mechanisms for activating the environmental work at legislative and administrative level, and starting effective work channels between sectors of the direct relation with environment,
- 6) Conducting term evaluation of the performance of the general plan, programs and projects depending on specific indicators and modifying them as needed to be modifies as necessary,
- 7) Spreading the applicable environmental culture through joint programs between the relevant ministries and the local communities,
- 8) Creating job opportunities and granting bank facilities to encourage the economical investment in environment,
- 9) Setting long term applicable program for training the administrative and technical staff that work in environmental field and all relevant categories in the society,
- 10) Activating the scientific research based on applicable and field studies of environment, and
- 11) Building a data base for the environmental information and attracting specialized skills depending on scientific functional description policy.

Table 1.3 Main Strategies of the 10th Five-year Plan

| Strategy | Program and project | Expected outcome | Indicator | Implementing organization | Schedule |
|--|---|---|--|--|-------------|
| Strategy 1): Setting national plan to confront with environmental emergencies and control pollution | Establishment of the national environmental monitoring station | Providing observing, monitoring and evaluating data on all components of environment. | Specifications of water, air and soil comparing to the international standards. | Ministry of Local Administration & Environment (MOLAE) | 2010 |
| | Setting national measurement system according to the international standards. | Finding limits and standards for pollution control and activating the environmental inspection and providing the tool to apply the environmental law. | The national standard for the environmental components and pollutants | MOLAE in cooperation with relevant authorities | Continuous |
| | Air quality observing stations net in Damascus, Aleppo, Homs and Dier-Ezzor | Providing immediate and continuous data on air quality in these cities. | The gas emission values for air pollutants and the internationally permitted exceeds | MOLAE and relevant Ministries | 2006 |
| | Pollution measurement equipments all over Syria | Providing immediate and continuous data on land deterioration condition | Comparison the values of soil pollutants with the international standards | MOLAE (governorates) | 2006 |
| | Execution of the integrated management of solid waste program. | Controlling pollution and organizing wastes management and the possibility of recycling some material. | Performance follow up indicators Digital indicators on number of containers and vehicles and the recycled rate of wastes. | MOLAE (governorates) | 2006 - 2015 |
| | Execution of treatment stations for the hazardous and medical wastes. | Providing regular establishments and incinerators to treat the hazardous wastes in order to reduce their negative impact on environment | Quantitative & qualitative indicators of hazardous wastes. | MOLAE (governorates) | 2006 - 2015 |
| | Execution of treatment stations for swage water in all governorates. | Providing necessary systems for swage water treatment to protect natural resources and provide water for irrigation | Improvement of swage water indicators comparing to international standards | MOLAE (governorates), Ministry of housing and construction | 2006 - 2011 |
| | Establishment of the national bureau land use planning. | Production land use maps to be depended on at preparing the organizational plans at governorates | Land use maps | MOLAE - SPC | 2006 - 209 |
| | Preparation of environment condition report. | Description of the current environmental condition in all sectors | Quantitative & qualitative indicators of environment condition | MOLAE | 2006 |
| Strategy 2): Adoption of environmental evaluation and checking | Establishment of national center for cleaner production an environmental management | Reaching to environmental work strategy in the industrial sector and promoting environmental management's concepts and applications | Rates of gas emissions Quantitative and qualitative specification of swage water | MOLAE | 2009 |

| Strategy | Program and project | Expected outcome | Indicator | Implementing organization | Schedule |
|--|---|---|--|---|-------------|
| | Preparation of national system for environmental inspection | Activating the application of environmental laws and reaching approved unified system for environmental inspection to control pollution | Number of industrial unite that adopted environmental management systems | MOLAE | 2006 |
| | Rehabilitation and redistribution of the industrial areas | Better performance for industrial sector and attraction of foreigner investments | Increase of industrial units in the industrial areas. Number of industrial units that were moved out of cities. | MOLAE (governorates) | 2006 - 2010 |
| Strategy 3): Adoption of decentralization to activate local work | Conducting environmental field survey at level of governorates and areas | Obtaining necessary data to identify the local environmental problems and determining the treatment priorities | Accurate identification of environmental problems and priorities at local level | MOLAE (governorates) | 2006 |
| | Preparation and execution of national and local plans for environmental emergencies | Raising the level preparation to face emergencies and reducing the environmental losses | Number of training courses on dealing with emergency cases | MOLAE (governorates), GCEA and relevant authorities | 2007 |
| Strategy 5): Setting new mechanisms for activating the environmental work at GCEA and DFEAs and encouraging the joint environmental work among all sectors | Providing vehicles to GCEA and DFEAs | Providing the necessary transportation inspection and monitoring for better performance. | Number of vehicles delivered to DFEAs | MOLAE | 2006 |
| | Completing the provision of suitable buildings for GCEA and DFEAs | Realizing proper work environment for better performance | Schedules for achievement | MOLAE (governorates), GCEA | 2207 |
| | Providing DFEAs with mobile labs and equipment and completing office equipments | Providing the necessary data for environmental monitoring and evaluating | Number of mobile labs delivered to DFEAs Quantity and qyality of lab equipment available oin DFEAs and GCEA | MOLAE | 2007 |
| Strategy 7): Spreading the applicable environmental culture through joint programs between the relevant ministries and the local communities | Establishing national annual program for eco-tourism | Protection of tourists attracting areas an application of environment protection bases | Number of tourism projects that have positive environmental impact Number of joint projects between MOT and MOLAE or others | MOLAE, MOT | 2007 |
| | Preparation and execution of national program for environmental education and culture | Execution of integrated program with clear components(work shops, Advertisement, competitions, volunteering activities, field visits) for promoting environmental culture for students | Number of educational environmental programs Number of educational environmental work shops Number of students participating in environmental activities | MOLAE, MOE, MOI | 2007 |

| Strategy | Program and project | Expected outcome | Indicator | Implementing organization | Schedule |
|---|---|---|--|---|-------------|
| | Supporting NGOs specialized in environment protection in the society of women children | Activating the role of women and children in environment protection | Number of NGOs working with women and children | MOLAE (governorates), GCFA, NGOs | 2007 |
| | Establishing the modal school for environmental education in Damascus | Preparation of applicable theatrical environmental curriculum in the primary school | Number of implemented environmental activities Number of the beneficiaries | MOLAE, MOE | 2006 - 2007 |
| Strategy 9): Setting long term applicable program for qualifying the staff | Preparation and execution of qualitative technical and administrative training course (administrative courses, technical and language) for the staff working in environment | Preparing the staff working in environment sector to qualify them administratively and technically in order to raise the level of performance in environmental sector | Number of training courses Number of trainees and trainers Number of qualitative specialized courses | MOLAE in cooperation with relevant ministries and private sector | Continuous |
| Strategy 11): Building data bases for environmental information | Preparation the national accounts to take the environmental deterioration accounts into consideration | Providing indicators on the costs of environmental deterioration and its impact on the national economy | The economical indicators for environmental deterioration costs | Central Bureau for Statistics | 2010 |
| | Establishing the national center for geographic information and systems | Finding reference center specialized in geographic information and systems for providing maps of one accurate reference that provide spatial data for all sectors | Number of produced maps Number of beneficiaries from public and private organizations | MOLAE, General Institute for Land Registry, General Commit ion for Remote Sensing | 2006 – 2009 |
| | Establishing the national system for environmental information | Providing reliable data bases available for sectors to contribute in supporting the environmental decision on scientific bases | Number of executed data bases Number of beneficiaries from public and private organizations | MOLAE in cooperation with relevant ministries | 2006 - 2008 |

Source: State Planning Commission, 10th Five-year Plan

1.5 Law Related to Land Expropriation and Compensation

Law 9 of 1974 has the provision for land sub-division and development by the private sector on the conditions that such development complies with the master plan and it allocates up to 50% of the land for public purposes. This law, however, has been largely superseded by Law 60 of 1979 as amended by Law 26 of 2000.

Where Law 9 of 1974 is not applied, the municipalities are to take the land in the expansion area either by the Expropriation Law 20 of 1983 on the basis that the project is for public benefits or by Law 26 of 2000 on the basis of “urgency.” The “urgency” applies under Law 20 of 1983 to the expropriation of “non-built real estate” i.e. rural or agricultural land, as soon as the expropriation decree is issued and before compensation is paid.

Law 46 of 2004 facilitates the granting of title for informal housing areas as part of program of land readjustment under Law 9 of 1974. Also, the law requires that public utility bodies supply water and electricity to those developments for which the residents are expected to pay for them.

Law 1 of 2003 is to prohibit illegal land sales in expansion areas by imposing high penalties against them. The enforcement of penalties, however, would involve large resources in the public sector.

Chapter 2 Natural Environment

2.1 Topography

As for the Damascus city, Mt. Qassyoun borders the city to the northwest, and has the highest level of 1,153 meters above sea level. The city tends to decrease in altitude from west to east as observed along the Barada river route where the level is 650 meters as the river crosses the Ghouta and falls to 110 meters at its outlet into the Ottayba Lake, east of the city. As for the northern part of Rural Damascus Governorate, the altitude increases toward north, being 1,100m in Qutayfeh and 1,650m in Yabroud above sea level. In Zabadani area, the west of Damascus city, the altitude reaches 1,500m above sea level in Bloudan, adjacent to the Lebanese border and mountains.

2.2 Geology

2.2.1 Soil conditions

The Damascus region may be broadly divided into four regions with similar soil conditions based on the past soil investigations.

The first region follows the Barada river route. Soil formation in the Barada valley consists of top black clay layers to depths of 2-7 meters, with silty clay layers below 7 meters to depth of about 25 meters. Groundwater level in that region is about 3.5 meters below ground level.

The area falling north of Barada river valley and extending north of Baghdad Street is characterized by having top black silty clay to depths of 2-5 meters. At deeper depth mixture of gravel, sands and silt are observed. Groundwater levels are deeper in this region ranging 5-12 meters below ground level. Bearing capacity ranges 3.5-5.0 kg/cm³.

Soil conditions in the area north of Baghdad Street are similar but bearing capacity is lower ranging between 1.5 to 2.5 kg/cm³. Top layers consist of black clay to depths of 2.5-3.5 meters, followed by clay and silt soils to depths of 15-20 meters. Groundwater levels are 10-15 meters below the ground surface.

The fourth region lies south of Barada river valley. Thin topsoil layers here are black or red clay layers, with stiff mixtures of gravel, sand and silt to depths of 20-25 meters. Bearing capacity ranges 5-7 kg/cm³, and the groundwater levels are at deep depths of 25-30 meters from ground surface.

The study area is located in and directly influenced by the eastern edge of the collapse area, especially Damascus area, located on the extension of the Palmyra fault line. Damascus

fault forms crack band starting at the southern part of Mt. Qassyoun, also several parallel fault lines penetrate the area and the eastern and southern parts of the region.

2.2.2 Rock formations

The rock formations are studied in the GCEC report as follows:

Very hard rocks

They are represented by the dolomite and lime dolomite rocks, which are spread in Qassyoun mountain and at north of Al Fijeh spring.

Hard rocks

They are represented by the crystal lime rocks, located in Ma`arouneh, Hafir Al Fawqa, Al Sabboura, Ain Al Fijeh, Saidnaya and west of Al Mazzeh.

Medium hard rocks

They are represented by lime rocks layers followed by clay ones, spread in north of Qutayfeh, near Ma`arouneh, Al Tall and Ain Al Fijeh.

Soft rocks

They occupy large spaces of the region, they are sandy and clay rocks, spread in Saidnaya, Talfita, Ma`arouneh, Al Tall, south-west of Al Somariyeh, Al Dimas, Qudsaya, Dummar, Ya`afour and Qura Al Assad (Al Assad villages).

Agricultural soil

It consists of sand and pebbles and different agricultural soil covering the Damascus basin, Utaybeh and Al Haijaneh, as well as the river valise. While in the southern area we see the agricultural soil resulted from the erosion of basalt and volcanic soil mixed with sediments, as in Hirjelleh and Al Kissweh, in addition to a number of weak caves in Muhajireen, Ish Al Warwar, Al Mazzeh and Al Somariyeh.

2.2.3 Economical raw materials

Sedimentary iron

It is located in Al Zabadani and north of Bloudan. They are iron layers followed by clay and sand layers, which can be used in iron and aluminum industries.

Sand and pebble materials

They are located in several areas in the region and used as construction raw materials.

Rock quarries

They are located at the southern part of Mt. Qassyoun, Saidnaya and Talfita, in addition to reddish-brown sand quarries in Abu A`ata Mountain. Many deserted rock quarries are located near Damascus, Al Somariyeh, Al Sabboura, Ish Al Warwar and the road to Al Tall, also there are some quarries at the northern part of Qassyoun Mountain, especially along the north bypass between Ma`araba in the east and Dummar in the west.

2.3 Water Resources

2.3.1 Overview of Water Resources in Syria

Syria is divided into seven water basins: 1) Barada & Awaj, 2) Al Khabour & Tigris, 3) Euphrates & Aleppo, 4) Orontes, 5) Coastal, 6) Al Yarmouk and 7) Steppe. General conditions of the seven basins are as shown in Table 2.1. MOI estimates that total water balance of Syria is negative by -374million m³/year due to the demand higher than renewable water resources. This situation means that utilization of water resources is excessive to sustainable level.

Among these basins, the Barada & Awaj basin involves completely the DMA and the water balance is negative as shown in Table 2.1.

Table 2.1 General Conditions of Syrian Basins

| No | Name of Basin | Area (km ²) | Water balance (million m ³ /year) | | | Major cities |
|-------|---------------------|-------------------------|--|--------|---------|-------------------|
| | | | Availability | Demand | Balance | |
| 1 | Barada & Awaj | 8,630 | 1,123 | 1,335 | -212 | Damascus |
| 2 | Al Khabour & Tigris | 21,129 | 2,794 | 4,559 | -1,765 | Al Hassakeh |
| 3 | Euphrates & Aleppo | 51,238 | 8,363 | 7,777 | 586 | Aleppo, Al Raqqa |
| 4 | Orontes | 21,624 | 2,872 | 2,710 | 162 | Hama, Homs |
| 5 | Coastal | 5,049 | 1,575 | 791 | 784 | Tartous, Lattakia |
| 6 | Al Yarmouk | 6,724 | 484 | 527 | -43 | Dara'a |
| 7 | Steppe | 70,786 | 243 | 129 | 114 | Syrian desert |
| Total | | 185,180 | 17,454 | 17,828 | -374 | |

Source: Initial Assessment Study of Water Sector Management, 2004, Joint Assessment Team Syria - Germany

Unit: mm/area

Source: WRIC

2.3.2 Hydrology in and around Damascus

The GCEC report indicates that the hydrological borders of the region are characterized by the closed basins, disconnected with the neighboring basins. A chain of high mountains (Mt. Al Shaikh, the eastern mountain, is located at the west of the basin, and the Palmyra mountainous chain is located at north and north-east of the basin. This chain consists of paralleled mountains extending from south-west to north-east, the most important of which are Mt. Ma`aloula, the eastern mountain, Mt. Abu A`ata, Mt. A`antar, Mt. Qassyoun, Mt. Dumair and others. At the eastern direction, there are some hills and there are number of basalt hills at south-east, and Al Arab mountain chain at south and there are Allujat and Horan heights at

south-west. The most important rivers of the basin are the Barada and Awaj. The total area of those basins is about 8,600 km².

The Barada river starts from the eastern hills of the Lebanese mountains and it forwards to south-west direction till the Al Tikiyeh area, where the direction becomes east till the Al Rabweh area. After exiting Al Rabweh, it penetrates the Damascus city center. The seven tributates of the river are considered the vital artery of the city, which has the main influence on its environmental and organizational characteristics. The river ends at the Al Utaybeh lake. This lake is dried out in summer and autumn because of the great loss of water by irrigation, leakage and evaporation. Feeding system of the river depends on the rain and snow that falls in winter and spring.

The Awaj river flows out from several springs at the eastern side of the Mt. Al Haramoun. The area of its basin is 1,100 km², however, it runs out in summer and it does not influence the Damascus city since it touches only the southern part of the city. In addition to the rivers, the city is influenced by seasonal ravines, like the Qassyoun ravines, which influence the several areas such as Al Mazzeh, Al Muhajireen and Al Akrad, as well as the ravines of the northern part of the city such as the ones of Abu Al A`ata and Saidnaya.

About 550 springs are spread in the Barada and the Awaj basins such as Al Fijeh, Barada and the main Al Haramoun springs. The Al Fijeh springs are the most important ones and the main water resource for the city (4.0-4.4 m³/sec). The Barada springs come in the second place after Al Fijeh (2.1 m³/sec).

2.3.3 Water pollution

The discharge of untreated industrial and municipal sewerage to the lands and the water bodies causes degradation of the water environment of rivers, lakes and groundwater. Some examples are described below.

(1) Pollution of river water

The Barada river is polluted by sewage wastewater. BOD is very high in all Barada river branches and especially in the downstream. The value of BOD reached 130 mg/ℓ in one branch at the beginning of 2006, while the maximum limit for rivers is 25 mg/ℓ according to the British standards. Ammonium rate also increased in the Barada river and it reached more than 13 mg/ℓ in one of the branches in 2006 as an example while the British maximum value is 3 mg/ℓ for river water.

The concentration of chromium of 1.18 mg/ℓ was observed in the Al-Dairani branch downstream area of the Barada river in March 2005, while the allowed value for river water in the British standards is 0.1 mg/ℓ. This is due to the existence of tannery plants along the river

and the discharge of their industrial wastewater directly to the river without treatment.

(2) Pollution of groundwater

The nitrite concentration reached 100-200 mg/l (the standard for drinking water should not exceed than 40 mg/l) due to the extra usage of the nitrate fertilizer in agriculture and irrigation using the sewage water without any treatment in the Ghouta area. The concentration of ammonia of groundwater reached 3.2 mg/l in the Ghouta area in 2005 while the allowed standard for drinking water is 0.3 mg/l. Pumping water was stopped in 200 wells used for drinking water in the Ghouta area in Rural Damascus in 2005.

The problems of the pollution of water resources are attributed to the followings:

- Insufficient study on the water balance on both national and basin level,
- No clear completion of the water policy to achieve sustainable development supported by laws and regulations,
- Weak institutional framework for water sector,
- Weak communication and coordination between the related authorities,
- Insufficient training and qualification of the existing staff,
- Weak economical tools used to decrease the demand for water,
- No control for usage of water resources,
- Incomplete monitoring system for the water resources on the national level, and
- Weak role of the beneficiaries in the planning and participation in the management of water resources.

2.4 Climate

The temperature registered in the Al Mazzeh station are 36.1C° on the highest monthly average of temperature, 44 C° at the ultimate maximum in August, 2.3C° at the minimum in January and -8.3 C° at the ultimate minimum. The temperature above 25C° lasts for about 180 days in the areas of 700-800m above sea level, but in higher areas (1,400m above sea level) it lasts for about 20 days.

Humidity is between 28% and 48% in summer, and between 72% and 79% in winter, respectively. As for precipitation, the maximum annual precipitation is 800 mm in the areas of 900 m above sea level in the west and the south, while the minimum annual precipitation is 90 mm in Al Utaybeh and Haijaneh. The rain falls between October and May. The monthly precipitation reaches its maximum at the end of January. The seasonal distribution is between 45% and 65% in winter, between 25% and 30% in spring, between 0.1% and 0.5% in summer, and between 15% and 20% in autumn, respectively.

2.5 Flora

The information on flora, which is on the national level, is available in the National Strategy for Biodiversity in the Syrian Arab Republic prepared by UNDP. There are around 3,150 kinds of plants in Syria and this number is big compared with other similar countries, in consideration of that more than 50% of the area of Syria is a desert and semi-dry area, where there are no plants. This biodiversity and variation is attributed to the variation of climate and topography in general and to the history of the plants. Table 2.2 shows the conditions of the plants in relation to threats.

Table 2.2 Conditions of the Plants with Numbers of Species

| Total number of plants in Syria | Extinct registered plants to the present | Plant kinds facing critical danger | Threatened kinds to be extinguished soon | Sensitive kinds |
|---------------------------------|--|------------------------------------|--|-----------------|
| 3,150 | 2 | 7 | 28 | 36 |

Source: National Strategy for Biodiversity in Syria (UNDP 2003)

The most important kinds to be extinguished and very rare are *Ceratonia Siliqua*, *Ertonia Siliqua*, *Olea Europea*, *Cerasus Mahleb*, *Juniperus Exelsa*, *Pistacia Atlantica*, *Pistacia Mutica*, *Fraxinus Syriaca*, and *Malus Trilobata*.

2.6 Fauna

The National Strategy for Biodiversity points that there are more than 3,000 kinds of animals in Syria including land and water animals. As for birds about 360 kinds are registered, out of which 143 kinds are migrating birds stopping in Syria for marriage and having babies. The number of the threatened migrated birds locally which come to Syria is about 15 kinds: *Aegyptus Monachus*, *Serinus Syriacus*, *Aquila Chysaetos Homeyeri*, *Chlamydotis Undulata*, *Pelecanus Onocrotalus*, *Falco Peregrinus*, *Geronticus Eremita* and others.

The study points out that there are 124 kinds of the mammals, out of which 24 kinds are meat eaters, seven kinds insects, 25 kinds bats, 42 kinds rats. As for the amphibia and reptile, the study shows the registered 127 kinds including nine kinds of turtles and 70 kinds of reptiles and 48 kinds of snakes. As for the reptiles there are some important kinds such as *Rafetus Euphratices* and *Caretta Caretta*. Table 2.3 shows the number of fauna species threatened to be extinguished.

Table 2.3 Number of Threatened Species

| Group | Number of species | Number of threatened species to be extinguished |
|----------|-------------------|---|
| Amphibia | 16 | 3 |
| Turtles | 9 | 2 |
| Reptile | 70 | 19 |
| Snakes | 48 | 10 |

Source: Ibid.

As for the insects about 1,456 kinds were registered classified to 16 groups and most of them decreased recently due to the extra usage of the pesticides.

2.7 Ecological Changes

The satellite images as presented in Figure 2.1 show the difference in the urban and agriculture area in the DMA between 1972 and 2005.

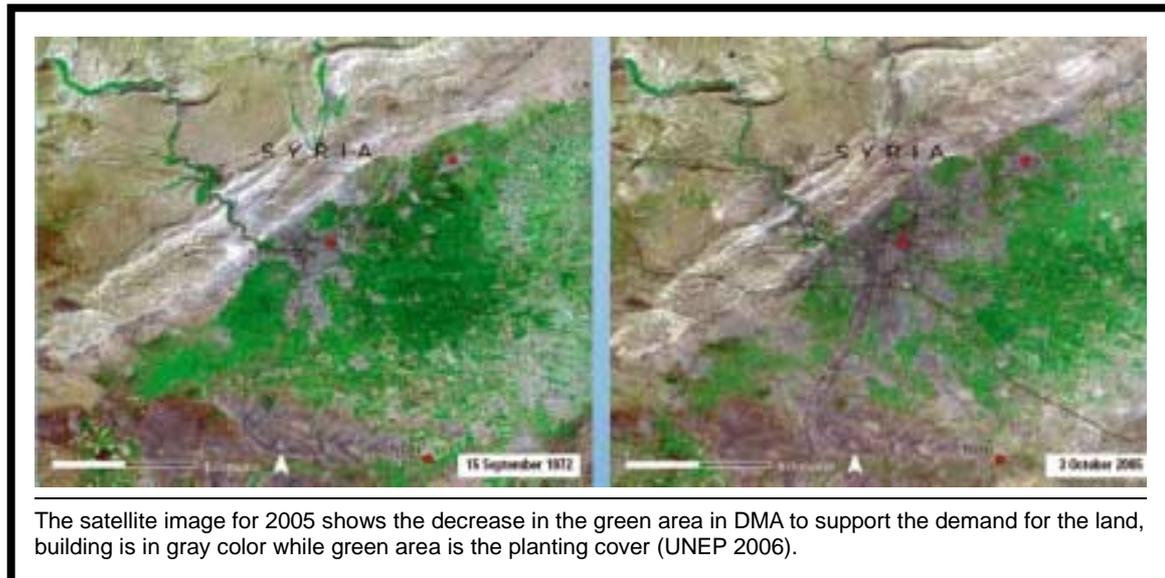


Figure 2.1 Comparison between Two Satellite Images, the DMA in 1972 and 2005

The flora and fauna are affected by the following direct threats.

- Agricultural, industrial and urban expansion,
- Vegetation, wooding, cutting the trees and plants collection,
- Non-organized hunting and dealing in live animals, and
- Introduced or smuggled kinds of vegetables/animals.

Other threats on the ecological system are:

- No clear rules for disaster management especially for environment,
- Desertification problems due to the increase in the urban area and especially in the Ghouta area,
- Internal migration to the DMA from other parts in Syria which cause pressures to the natural resources,
- Industrial pollution and especially the industrial wastewater and its effect to the groundwater,
- Sewage water in some areas that affects the quality of the groundwater (part of it is out of service),

- Effects of transport to the ecological system especially for the air quality due to the emissions from the vehicles and the noise,
- Population increase in the DMA,
- Land corrosion by desertification or the contamination by chemical fertilizers or pesticides,
- Fire at the forests and the careless vegetation there,
- Climate changes leading to many other changes,
- Pollutants discharged to the marine environment on the Syrian shore,
- Extra usage of the mineral resources and excessive usage of the quarries,
- Contaminated land by the landfill cause by commingled collection of wastes,
- Effects of the economic activities and new life styles, and
- Depreciation of some old ruins, heritage and historical sites.

Chapter 3 Social Environment

3.1 Population and Ethnicity

3.1.1 Population

The total population in Syria is 17,793,000 in 2004, while it was 13,782,000 in 1994. The annual growth rate for the population is 2.58%. The average of household size is 5.55 while it was 6.25 in the previous census. The number of households increased from 2,566,000 in 1994 to 3,701,000 in 2004.

The census of 2004 shows that the increasing rate is 2.4%, while that of 1999 was 2.7%. It was noticeable that the population of Syria has doubled more than three times in the last 50 years. The population was 3 millions in 1950 while it is about 18 millions in 2004 and this made pressures to the environmental resources. Of the total population, 45% is concentrating in the Damascus city, Rural Damascus and Aleppo. Figure 3.1 shows the population increase in Syria.

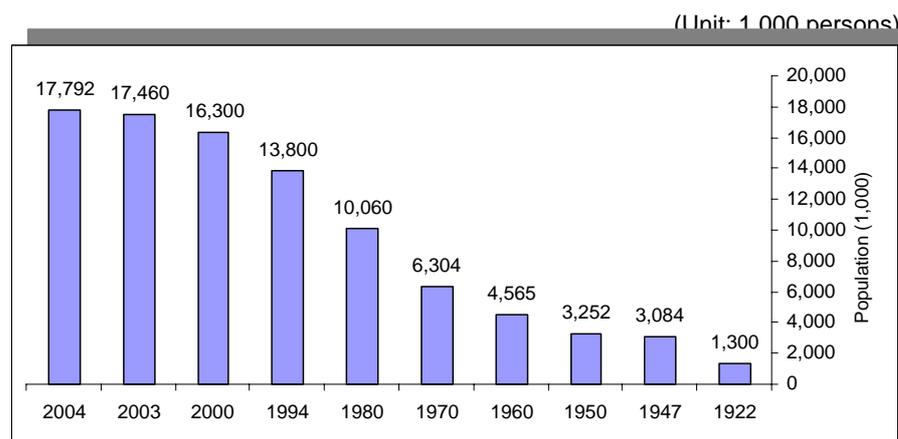


Figure 3.1 Population Increase in Syria

The rate of the population below 15 years old decreased from 44.8% in the year 1994 to 39.5% in the year 2004. The rate of the population 15-60 years old increased from 52.2% in the year 1994 to 57.2% in the year 2004. Table 3.1 shows the population distribution by age group in Damascus city and Rural Damascus.

Table 3.1 Population Distribution by Age Group

(unit: %)

| Age group | Damascus city | Rural Damascus |
|-------------|---------------|----------------|
| 0 | 1.9 | 2.4 |
| 1 - 4 | 8.8 | 11.0 |
| 5 - 9 | 10.9 | 13.2 |
| 10 - 14 | 10.6 | 12.1 |
| 15 - 19 | 10.6 | 11.6 |
| 20 - 24 | 10.6 | 10.1 |
| 25 - 29 | 8.5 | 8.3 |
| 30 - 34 | 7.3 | 7.1 |
| 35 - 39 | 6.7 | 6.4 |
| 40 - 44 | 5.9 | 5.3 |
| 45 - 49 | 4.6 | 3.8 |
| 50 - 54 | 3.6 | 2.7 |
| 55 - 59 | 2.9 | 1.9 |
| 60 - 64 | 2.4 | 1.4 |
| 65 - 69 | 1.8 | 1.0 |
| 70 - 74 | 1.5 | 0.8 |
| 75 and more | 1.5 | 0.8 |
| Total | 100.0 | 100.0 |

Source: Central Bureau of Statistics

3.2 Employment and Income Levels

The labor force in the census of 2004 is 27.6% of the total population while 24.4% in 1994. The unemployment rates are 4.0% in the Damascus city and 7.5% in Rural Damascus respectively, and the rate for female is higher than that of men in both Damascus city and Rural Damascus as shown in Table 3.2.

Table 3.2 Unemployment Rate of 15 Years and Over

(Unit: %)

| Damascus city | | | Rural Damascus | | |
|---------------|--------|-------|----------------|--------|-------|
| Male | Female | Total | Male | Female | Total |
| 3.0 | 8.9 | 4.0 | 6.6 | 13.8 | 7.5 |

Source: Central Bureau of Statistics

Table 3.3 shows the workers distribution by type of job. Engineers and other architects have the largest share for male, and clerical works for female in the Damascus city. The engineers and other architects has the largest share for male, and technicians for female in Rural Damascus.

Table 3.3 Workers Distribution by Type of Job

(Unit: %)

| | Damascus city | | | Rural Damascus | | |
|------------------------------------|---------------|--------|-------|----------------|--------|-------|
| | Male | Female | Total | Male | Female | Total |
| Directors and administrative works | 2.4 | 2.0 | 2.3 | 1.1 | 0.8 | 1.0 |
| Professional | 7.3 | 21.5 | 9.6 | 3.7 | 14.3 | 4.9 |
| Technicians | 2.7 | 23.6 | 6.1 | 2.5 | 29.7 | 5.5 |
| Clerical works | 12.6 | 27.5 | 15.0 | 11.2 | 19.3 | 12.1 |
| Sales | 18.8 | 3.2 | 16.2 | 10.1 | 2.5 | 9.3 |
| Service | 11.1 | 10.2 | 10.9 | 11.1 | 9.4 | 10.9 |
| Agriculture | 1.0 | 0.2 | 0.8 | 7.3 | 4.1 | 7.0 |
| Production machinery | 12.3 | 9.2 | 11.8 | 10.3 | 13.6 | 10.7 |
| Engineering and other architect | 31.9 | 2.7 | 27.2 | 42.6 | 6.3 | 38.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Ibid.

Table 3.4 shows the workers distribution sector. Industry, building and construction, trade and administrative work are the main sectors for male occupying around 70% of the workers in both the Damascus city and Rural Damascus. Administrative work and education are the main sectors for female occupying around 60% of the workers in both the Damascus city and Rural Damascus.

Table 3.4 Workers Distribution by Sector

(Unit: %)

| | Damascus city | | | Rural Damascus | | |
|-----------------------------|---------------|--------|-------|----------------|--------|-------|
| | Male | Female | Total | Male | Female | Total |
| Agricultural and hunting | 1.0 | 0.3 | 0.9 | 7.4 | 4.2 | 7.1 |
| Fishing | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mining | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| Industry | 20.3 | 12.2 | 19.0 | 18.2 | 16.3 | 18.0 |
| Electricity and water | 0.3 | 0.4 | 0.3 | 0.1 | | 0.1 |
| Building and construction | 14.0 | 2.1 | 12.1 | 23.0 | 4.7 | 21.0 |
| Trade | 24.2 | 7.0 | 21.5 | 13.8 | 4.0 | 12.7 |
| Transport and communication | 8.4 | 2.6 | 7.5 | 8.7 | 1.1 | 7.9 |
| Finance | 0.2 | 1.6 | 0.4 | 0.1 | 0.4 | 0.1 |
| Properties and real estates | 4.5 | 4.7 | 4.5 | 3.1 | 4.2 | 3.2 |
| Administrative work | 20.2 | 30.2 | 21.8 | 20.0 | 25.2 | 20.6 |
| Education | 2.0 | 28.6 | 6.2 | 2.0 | 33.7 | 5.5 |
| Social services | 3.3 | 5.2 | 3.6 | 3.7 | 2.4 | 3.7 |
| Home service | 0.3 | 2.5 | 0.6 | 1.1 | 0.4 | 1.1 |
| Embassies | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 |
| International organization | 1.1 | 2.3 | 1.3 | 1.4 | 1.0 | 1.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Ibid.

Table 3.5 shows the income distribution by sector in national level. The lowest group (less than SL.5,000/month) occupies the largest share in the first four sectors such as agriculture, industry and construction. In contrast, the highest group (over SL.9,000/month) occupies the largest share in the last three sectors such as transport, finance and services. The gap between

male and female is not large in total, though it is large in some sectors such as agriculture and it is little in some sectors.

Table 3.5 Income Distribution by Sector at National Level

| Sector | Sex | Number of workers | Income bracket (SL./month) | | | | | |
|---|--------------|-------------------|----------------------------|--------------|--------------|--------------|--------------|--------------|
| | | | -5,000 | 5,001-6,000 | 6,001-7,000 | 7,001-8,000 | 8,001-9,000 | 9,000- |
| 1.Agriculture | M | 148,049 | 41.8% | 24.8% | 13.4% | 7.7% | 2.8% | 9.5% |
| | F | 35,185 | 78.8% | 8.4% | 5.8% | 1.6% | 0.5% | 5.0% |
| | Total | 183,234 | 48.9% | 21.7% | 11.9% | 6.5% | 2.4% | 8.6% |
| 2.Industry, electricity, gas and water | M | 399,770 | 22.7% | 15.3% | 14.3% | 17.6% | 8.2% | 21.9% |
| | F | 31,036 | 39.8% | 19.1% | 14.7% | 9.9% | 5.9% | 10.6% |
| | Total | 430,806 | 24.0% | 15.6% | 14.3% | 17.0% | 8.0% | 21.1% |
| 3.Building and construction | M | 414,329 | 30.5% | 18.3% | 12.2% | 13.7% | 7.7% | 17.6% |
| | F | 3,853 | 52.0% | 0.0% | 9.2% | 14.7% | 10.2% | 13.9% |
| | Total | 418,182 | 30.7% | 18.1% | 12.2% | 13.7% | 7.7% | 17.6% |
| 4.Trade, hotels and restaurants | M | 213,994 | 34.6% | 15.7% | 9.5% | 14.1% | 5.0% | 21.1% |
| | F | 10,538 | 52.1% | 14.5% | 4.0% | 18.8% | 2.0% | 8.7% |
| | Total | 224,532 | 35.4% | 15.7% | 9.2% | 14.4% | 4.8% | 20.5% |
| 5.Transport, storage and communications | M | 174,348 | 11.8% | 13.4% | 13.5% | 16.0% | 10.5% | 34.8% |
| | F | 4,198 | 16.7% | 13.1% | 9.2% | 25.8% | 8.7% | 26.4% |
| | Total | 178,546 | 11.9% | 13.4% | 13.4% | 16.3% | 10.4% | 34.6% |
| 6.Financial, insurance and preparations | M | 34,231 | 13.7% | 12.2% | 12.3% | 7.6% | 7.1% | 46.9% |
| | F | 8,136 | 22.7% | 15.7% | 27.1% | 9.3% | 6.9% | 18.4% |
| | Total | 42,367 | 15.5% | 12.9% | 15.2% | 8.0% | 7.1% | 41.4% |
| 7.Services | M | 856,778 | 15.0% | 13.0% | 13.2% | 12.4% | 10.8% | 35.7% |
| | F | 322,985 | 16.4% | 12.5% | 14.2% | 14.3% | 11.8% | 30.7% |
| | Total | 1,179,763 | 15.4% | 12.8% | 13.5% | 13.0% | 11.0% | 34.3% |
| Total | M | 2,235,218 | 22.7% | 15.5% | 12.9% | 13.7% | 8.6% | 26.7% |
| | F | 415,931 | 24.8% | 12.7% | 13.4% | 13.0% | 10.0% | 26.0% |
| | Total | 2,651,149 | 23.0% | 15.0% | 13.0% | 13.6% | 8.8% | 26.6% |

Source: Labor Force Survey 2005

3.3 Education

Table 3.6 shows the distribution of education level. The illiterate rate for female is much larger than that of male. The rate for university and above for female is smaller than that of male. These tendencies are common in the Damascus city and Rural Damascus.

Table 3.6 Distribution of Education Level for 15 Years and Older

| | Damascus city | | | Rural Damascus | | | (unit: %) |
|--------------------------|---------------|--------|-------|----------------|--------|-------|-----------|
| | Male | Female | Total | Male | Female | Total | |
| Illiterate | 4.2 | 10.2 | 7.2 | 6.9 | 15.2 | 10.9 | |
| Literate: read and write | 21.9 | 21.5 | 21.7 | 28.0 | 26.2 | 27.1 | |
| Primary | 22.2 | 18.2 | 20.2 | 26.4 | 21.8 | 24.2 | |
| Preparatory | 20.4 | 20.2 | 20.3 | 18.1 | 17.9 | 18.0 | |
| Secondary | 15.5 | 16.2 | 15.9 | 10.5 | 10.6 | 10.6 | |
| Institute | 4.8 | 6.0 | 5.4 | 3.6 | 4.3 | 4.0 | |
| University and above | 10.4 | 7.2 | 8.9 | 5.5 | 2.8 | 4.2 | |
| Not known | 0.4 | 0.5 | 0.5 | 1.0 | 1.1 | 1.1 | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | |

Source: Central Bureau of Statistics

3.4 Access to Basic Services

Almost all the populations in the Damascus city and Rural Damascus have good access to the basic service as shown in Table 3.7, Table 3.8 and Table 3.9. The public sewerage network covers 93.1% of the Rural Damascus area as shown in Table 3.9, but almost all the wastewater is not treated.

Table 3.7 Distribution of the Houses According to the Water Supply Means

(Unit: %)

| Means | Damascus city | Rural Damascus |
|-----------------------------|---------------|----------------|
| Public network | 98.9 | 91.9 |
| Joint outlet | 0.1 | 0.5 |
| Joint well | 0.7 | 1.5 |
| Special well for the family | 0.1 | 2.2 |
| Others | 0.1 | 3.6 |
| Not known | 0.1 | 0.3 |
| Total | 100.0 | 100.0 |

Source: Central Bureau of Statistics

Table 3.8 Distribution of the Houses According to the Electricity Means

(Unit: %)

| Means | Damascus city | Rural Damascus |
|----------------------------|---------------|----------------|
| Public electricity network | 98.7 | 98.7 |
| Self electricity | 0.3 | 0.3 |
| Others | 0.7 | 0.7 |
| Not known | 0.3 | 0.3 |
| Total | 100.0 | 100.0 |

Source: Ibid.

Table 3.9 Distribution of the Houses According to the Sewerage Means

(Unit: %)

| Means | Damascus city | Rural Damascus |
|-------------------------|---------------|----------------|
| Public sewerage network | 99.5 | 93.1 |
| Others | 0.4 | 6.6 |
| Not known | 0.1 | 0.3 |
| Total | 100.0 | 100.0 |

Source: Ibid.

3.5 Informal Settlements

3.5.1 Present conditions

(1) General

The informal areas are the areas which contain houses constructed without permission or license. These areas are attraction centers for the immigrants from other governorates. The informal areas in Damascus started to appear in early 1950s due to the migration from rural areas to the city with the establishment of industries. They expanded to the agricultural areas

neighboring the urban areas, to the protection areas and to the suburban areas surrounding the city. During the 1980s and 1990s these areas grew up rapidly consisting one third of the total population of the city.

As for the Damascus city, the informal settlements within the city borders are distributed on the circumference of the city starting from Mt. Qassyoun as the location of the Kurd who come from Hasakeh and the north of Aleppo to work and live there, and spreading to Berzeh and Qabboun, Zablalani, Jobar, Qazaz, Alwahdeh, Belal, Yarmouk, Qadam, Daf Alshouk, Tadamoun, Zahira, Dummar, the Alrez Mountain, Kafer souseh, Lawwan, Mezzeh 86, and other areas. The government is always trying to provide the required services to these informal settlements, and more than 95% of the residence is receiving the basic needs for living such as water supply, electricity and others in Damascus.

(2) Geographical distribution and characteristics

The geographical distribution of the informal areas is explained as follows.

a) Inside the administrative boundaries of the Damascus governorate

Twenty informal residential areas within the city boundaries can be found, and most of them were constructed on lands which are not allocated for housing purposes. The areas were divided into four areas.

- Rural activities area,
- Protection area (areas that maintain Ghouta),
- Internal agriculture area, and
- Green areas (for public use only, however, 90 % of these areas are occupied by informal houses at present).

b) Outside the administrative boundaries of the Damascus city

There are more than 17 informal areas outside the administrative boundaries of the Damascus city. These areas are closely related to inside informal areas, because the inside areas extended to outside the boundaries, such as the Tishreen quarter, Ish Al Warwar, Al Qazzaz, Al Qaboun, Qudsaya, Esali, Al Tadamon, Al Tabbaleh and Al Dwaila'a.

The characteristics of the settlements are explained as follows. The population in the total informal areas within the boundaries was estimated to be 583,200, 38% of the total population estimated as 1,550,000 in 2004. The population outside the boundaries is around 375,000, 39% of the total population, estimated as 958,200.

The total area of the informal areas within the administrative boundaries is 1,458ha, 32 % of the total net residential area of the city, 4,590ha.

The average population density within the administrative boundaries is 400 person/ha,

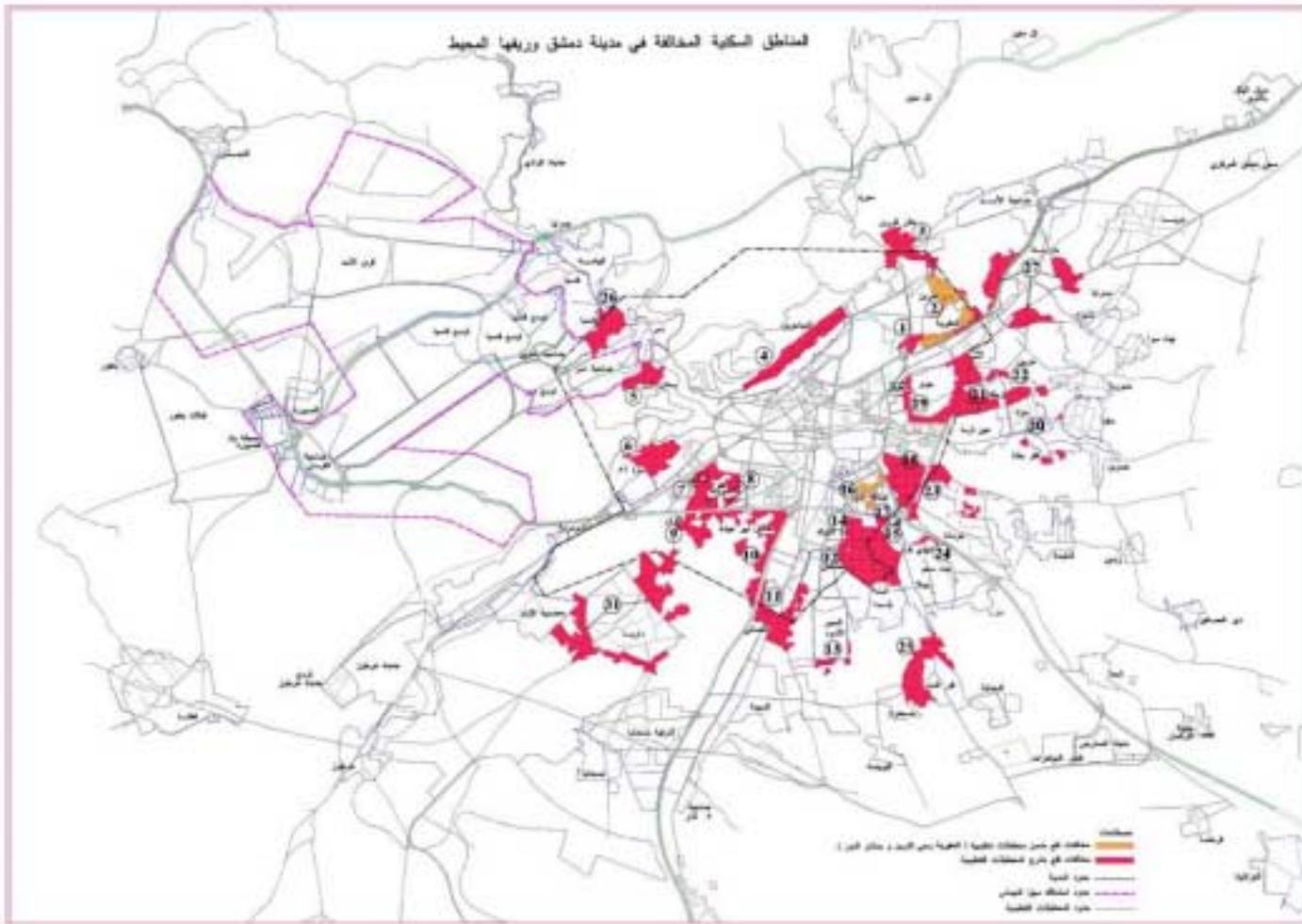
and the one of the outside is 430 persons/ ha. In some cases, the net density reaches from 700 to 800 persons/ha.

Table 3.10 shows the informal settlements, and the respective locations of those settlements are shown in Figure 3.2.

Table 3.10 Informal Settlements in the Damascus city and Rural Damascus

| No. | Name | Area (ha) | | | Note |
|-----|------------------------|--------------|--------------|---------------|---|
| | | Total | Inside of DG | Outside of DG | |
| 1 | Kasr Al Labbad | 21 | 21 | 0 | |
| 2 | Al Kaboun | 61 | 51 | 10 | Part of this area is in acquisition of Kaboun station. |
| 3 | Hai Tishreen | 62 | 56 | 6 | Part of it located in master plan of Hai Tishreen. |
| 4 | Osh Al Warwar | 102 | 48 | 54 | |
| 5 | Al Mohajreen | 142 | 142 | 0 | All the informal areas located in the north of the forth planning zones are included. |
| 6 | Bestan Al Rezz | 56 | 56 | 0 | |
| 7 | Mezze 86 | 94 | 94 | 0 | |
| 8 | behind Al Razi | 49 | 49 | 0 | |
| 9 | Kafrososah | 74 | 74 | 0 | |
| 10 | Al Lwan | 82 | 82 | 0 | |
| 11 | Dahadeel Nahr Esha | 116 | 116 | 0 | |
| 12 | Al Esali | 127 | 34 | 93 | Part of it is expanded to Al Kadam plan. |
| 13 | Al Tadamon | 203 | 135 | 68 | |
| 14 | Daf Al Shouk | 41 | 41 | 0 | |
| 15 | Al Hajar AL Aswad | 19 | - | 19 | |
| 16 | Al Kazzaz | 22 | 10 | 12 | |
| 17 | Bestan Al Dour | 35 | 35 | 0 | |
| 18 | Tabbala-Dwela,a | 122 | 122 | 0 | Area of cemeteries is excluded. |
| 19 | Moukhauem Jaramana | 57 | 50 | 7 | The master plan covers a part of the area (not been taken into consideration). |
| 20 | Jaramana | 19 | - | 19 | Part of it is taken into consideration in the master plan. |
| 21 | Jobar | 162 | 162 | 0 | |
| 22 | Zamalka | 73 | - | 73 | Part of it is taken into consideration in the master plan. |
| 23 | Sakba Kafr Batna Hazze | 19 | - | 19 | Part of it is taken into consideration in the master plan. |
| 24 | Erbeen | 12 | - | 12 | |
| 25 | Harasta | 165 | - | 165 | |
| 26 | Sidi Mikdad | 8 | - | 8 | |
| 27 | Qudsaya | 87 | 80 | 7 | |
| 28 | Yelda | NA | NA | NA | Part of it is taken into consideration in the master plan. |
| 29 | Babbila | NA | NA | NA | Part of it is taken into consideration in the master plan. |
| 30 | Ean Tarma | NA | NA | NA | Part of it is taken into consideration in the master plan. |
| 31 | Darea | 300 | - | 300 | |
| | Total | 2,330 | 1,458 | 872 | |

Source: General Master Plan of Damascus City and the Surroundings Regional Development (GCEC)



Source: General Master Plan of Damascus City and the Surroundings Regional Development (GCEC)

Figure 3.2 Informal Settlement Areas in Damascus

(3) Background of informal settlements expansion

Despite the attempt to stop the expansion of informal settlements by strict rules, but they are still expanding in spite of these countermeasures. The housing conditions in Syria can be summarized based on collected information, and those are considered as the direct causes of the informal settlements.

- Number of exiting houses is not enough in whole Syria and around 9% of households in Damascus and Rural Damascus cannot have their own houses based on a calculation.
- The government is aware of the shortage of houses and making efforts, but the number of houses actually supplied is not enough.
- Houses are rather expensive for Syrian people. The average house costs around 7-10 times of their average yearly income.
- In addition, the following facts exist as the background of informal settlements.
- The city areas attract many people from other areas, because most of the economic activities are concentrated and infrastructure such as water and electricity supply, education facilities, medical facilities and others are provided in those areas.
- Many of the master plans in the DMA have not been implemented mainly because of financial constrains, and existing master plans for urban planning do not always cover future needs of houses. Therefore, official houses within the urban area are limited.
- The regional plans, which include rural area improvement plans, have not been prepared, and therefore, the people in rural areas where economic activities are declining selected to move to the city areas.

The Syrian government is fully aware of the lack of houses, and they are going to secure the quantity and quality of houses. If the construction of 483,000 houses, the target number of houses to be built in 2006-2010, the number will be enough. However, many houses are still informal houses, and therefore, it is required to make efforts to formalize the informal houses in addition to building new houses.

Chapter 4 Solid Wastes Management

4.1 Solids Wastes Management in Damascus City

4.1.1 General

The Damascus governorate is responsible for waste management through the Cleanliness Directorate of the governorate. The number of the staff for waste management is 3,200, out of which 200 staff are sweepers.

Recently, the Damascus governorate has started to make contracts with private companies in some parts of the city for waste collection. The first areas selected are Dummar and Qassyoun. The second contract is for the Old Damascus where there were some difficulties for collection because of the narrow streets, and the private contractor prepared special collection vehicles such as small capacity compactors or dump trucks. The third contract is for the area of Rukin Eddin, also because of the topography of that area (mountain area) and the very narrow streets. They cover around 25% of the entire city, and around 1,000 staff are working in these private companies at present. The Damascus governorate has a plan to make contracts with private companies for 50% of the collection area by 2010.

All the vehicles are used by the Cleanliness Directorate for waste management as shown in Table 4.1. Almost all the vehicles are old including 25-year old ones.

Table 4.1 Number of Vehicles Used for Waste Management

| Large compactor | Medium compactor | Small compactor | Tractor | Trailer | Loader | Truck |
|-----------------|------------------|-----------------|---------|---------|--------|-------|
| 93 | 38 | 74 | 44 | 12 | 3 | 20 |

Remark: Tractors are used only in informal settlement areas.

Source: Cleanliness Directorate of Damascus governorate

The amount of collected waste is 1,200tons/day (=438,000tons/year). The waste generated per person is calculated as 0.8 kg/person based on the official population data of 1.5 million in Damascus city. Trivalor, a French consultant, prepared "Master Plan for Waste Management in the Syrian Arab Republic" in 2004, and they estimated the waste at 0.4 kg/person assuming that the actual population in Damascus city is 3 million. Table 4.2 shows the composition of sample wastes.

Table 4.2 Composition of Sample Wastes

| (% of fresh weight) | | | | | | | |
|---------------------|---------|---------------------|---------|-------|-------|------|-------|
| Organic | Plastic | Paper and cardboard | Textile | Glass | Metal | Wood | Other |
| 53.8 | 13.4 | 15.9 | 4.4 | 1.7 | 1.7 | 0 | 9.1 |

Source: Trivalor, "Master Plan for Waste Management in the Syrian Arab Republic", 2004

The quantity of all the wastes is estimated in Table 4.3.

Table 4.3 Estimated Waste Quantity by Waste Category

| Waste category | Quantity(ton/year) | (%) |
|---------------------------------|--------------------|-------|
| Domestic and commercial wastes | 438,000 | 70.2 |
| Industrial and slaughter wastes | 2,300 | 0.4 |
| Medical waste | 700 | 0.1 |
| Rubble and soil | 183,000 | 29.3 |
| Total | 624,000 | 100.0 |

Source: Ibid.

The annual cost for waste management in 2002 is described in Table 4.4

Table 4.4 Annual Cost for Waste Management in 2002

| (Unit: 1,000 SL.) | | |
|------------------------------------|---------|-------|
| Category | Cost | (%) |
| Labor cost | 394,000 | 59.7 |
| Waste transportation | 35,400 | 5.4 |
| Other private contracts | 47,600 | 7.2 |
| Materials and equipments | 10,100 | 1.5 |
| Fuel and oil | 15,000 | 2.3 |
| Maintenance of vehicles | 130,000 | 19.7 |
| Composting plant | 23,000 | 3.5 |
| Administrative cost and stationery | 5,000 | 0.8 |
| Total | 660,100 | 100.0 |

Source: Ibid.

The budget estimated for 2003 was SL. 685 million, corresponding to SL. 1,750 per ton or SL. 228 per inhabitant. It is one of the highest budgets per inhabitant compared with other cities in Syria.

4.1.2 Collection and transfer

The waste from households is put to the containers in the streets as mixed wastes. The business entities also can use those containers but they are required to pay for waste collection. The number of containers is 2,500 with two kinds of size, 1.3m³ and 3.6m³. The waste in the containers is collected by the compactor cars and conveyed to the Bab Sharqi transfer station, west part of the Jober service department. The collection frequency is three to four times a day in almost all the city. The waste is transferred to a trailer with a loading capacity of 35tons to be sent to the final disposal site. It is reported that the transfer station has problems from the health and technical view points and the location is not suitable because it is in the middle of the city, near a mosque.

4.1.3 Final disposal

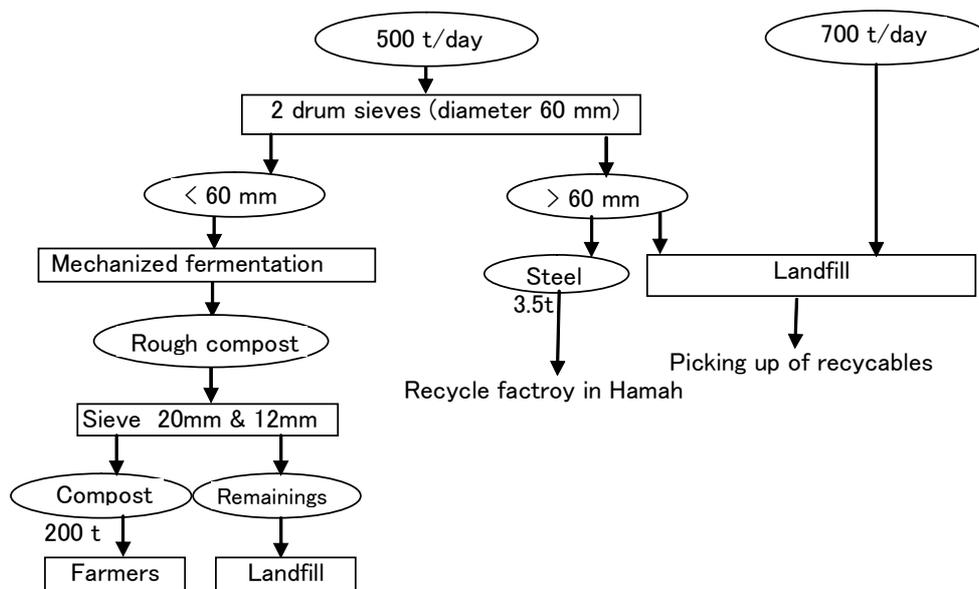
The situation of the final disposal site is summarized below.

| | |
|------------------------------|---|
| Location: | Al Joronia, 40km from Damascus city |
| Superficies : | 60ha |
| Geology: | Basalt lava flow and alluvial sediments (clayey) |
| Operation period : | Started in1983, and will be finished in 2010 |
| Control at the entrance: | Yes |
| Fencing: | Yes |
| Weighbridge: | Yes |
| Water proofing: | No |
| Leachate management: | Collected in the pond and let it dry to prevent infiltration |
| Biogas recovery : | Yes (partly, only 30 pipes in the old cells near the compost plant) |
| Landfill coverage: | Yes (every three days) |
| Automotive trash compaction: | Yes (one compactor and three bulldozers) |
| Excavator: | Yes (two excavators to dig material to be used for cover) |
| Scavengers: | Yes (under the agreement with the Cleanliness Directorate) |
| Future extension: | Yes (extension of the current site for 60ha is planned) |

Source: ibid. and Solid Waste Management Plant of the Damascus governorate

The wastes are first put into the composting plant, which is built in 1990, till the wastes reach the capacity of the plant, 500tons/day. The wastes are sieved in two drum sieves with 60 mm diameter, after being crashed in the hammer mills. The flow of the wastes is shown in Figure 4.1. The compost is produced at the ferment area taking time of 36days. Composting is done in a mechanized way in a huge area of 20,000m², with ten staff members using four windrow turning machines. The compost is sold to the farmers at the price of SL. 240 per ton.

The remaining 700tons per day of wastes out of the total 1,200tons per day is dumped to the final disposal site without any treatment.



Source: Interview with Solid Waste Management Plant of the Damascus governorate

Figure 4.1 Wastes Flow at Final Disposal Site of the Damascus Governorate

4.1.4 Recycling

There are around 200-300 waste pickers (scavengers) in the landfill and they are organized. Respective pickers pay a certain amount of money to the group leader and the group has a contract with the Damascus governorate. The contract amount is SL. 2 million for this year. It is estimated that the following recyclables are picked up by them in the landfill. The collected materials are sold to the middle men to be recycled. There are waste pickers who pick the recyclable from the containers directly.

Table 4.5 Estimated Recyclable Recovered from Wastes

(Unit: ton/day)

| Iron | Glass | Paper | Plastic bags | Other plastic | Rubber |
|------|-------|-------|--------------|---------------|--------|
| 3 | 2 | 3 | 3 | 3 | 0.5 |

Source: Solid Waste Management Plant, Damascus Governorate

An experiment to separate waste into two groups (organic waste and others) was done in the past. Two containers were prepared for respective waste types and the residents are required to separate wastes. However, it did not succeed and the main reason is supposed to that raising awareness for citizen was not enough.

4.1.5 Medical waste management

The Cleanliness Directorate enforces the hospitals to sort their waste and to put their medical waste in special containers (plastic medical waste: in blue bags, other medical waste: in yellow bags), and the medical waste is collected separately by a special three-ton compactor, then it is transferred to the incinerators adjacent to the composting plant after transferring in the transfer station.

They charge SL.5 per kg to the hospitals for waste disposal. This activity began as an experiment to collect the medical waste separately in some areas, but the collection is done in all the area in Damascus city at present. They cover only hospitals, and clinics and other related facilities are not included. After collection, the yellow bag wastes are burned in the incinerator plant. The temperature is around 950°C in the first furnace, and around 1050°C in the second. The ash is buried in the landfill. The blue bags with plastic medical waste are not burned because of the fear of dioxin generation, and therefore they are buried as they are.

4.1.6 Future plan and prospect

They are planning the following additional facilities:

- An additional compost plant (1,000tons/day) (the construction will take two years starting this year with financial support from the central government),
- A closed landfill for hazardous waste (under construction),
- A sorting plant for manual sorting of recyclables, and

- An expansion of the existing landfill.

They want to burn the plastic medical waste, which is buried without any treatment at present, in a proper way in the future.

4.1.7 Problems pointed out

The following issues are raised as the problems by the persons in charge.

- The medical waste is collected by a compactor car, but it is not good because the bags are often broken and the contents go out of the bags. Special protected cars are needed.
- The land compactor is made in the USA, and there are difficulties to procure the spare parts.

4.2 Solid Wastes Management in Rural Damascus

4.2.1 General

The Technical Services Directorate of the Rural Damascus governorate is responsible for policy of solid wastes management in Rural Damascus, and a committee is organized to decide the policy. The Directorate of Environment in the Rural Damascus governorate is a member of the above committee, and monitoring some technical matters related to the selection of landfills, disposal method and other related matters. The solid wastes are managed locally by municipalities and city councils respectively. The estimated waste quantities are shown in Table 4.6.

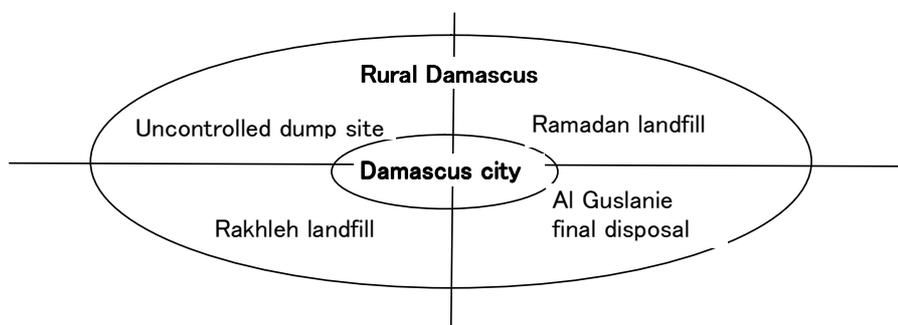
Table 4.6 Estimated Waste Quantities in Rural Damascus

| Municipality | Population | Municipal waste excluding demolition waste,2002 | | |
|---------------------------------------|------------|---|------------------|----------|
| | | (t/day) | (kg/day/inhab .) | (t/year) |
| Douma | 300,000 | 225 | 0.8 | 82,125 |
| Harasta | 120,000 | 76 | 0.6 | 27,740 |
| Erbeen | 42,000 | 48 | 1.1 | 17,520 |
| Zabadani | 40,000 | 28 | 0.7 | 10,227 |
| Nabik | 47,000 | 17 | 0.4 | 6,196 |
| Yabroud | 38,000 | 24 | 0.6 | 8,851 |
| Al Ruhaybeh | 27,000 | 11 | 0.4 | 4,161 |
| Daraya | 150,000 | 118 | 0.8 | 43,004 |
| Qutayfeh | 28,000 | 14 | 0.5 | 5,256 |
| Jaramana | 300,000 | 177 | 0.6 | 64,605 |
| Total towns with questionnaire | 1,092,000 | 731 | 0.7 | 266,761 |
| Other towns | 1,218,000 | 815 | 0.7 | 297,541 |
| Total | 2,310,000 | 1546 | 0.7 | 564,302 |

Source: Trivalor, Master Plan for Waste Management in Syrian Arab Republic, 2004

Wastes generated in Rural Damascus are carried to three landfills and uncontrolled dump sites, and Rural Damascus can be divided into four areas roughly according to the landfill to which the wastes are carried as illustrated below. The municipalities in the south-east area use the landfill of Al Ghizlaniyeh. The municipalities in the north-east area and south-west areas use Ramadan and Rakhleh respectively, but those two are not provided with necessary facilities to prevent pollution. The north-west area has no landfill, and uncontrolled dump sites are used in this area. Other than those, many uncontrolled dump sites exist (Figure 4.2).

There are regulations under which medical wastes should be collected separately to be treated properly, but it is not done at present. As for industrial wastes, factories make individual contracts with the municipality to deal with the wastes properly. However, it is not clear whether those wastes are properly dealt with or not.



Source: Interview with Directorate of Environment in Rural Damascus and a local consultant

Figure 4.2 Use of Landfills in RDG

The common problems in almost all the municipalities in Rural Damascus are:

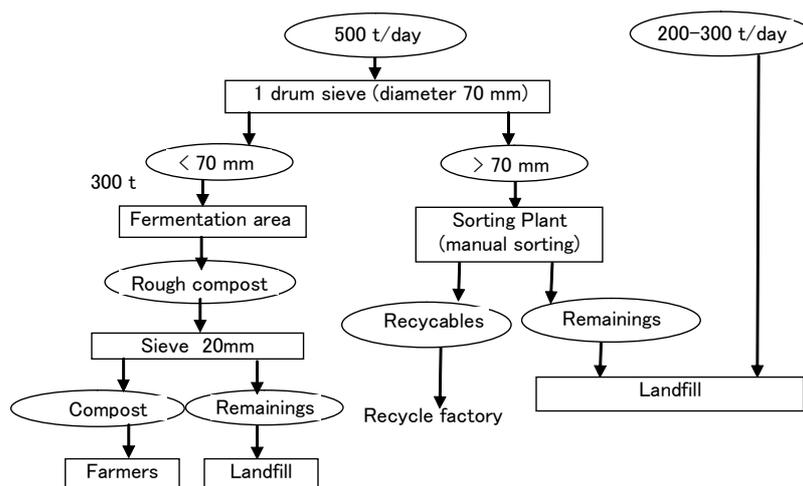
- The landfill does not have necessary facilities to prevent pollution,
- The landfill sites are too far, and
- The vehicles to carry wastes are too old.

4.1.2 Final disposal at Al Ghizlaniyeh

(1) General

The wastes carried to the final disposal site at Al Ghizlaniyeh are first put into the drum sieve, till the wastes reach the capacity of the sorting plant, 500tons/day. They are sieved in the drum sieves to be sorted to organic wastes (smaller than 70mm) and others (larger than 70mm). The former are sent to the fermentation area and the latter to the sorting plant. The remaining wastes of 200-300 tons/day are dumped to the final disposal site without any treatment.

The wastes flow at Al Ghizlaniyeh is illustrated in Figure 4.3.



Source: Interview with Rural Damascus governorate and a local consultant

Figure 4.3 Wastes Flow at Al Ghizlaniyeh Final Disposal Site

The Al Ghizlaniyeh landfill, with the area of 40ha, adjoins the landfill of Damascus city at Al Joronia, and started in 2003. The landfill is provided with neither leachate treatment system nor biogas recovery system. Attention is paid to hazardous waste, and there is a hole with a diameter around 10m for hazardous wastes, though only it has waterproof sheets on the bottom and the fence around it. A local is responsible for comprehensive management of the landfill under the contract with the Rural Damascus governorate in 2006. They are going to improve the conditions of the present landfill during 2006-2010.

(2) Recycling

Recovery of recyclable materials is done in the sorting plant, built in 1990 in the landfill site. The operation started in 2004 and around forty people are working there by manual. Recovered materials are estimated as shown in Table 4.7. Bread is also picked up to be fed to animals. There are no waste pickers in the landfill.

Table 4.7 Estimated Recyclables Recovered from Wastes

(Unit: ton/day)

| Metal | Glass | Paper | Plastic |
|-------|-------|-------|---------|
| 15 | 5 | 35 | 70 |

Source: Interview with the Rural Damascus governorate and a local consultant

(3) Future plan

They are going to continue their way to collect the mixed wastes, and sort them at the disposal site by both mechanical ways such as drum sieves and manual sorting. They are not thinking of asking the residents to sort their wastes at home in the upstream because they consider raising awareness for the residents and car arrangement for wastes collection by type is not ready.

Chapter 5 Heritage

5.1 Historic Background of Damascus

Damascus is always referred to as the oldest inhabited city in the world and archaeological evidence shows that the population center flourished here. The historic records of the city date back to its seizure by the Egyptian Pharaoh Tuthmoses III in 1468 BC. After the Egyptian over twenty different governments ruled Damascus, which attracted to it from different areas of the world; Egypt, Arab peninsula, Persia, Babylon, Greece, Roman empire, Turkey and France. While the civilizations left their marks on Damascus, Damascus also contributed to the growth of many of these civilizations and became a capital or a major city in some of them because of its important location and the richness of its civilizations.

The walled old city of Damascus was declared as one of the sites under UNESCO conservation program in October, 1979. Conservation of the city's culture resources should be taken into consideration in any development projects (Figure 5.1).



Source: Damascus governorate

Figure 5.1 Culture Resources Areas in the Damascus City

5.2 Registered Antiquities

The total number of the registered antiquities listed in the Damascus city is 265, but clear data is not found for these in Rural Damascus. The categorization of them is shown in Table 5.1. The registered antiquities in the Damascus city are shown in Figure 5.2 and through Figure 5.4.

Table 5.1 Categorization of Registered Antiquities Sites in the Damascus City

| Religious and Sacred sites | | | | Citadel, wall and doors | Houses and dormitories | Bath Houses | Governmental Buildings | Others |
|----------------------------|--------|--------|--------|-------------------------------|------------------------------|----------------|---------------------------|--------|
| Mosque | School | Church | Graves | | | | | |
| 25% | 13% | 1% | 25% | 11% | 10% | 6% | 5% | 4% |

Source: Antiquities Department

Table 5.2 Registered Antiquities in the Damascus City

| Antiquity site | Year | Antiquity site | Year |
|--------------------------------|-------|-----------------------------------|-------|
| 1- El Sour (city wall) | | 2- Nour El Dine Tower | |
| 3- Saleh Ayoub Tower | C1200 | 4- Bab Sharki Gate | C300 |
| 5- Bab Touma Gate | C1200 | 6- Bab Al Salam Gate | 1243 |
| 7- Bab Al Sagheer Gate | | 8- Bab Al Jabiyeh Gate | |
| 9- Bab Al Faraj Gate | | 10- Bab Al Faradis Gate | 1243 |
| 11- Bab Kisan Gate | | 12- Citadel | 1218 |
| 13- Roman Canal | | 14- St. Jean excavations | C100 |
| 15- Umayyad Mosque | | 16- Safwat Al Moulk Grave | |
| 17- Nouri Bimarastan Hospital | 1154 | 18- Hammam Nor El Din | C1200 |
| 19- Al Nouria Al koubra School | | 20- Al Feroukhoushahiya school | |
| 21- Al Shamyia School | | 22- Salh El dine Mausoleum | 1196 |
| 23- Ibn Al Mokaddam Mausoleum | | 24- Al Adleiya School | 1218 |
| 25- Al Aziya school | | 26- El Toubah Mosque | 632 h |
| 27- El Jawzeh Hammam | | 28- Al Nabi Younes Grave | |
| 29- Yalbougha Mosque | | 30- Al Zaheria School | 1277 |
| 31- Al Baridi Water Fountain | | 32- Tenkez Mosque | |
| 33- Wali El Shibanneh tomb | | 34- Afridounia Cemetery | 749 h |
| 35- Arak Mausoleum | | 36- Hammam El Ward | |
| 37- Monjek Mosque | | 38- El Taynabia Mousque | |
| 39- El Rashidiya Mosque | | 40- El Khezana water fountain | |
| 41- El Sadat Mosque | | 42- El Tayrouzi Mosque | |
| 43- Hammam El Tyrouzi | | 44- Al Jaqmaqyia school | 1421 |
| 45- Hisham Mosque Minaret | | 46- El Qal'i Mosque Minaret | |
| 47- Kimarrieh Mausoleum | | 48- Al Sebaeya School | 1515 |
| 49- Sulaimannieh Mosque | 1560 | 50- Saad El Din Mastaba | |
| 51- Khan Al Harir dormitory | | 52- Darwish Basha Mousque | C1500 |
| 53- Darwish pasha Mausoleum | C1500 | 54- Senan pasha Mosque | 1590 |
| 55- Khan Suliman pasha Dorm | 1732 | 56- El Azem Palace | 1749 |
| 57- Khan Assad pasha dorm | 1749 | 58- Al Umariya School | |
| 59- Al Khatouniya Grave | | 60- El Badriya Grave | |
| 61- Al Hanabila Mosque | | 62- Rokn El Din Mosque | |
| 63- Al Mardinia mosque | | 64- Amatu Al Latif Grave | |
| 65- Al Tabikiyia School | | 66- Al Sahibyia School | |
| 67- Al Maristan Al qimari | C1200 | 68- Al Adeyia Al Barranieh graves | |
| 69- Al Takrityia graves | | 70- Qubbat Sayyar | |
| 71- Mohi El Din Mosque | 1518 | 72- Al Takkiya Al Salimia | |
| 73- Sett El sham grave | | 74- El Dehdah Mausoleum | |
| 75- Dar El Hadith El Nouriyah | | 76- Sultan Hasan Mosque | |
| 77- Mawoodod Bin Zinki grave | | 78- Al Kalijia School | |
| 79- Dar El Quran | | 80- Al Kawakebiya Graves | |
| 81- Al Qinshliya School | | 82- El Tawousseya Mosque | |
| 83- Al Sanjakdar Mosque | | 84- El Refaii Hammam | |
| 85- Al Ikhnaeya Grave | | 86- Sultan Hammam | |
| 87- Sheikh Hasan Mosque | C1450 | 88- Al Sabouniyya School | C1400 |
| 89- Moaalek Mosque | | 90- Senan Pasha Office | 999h |
| 91- Fathi Hammam | | 92- Khan El Jomrok Drom | 1609 |
| 93- Kadam Mosque | | 94- Az Azin Hammam | |
| 95- Serougieh Hammam | | 96- El Jarkasieh School | |
| 97- Ibn Salama Graves | | 98- Al Faantiya Mausoleum | |
| 99- Al Hafezziya Graves | | 100- Al Nasseria School | |

| Antiquity site | Year | Antiquity site | Year |
|--|-------|--|------|
| 101- Al Nakeshbandi School | | 102- Al Nasseria School | |
| 103- Al Baderiya School | | 104- El Jawza Mosque | |
| 105- Al Nahhasien Mosque | | 106- Siti Raba Mosque | |
| 107- Sheikh raslan Mosque | | 108- Ibn Al Walid Mosque | |
| 109- Al Badryia Graves | | 110- Al Khaidaryia School | |
| 111- Al Adelia School | | 112- Jarrah Mosque | |
| 113- Al Kajkouria graves | | 114- Dar El Hadeeth School | |
| 115- Dar Al Quran Dolamiya | | 116- Mithqal Grave | |
| 117- Al Nabulsi Mosque | 1146h | 118- Al Sayeda Fatema Grave | |
| 119- Al Sayeda Sekina grave | | 120- Al Amir Ghourlo Grave | |
| 121- Al Kari Mosque Minaret | | 122- Ubai Ibn Kaab Grave | |
| 123- Mu'aweyia Grave | | 124- Al Kawarezmeia Grave | |
| 125- Al Qawamiya grave | | 126- Roman Arch | |
| 127- El Sebaiya House | C1700 | 128- Al Khatib House | |
| 129- Farhey House | | 130- Nizam House | |
| 131- Shiekh Amini House | | 132- Howraneya House | |
| 133- Zeinab Fawaz School | | 134- Sawaf House | |
| 135- Jabri House | | 136- El Azm House | |
| 137- Al Amedyia grave | | 138- felous Mosque | |
| 139- Senan Agha Mosque | | 140- Al messsggat Grave | |
| 141- Hamma Darwish Pasha | C1500 | 142- El Mojaled House | |
| 143- Al Shabliqiya School | | 144- Sabil El Shiekh Reslan | |
| 145- Al Taibi House | | 146- Al Khayateen Market | |
| 147- Abdalla Al Azm School | | 148- Shaz Bek School | |
| 149- Al Saweya Grave | | 150- Al Tashtadar Mosque | |
| 151- Al Diyaiyah School | | 152- Al Kangiasah grave | |
| 153- Bin Najd Grave | | 154- Ayanbek Graves | |
| 155- unknown Ayyoubid grave | | 156- Al Nathifah Grave | |
| 157- Bousaka Mosque | | 158- Al Qahiriah School | |
| 159- Al Assadyia Grave | | 160- Rihan Grave | |
| 161- Bitkahas Al Soudouli grave | | 162- unknown Ayyoubid grave | |
| 163- Linado House | | 164- Dar Anbar House | |
| 165- Al Fathia School | | 166- Siyaghous Mosque | |
| 167- Khan Al Sadraneyya drom | | 168- Al Teten Dormitory | |
| 169- Khan El Zeit Dormitory | C1500 | 170- Assem Mosque | |
| 171- Soliman Al Azm School | | 172- Unknown Mamlouk grave | |
| 173- Al Sarameya grave | | 174- Old Damascus City | |
| 175- Al Amir Aldin grave | | 176- Al Minshar Rock | |
| 177- Ministry of Interior Bldg. | | 178- Ain Al Feijeh water Bldg. | |
| 179- Al Abed Bldg. | | 180- Al Hijaz Station Bldg | 1913 |
| 181- Al Assali Mosque | | 182- Bab Al Saghir graves | |
| 183- Al Qaimaryia School | | 184- Al Hiyoutyia Mosque | |
| 185- Hammam Dummar | | 186- Khazan Al Afif | |
| 187- Al Ras Mosque | | 188- unknown Ayyoubid grave | |
| 189- Dar El Moallemin Bldg. | | 190- Bab Al Salam mill | |
| 191- Lisbona House | | 192- Al Bizouria Mosque | |
| 193- National Museum Bldg. | | 194- Jubar Jweish Temple | |
| 195- Al Qwately House | | 196- wall west of Bab Kisan | |
| 197- wall (Bab kisan round tower) | | 198- wall (round tower Zaouia tower) | |
| 199- Zaouia Tower | | 200- wall (Zaouia Tower Bab Sharki) | |
| 201- wall (Bab Sharki round tower) | | 202- round tower | |
| 203- wall (round tower- Al Saleh Ayyoub tower) | | 204- Wall (Al Saleh tower- Bab Toma) | |
| 205- wall (Bab Al Salam – Bab Alfaradis) | | 206- Wall (Bab Al Faradis – Bab Al Farag) | |
| 207- wall (Bab Al Gabayia- Nour El Din tower) | | 208- wall (Nour El Din Tower- Bab Al Saghir) | |
| 209- wall (Bab Al Saghir – Kayssan) | | 210- (Shiekh Al Nakshbandi mosque) | |
| 211- Al Zeinabeia grave | | 212- Unknown grave | |

| Antiquity site | Year | Antiquity site | Year |
|-------------------------------|------|-----------------------------------|------|
| 213- unknown grave | | 214- Battnah Mosque | |
| 215- Al Sit Yasmin grave | | 216- unknown Ayyubid grave | |
| 217- unknown Mamluk grave | | 218- Al Harirya grave | |
| 219- Ain Almolk grave | | 220- Zaouia Arroudak | |
| 221- Hammam Al Moaddam | | 222- Al Shohadda mosque | |
| 223- Hammam Al Khangi | | 224- Al Hageb Mosque | |
| 225- Al Aghaouani Mosque | | 226- Al Bashoura Mosque | |
| 227- Al Ameriya Mosque | | 228- Al Badiri Mosque | |
| 229- Al Bayyada Minaret | | 230- Al Zaouia Al Semaddiea | |
| 231- Al Basrawe Mosque | | 232- Ghazi house | |
| 233- Temple of Jubiter | | 234- Hammam Malaka | |
| 235- Bahret Mreiden House | | 236- Nour El Din Waterwheel | |
| 237- Al Mossaly Mosque | | 238- Al Shahem Mosque | |
| 239- Bahadur grave | | 240- Al Karimi Mosque | |
| 241- Al Rahbyia tomb | | 242- Al Migaheddy School | |
| 243- Al Saqifa Mosque | | 244- Al Dam Cave | |
| 245- Hassan Mosque | | 246- Al Kamalyia Grave | |
| 247- Al Zoizyana graves | | 248- Al Qaa Al Dimashkia | |
| 249- Parliment Bldg | | 250- Damascus University Bldg. | |
| 251- Al Doubaghiya Graves | | 252- Al Sinhalya Al Osmania Grave | |
| 253- Al Yehyaweya Grave | | 254- Al Annay Mosque | |
| 255- Al Sefargalaley Mosque | | 256- Al Khawaerzmia grave | |
| 257- Mostafa lala Grave | | 258- Khan Gekmak Dormitory | |
| 259- Al Zaouia Al Maoulaouia | | 260- Al Takrania Grave | |
| 261- Hammam Al Malek Al Zaher | | 262- Hammam Al Karamani | |
| 263- Al Adli Justice Palace | | 264- Al Nagari Mosque | |
| 265- National Hospital | | | |

Year C1200: circa 1200, h999: 999 Islamic Hijrah year

Source: Anitquities Department



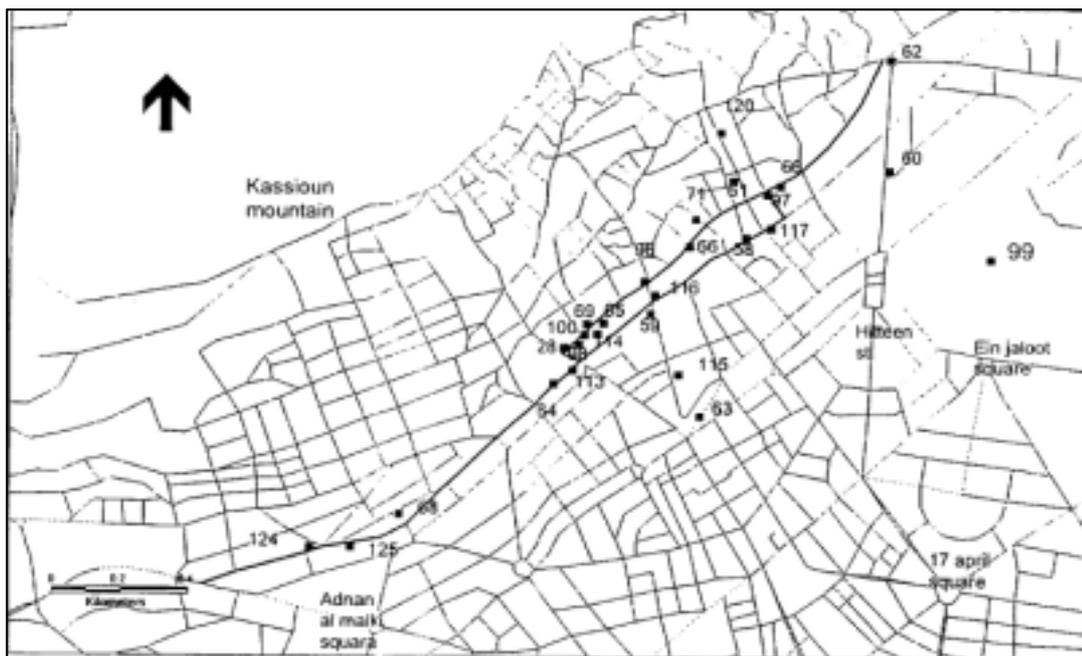
Source: Damascus governorate

Figure 5.2 Antiquities Sites in the Old Damascus and Surrounding Areas



Source: Damascus governorate

Figure 5.3 Midan Street Antiquities Sites



Source: Damascus governorate

Figure 5.4 Salhiyeh Area Antiquities Sites

Chapter 6 Scoping for Initial Environmental Examinations

Scoping is a procedure to identify environmental aspects which should be covered by the EIA or the Initial Environmental Examinations (IEE). A scoping for the IEE for the preparation of the master plan in the DMA was carried out based on the present environmental conditions including the Damascus city and Rural Damascus, as listed in Table 6.1.

Table 6.1 Scoping for IEE

| No. | Impacts | Rating | Brief Description |
|----------------------------|--|--------|---|
| Social Environment | | | |
| 1 | Involuntary Resettlement | B | Some people may be required to resettle. |
| 2 | Local economy such as employment and livelihood, etc. | — | |
| 3 | Land use and utilization of local resources | — | Positive effects are expected by suppressing the encroachment on the remaining greenery in Ghouta. |
| 4 | Social institutions such as social infrastructure and local decision-making institutions | — | |
| 5 | Existing social infrastructures and services | — | |
| 6 | The poor, indigenous and ethnic people | — | |
| 7 | Misdistribution of benefit and damage | C | Benefit brought by the development may not spread equally. |
| 8 | Cultural heritage | C | Expansion of urban areas may deteriorate cultural heritage or decrease the area of it. |
| 9 | Local conflict of interests | C | Conflicts may arise between existing residents and those to be resettled. |
| 10 | Water Usage or Water Rights and Rights of Common | — | |
| 11 | Sanitation | C | Sanitation conditions may be worsened if proper management is not done in line with development. |
| 12 | Hazards (Risk) Infectious diseases such as HIV/AIDS | — | |
| Natural Environment | | | |
| 13 | Topography and Geographical features | C | Local topography may change due to expansion of urban areas. |
| 14 | Soil Erosion | C | Soil erosion may associate with expansion of urban areas. |
| 15 | Groundwater | B | Extension of water supply and increased wastewater discharge may affect groundwater quantity and quality. |
| 16 | Hydrological Situation | C | Local hydrology may change due to changes in drainage. |
| 17 | Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.) | — | |
| 18 | Flora, Fauna and Biodiversity | — | Positive effects are expected by tree planting along new roads and parks in new urbanization areas. |
| 19 | Meteorology | — | |
| 20 | Landscape | B | Landscape may change due to expansion of urban areas or urban renewal. |
| 21 | Global Warming | — | |
| Pollution | | | |
| 22 | Air Pollution | C | The construction works may cause air pollution because of increase of traffic |
| 23 | Water Pollution | A | Extension of water supply and increased wastewater discharge may cause water pollution. |
| 24 | Soil Contamination | — | |
| 25 | Waste | C | Waste generation will change due to expansion of urban areas. |
| 26 | Noise and Vibration | C | The construction works may cause noise pollution because of increase of traffic |
| 27 | Ground Subsidence | — | |
| 28 | Offensive Odor | — | |
| 29 | Bottom sediment | — | |
| 30 | Accidents | — | |

Rating:

A: Serious impact is expected.

B: Some impact is expected.

C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.)

—: No impact is expected. IEE/EIA is not necessary.