

Japan International Cooperation Agency (JICA)

Ministry of Local Administration and Environment (MLAE)

Damascus governorate (DG)

Rural Damascus governorate (RDG)

The Syrian Arab Republic

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

Final Report

Volume 1

Executive Summary

March 2008

**RECS International Inc.
Yachiyo Engineering Co., Ltd.**

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PREFACE

In response to the request from the Government of Syrian Arab Republic, the Government of Japan decided to conduct “The Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area” and entrusted the execution of the Study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched the Study Team headed by Dr. Tsuyoshi Hashimoto of RECS International Inc., consisted of experts nominated by RECS International Inc. and Yachiyo Engineering Co. Ltd., to Syrian Arab Republic for a series of fieldworks from September 2006 through December 2007. JICA set up an Advisory Committee consisting of Dr. Koji Yagi from Tokyo Institute of Technology and Dr. Yuji Arai from Aichi Sangyo University to examine the Study from the professional and technical points of view.

The Study Team held discussions with the officials concerned of Syrian Arab Republic and conducted the Study in close collaboration with the Syrian counterpart experts. Upon the last return to Japan, the Study Team has finalized the study results to produce the Final Report.

I hope that this report will contribute to the development of the Syria’s socio-economy and to the enhancement of friendly relationship between the two countries.

Finally, I wish to express my sincere appreciation for all the officials concerned of the Government of Syrian Arab Republic and other experts for their cooperation extended to the Study.

March 2008

Eiji Hashimoto
Vice President
Japan International Cooperation Agency

Mr. Eiji Hashimoto
Vice President
Japan International Cooperation Agency
Tokyo, Japan

March, 2008

Letter of Transmittal

Dear Mr. Eiji Hashimoto,

It is our pleasure to submit herewith the Final Report of the Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area in the Syrian Arab Republic. A team of experts organized by RECS International inc. in collaboration with Yachiyo Engineering Co. Ltd. was contracted with JICA as the JICA Study Team to carry out the Study. The Study has been conducted through a series of field works from September 2006 through December 2007 as well as limited works in Japan for a total of 18 months with 61 person-months.

In Syria, the JICA Study Team established and maintained its office in the Damascus Governorate, and worked closely with the experts of the Ministry of Local Administration and Environment (MLAE), the Damascus Governorate and the Rural Damascus Governorate on a daily basis. The JICA Study Team and its Syrian counterpart team had weekly meetings throughout the fieldwork periods, sharing views and ideas for the urban development of the Damascus Metropolitan Area (DMA), conducted surveys jointly, and cooperated in data collection, compilation and analyses.

The Study has established a master plan for the urban development of the DMA, reflecting the position of the capital region in the socio-economic development of Syria in relation to other regions. The master plan includes complementary projects and related institutional measures formulated under the three planning concepts of economic efficiency, human security and cultural city. More detailed plans have been prepared for three selected areas to facilitate their early realization. The detailed plans for the selected urban heritage area and the informal housing area, participatory planning was effected by the collaborative efforts between the JICA Study Team and the Syrian counterpart team.

It has been our honor to serve the people and the country of Syria through the execution of this important study. I would like to take this opportunity to express our deepest gratitude for all involved in this undertaking. I sincerely wish that the Study and the Final Report would continue to serve as an important base for further cooperation between Syria and Japan.

Very truly yours,

Tsuyoshi Hashimoto
Team Leader, JICA Study Team



Study Area: Syria and the DMA



Study Area: Damascus Metropolitan Area (DMA)



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

Final Report Executive Summary

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Abbreviations and Acronyms

| | |
|------|--|
| CBD | Central business district |
| CD | Capacity development |
| DG | Damascus governorate |
| DMA | Damascus metropolitan area |
| EIA | Environmental impact assessment |
| EU | European Union |
| GCEC | General Company for Engineering Studies and Consulting |
| GDP | Gross domestic product |
| GFCF | Gross fixed capital formulation |
| GIS | Geographic information system |
| GRDP | Gross regional domestic product |
| GSP | General structural plan |
| GTZ | Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation Agency) |
| HIV | Human immunodeficiency virus |
| ICOR | Incremental capital to output ratio |
| IEE | Initial environmental examination |
| IT | Information technology |
| JICA | Japan International Cooperation Agency |
| LCD | Litre per capita per day |
| MAM | Municipal Administration Modernization |
| MLAE | Ministry of Local Administration and Environment |
| MOH | Ministry of Health |
| MOHC | Ministry of Housing and Construction |
| MOT | Ministry of Transportation |
| NGO | Non-governmental organization |
| OD | Origin – destination |
| PCU | Passenger car unit |
| PHA | Periphery heritage area |
| PHCF | Primary health care facility |
| RDG | Rural Damascus governorate |
| SC | Steering Committee (for the present study) |
| SD | Service department |
| SEA | Strategic environmental assessment |
| SHM | Stakeholders' meeting (for the present study) |
| UFW | Unaccounted-for water |

| | |
|-----------------|--|
| UN | United Nations |
| UNHCR | United Nations High Commission for Refugees |
| UNICEF | United Nations International Children's Emergency Fund |
| WG | Working group |
| WRIC | Water Resources Information Center |
| etc. | et cetera |
| ha | hectare |
| km | kilometer |
| km ² | square kilometer |
| mil. | million |
| mm | millimeter |
| mt./Mt. | mount |
| °C | degree(s) centigrade |

Executive Summary

1 Macro Frameworks and Development Scenario for Syria

1.1 Socioeconomic Framework

1.1.1 Issues for socioeconomic development of Syria

Based on the review of recent performance of the Syrian socio-economy and the development policy of the Syrian Government as expressed in the current five year plan, key issues for the further development of the Syrian socioeconomy have been identified as follows:

- (1) Continued deregulation and structural reform to promote private investments under the new Investment Law no. 10 of 1991, while ensuring social stability with the social safety nets;
- (2) Development and diversification of non-oil economy to compensate for the declining oil and natural gas production;
- (3) Modernization of agriculture responding to changing conditions in the urban and export markets;
- (4) Utilization of domestic and international tourism for self-reliant economic development; and
- (5) Regional development for poverty alleviation and balanced development of the national territory.

1.1.2 Socioeconomic framework for Syria

Based on the review of the current five year plan and the estimates by SPC, the socioeconomy of Syria is projected to the target year of 2025 and an intermediate year of 2015 as summarized in Table 1.

Table 1 Projection of Syria's Socioeconomy, 2004-25

| | 2004 | 2015 | 2025 | Growth rate (% p.a.) | | |
|-----------------------|--------|--------|--------|----------------------|---------|---------|
| | | | | 2004-15 | 2015-25 | 2004-25 |
| Population (1,000) | 17,921 | 23,114 | 27,657 | 2.34 | 1.81 | 2.09 |
| Per capita GDP (US\$) | 1,389 | 2,100 | 3,800 | | | |
| GDP (US\$ billion) | 24.9 | 48.5 | 105.1 | 6.24 | 8.04 | 7.10 |

Source: Projection by JICA Study Team based on the SPC estimates

1.2 Spatial Framework

1.2.1 Urban axes

The spatial development of Syria has been analyzed based on the distribution of urban population and the artery road network. Alternative urban axes are compared in Table 2 by the concentration of urban population per unit length of artery road. The following are observed.

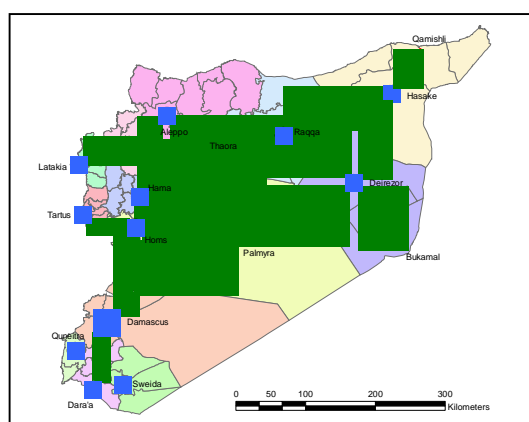


Figure 1 Definition of Urban Axes with Urban Centers in Syria

Table 2 Comparison of Alternative Urban Axes

| Urban axis | Total road length (km) | Urban population (1,000) | | Urban population concentration (/km- road length) | |
|------------|------------------------|--------------------------|------------|---|------------|
| | | Major cities | All cities | Major cities | All cities |
| 1 | 782 | 3,324 | 3,464 | 4,251 | 4,430 |
| 2 | 778 | 3,536 | 3,676 | 4,545 | 4,725 |
| 3 | 881 | 4,230 | 4,564 | 4,801 | 5,180 |
| 4 | 718 | 1,463 | 1,476 | 2,038 | 2,056 |
| 5 | 947 | 5,765 | 7,018 | 6,088 | 7,411 |
| 6 | 821 | 5,466 | 6,882 | 6,658 | 8,382 |
| 7 | 947 | 3,185 | 4,195 | 3,363 | 4,430 |
| 8 | 821 | 2,886 | 4,059 | 3,515 | 4,944 |
| 9 | 735 | 2,270 | 3,097 | 3,088 | 4,214 |
| 10 | 503 | 5,064 | 7,026 | 10,068 | 13,968 |
| 11 | 90 | 497 | 595 | 5,522 | 6,611 |

Definition of alternative Urban axes

- Urban axis 1: Latakia - Idleb - Aleppo - Raqqah - Hasake - Kamishli
 2: Latakia - Idleb - Aleppo - Raqqah - Deirezor - Hasake - Kamishli
 3: Tartus - Homs - Hama - Aleppo - Raqqah - Deirezor - Hasake - Kamishli
 4: Tartus - Homs - Palmyra - Deirezor - Hasake - Kamishli
 5: Damascus - Homs - Hama - Aleppo - Raqqah - Deirezor - Hasake - Qami:
 6: Damascus - Homs - Hama - Aleppo - Raqqah - Deirezor - Bukamal
 7: Damascus - Homs - Raqqah - Deirezor - Hasake - Kamishli
 8: Damascus - Homs - Raqqah - Deirezor - Bukamal
 9: Damascus - Palmyra - Deirezor - Hasake - Kamishli
 10: Aleppo - Hama - Homs - Damascus - Dara'a
 11. Latakia - Tartus

- (1) The strength of Aleppo is significant. Hama is more strongly linked to Aleppo than Al Raqqah, and the link of Aleppo to Damascus is not as strong as the link of the Southern region to the capital city. The access from Lattakia to Aleppo is comparatively more important than the access from Tartous to the inland. All in all, Aleppo is regarded as a self-reliant urban center, extending its effects widely to neighboring areas.

- (2) The Southern region is strongly linked to the capital city and its vicinities.
- (3) Deir-Ezzor is in an important position as its development would affect the urban population concentration of eight axes out of 11 examined above. Its development would strengthen the east-west axes and also links to Iraq and Turkey.
- (4) Most urban centers along the border with Turkey do not constitute part of any urban axis. Also, urban centers are very limited in the eastern half of the Country, except along the road to Iraq from Deir-Ezzor, to make the incorporation of these areas difficult into any development axes.

1.2.2 Macro water balance

Based on the macro water balance worked out by MOI summarized in Table 3, the following may be noted for development potentials of different basins.

- (i) Even if the water saving irrigation technology is fully adopted, the Khabour and Tigris basin is most critical in terms of water availability.
- (ii) The Euphrates and Aleppo basin has the highest development potentials with vast land still available for development of irrigated agriculture if the water saving irrigation technology is adopted.
- (iii) The Barada and Awaj and the Yarmouk basins can be made self-reliant if water use for urban population as well as agriculture is properly managed.
- (iv) The Coastal and Steppe basins have excess water available but land availability is the constraint to further agricultural development.

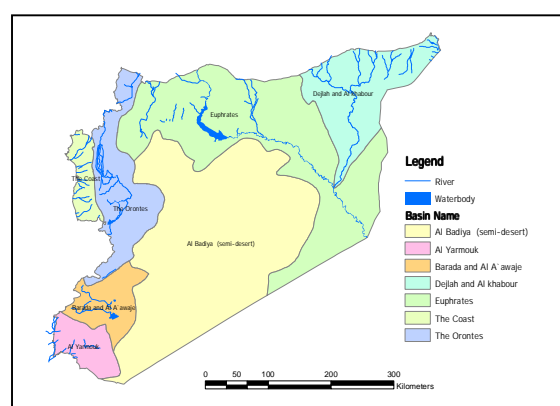


Figure 2 Water Basins Division in Syria

Table 3 Macro Water Balance of Seven Basins in Syria

| No. | Basin | Area (km ²) | Water balance (million m ³ /year) | | | Satisfaction ratio (%) |
|-----|----------------------|-------------------------|--|--------|---------|------------------------|
| | | | Availability | Use | Balance | |
| 1 | Barada and Awaj | 8,630 | 1,194 | 1,337 | -143 | 89.3 |
| 2 | Khabour and Tigris | 21,129 | 2,447 | 4,232 | -1,785 | 57.8 |
| 3 | Euphrates and Aleppo | 51,238 | 8,085 | 7,058 | 1,027 | 114.6 |
| 4 | Orontes | 21,624 | 1,911 | 2,215 | -304 | 86.3 |
| 5 | Coastal | 5,049 | 1,173 | 715 | 458 | 164.1 |
| 6 | Yarmouk | 6,724 | 420 | 421 | -1 | 99.8 |
| 7 | Steppe | 70,786 | 378 | 328 | 50 | 115.2 |
| | Total | 185,180 | 15,608 | 16,306 | -698 | 95.7 |

Source: MOI as for 2003

1.2.3 Spatial development strategy for Syria

The strategy for spatial development of Syria may be established with the following components as illustrated in Figure 3:

- (i) Consolidate the two clusters of development centering on the DMA and the Northwestern region;
- (ii) Strengthen links from the two clusters to Deir-Ezzor;
- (iii) Strengthen links from Deir-Ezzor to Turkey and Iraq; and
- (iv) Establish a strong urban corridor linking Aleppo, through the DMA, to Dara'a.

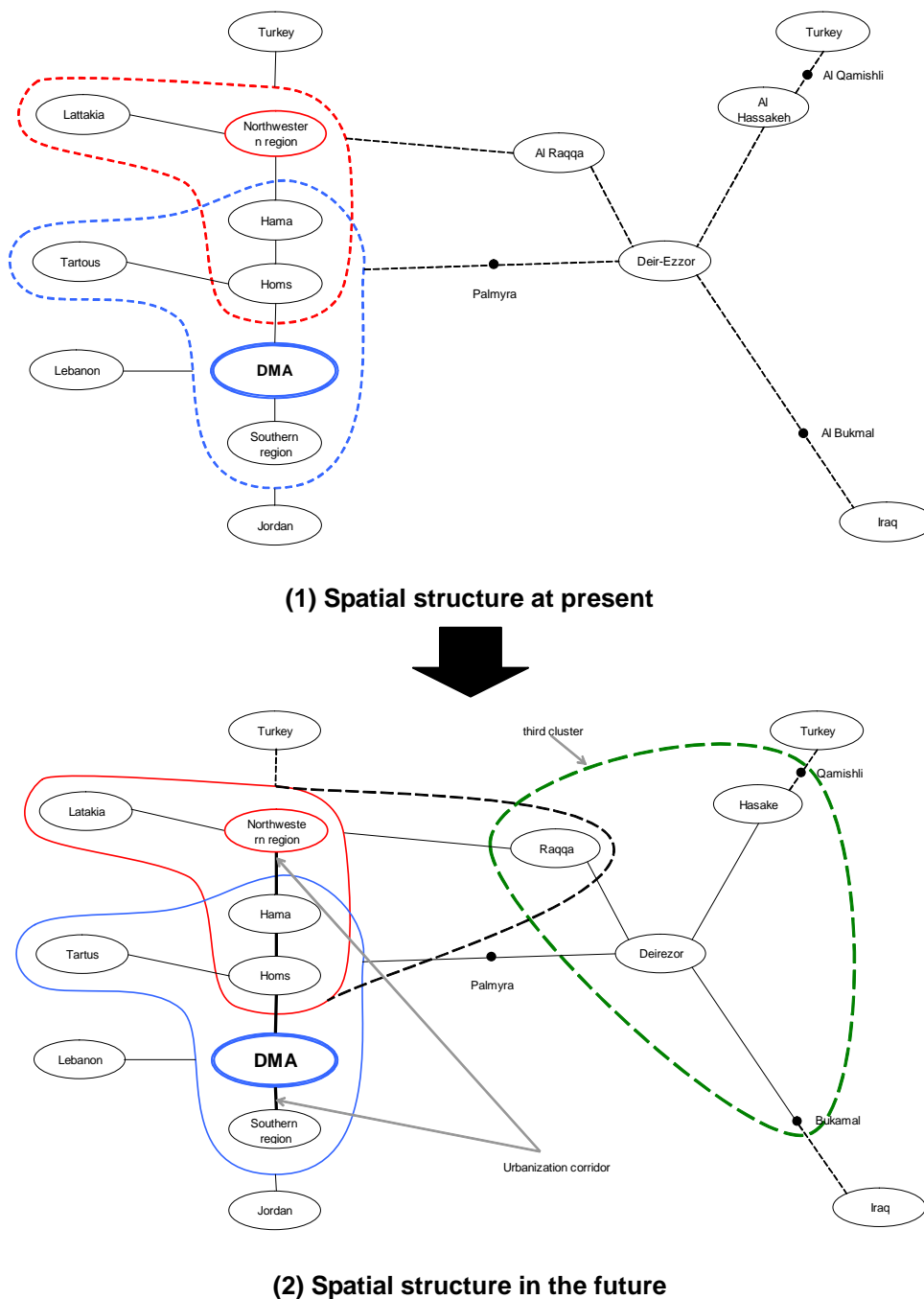


Figure 3 Strategy for Spatial Development of Syria

1.3 Development Scenario for Syria

1.3.1 Phase 1: up to 2013

(1) Overview

This phase is characterized by the realization of more open socio-economy and more liberalized trade and financial sectors as a result of steady implementation of the comprehensive stabilization and structural reform strategy currently pursued by the Government. Active private sector investments in all the sectors under increasingly liberal climate would more than compensate for the declining domestic oil production. Prerequisites are the restoration of political stabilization in the neighboring countries and continued access to the regional Arab markets.

(2) Economy

In agriculture, the water saving irrigation technology would be fully developed and widely applied. The adoption of water saving irrigation would provide opportunities for diversifying crops to meet the changing demand in the growing urban and export markets. The two strategic crops of cotton and wheat should be maintained, but sugar beet would be converted to other more lucrative crops. New industrial crops would be introduced such as oil crops suited to local climatic conditions. Crop diversification should be realized also for greenhouse agriculture. Olive production will continue to be important throughout the Country, but it should be directed to the formation of olive cluster to contribute to increased value-added in related sectors as well.

The development of industrial areas will be in full swing in Adra, Hasya and Shaikh Najjar, and some regional specialization in industrial sub-sectors would start to be realized. The textile industry in the Shaikh Najjar industrial area, for instance, would develop into an advanced industrial complex with both upstream and downstream industries. The first priority industries listed in Table 4 may be strengthened in different regions. In the Eastern region, resource-based industries would be newly established or expanded such as some agro-processing and oil refinery based on imported petroleum from Iraq as well as domestic petroleum.

Table 4 Possible Priority Industries in Different Regions

| Type of industries | Priority regions | |
|--|--|-------------------------------------|
| | First priority | Second priority |
| Resource-based Agro-processing Construction materials based on domestic resources | Southern, Eastern Central | DMA (Rural D.) Northwestern, DMA |
| Import processing for domestic market Construction materials based on imported materials Consumer goods | Central, Northwestern (Aleppo) DMA, Northwestern (Aleppo) | DMA Eastern |
| Export processing | Mediterranean, Northwestern (Aleppo) | DMA |
| Knowledge-based | DMA | Northwestern |

Source: JICA Study Team

The services sector will continue to develop steadily along with the growth of the production sectors. In particular, the development of financial services and business/private services will accelerate led by the private sector. Domestic tourism would develop as the income levels are enhanced, and more people are exposed to the more open socio-economy. This would have positive effects also on the initial diversification of international tourism.

(3) Spatial development

During this phase, positive changes would be observed in three components of the spatial development strategy of Syria presented above. First, the two development clusters will be consolidated centering on the DMA and Aleppo, through the development of stronger economic links with the respective hinterlands as well as improved urban infrastructure within each metropolitan area. Second, planned urbanization should be initiated in the Eastern region, centering on Deir-Ezzor. Third, more effective links with Turkey would be established based on the bilateral discussions and joint economic program by the government initiatives of the both countries. Also, an initial link would be established with Iraq to reactivate the trade.

1.3.2 Phase 2: 2014-19

(1) Overview

Based on the successful transformation of administrative, financial, trade and other sectors as well as the robust economic structure established through Phase 1 guided by the Government and substantiated by the private sector, the economic development would accelerate in all the sectors during this phase.

(2) Economy

In agriculture, further crop diversification and high value-added agriculture would be pursued through this phase. Some agricultural products such as organic vegetables and fruits

would cater to international tourism as well in the form of indirect export. Some forms of industrial agriculture would develop, including highly managed greenhouse agriculture.

The industrial areas in the major cities will be fully developed. The second priority industries listed in Table 4 would also be promoted in different regions. Some resource-based industries particularly in the Eastern region would expand to process additional raw materials imported from the neighboring countries. Also markets for some import processing industries would expand into the neighboring countries to become in fact export processing.

Major export-oriented services would establish and some high grade services introduced in major cities. The latter may include advanced education and research, and specialized health care, which may attract people from other regions and countries. This is the case of service export.

International tourism will diversify with the development of alternative tourism such as eco tourism and agro-eco tourism in the Western region, adventure tourism in the Eastern region based in Raqqa and mountain and beach resort tourism in the Mediterranean region. The dominant cultural tourism will be upgraded through major promotion activities for the Southern region by public-private partnership and integration of the Eastern region in tour itineraries. Domestic tourism will also develop further based especially in the Central region, where more man-made attractions may be introduced for weekend tourists from the DMA and Aleppo.

(3) Spatial development

Almost continuous urbanization would take place to form a strong urban corridor linking Aleppo, through the DMA to Dara'aa, and international links will be improved from there to Lebanon, Jordan and other countries. Urban development in the Eastern region will accelerate, and links with Turkey and Iraq further strengthened.

1.3.3 Phase 3: 2020-25 and beyond

During the early part of this phase, high value-added agriculture and specialization of industries in different regions would be fully established. Accelerated development of transportation and communication services will support the integration of different regions into coherent and balanced national territory where different regions complement one another. Inter-regional and urban-rural disparities should be reduced through better physical and economic linkages. Domestic and international tourism and related services would be increasingly the driving force for the Syria's socio-economic development.

Stronger international links expand both the resources base and markets for a variety of viable economic activities in different regions. The third development cluster will develop in the Eastern region centering on Deir-Ezzor.

2 Meso Level Analyses on Regional Development

2.1 GRDP Estimate by Region

A crude estimate is made here for the gross regional domestic product of the five regions, except the DMA, based on the available population and employment data by region and the macro socioeconomic data of Syria. The results are summarized in Table 5.

Table 5 Crude Estimate of Agricultural and Non-agricultural GRDP of Five Regions

| | Unit | Northwestern | Mediterranean | Central | Southern | Eastern |
|---|--------------|--------------|---------------|---------|----------|---------|
| (A) Rural population | 1,000 | 2,367 | 931 | 1,577 | 738 | 1,881 |
| (B) Working age population in rural area | | 1,298 | 663 | 956 | 447 | 1,030 |
| (C) Rural employment: 70% of (B) | | 909 | 461 | 669 | 313 | 721 |
| (D) Agriculture employment: 40% of (C) | | 364 | 184 | 268 | 125 | 288 |
| (E) Agriculture GRDP (at US\$ 4,500/employment) | US\$ million | 1,638 | 828 | 1,206 | 563 | 1,296 |
| (I) Total working age population | 1,000 | 2,908 | 1,043 | 1,707 | 696 | 1,585 |
| (II) Labor force | | 1,399 | 562 | 821 | 310 | 737 |
| (III) Unemployment | | 133 | 122 | 120 | 33 | 133 |
| (IV) Employment: (II) - (III) | | 1,266 | 440 | 701 | 277 | 604 |
| (V) Non-agricultural employment: (IV)-(D) | | 902 | 256 | 433 | 152 | 316 |
| (VI) Non-agricultural GRDP (at US\$ 5,800/employment) | US\$ million | 5,232 | 1,485 | 2,511 | 882 | 1,833 |
| GRDP: (E) + (VI) | US\$ million | 6,870 | 2,313 | 3,717 | 1,445 | 3,129 |

Sources: 2004 Census: (A),(B),(I),(II),(III)
Estimates by JICA Study Team

The GRDP of the DMA are estimated separately. The employment structure is roughly estimated to be 5% agriculture, 20% industry and 75% services. The labor productivity is assumed to be slightly higher in the DMA for each sector than the national averages, respectively. Based on these assumptions, the GRDP of DMA are estimated by broad sector as summarized in Table 6. The GRDP of the DMA is thus estimated to be 30% of the Syria's GDP. The per capita GRDP is calculated to be US\$1,932, 39% higher than the per capita GDP.

Table 6 Estimate of GRDP of the DMA by Sector, 2004

| Sector | Employment (1,000) | GRDP/employment (US\$) | GRDP (US\$ million) |
|-------------|-----------------------|---------------------------|------------------------|
| Agriculture | 53 | 5,000 | 265 |
| Industry | 210 | 6,500 | 1,365 |
| Services | 789 | 7,300 | 5,760 |
| Total | 1,052 | 6,950 | 7,390 |

Source: Estimate by JICA Study Team

2.2 Development Diagnosis by Region

A diagnostic analysis has been conducted by region for the five regions of Syria, except the DMA as reported in Section 2.2 of the Master Plan Report. Main results are summarized in Table 7.

Table 7 Development Diagnosis by Region

| Region (governorates) | Economic development prospects | Development needs |
|---------------------------------------|---|--|
| Northwestern (Aleppo, Idleb) | <ul style="list-style-type: none"> - Import processing mainly for domestic market – textile & apparel, metal and wood products - Fruits & pistachio production - Olive industry cluster - Eco/agro-eco tourism | <ul style="list-style-type: none"> -Shiek Najar new industrial city -Diversification of services employment -City beautification of Aleppo -Provision of high quality tourism facilities |
| Mediterranean (Lattakia, Tartous) | <ul style="list-style-type: none"> -Diversification of greenhouse agriculture -High value-added agro-processing – orange juice, chilled vegetables etc. -Tourism development by strategic planning and proactive marketing | <ul style="list-style-type: none"> -Improvement of Lattakia port and airport -Improvement of sewage treatment and solid waste management -Lattakia & Tartous cities development as tourism bases |
| Central (Homs, Hama) | <ul style="list-style-type: none"> -Trade and tourism related services development – Homs as trade base and Hama as base for domestic tourism -Processing industries for domestic market -Oil crops and edible oil industry | <ul style="list-style-type: none"> -Intensification of environmental management -Hasya industrial district -Improvement of tourism facilities |
| Southern (Sweida, Dara'aa, Quneitra) | <ul style="list-style-type: none"> -International & domestic tourism development -Handicraft industries -Horizontal expansion of crop cultivation – horticultural crops etc. | <ul style="list-style-type: none"> -Improvement of road network -Organizational strengthening of local tourism association etc. -New city/industrial district in the north |
| Eastern (Deir-Ezzor, Hassakeh, Raqqa) | <ul style="list-style-type: none"> -Crop conversion under irrigation – organic olive, fruits, oil crops etc. -Enhancement of livestock productivity through breed improvement, managed pasture and fodder crops Agro-processing and related services -Cooperation with Turkey for complementary economic development and environmental management | <ul style="list-style-type: none"> -Promotion of water-saving irrigation -Management of urban sewage, agricultural drainage, and solid wastes -Intensified management of groundwater -Enhancement of urban planning capacity -Expansion of grain silo capacity -Economic partnership negotiation with Turkey |

Source: JICA Study Team

2.3 Development prospects by region

Combining the comparative analysis on the six regions and the spatial analyses presented above, the following observations may be made for different regions.

- (1) The Eastern region is the least developed economically, and the use of the Euphrates water in its western part is critically important for its development as the Khabour and Tigris basin in its eastern part faces very tight water balance. The urban development in general holds a key for the development of the region, and in particular, the urban development of Deir-Ezzor would strengthen the spatial structure of Syria as a whole.

- (2) The Southern region coinciding largely with the Yarmouk basin should be made self-reliant in terms of water by adopting water saving irrigation widely, although the region is strongly linked to the capital region economically.
- (3) The Central region served mainly by the Orontes basin and partly by the Steppe basin faces constraints on land rather than water availability, especially as it pursues service-oriented development as trade and tourism base.
- (4) The Mediterranean region coinciding largely with the Coastal basin faces no water constraint but land availability is the constraint. With the two ports in Lattakia and Tartous, the region provides important nodes in a few urban axes examined and links between the inland and the international markets. The economic link with the Northwestern region from Lattakia would be particularly important.
- (5) The Northwestern region would continue to develop as a self-reliant region, supported by the strong urban functions of Aleppo and the high agricultural potentials in the hinterland. As the region develops further, economic links with the neighboring regions would be strengthened.
- (6) The DMA will continue to be the most important region economically, administratively and otherwise, but it would be complemented increasingly by the Northwestern region in the medium term and also by the Eastern region in the long run. The Central region would hold a unique position affected equally by the Northwestern region.

3 Basic Conditions for DMA Urban Development

3.1 Carrying Capacity

If the gross unit water demand remains at 250ℓ/cap/day, the total amount of water safely exploitable over years, estimated to be 528million m³/year, can support the population of 5.79 million. This should be regarded as the maximum service population for piped water supply, given only the local sources of water utilized as water sources, unless treated sewage is also used for non-irrigation purposes.

If the piped water supply for the DMA depends only on the firm yield of the Barada and Awaj basin, the balance between the firm yield and the average water availability or 350million m³/year is still available for rural/agricultural uses. Thus, the total of 700 million m³/year water is available for rural/agricultural uses on average (Figure 4).

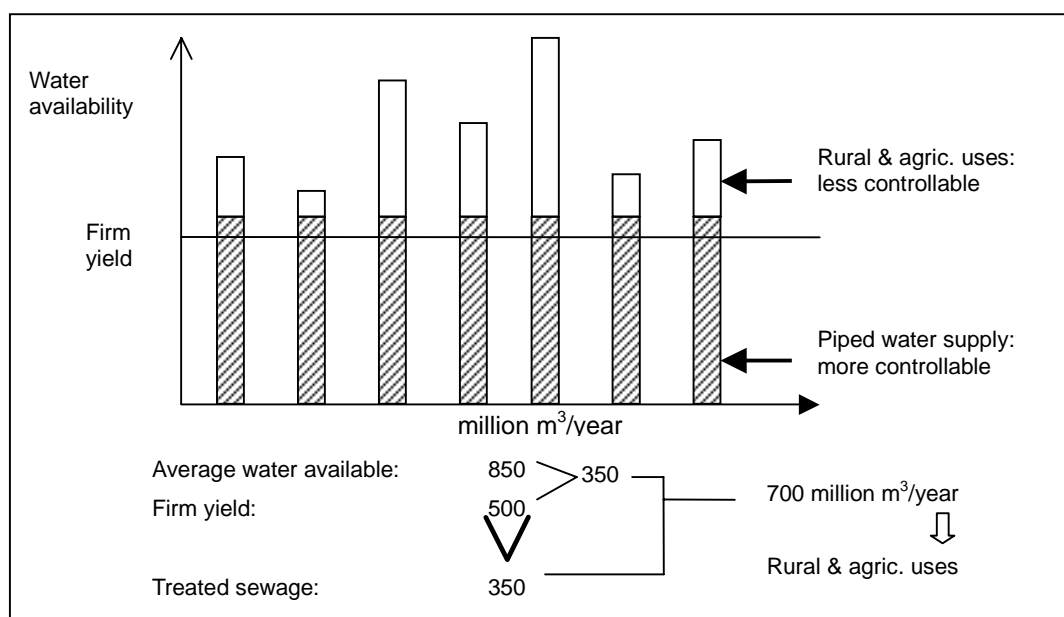


Figure 4 Concepts of Water Allocation in Barada and Awaj Basin

3.2 Definition of the DMA

The DMA may be defined based on available population data by administrative unit. If all the districts (nahiya) having some area within the 30km radius from the city center as suggested by the Scope of Work for the Study are taken to be within the DMA, 28 districts are included. The total area is approximately 4,700km², and the population in 2004 is 3.64 million, consisting of 1.55 million in the Damascus governorate and 2.09 million in the Rural Damascus governorate. The population density is 7.8/ha.

3.3 Position of the DMA in Syria's Development

3.3.1 Present position

The present position of the DMA in the overall development of Syria is examined on the basis of the data and analyses by region and the existing conditions of the DMA. The shares of the DMA in Syria with respect to selected indices are summarized Table 8.

Table 8 Position of the DMA in Syria

| | Unit | Syria | DMA | DMA share (%) |
|---------------------------|-----------------|------------|-----------|---------------|
| Total population | | 17,920,519 | 3,824,979 | 21.3 |
| Urban population | | 9,624,350 | 3,021,463 | 31.4 |
| Land area | km ² | 185,180 | 18,140 | 9.8 |
| Cultivable land | | 59,100 | 2,290 | 3.9 |
| Irrigated land | | 14,390 | 750 | 5.2 |
| Industrial establishments | no. | 600,993 | 159,995 | 26.6 |
| Large idust estab. | | 207 | 99 | 47.8 |
| Wheat production(2003) | ton | 4,912,993 | 66,884 | 1.4 |
| Cattle population(2003) | | 937,098 | 189,326 | 20.2 |
| Sheep population(2003) | | 15,292,722 | 1,328,079 | 8.7 |
| In migrants (1995-2005) | | 139,249 | 82,717 | 59.4 |
| Out migrants(1995-2005) | | 139,249 | 67,423 | 48.4 |
| Gross domestic product | US\$ million | 24,900 | | ~30 |
| Agricultural GDP | | 5,852 | | ~5 |
| Industrial & services GDP | | 19,049 | | ~37 |

Sources : 2004 census

CBS, Statistical Yearbook 2005

CBS, Results of Establishment Survey 2004

JICA Study Team for the DMA

3.3.2 Prospects

The DMA with the 30% contribution to the Syria's GDP should continue to serve as a driving force for Syria's socioeconomic development for more than a few reasons. First, the DMA offers the largest urban market for a wide range of goods produced in other regions. The link with the Southern region is particularly strong, and it extends beyond the borders to neighboring countries. Second, as the capital region, the DMA offers higher order services in the hierarchy of health and education services in Syria as well as administrative services. Third and most importantly, the DMA should function as the center of the Islam as its millennia long history would justify.

To realize further socio-economic development under the severe water constraint, the DMA should pursue more service oriented development for higher value-added with smaller water use. Some high grade social services should be provided to serve neighboring countries as well such as advanced education and research and specialized health care. The DMA would continue to serve as the gateway and the base for international tourism, which would induce a wide range of related services. Most importantly, the DMA should embrace multiple cultures in harmony with the Islam as interactions with different cultures would be a source of vitality for the DMA socio-economy, attracting people of different backgrounds from all over the world.

The DMA should be specialized more in knowledge-based industries, including ICT and electronics, rather than resource-based industries represented by construction materials and food processing. Import processing type industries should be only selectively located in the DMA as most of them should better be located either in a port area or in an industrial area with high quality infrastructure and do not necessarily located in or near the urban market. Large

industrial areas are already developing in Shaikh Najjar in the Aleppo governorate and Hasya in the Homs governorate.

Agriculture can and should be maintained in the DMA, but higher productivity and value-added should be pursued under better management. Crop production should be undertaken under water saving irrigation to produce fresh products for the urban market of the DMA itself. Livestock raising should adopt more managed practices through efficient fodder production and managed pasture.

The management of water continues to be most important part of urban management for the DMA. The expansion of piped water supply should be based on the firm yield of the water resources in the Barada and Awaj basin. This would leave ample amount of groundwater available for rural uses in most years. In a drought year, the groundwater may be over-extracted in rural areas to sustain the livelihood there, but the aquifers can be recharged during other years as long as the safe yield is not exceeded by the piped water supply.

The treated sewage should better be utilized primarily for agriculture for a few reasons. First, the treatment costs would become prohibitively high (maybe almost as high as the cost of water transferred from distant regions), if it is to be used for industrial purposes, to say nothing of domestic/drinking purposes. Second, agricultural areas in the downstream of the Adra sewage treatment plant should be served naturally more effectively. Third, if hazardous elements are not contained in the treated sewage, the recharge to the groundwater would offer most cost-effective tertiary treatment of the treated sewage for agricultural and even domestic uses.

4 Development Objectives and Strategy for the DMA

4.1 Planning Concepts

Three planning concepts are defined to guide the planning for the DMA urban development: economic efficiency, human security and cultural city. Each of the planning concepts is elaborated below. These planning concepts, in fact, are complementary and support each other to realize the high grade urban spaces for residents and visitors alike.

(1) Economic efficiency

Economic efficiency is a necessary condition for any country or region to survive in the globalizing economy as it means the cost-effective utilization of limited development resources. The DMA as the capital region should satisfy this condition at the highest possible level. Urbanization pursues the agglomeration economy due to the concentration of people and economic activities. As it proceeds, it may result in the external diseconomy due to the

over-concentration.

The agglomeration economy due to the concentration realizes reduction of economic transaction costs, supported by large and efficient urban market, and high quality transport and other infrastructure facilities. To minimize the external diseconomy due to the over-concentration, traffic congestion and other problems need to be solved. This may be realized in the DMA, among others, by improved urban road network, more efficient public transportation, introduction of a new mode of transport, and provision of adequate parking spaces.

Compact urbanization pattern may also contribute to the economic efficiency for the DMA by realizing more efficient use of limited water resources. This, in turn, would leave larger area for productive greenery as well as agriculture in the vast hinterland of the urbanized area.

(2) Human security

The pursuit of economic efficiency through urbanization tends to result not only in the external diseconomy but also in the deterioration of social/living environment as already observed in the DMA. This outcome is observed in many mega cities developed during the 20th century in both developing and developed countries. To avoid such an overwhelming trend of the 20th century urbanization, a strong counter-concept should be defined to guide the 21st century urbanization. This may be expressed as the human security in urban life.

The human security in urban life cannot be ensured without voluntary cooperation and participation of city residents for community development, welfare promotion, disaster management and other essential urban activities. This may be supported in the DMA by pedestrian-friendly urban spaces, traffic safety, urban disaster management and social safety net.

The pedestrian-friendly urban spaces may be created by a network of pedestrian ways with river malls, urban parks and plazas, sidewalks and pedestrian crossings, urban landscaping and other measures. The traffic safety is promoted through improvement of public transportation and better traffic regulation for one-way streets, parking, inter-sections and other transport facilities. The urban disaster management would involve community organizing and information dissemination, monitoring and reporting of floods, poor drainage, wastewater discharge, fire hazard and other possible events, and evaluation system.

(3) Cultural city

The DMA through its millennia long history has attracted many people of widely different backgrounds, which has served as the source of energy and dynamism for various urban activities. The presence of many people of different backgrounds may also serve as an

insurance against possible ethnic conflicts. Cultural value is essential for attracting many people of different backgrounds, and the resultant diversity in cultural value would further attract more people.

The urban spaces of the DMA should embrace multiple cultures in harmony with the Islam. Urban and architectural heritage of the DMA should be effectively utilized to encourage communications between people of different backgrounds, while privacy of individual citizens ensured, learning from the traditional wisdom of the Arab architecture. Cultural centers with multiple functions may also support this function.

The DMA as the international conference center and tourism gateway as suggested in the previous subsection would support this function. High grade social services such as advanced education and research, and specialized health care would help to attract people from other regions and even from other countries.

4.2 Objectives for DMA Urban Development

The following three objectives have been established for the DMA urban development:

- (1) To realize the economic development potentials fully in the DMA to lead sustainable development of the Syria's economy;
- (2) To improve the social/living environment in the DMA to ensure decent life for residents and visitors; and
- (3) To enhance the cultural value of the DMA to realize active and dynamic society through attracting people of different backgrounds.

4.3 Strategy for DMA Urban Development

4.3.1 Basic strategy

The basic strategy for the DMA urban development is established with the following components:

- (i) Pursuing more service-oriented development to suppress the water demand while realizing comparatively larger value-added;
- (ii) Reducing population pressure on the central part of the DMA by encouraging the development of outer areas as well as other regions; and
- (iii) Effecting broad capacity development at individual, organizational and institutional/social levels for effective urban and regional planning.

4.3.2 Spatial development strategy

The following strategy is established for spatial development of the DMA.

- (1) More compact urbanization pattern should be pursued for the Damascus city and its expansion areas to realize higher water use efficiency;
- (2) The urbanization to the south should be guided beyond the Rural Damascus boundaries into the Yarmouk basin, where the water saving irrigation technology should be pursued to ease the tightening water balance;
- (3) The urbanization to the southeast should be guided centering around the airport area to minimize the land and water use conflicts with agriculture;
- (4) The self-reliant urban development should be encouraged to the northeast into Yabroud and beyond;
- (5) New urban centers should be created in the northern, western and southwestern directions of the Damascus city as well as the development of the Adra industrial city with larger residential area than originally planned; and
- (6) The urbanization to the northwest into Al Zabadani should be discouraged to develop the area as important summer and weekend resorts.

5 Frameworks and Scenario for DMA Urban Development

5.1 Socioeconomic Framework for the DMA

5.1.1 Planned population growth

It is assumed for the planning purpose that the sustainable population of 6.0 million by the safe yield of water resources in the Barada and Awaj basin is reached by the year 2025. During this period, the population growth in the Damascus city may be decelerated from the average annual population growth at 1.08% in 1994-2004 as shown in Table 9. The population in the city would be 1.8 million in 2025. The population in Rural Damascus would increase from 2.27 million in 2004 to 4.2 million in 2025 at the annual average rate of 2.97 %. This growth represents the deceleration of the growth in Rural Damascus from 3.28% during 1994-2004. The total population in the DMA would increase from 3.82 million in 2004 to 6.0 million in 2025 at the average annual rate of 2.17%.

Table 9 Planned Population Growth

Planned population

Unit: '000

| | 2007 | 2015 | 2025 | Growth rate (% p.a.) | |
|--------|-------|-------|-------|----------------------|---------|
| | | | | 2007-15 | 2015-25 |
| DG | 1,600 | 1,710 | 1,800 | 0.83 | 0.51 |
| RDG | 2,360 | 3,200 | 4,200 | 3.88 | 2.76 |
| DG+RDG | 3,960 | 4,910 | 6,000 | 2.72 | 2.03 |

Source: JICA Study Team

5.1.2 GRDP and employment

The GRDP of the DMA is projected by sector as summarized in Table 10. The GRDP of the DMA would grow at the annual average rate of 7.14% to the year 2025, slightly higher than the expected growth of the Syria's GDP shown above. The total employment in the DMA would more than double from 1,052,000 in 2004 to 2,134,000 in 2025 at the annual average rate of 3.43%.

Table 10 Projection of the GRDP and Employment in the DMA by Sector

| | GRDP (US\$ million) | | GRDP growth rate 2004-25 (% p.a.) | GRDP/employment (US\$) | | Increase rate 2004-25 (% p.a.) | Employment (1,000) | |
|-------------|------------------------|--------|---|---------------------------|--------|---|-----------------------|-------|
| | 2004 | 2025 | | 2004 | 2025 | | 2004 | 2025 |
| Agriculture | 525 | 927 | 3.0 | 5,000 | 9,300 | 3.0 | 105 | 105 |
| Industry | 2,054 | 8,503 | 7.0 | 6,500 | 13,400 | 3.5 | 316 | 635 |
| Services | 4,732 | 21,608 | 7.5 | 7,500 | 15,500 | 3.5 | 631 | 1,394 |
| Total | 7,311 | 31,095 | 7.14 | | | | 1,052 | 2,134 |

Source: JICA Study Team

5.2 Spatial Framework for the DMA

5.2.1 Spatial development directions

A method of urban hierarchical analysis has been applied to assess the urbanization potentials by district in Rural Damascus. The results are shown in Figure 5 and Figure 6.

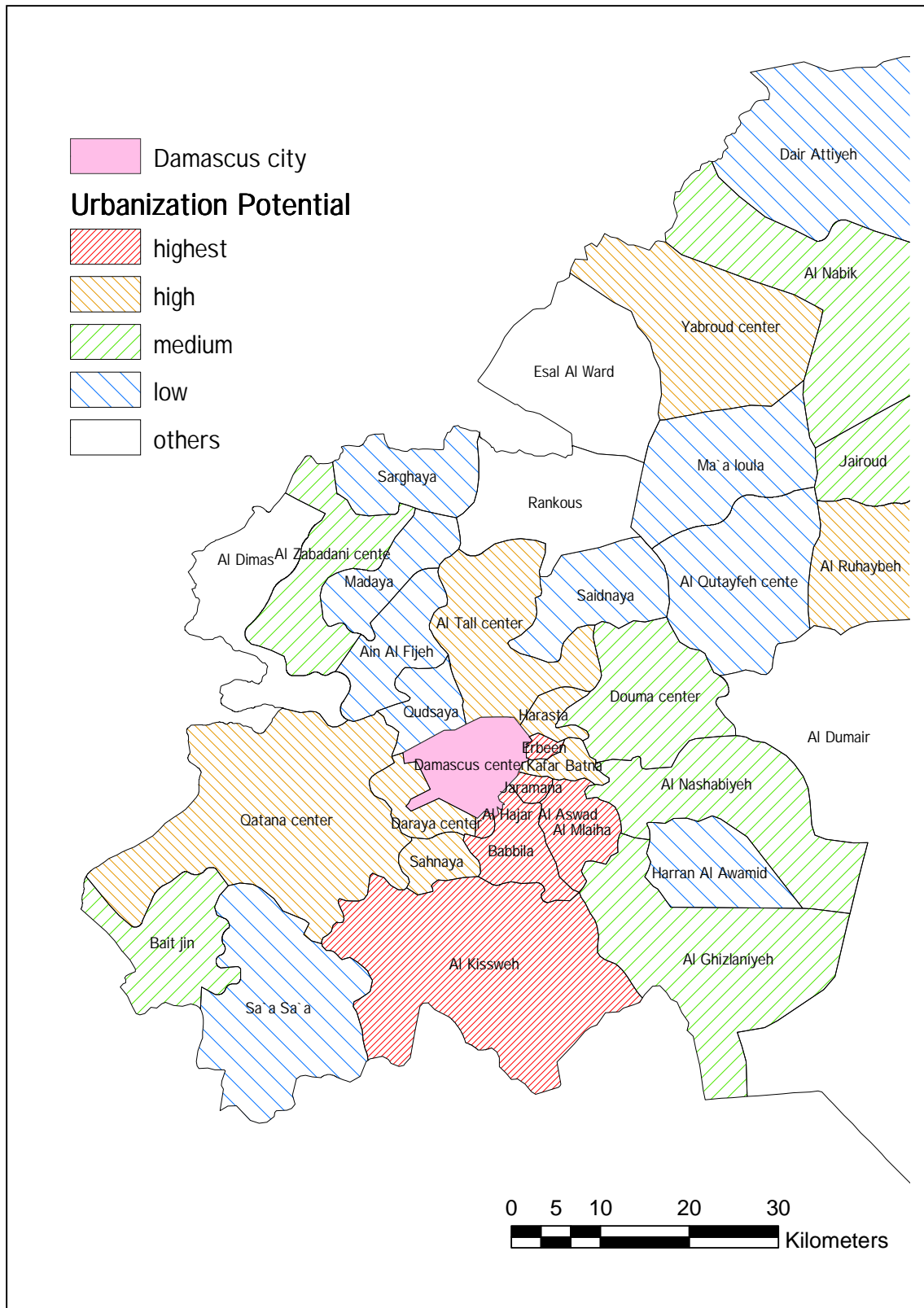


Figure 5 Urbanization Potential by District in Rural Damascus

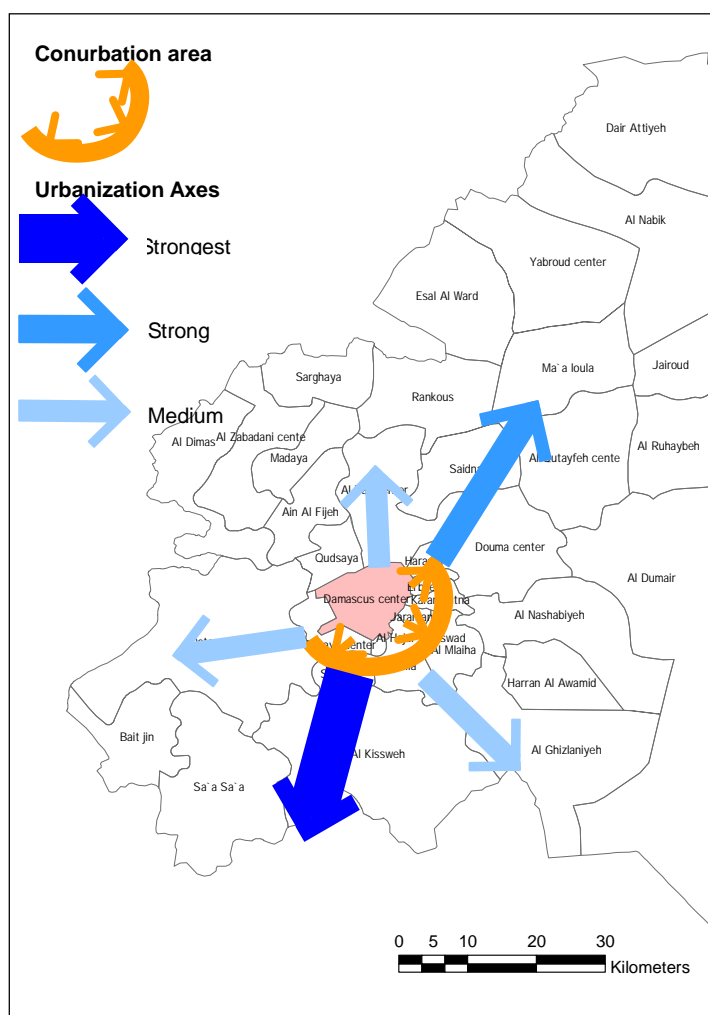


Figure 6 Conurbation area and Urbanization Axes Extending from Damascus City

5.2.2 Macro zoning

The DMA is divided into the following eight zones for the planning purposes (Figure 7).

- (1) Damascus city (DC): Damascus governorate
- (2) Damascus urban conurbation corridor (DUC): Harasta, Erbeen, Kafar Batna, Jaramana, Al Mlaiha, Babbila, Sehnaya, Daraya and Qudsaya
- (3) Southeastern rural villages area (SRA): Al Nashabiyeh, Harran Al Awamid and Al Ghizlaniyeh
- (4) Northeastern industrial corridor (NIC): Douma Center, Al Qutayfeh and Ma'aloula
- (5) Southern industrial corridor (SIC): Al Kissweh
- (6) Northwestern mountain resort area (NRA): Al Zabadani, Al Dima, Madaya, Sargaya and Ain Al Fijeh
- (7) Western valley area (WVA): Qatana Center, Bait Jin and Sa'a Sa'a
- (8) Northern upland area (NUA): Al Tal, Rankous and Sednaya

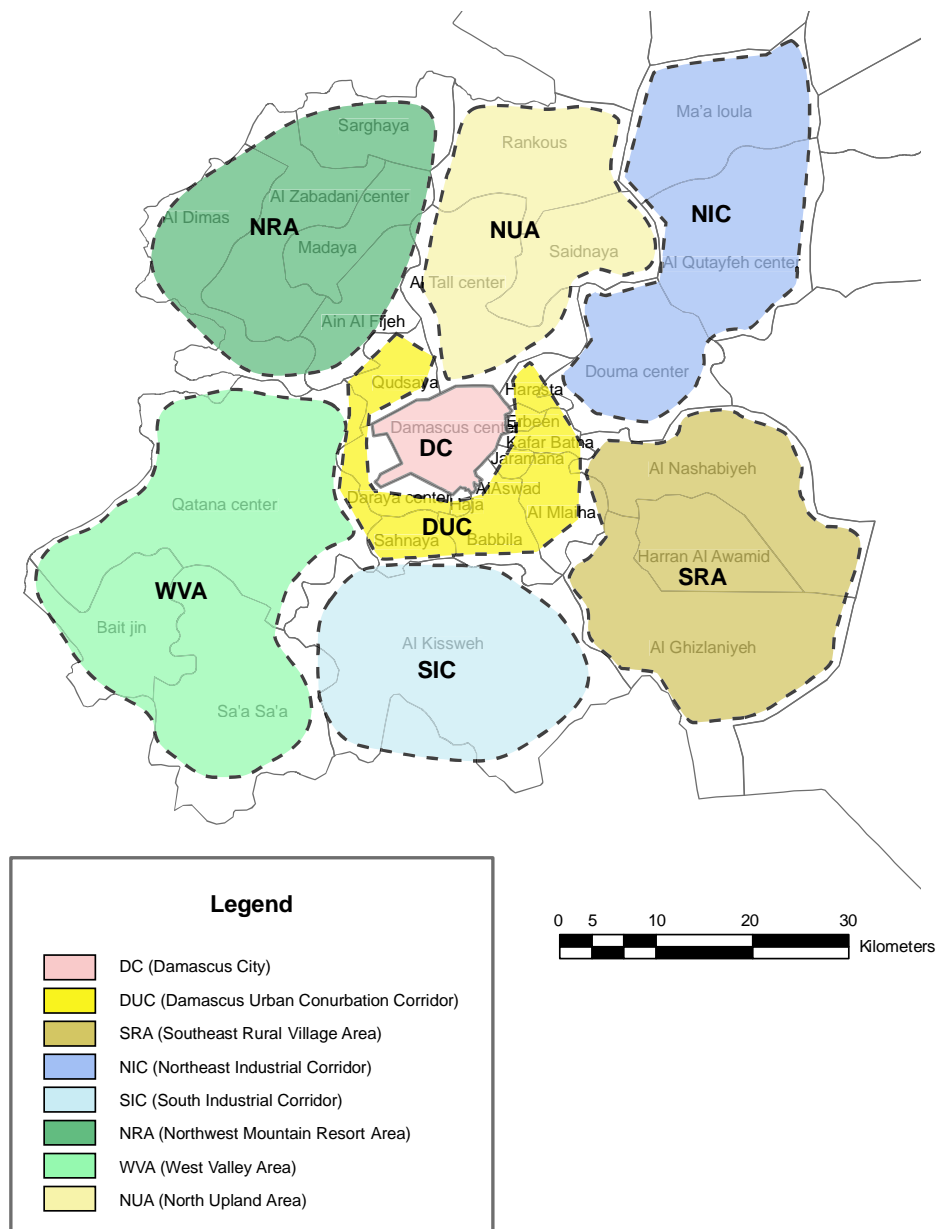


Figure 7 Macro Zoning of the DMA

Profiles of these zones are summarized in Table 11.

Table 11 Profiles of the Eight Zones of the DMA

| Zone name | Summary descriptions | Territory | Urbanization | Agriculture | Industries | Tourism | Nature | Present Conditions | Urbanization Prospect |
|---|--|--|---|--|---|---|---|---|--|
| Damascus City (DC) | Location of Syria's headquarter functions in economy, politics, culture, entertainment, concentrated mainly in Sarouja, Al Muhajreen, Qanawat, Sahlén and Old Damascus | Damascus Governorate with 16 service departments | Built-up areas extending from the central area to surrounding service departments of Mazzeh, Dumar, Berzeh, Qabourn, Jobar, Shahrour, Qadam and Kafar Souseh | Remaining agricultural area mainly in Kafar Souseh disappearing rapidly | No big factories; small car workshops in the eastern and the southern service departments such as Qadam, Qabourn, Jobar and Midan; the Government policy to relocate all industries into Rural Damascus | Landscape of Mt. Qassioun, historical and cultural heritage in old Damascus as the main features of Syria's tourism development, currently undermined by informal housing and inadequate urban management | Mt. Qassioun and urban parks of Jarash Jardin and Tishrin with greenery | Urban decline taking place in some parts of the central area as planned urban development is not kept up with informal development | Need to harmonize the preservation of urban heritage and the enhancement of economic efficiency; redevelopment necessary to reconcile both |
| Damascus Urban Conurbation Corridor (DUC) | Most rapid Population growth causing chaotic land use, disappearing agriculture etc.; water shortages becoming critical | Urbanization corridor surrounding DC in the southeast | Continuous urbanization from DC with spill-over population, extending further outward | Some agricultural areas remaining but converting into informal housing and industrial areas; scarce water constraining agriculture | Dense industrial location, including wood processing and furniture in Erbeen, Daraya and Kafar Batna, sewing and garment in Jaramana and Al Mhailha, and large national factories for chemicals, medicines etc. in Al Mhailha | Green areas used to be weekend picnic areas almost disappeared; | Green areas remaining in peripheries, likely to disappear in the near future | Effectively part of Damascus urban agglomeration with many urban problems including informal housing, industrial and agricultural pollution, low water quality, insufficient water etc. | Several sub-center functions to be established with mixed land use for self-reliant and sustainable development |
| Southeast Rural Village Area (SRA) | Urbanization with spill-over population not reached here yet; rural village atmosphere still remaining with agriculture as the mainstay | Located to the southwestern part of DC composed of Al Nashabiyeh, Harran Al Awamid and Al Ghizlaniyeh | Main development axis envisioned by 1968 Master Plan not realized, constrained mainly by water shortages | Agriculture still as the main source of income but constrained by water shortages; crop conversion attempted to reduce water requirements. | Damascus airport and the Tishrin power plant offering new employment opportunities; also several research institutions and land fill sites located in Al Ghizlaniyeh | "Three columns" of Roman era not preserved properly and used for housing; no leisure facilities to utilize abundant nature | Threat of decline due to expansion of semi-desert area | Water supply critical to support agriculture or its conversion into residential development | Service-oriented development conceived in association with the existing airport and research institutions |
| Northeast Industrial Corridor (NIC) | Rapid urbanization and industrialization proceeding with the Adra industrial city development | Constituting part of the national development artery, comprising Douma Center and Maaloula Maalula | Many formal and informal housing encroaching on agricultural land, creating various problems including the increasing sewage; further acceleration likely by the Adra industrial city development | Remaining agricultural land mixed with residential and industrial developments; some agricultural land to be maintained | Adra industrial city to be promoted as the national flagship project together with other industrial estates for balanced urbanization | Shopping, sporting and other leisure tourism to be promoted; industrial pollution to be controlled as prerequisites | Remaining nature to be preserved and additional greenery created in association with the Adra and other developments; industrial wastes and sewage to be treated properly | Development along the national artery inevitable and thus planned to guide it | Large industrial estate development to be reviewed for balanced and sustainable urban development |
| South Industrial Corridor (SIC) | Urban and industrial development proceeding from DC to Dara and Sweida along the highways, centering on the city of Kissweh | Composed of the Kissweh district, south of Babbila and Sehnaya | Kissweh city master plan to expand its area from 250ha to 400ha | Agriculture constrained by insufficient water | Various industries located in the Kissweh city such as cement, textile and garment, printing, food processing and construction materials | No significant tourism resources | Limited nature with semi-desert areas | Favorable locational conditions for urban and industrial development; critical water supply to be solved by water transfer from Bait Jin | Strategic approach to be taken for value-added development with a science park city, knowledge-based R&D industries etc. |
| Northwest Mountain Resort Area (NRA) | Watershed areas of the DMA; also weekend and seasonal resort and leisure areas for the city residents | Situated in mountains and valleys areas, comprising Zabadani, Al Dimas, Madaya, Sergaya and Ain Al Fijeh | Urbanization not to be undertaken and resort/leisure development to be undertaken carefully | Agriculture mainly in valley areas to be maintained and enhanced | No industrial development to be undertaken | Weekend and seasonal tourism capitalizing on mountains and clear air and water for the city residents as well as visitors from other regions | Abundant nature to be preserved | Good environmental conditions | Resort and leisure facilities to be developed with sound environmental management |
| West Valley Area (WVA) | Quiet rural communities with abundant nature and beautiful landscape | Located in the west of DC, extending on the foot of Mt. Shiek and Mt. Qalamun | Small scale urban developments started to take place | Agriculture supported by sufficient water of good quality | No industrial activities | Security situations suppressing tourism due to proximity to the Golan heights | Beautiful mountain landscape and plenty of water | Rural atmosphere surrounded by abundant nature | Knowledge-based, IT industries promising |
| North Upland Area (NUA) | Upland area to the north of DC | Extending beyond Barzeh of DC, centering on Al Tal | Urbanization started to proceed and expected to accelerate | Small scale agriculture, including olive and apple production | Al Tal as a center of quarries, contributing also to construction workers for DC; many overseas workers in the Gulf region and South America | Many catholic churches in Saidnaya on top of hills, attracting tourists | Mountains and hills where cities are located | Residential areas dominant for those commuting to DC | To be developed for self-sustained urban settlements |

5.3 Scenario for DMA Urban Development

5.3.1 Phase 1: up to 2013

(1) Overview

The planned urban development of the DMA is to be pursued under the three planning concepts: (1) economic efficiency, (2) human security, and (3) cultural city. These concepts should be made widely known and accepted by all the residents. While the master plan itself has technical elements not easily understood by residents, these concepts are easy to understand. Sharing these concepts in planning and implementing urban developments would make big differences in the long run. To cultivate wide public acceptance of these concepts, they should be applied to initial developments to create something visible and accessible by many residents. Such developments may include a new commuter bus route or services to represent economic efficiency, river-side mall or pedestrian crossing to represent human security, and a new cultural center or preservation of architectural heritage for cultural city.

On going and already planned developments should be completed within this phase, modified as necessary to comply with the master plan. Expansion areas proposed by the master plan would be planned in detail and their implementation started also in this phase. The plan for Adra industrial city would be reviewed in the light of the master plan, while its implementation continues. As prerequisites to the planned urban development, this phase is characterized by institutional development in various aspects such as incentive measures for investment promotion, land registration and transactions and resources management as well as urban and regional planning.

(2) Socio-economy

In agriculture, water saving irrigation technology will be established and widely applied in Rural Damascus during this phase in advance of wider application in other regions. The renewed initiative will be taken to enhance the productivity of livestock raising through managed pastures and fodder crops. With increasing productivity in agriculture, rural population would stay at the similar level throughout the phase.

The use of Ghouta area will start to change positively, supported by incentive measures such as subsidies to be introduced following the master plan, by which any uses maintaining permanent vegetation cover of the land would be encouraged. Specific uses include the establishment/expansion of tourism orchards and ranches, and upgrading of sporting and cultural facilities. Mixed farming combining fruit trees and vegetable production under the shade may be allowed. Heritage parks would be established in the Ghouta area to preserve the

remaining heritage in Rural Damascus and to enhance the awareness of residents visiting there on the heritage value.

The Adra industrial city will continue to develop, but the development concept may change with slightly less emphasis on industries of all the different types and more services establishments and larger resident population. Such changes will help to make the city more self-reliant rather than relying on the Damascus city. Most large and polluting industries will be relocated from the city to the Adra industrial city. Polluting industries would re-establish in Adra in principle with their own pre-treatment facilities for industrial effluents and emissions. Some high-tech industries will newly establish with research and development facilities either in Adra or the western part of Rural Damascus.

The private sector will take the stronger initiative for tourism development during this phase. Local tourism agents will associate with international agents to carry out major campaigns, and local tourism associations will be strengthened for proactive marketing. Some major conference facilities may be established, and conference tourism promoted as well.

(3) Spatial development

The ongoing and already planned developments in and around the Damascus city would accommodate the increase in its population within the present administrative boundaries and the spill-over areas, including new districts in Al Assad and Qudsaya. With the suppressed population increase in the Ghouta area, most incremental population would have to be accommodated in the outer areas of Rural Damascus. For this purpose, planned urban developments should be initiated in a few selected urban centers having superior potentials in addition to the Adra industrial city. A new outer ring road should be planned as part of the regional development structure to provide effective links between these urban centers to facilitate their complementary development. Under its stage-wise development plan, the initial links may be established during Phase 1.

Within the Damascus city, initial efforts should be made to transform the urban structure to improve economic efficiency or to reduce economic transaction costs. This would include the establishment of a few road links, improvement of intersections and traffic control, and provision of parking spaces in and around the city center. The introduction of a new mode of transport system should be planned, its feasibility study conducted, and if found feasible, detailed design initiated during Phase 1. If underground railway is to be adopted, underground parking spaces should be located in line with future alignments of the railway lines to lead the way as a precursor.

In Rural Damascus, the piped water supply system will be extended from the Damascus city into most urban areas in the Ghouta area as well as Harasta. Separate systems would be

established for additional urban centers with priority to those having better opportunities for the use of treated sewage. The upgrading of the existing sewage treatment plant in Adra for tertiary treatment should be examined carefully together with the review of the development plan for the Adra industrial city itself as mentioned above and relocation of polluting industries from the Damascus city.

5.3.2 Phase 2: 2014-19

(1) Overview

This phase will be characterized by active transformation of the urban structure in the Damascus city, extending the efforts during Phase 1. This would involve the improvement of the urban road network with inner ring road sections, improved intersections and more effective east-west and north-south links, and provision of more parking spaces as well as better traffic control and public transportation.

Based on the institutional development during Phase 1, active private sector investments will take place in designated areas following the master plan zoning to change the distribution of employment opportunities in various sectors and sub-sectors. This would help to optimize the person-trip distribution throughout the DMA and contribute to the reduction in economic transaction costs.

Supported by the wide acceptance of the planning concepts of human security and cultural city by city residents, more pedestrian-friendly spaces, and facilities and spaces for wide communications would be created throughout the city. Planning for such urban spaces should be undertaken by participatory approach, involving local residents as will be prescribed by relevant law, as part of community development.

(2) Socio-economy

High value-added agriculture will fully establish during this phase with horticultural production under water saving irrigation and high productivity livestock raising in managed pastures and with fodder crops. Agriculture in the Ghouta area will be activated to become important supplier of fresh vegetables, fruits and dairy products to the growing urban market of the Damascus city as well as directly to weekend visitors.

The Adra industrial city will become a self-reliant new city, providing employment opportunities in various industries and services to its residents and those commuting from neighboring areas. More knowledge-based industries will establish together with related services in the industrial areas established during Phase 1. Increasing number of industries would start to produce for export, including some established initially as import processing

industries. To support them, major export-oriented services will establish such as trading houses and logistic services.

In addition to the expansion of the research and development facilities established in Phase 1, more high grade services will start to establish. They include advanced research and education and specialized health care. A wide range of financial and property services and business/private services will also develop rapidly during this phase.

Tourism facilities and functions will be much improved during this phase to make the Damascus city truly the gateway and base for international tourism. Strong private sector initiatives and involvement of local people and communities will be essential conditions for both international and domestic tourism development, in line also with the concepts of human security and cultural city.

(3) Spatial development

As mentioned above, the urban structure in the Damascus city will be transformed during this phase to promote economic efficiency. This will make private investments in various activities more effective, and contribute to creating high quality urban spaces. The new mode of urban transport system examined during Phase 1 will be established with an initial line by the end of this phase.

The few urban centers selected in Phase 1 for accelerated urbanization will develop rapidly during this phase. The combined population in these centers and the Adra industrial city would have to increase by some 800,000 during this phase, of which 300,000 may be accommodated in Adra including the new residential areas to be developed nearby. Sections of the outer ring road linking these urban centers would be completed during this phase.

The piped water supply system will be further extended from the Damascus city to cover more urban areas in Rural Damascus, including integration with some separate systems established in Phase 1. The industrial wastewater treatment plant in the Adra industrial city will be established as a closed system to treat all the effluents generated by industries located there. The tertiary treatment plant will be established in Adra to further treat the domestic sewage and to generate industrial process water. This will not affect the irrigated agriculture as water saving irrigation will be fully adopted in Rural Damascus.

5.3.3 Phase 3: 2020-25

The new urban structure will be completed in this phase for economic efficiency, human security and cultural city. It is represented by the new mode of urban transport system as well as the efficient urban road network for economic efficiency, a network of pedestrian ways for human security, and urban fora utilizing preserved urban and architectural heritage and cultural

facilities for cultural city. High quality urban spaces will be created throughout this phase for various socio-economic activities. The Damascus city will be specialized in services activities, including high grade services and tourism-related services. In Rural Damascus, a variety of industries will develop, including some high-tech industries, together with related services such as export and logistic services, and research and development. In the vast hinterland, high value-added agriculture is established, which would serve as a model for other regions.

The DMA would become the first sustainable mega-city in the modern world, where the development only means the quality enhancement of urban spaces for more comfortable living environment for its citizens. The population may increase beyond 6.0million, if and only if the net unit water use is decreased due to increased recycling and/or reduction of losses and wasteful uses of piped water.

The DMA will be characterized ultimately by the following:

- (1) Center for high grade social services such as advanced education and research and specialized health care,
- (2) International tourism gateway and base including conference tourism and various forms of alternative tourism,
- (3) Specialization in knowledge-based industries capitalizing on educated human resources,
- (4) Large and sophisticated urban markets for products from other regions,
- (5) Model region for high value-added agriculture with water saving irrigation for crops and managed livestock raising, and
- (6) Cultural city embracing multiple cultures in harmony with the Islam.

6 Urban Development Plan in the DMA

6.1 Land Use Plan

6.1.1 Directional land use plan for the DMA

A land use plan for the DMA is prepared to guide the urbanization for both the realization of more desirable urban spaces and the preservation of greenery and agricultural land as much as possible. The basic idea of the land use planning is to indicate broadly general uses of different areas allowed in line with the desirable urbanization pattern rather than to designate the precise land use for each area.

A land suitability map is prepared by applying the criteria of the topography or the slope of land, access from the existing urban areas directly or through artery roads, water availability, geology or more specifically the vulnerability to earthquake risk, and the environmental

consideration represented by the need to protect watershed areas (Figure 8). The existing land use map has been prepared by a sub-contract work (Figure 9). It is overlaid with the land suitability map by the GIS, and a future land use map is prepared to indicate the desirable land use pattern to be realized in the long run. Finally, areas for specific developments planned by the master plan are delineated largely in line with the future land use map (Figure 10).

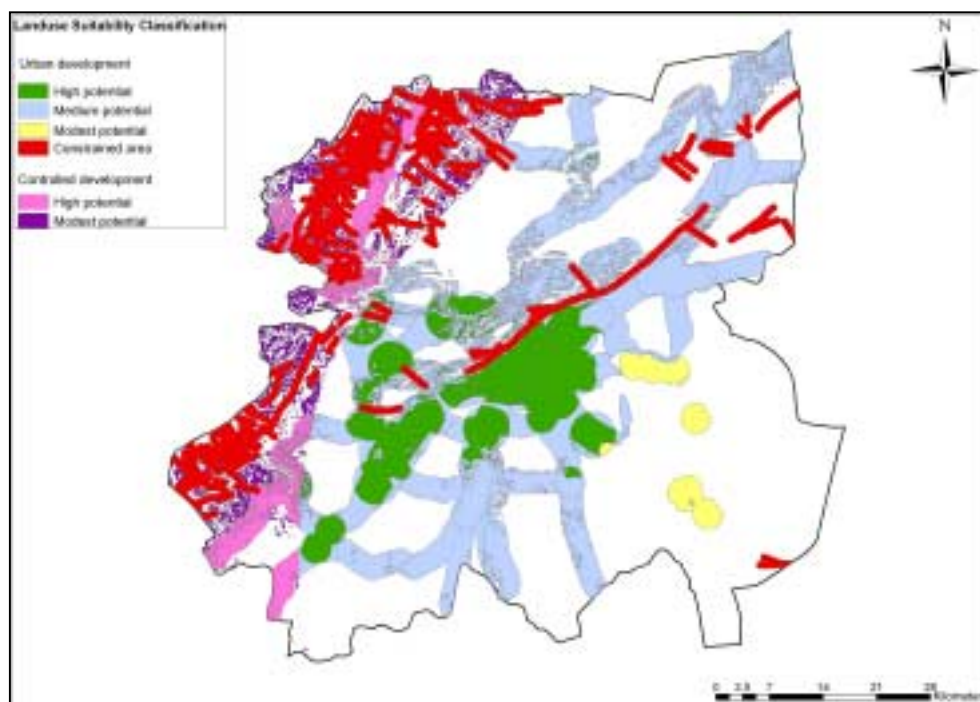


Figure 8 Land Suitability for Urban and Controlled Development in the DMA

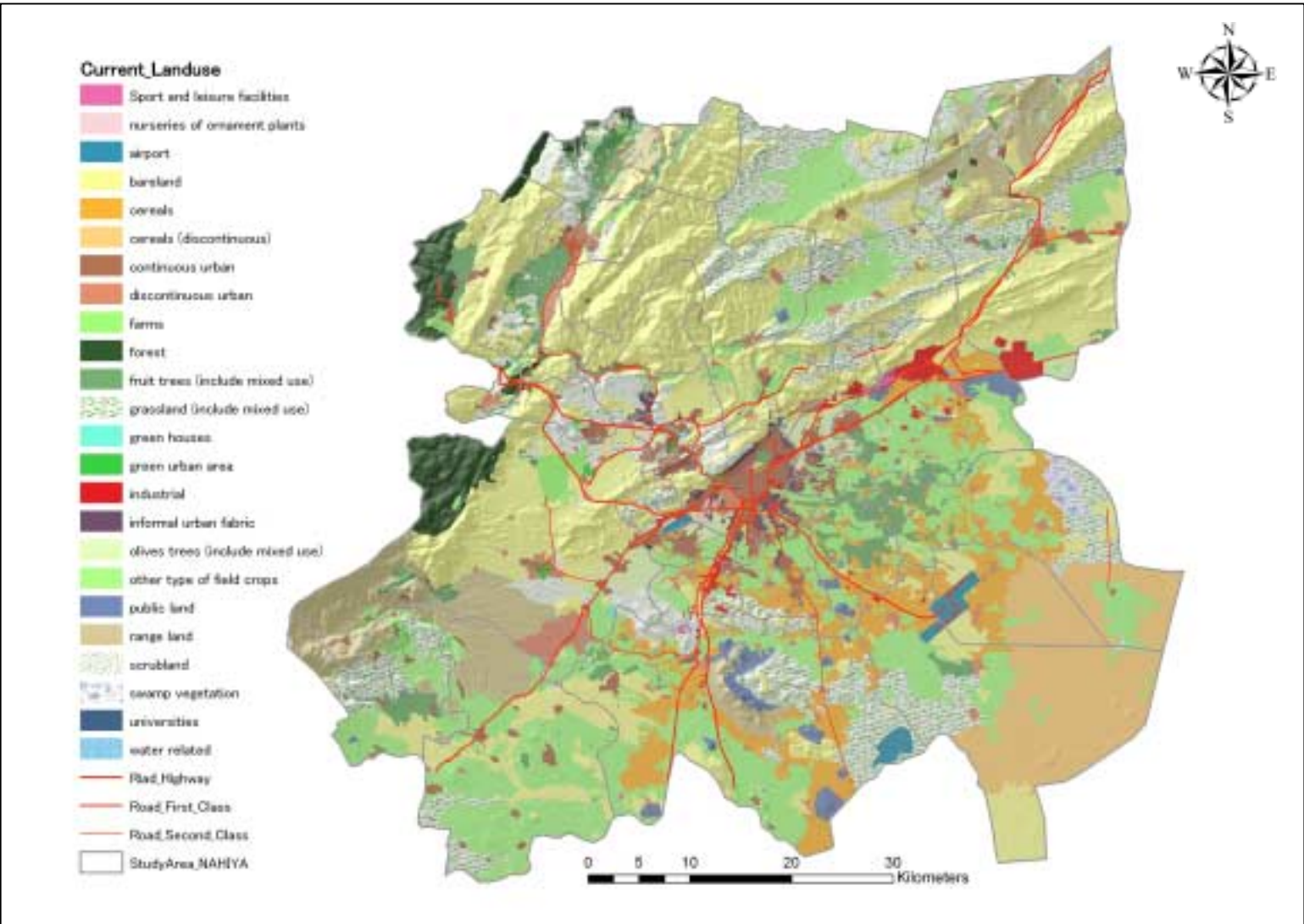


Figure 9 Existing Land Use in the DMA

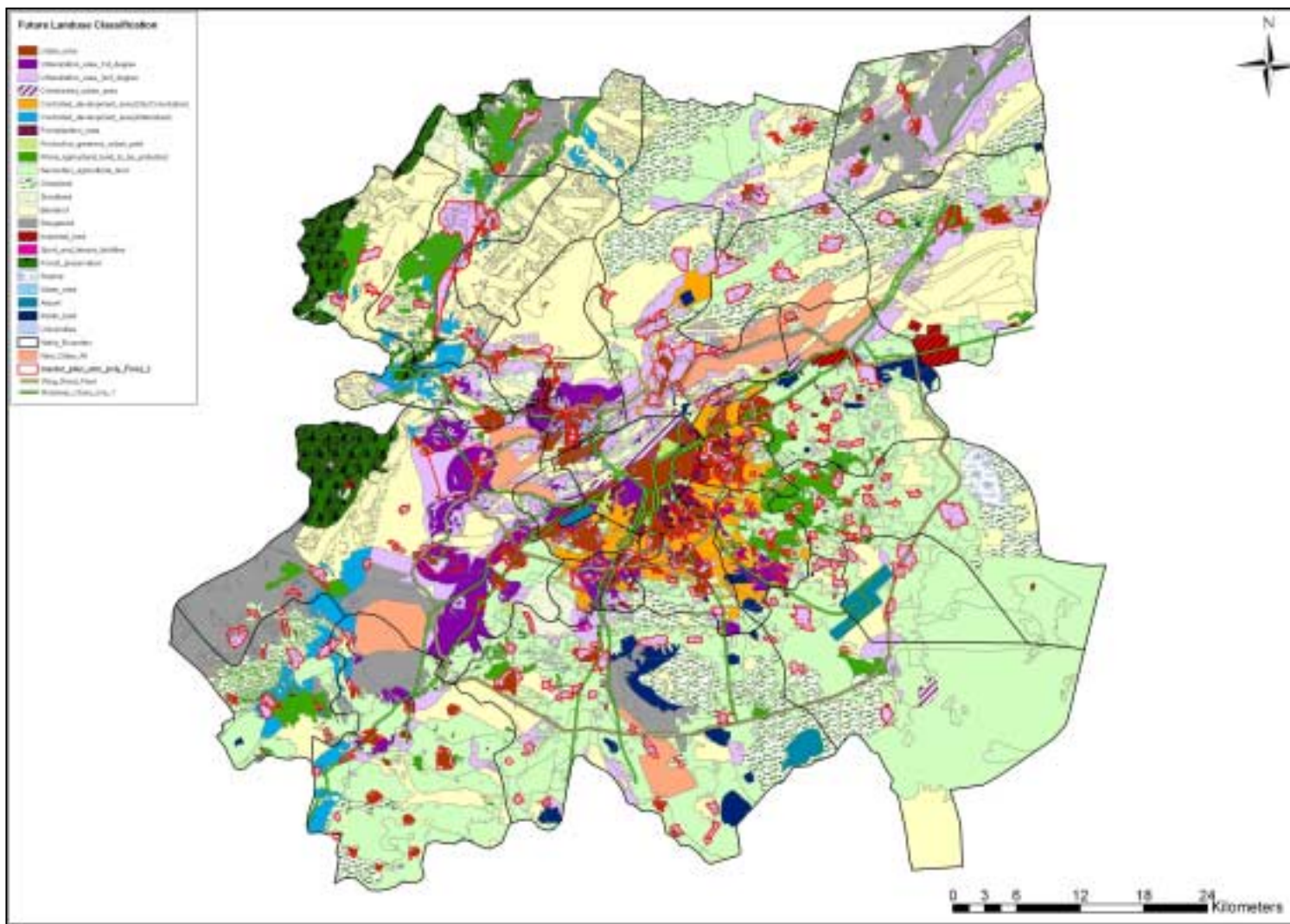


Figure 10 Directional Land Use Plan for the DMA

6.1.2 Indicative land use plan for the Damascus city

By taking the directional land use plan for the DMA as a framework, an indicative land use plan has been prepared for the Damascus city as shown in Figure 11.

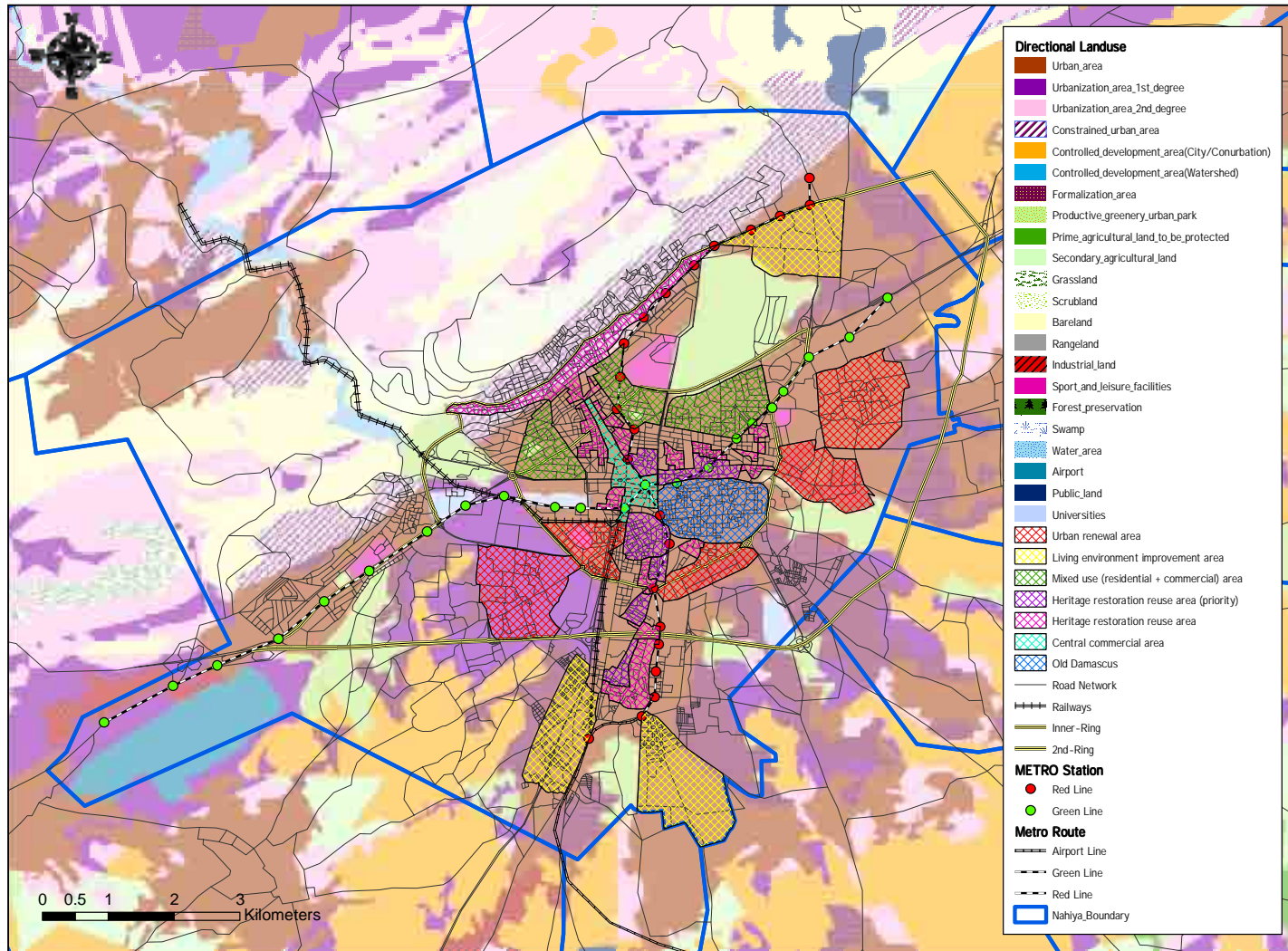


Figure 11 Indicative Land Use Plan for the Damascus City

6.2 Development Programs and Projects

6.2.1 Structure of the development plan

The development plan for the DMA consists of the Urban Structure Transformation Initiative comprising two programs with 15 projects, the Living Environment Improvement Initiative comprising six programs with 18 projects, and the Special Program for Urban Heritage Restoration and Use with six projects. The correspondence between each program and the three planning concepts is indicated in Table 12. Each program and project is outlined.

Table 12 Correspondence between Proposed Programs and Planning Concepts

| Program | Economic efficiency | Human security | Cultural city |
|---|---------------------|----------------|---------------|
| 1.Artery transport network development | | | |
| 2.New cities development | | | |
| 3.Multi-functional urban centers development | | | |
| 4.Informal housing areas formalization | | | |
| 5.Controlled urban & agricultural development | | | |
| 6.Social infrastructure | | | |
| 7.Urban renewal | | | |
| 8.Water supply and sewerage improvement | | | |
| 9.City transport system improvement | | | |
| Special program for urban heritage | | | |

: strong relevance; : relevance
 Source: JICA Study Team

6.2.2 Urban structure transformation initiative

(1) Artery transport network development program

This program aims at transforming the artery transport network of the DMA in the medium to long terms in order to decongest the Damascus city and at the same time to consolidate the DMA development cluster defined above with improved links between the DMA and the Southern, Central and Mediterranean regions. The program consists of the following projects.

- 1.1 Outer ring road development
- 1.2 Radial roads upgrading
- 1.3 Second ring road establishment
- 1.4 Third ring road establishment
- 1.5 Damascus-Quneitra road development

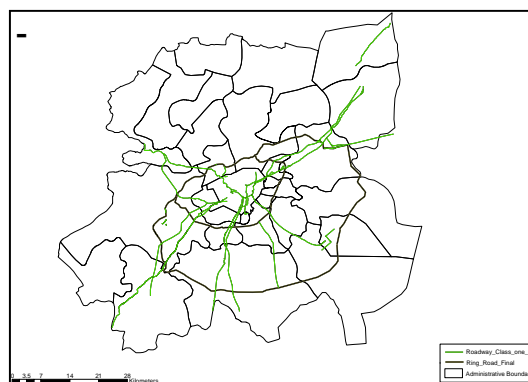


Figure 12 Artery Transport Network Development Program

The outer ring road is instrumental in strengthening the links between the DMA and other regions as well as decongesting the DMA in the long run. Other projects would help to reduce the urbanization pressure on the Damascus city and its vicinities by strengthening the links between the proposed new cities and multi-functional urban centers just outside the city.

(2) New cities development program

The program is to establish the following four new cities as self-contained and self-reliant cities to offer employment opportunities as well as residential spaces (Figure 13).

- 2.1 Adra industrial city development
- 2.2 Qatana IT city development
- 2.3 Government city development
- 2.4 Al Kissweh industrial city development

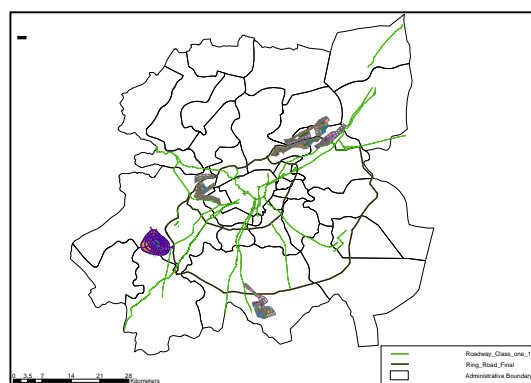


Figure 13 New Cities Development Program

These city areas are located 15-25km from the Damascus city center, closer to rural uplands, forests, agricultural lands and tourism areas. Therefore, carefully planned development should be pursued. Each new city should grow into a self-reliant multi-functional city with distinct characteristics, respectively to develop complementary to one another to reduce the urbanization pressure on the city and its conurbation areas together.

(3) Multi-functional urban centers development program

The program is to establish the following six urban centers in the immediate vicinities of the Damascus city with multiple functions for employment, shopping, education and other urban purposes so that the residents would not need to go to the city for these purposes (Figure 14).

- 3.1 East business and commercial center
- 3.2 Southeast tourism and cultural center
- 3.3 South mixed use urban center
- 3.4 Southwest international communication center
- 3.5 Northwest social development center
- 3.6 North suburban business center

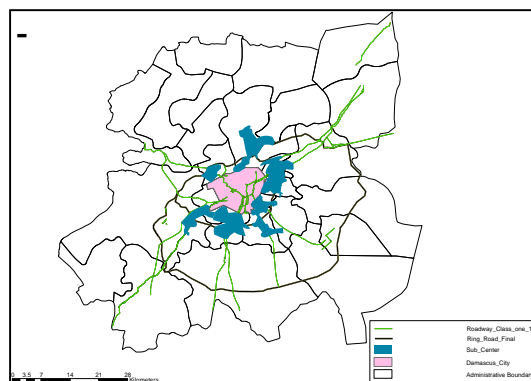


Figure 14 Six Multi-functional Urban Centers

These areas are already urbanized mainly by spill-over of population from the Damascus

city, and therefore, they have developed primarily as residential areas. The program aims to equip these areas with multiple functions for residents. Important functions would be different depending on the background and characteristics of each area. More important functions conceived for each area are summarized in Table 13.

Table 13 Urban Functions of Six Multi-functional Urban Centers

| Urban function | East | Southeast | South | Southwest | Northwest | North |
|--|------|-----------|-------|-----------|-----------|-------|
| Business center | | | | | | |
| Office park | | | | | | |
| Free trade zone | | | | | | |
| Industrial testing and R&D center | | | | | | |
| Showroom for industrial goods | | | | | | |
| Trade center | | | | | | |
| Up-market shopping | | | | | | |
| Large-scale shopping mall | | | | | | |
| Entertainment | | | | | | |
| Hotels & restaurants | | | | | | |
| Tourism services | | | | | | |
| Green park with sporting/cultural facilities | | | | | | |
| Higher education | | | | | | |

: most important; : important
 Source: JICA Study Team

6.2.3 Living environment improvement initiative

(1) Informal housing areas formalization program

There exist about 30 informal housing areas in the Damascus city with some half a million residents. They cover the land area of 1,300ha more or less to make the average population density about 380/ha. The population density, however, is as high as 800/ha in some areas. These areas should be formalized as a matter of principle, except the area with severe physical constraints such as large slope, geological faults and water availability. For these latter areas, the improvement of access is the priority for disaster preparedness. Most informal housing areas to be formalized are located in seven service departments in the city, covering in total some 970ha.

In Rural Damascus, the informal housing areas cover about 1,300ha in 12 nahiyas. Of this total, some 1,070ha are located in seven nahiyas in the immediate vicinities of the Damascus city: These areas are subject to formalization. These areas are included in the six multi-functional urban centers proposed to be strengthened. Therefore, the formalization of these informal settlements constitutes important part of the multi-functional urban centers development program.

Participatory approach should be taken as a matter of principle to plan and implement the formalization of each settlement. This is a cost-effective way to utilize the limited resources in the public sector, and necessary to cover the large area identified above. It may start with a

problem identification workshop, followed by the participatory formulation of a community development project to solve the identified problem. The project would have a better chance to be implemented and managed by the support of the local community. Organizational strengthening of the community for the continual planning and implementation is an important part of the participatory approach.

(2) Controlled urban and agricultural development program

The program introduces a new control mechanism to guide the urbanization so that the greenery in and around the conurbation areas of the city will be preserved as much as possible, and the agricultural areas maintained outside the conurbation areas. The program contains the following five projects for different types of land uses.

- 5.1 Productive urban greenery development
- 5.2 Sports and cultural complex development
- 5.3 Heritage parks establishment
- 5.4 Cooperative agricultural development
- 5.5 Controlled watershed area development

To preserve the remaining greenery as much as possible, the Government should encourage controlled development of such areas by establishing a building code to limit the land coverage ratio of facilities for sizable areas. At the same time, the Government should introduce a subsidy scheme to support the provision of additional facilities necessary to convert the existing agricultural land into tourism orchards or ranches, residential and other areas. The subsidy scheme should be introduced only for designated areas. Also, the improvement of access roads to such tourism areas would help to make them more successful. Such public investments would be justified as the tax revenue from these lands would increase with the appreciation of the land value as well as increased income.

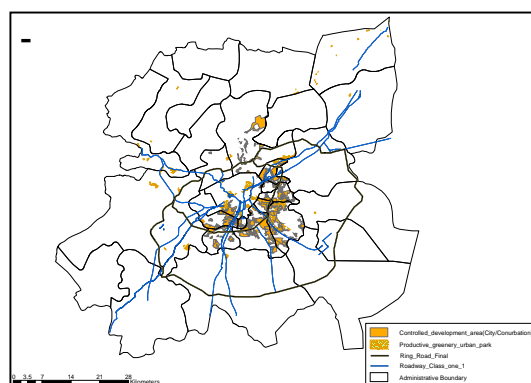


Figure 15 Controlled Urban Development Program Area

Some of the remaining greenery may be acquired by the Government and developed for sports and cultural complex. This should be applied only to such areas that cannot be effectively covered by the private initiative described above and the public development is considered indispensable to protect the valuable greenery. The development by the Government may follow the model of the East Park in the Damascus city.

Another type of development where the public development would be justified to protect the remaining greenery is to establish heritage parks in the Ghouta area. A heritage park should be established in such an area of the Ghouta still having rich heritage remaining but threatened by the urbanization pressure. The public sector initiative would be justified as coordinated efforts of related public organizations would be indispensable first in identifying the areas to be developed into the heritage parks. Some historical monuments and traditional houses may be transferred from the original locations to the areas selected for heritage parks for preservation and use as part of the park attractions. Use of heritage parks by the citizens would certainly help to enhance their awareness for the rich heritage that they have inherited over millennia, and have positive effects on the new buildings to be constructed by the private developers.

The agricultural sector in the DMA should be transformed and serve as the model for high value-added agriculture that can survive in the global economy. To realize this idea, concerted efforts are necessary by farmers and the governments. Various support services by the governments should better be provided to cooperatives rather than individual farmers for effectiveness. Especially, small farmers should be organized into cooperatives and agricultural extension services provided to the cooperatives for new crops or cropping patterns, modern irrigation techniques, use of fertilizer and agro-chemicals, and marketing. Low interest credit or other tax incentives should be provided to small farmers with each cooperative providing joint guarantee instead of collateral requirements.

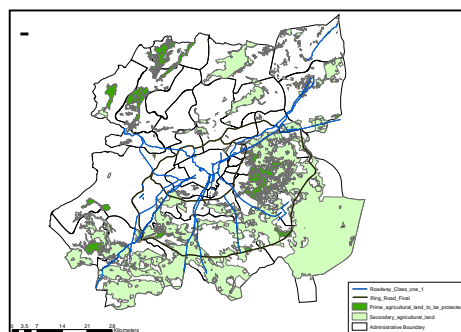


Figure 16 Cooperative Agricultural Development Project Area

The project should adopt a participatory approach first to formulate a plan for introducing new crops and modern technology, identifying water sources for irrigation and managing irrigation water use, and marketing the produce. Introduction of credit, repayment through sales of products, and financial management are also important aspects of participatory planning. Through the participatory planning, more viable and accountable cooperatives would be established.

Limited areas within the designated watershed area may be developed carefully as the controlled watershed area development. Types and magnitude of developments allowed in this area should be designated and enforced by law. Developmental activities should be confined to areas identified by the DMA land use plan as the controlled development areas in the watershed. Proper land protection measures to be implemented associated with any

development should also be specified. More strict regulations should be introduced for sewage discharges, water extraction and solid waste disposal. Use of fertilizer and agro-chemicals should be controlled.

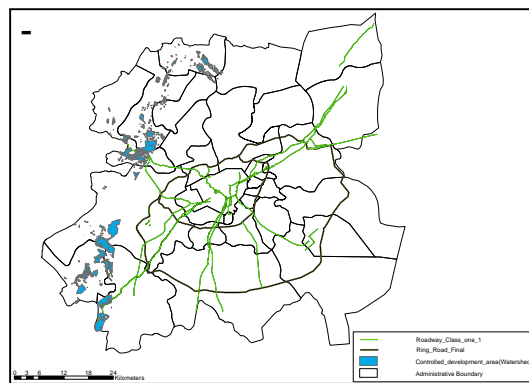


Figure 17 Controlled Watershed Area Development Project Area

(3) Social infrastructure program

To improve the living environment in the DMA, the provision of various social infrastructure needs to be consistently expanded to cover the increasing population. Moreover, the quality of social services should be upgraded to meet more sophisticated needs of the residents and visitors as essential conditions for the DMA to become the center for high grade social services. This program contains the components for general education and health facilities, higher education institute, hospitals, and cultural centers as follows.

- 6.1 Education facilities expansion and improvement
- 6.2 Higher education institute establishment
- 6.3 Health care facilities expansion and improvement
- 6.4 Hospitals development
- 6.5 Cultural centers development

The education facilities expansion and improvement project and the health care facilities expansion and improvement project are to provide adequate facilities for general education and health services for the increasing number of residents, and would be implemented continually. The higher education institute establishment project aims to establish a new education institute to support the knowledge-based and ICT-oriented industrial development with strong R&D functions. The hospitals development project is to establish additional hospitals or upgrade existing ones for some specialized health care. The cultural centers development project would establish four additional cultural centers in the Damascus city and eight centers in Rural Damascus to provide comprehensive facilities for all the major cultural activities.

(4) Urban renewal program

Urban renewal or redevelopment in connection with industrial relocation is an important part of establishing the multi-functional urban centers in the east, southeast and south. Also within the Damascus city, urban renewal or redevelopment is necessary in some service departments. In Al Shaghour and Al Qadam, urban renewal should be undertaken to resolve

the industrial and residential mixed land use. Urban renewal would be necessary for the old settlement area in Jobar, central area in Sarouja and eastern part of Al Qanawat. In planned area of Rukin Eddin, land readjustment may be effective to integrate informal urban fabric into the formal urban area.

Various methods are available for renewal or redevelopment of already urbanized areas. The applicability of each method depends on local conditions such as land ownership, demographic structure, income levels and institutions as well as physical conditions. Different methods should be utilized for different areas in line with the existing institutions related to urban development to derive lessons on their applicability. Institutional arrangements may be modified as necessary for wider application of more effective methods.

(5) Water supply and sewerage improvement program

The DMA urban development is planned without assuming the water transfer from other basins. This program is to utilize the local water resources of the Brada /Awaj basin most effectively, while maintaining the inter-basin water transfer as the long-term option. The program consists of the following projects.

- 8.1 DAWSSA water supply expansion and improvement
- 8.2 R-DAWSSA water supply and sewerage development
- 8.3 Adra sewage treatment plant tertiary treatment
- 8.4 Water and sewage tariff rationalization

The DAWSSA water supply expansion and improvement encompasses the development of water sources, new pipelines and reservoirs to transmit and distribute the piped water to the Damascus city and its eastern and southeaster neighbors in Rural Damascus. Additional wells should be provided in the northwestern part of the DMA to produce 10m³/sec water, which should be transmitted to the city and its vicinity by the 1,600mm pipelines as already planned by DAWSSA. New supply bases need to be established in Ma'araba and Babbila with a reservoir of 50,000m³ storage capacity each for transmission and distribution of the water to the service areas within Rural Damascus. Additional reservoirs of smaller capacity would also be provided, some with pumping capacity. The upgrading of the DAWSSA distribution network should follow the ongoing works supported by the Kuwait fund.

The development of R-DAWSSA water supply and sewerage should follow the ongoing master plan study supported by JICA. In principle, water supply systems should be developed together with corresponding sewerage systems, and integrated area-wide as much as feasible. Replacement of old pipelines would be necessary covering the area of 500km² more or less.

The water source in the southwestern part of the DMA would be developed, and to

transmit and distribute the water, a supply base with a reservoir would be required in Al Kissweh. Also, four wells would be developed in the Yarmouk basin to supply water of 1.4million m³/year for Al Kissweh.

The Adra sewage treatment plant tertiary treatment is introduced in the existing plant at Adra in steps not only to further reduce the BOD level but also to reduce the total nitrogen in the treated sewage. This would involve extended aeration as well as chemical treatment. As prerequisites, all the industries discharging wastewater into the DAWSSA sewerage should be relocated into the Adra industrial area and possible sources of nitrogen contents in the sewage removed. Then, the treated sewage from the Adra plant can be used as industrial process water.

As the water supply system is improved, the demand side management would be increasingly more important to suppress the growth of water demand. The ongoing efforts to revise the water and sewage tariff should be pursued to rationalize the tariff. Lump sum water charges should be introduced for irrigation water uses in accordance with the water right. This should be combined with improved management of well registration and strict enforcement of penalties against non-registered wells.

(6) City transport system improvement program

The project is to improve the urban transport system of the Damascus city in line with the regional road network to be strengthened by the artery transport network development program. The program consists of the following projects.

- 9.1 Inner ring road improvement
- 9.2 City roads improvement
- 9.3 Underground parking development
- 9.4 Metro development

The inner ring road improvement project will improve the northern section of the existing ring road for about 2.8km length. An elevated road will be constructed between the Al Umawiyeen square and the Russian embassy. The city roads improvement project aims to improve the road link between the north and the south bus terminals. It involves the upgrading road sections of 49.8km. Also, the terminal facilities would be improved to increase the capacity to 100 buses for the south and 120 buses for the north terminals.

The underground parking capacity is increased especially in the central part of the city significantly. In view of the difficulty in acquiring the land for parking structures, underground parking should be adopted widely. In addition to the underground parking in buildings to be newly constructed, existing city parks should be utilized for the purpose. In

such a case, the location and structure of the parking should be such that the future construction of the metro railways would be facilitated. Also, multi-layer parks and parking should be adopted for some areas such as the greenery areas on both sides of the Shoukry Al Qouwatly street.

Two lines of the metro railway system have been studied at the feasibility level, but detailed plans are still to be worked out. The provision of underground parking spaces as mentioned above, which is more urgently needed, should be in line with future alignments of the metro to lead the way as a precursor.

6.2.4 Special program for urban heritage restoration and use

This program has been formulated to promote the restoration and use of urban heritage mainly in the Damascus city. It consists of the following measures.

- (1) Old Damascus and the periphery heritage areas management planning
- (2) Old Damascus utilities improvement
- (3) Old residential complexes restoration and use
- (4) Participatory historical areas planning
- (5) Heritage value awareness campaign
- (6) Heritage database establishment

Under the Old Damascus and the periphery heritage area management planning, a comprehensive management plan is prepared by involving a wide range of stakeholders, and through the planning, a unified management body is established for the implementation of the plan. The Old Damascus utilities improvement project would be implemented in stages, following the priority to be established by its plan. The Old Damascus residential complexes restoration and use project would be implemented in line with the prioritized improvement of the utilities.

The participatory historical areas planning would be conducted, following the case study undertaken as part of the DMA master planning. The heritage value awareness campaign should be conducted by mobilizing the stakeholders involved in the management planning for Old Damascus and the periphery areas and the participatory planning for historical areas. The heritage database establishment is undertaken by compiling the results of the participatory planning as a base.

7 Institutional Measures for DMA Urban Development

7.1 Implementing Arrangements for DMA Urban Development

7.1.1 Alternatives for implementing arrangements

The following four alternatives have been examined to clarify the institutional requirements for the DMA urban development in the immediate and long-term future:

- (1) Damascus Metropolitan Authority,
- (2) New governorate by merging the two governorates,
- (3) Damascus regional association, and
- (4) DMA council or commission.

The characteristics, advantages and disadvantages of each option are summarized in Table 14.

Table 14 Alternative Institutional Arrangements for DMA Urban Development

| Alternative | Basic features | Advantages | Disadvantages |
|---------------------------------|--|---|---|
| Damascus Metropolitan Authority | -Created by legislative measure as a legal entity -Autonomous with minimal supervision -Mandates, power and functions defined as created | -Most stable organization -Full authority to ensure coordinated development | -Need for tedious and meticulous process to establish -Danger of being politicized |
| New governorate | -Established by merging the two governorates -Same administrative status as the existing ones | -Minimal organizational re-structuring involved -Integration of experiences of the existing governorates | -Politically difficult as the number of governors and grant allocation are reduced |
| Damascus regional association | -Established as an umbrella organization of all the related administrations -Legal status needs to be defined | -Powerful enough if placed under the Office of the President -More stable than council/commission | -Difficult in ensuring balance between member agencies -Dependence on the executing arms of existing agencies |
| DMA council or commission | -Project-oriented organization with a project management office -Funding from member organizations -Mainly for coordination and project/investment promotion | -Easier and faster to establish | -Unstable and likely to be threatened by leadership turnover -Difficulty in securing funds for operation and maintenance |

Source: JICA Study Team

7.1.2 DMA council

Of the four alternatives examined above, the DMA council is recommended for establishment in the immediate future as it would be easy to establish and its functions may be expanded as it demonstrates its track records. First, the council may have only coordinating

and limited management functions. Its functions may expand in steps to include planning, project and investment promotion, monitoring and evaluation, and eventually implementation of some types of projects as well. Then, it would become effectively the regional development authority. The council should have a project management office with fulltime staff from the beginning to ensure accountability for the Master Plan implementation through coordination between related agencies.

7.2 Urban and Regional Planning Institutions

(1) Use of existing laws for the private sector-led urban developments

Private sector-led development

Law 9 of 1974 should be reinstated for the land sub-division and development by the private sector. While the section of this law dealing with the establishment of organizational areas and a process of land pooling and readjustment involves almost prohibitive steps to be taken, thus encouraging the municipalities to resort to Law 26 of 2000, the section dealing with the private sector-led development should not be so complicated.

Informal housing areas

The formalization of informal settlements has recently been given legal backing by Law 46 of 2004, which facilitates the granting of title 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. Thus, the ongoing efforts by the Damascus governorate to formalize informal settlements have received legal supports by the national policy.

Expansion areas

Once an expansion area is known either by formal announcement or informally, people will move in and buy from the existing “miri” land owners as the land owners can get much better prices from illegal sale than the compensation by the expropriator. Law 1 of 2003 is to prohibit such land sales by imposing high penalties against them. The enforcement of penalties, however, would involve large resources in the public sector. A better mechanism to control the land development is to encourage the land development under very strict conditions with respect to building coverage, floor area ratio, minimum land area for development and others, while providing some incentives such as subsidies for investment in buildings.

(2) Provision for public-private partnership

The revision of the legal and institutional system for urban planning, development and control should aim at more extensive and substantive public-private partnership. It is important for the legal and institutional system to provide a broad framework, and the

municipalities have options to choose from within the framework. The following should be accommodated in the revision.

Joint development

Alternative forms of public-private partnership for urban development have been undertaken in different countries. They include the following:

- 1) Public to establish a wholly owned company to undertake the development in partnership with private developers,
- 2) Public to assist land owners to establish a company or association/cooperative to undertake the development, and
- 3) Public to enter into a joint venture arrangement with a private entity to undertake the development.

A specific form of the public-private partnership for large scale land development is for the public sector to provide major infrastructure facilities following a master plan, and the private sector to plan and develop individual land lots following the master plan, including the infrastructure development for the individual land lots. This will reduce the resource requirements on the public side, and still coherent development of the entire land is ensured by the master plan.

Master planning

A master plan for any development area may be prepared also by the public-private partnership. Alternative arrangements are conceived as follows.

- i) The public entity prepares the master plan either directly or by outsourcing the works;
- ii) Private developers prepare the master plan for approval by the public; and
- iii) Private developers pool their resources and entrust them to the public entity for preparing the master plan.

Development methods and tools

The revised legal and institutional system should allow a variety of planning and implementation methods and tools to be applied to various cases of urban development. The land readjustment and pooling provided by Law 9 of 1974 and the expropriation provided by Law 20 of 1983 are just two possible methods. The provision should be made to allow more different methods to be used with a view to encouraging the private sector initiative as much as possible. The system relying more on the private sector initiative is much better than the one relying more on the public sector initiative in responding to rapidly changing needs of urban development.

The provision should also be made, however, that the reflection of concerns on heritage value, environmental sanitation, and other socio-cultural conditions contributing to the urban

amenity should be ensured. The public-private partnership is indeed a mechanism to ensure this provided that the public here represents general public as well as the governments. Therefore, the revised system should allow a wider participation of citizens in the planning process.

(3) Regional planning

The imminence and severity of the urban problems, however, often lead planners and administrators to practice responsive planning: i.e. planning in response to imminent needs. Such an approach tends to lead to more problems as the urbanization in the 20th century demonstrated with numerous examples.

Location of various socio-economic activities and infrastructure facilities and utilities serving them would better be planned from a region-wide point of view. Such planning pursues specialization and complementarity. Certain facilities and functions, such as an international airport and industrial estates, should better be located only in selected areas; hence, specialization. Facilities and functions in different locations should serve as a whole all the areas and activities; hence, complementarity. The regional planning aims at the optimal distribution of these functions and activities from a viewpoint of larger geographic area for cost-effectiveness and the best satisfaction of largest number of people.

The legal and institutional system for urban planning, development and control should be built in the broader system of socio-economic and spatial development. First, there should be a proper industrial location policy at the national level, supported by the trunk transportation and other infrastructure system within the context of the national land development. Then, under the conditions and roles dictated by such national level plans to different regions, a regional development plan should be prepared for any region considered to constitute integral part of the national development, respectively. Urban development plans should be prepared with the relevant regional plan as the framework.

The hierarchical planning system should be established with the view to realizing more balanced and robust development of the Country as a whole for the benefits of the people. In this system, regional planning holds the key position as it would pursue self-reliant development of any region complementary to the development of other regions. It is not only desirable for the welfare of the people in each region, but in fact necessary to survive in the globalizing economy.

8 Implementation Program

8.1 Indicative Investment Program

Investment costs of all the proposed projects and programs are roughly estimated, and an indicative investment schedule is constructed in line with the project prioritization as presented in Table 15. The total investment costs for all the proposed projects and programs are SL.113,198 million in Phase 1 (2008-13), SL.102,278 million in Phase 2 (20014-19), and SL.110,628 million in Phase 3 (2020-25). These estimates correspond to 59.0%, 30.2% and 28.3% of the total public investment allocation projected for Phase 1, Phase 2 and Phase 3, respectively.

Table 15 Indicative Investment Schedule for DMA Urban Development

| | | | | | | | (Unit: SL..million) | | | |
|--|--|----------|-----------------------|--------------------|----------------|----------------|---------------------|--|--|--|
| No. | Project title | Status | Implementing agencies | Investment Phase 1 | Phase 2 | Phase 3 | Total | | | |
| I. Urban Structure Transformation Initiative | | | | | | | | | | |
| 1. Artery transport network development program | | | | | | | | | | |
| 1.1 | Outer ring road development | New | MOT | 3,233 | 3,525 | 5,281 | | | | |
| 1.2 | Radial roads upgrading | Extended | | 415 | 391 | | | | | |
| 1.3 | Second ring road establishment | Extended | | 5,568 | 3,881 | 3,881 | | | | |
| 1.4 | Third ring road establishment | Extended | | 1,464 | 1,464 | | | | | |
| 1.5 | Damascus-Quneitra road development | | MOT | 229 | | | | | | |
| | | | Sub-total | 10,909 | 9,261 | 9,162 | 29,332 | | | |
| 2. New cities development program | | | | | | | | | | |
| 2.1 | Adra industrial city development | Extended | MLEA | 2,869 | 1,912 | | | | | |
| 2.2 | Qatana IT city development | New | | 1,412 | 2,838 | 2,838 | | | | |
| 2.3 | Government city development | Extended | MLAE | 2,266 | 2,266 | | | | | |
| 2.4 | Al Kissweh industrial city development | New | | 1,922 | 3,844 | 3,844 | | | | |
| | | | | 8,469 | 10,860 | 6,682 | 26,011 | | | |
| 3. Multi-functional urban centers development program | | | | | | | | | | |
| 3.1 | East business and commercial center | New | DG, RDG | 2,668 | 2,688 | 1,334 | | | | |
| 3.2 | Southeast tourism and cultural center | New | DG, RDG | 2,060 | 1,545 | 1,545 | | | | |
| 3.3 | South mixed use urban center | New | DG, RDG | 2,052 | 1,539 | 1,539 | | | | |
| 3.4 | Southwest international communication center | New | DG, RDG | 485 | 970 | 970 | | | | |
| 3.5 | Northeast social development center | New | DG, RDG | 376 | 751 | 751 | | | | |
| 3.6 | North suburban business center | New | DG, RDG | 439 | 585 | 439 | | | | |
| | | | | 8,080 | 8,078 | 6,578 | 22,736 | | | |
| II. Living Environment Improvement Initiative | | | | | | | | | | |
| 4. Informal housing area formalization program | | | | | | | | | | |
| | | | | 1,967 | 1,967 | 1,967 | 5,901 | | | |
| 5. Controlled urban and agricultural development program | | | | | | | | | | |
| 5.1 | Productive urban greenery development | New | RDG, Min. Agriculture | 2,500 | 2,500 | | | | | |
| 5.2 | Sports & cultural complex development | New | | 2,000 | 2,000 | 2,250 | | | | |
| 5.3 | Heritage parks establishment | New | RDG, Min. Antiquity | 1,245 | 1,245 | | | | | |
| 5.4 | Cooperative agricultural development | New | Min. Agriculture | 1,000 | 1,000 | 1,000 | | | | |
| 5.5 | Controlled watershed area development | New | Multi-agency | 1,000 | 1,000 | 1,000 | | | | |
| | | | | 7,745 | 7,745 | 4,250 | 19,740 | | | |
| 6. Social infrastructure program | | | | | | | | | | |
| 6.1 | Education facilities expansion & improvement | Extended | Min. Education | 30,811 | 16,022 | 18,676 | | | | |
| 6.2 | Higher education institute establishment | New | Min. Higher Education | 1,000 | 1,000 | | | | | |
| 6.3 | Health facilities expansion & improvement | Extended | Min. Health | 6,643 | 2,723 | 3,267 | | | | |
| 6.4 | Hospitals development | Extended | Min. Health | 4,522 | 2,515 | 2,863 | | | | |
| 6.5 | Cultural centers development | Extended | DG, RDG, Min. Culture | 244 | 122 | 122 | | | | |
| | | | | 43,220 | 22,382 | 24,928 | 90,530 | | | |
| 7. Urban renewal program | | | | | | | | | | |
| | | | | 2,490 | 2,490 | 2,490 | 7,470 | | | |
| 8. Water supply & sewerage improvement program | | | | | | | | | | |
| 8.1 | DAWSSA water supply expansion & improvement | Extended | DAWSSA | 3,363 | 729 | 204 | | | | |
| 8.2 | R-DAWSSA water supply & sewerage development | Extended | R-DAWSSA | 15,728 | 8,136 | 8,200 | | | | |
| 8.3 | Adra sewage treatment plant tertiary treatment | New | DAWSSA | 3,581 | 2,686 | 2,686 | | | | |
| 8.4 | Water and sewage tariff rationalization | Extended | DAWSSA, R-DAWSSA | 100 | | | | | | |
| | | | | 22,772 | 11,551 | 11,090 | 45,414 | | | |
| 9. City transport system improvement program | | | | | | | | | | |
| 9.1 | Inner ring road improvement | Extended | DG | 1,079 | 1,079 | | | | | |
| 9.2 | City roads improvement | Extended | DG | 2,352 | 2,352 | 1,040 | | | | |
| 9.3 | Underground parking development | Extended | DG | 1,780 | 1,780 | 1,780 | | | | |
| 9.4 | Metro development | New | DG | 3,000 | 20,000 | 40,000 | | | | |
| | | | | 8,211 | 25,211 | 42,820 | 76,242 | | | |
| Special Program for Urban Heritage Restoration and Use | | | | | | | | | | |
| 1 | Old Damascus & the PHA management planning | Extended | Multi-agency | 200 | | | | | | |
| 2 | Old Damascus utilities improvement | Extended | Multi-agency | 869 | 869 | | | | | |
| 3 | Old residential complexes restoration & use | New | Multi-agency | 705 | 705 | | | | | |
| 4 | Participatory historical areas planning | New | DG | 1,660 | 1,660 | 1,660 | | | | |
| 5 | Heritage value awareness campaign | New | DG, RDG | 100 | | | | | | |
| 6 | Heritage database development | New | DG, Min. Culture | 100 | 500 | | | | | |
| | | | | 3,634 | 3,734 | 1,660 | 9,028 | | | |
| Total | | | | 117,497 | 103,279 | 111,627 | 332,404 | | | |

Source: JICA Study Team

8.2 Initial Actions

(1) Master Plan adoption and promotion

To ensure the coordination of various development efforts by many agencies and timely implementation of inter-related projects, Master Plan proposals would have to be first discussed among related agencies, and sector concerns and possible conflicts should be resolved. For these purposes, an inter-agency committee may be convened to be chaired by the MLAE Minister. Sector concerns related to the respective programs would be clarified and resolved at the inter-agency committee. Based on the resolution, the MLAE Minister should issue a policy paper recommending the adoption of the Master Plan with addenda if necessary for submission to the cabinet. Addenda may be prepared to allow flexible operation of the Master Plan as well as revisions necessary to make it fit to policies of sector agencies.

(2) Establishment of the DMA council

The DMA council may be established as recommended above. The inter-agency committee mentioned above may be developed into the council, or the council may be established by the Presidential decree to perform the roles of the committee from the beginning.

(3) Preparation of detailed plans

Detailed plans should be prepared for priority areas for early initiation of development activities according to the Master Plan. They should cover the six multi-functional urban centers and the four new cities proposed by the Master Plan. For the Adra industrial city and the Government city, the existing plans should be reviewed and revised. Detailed plans may be prepared in steps also for some areas made available by the relocation of existing industries as well as selected historical and informal housing areas.

(4) Participatory planning

Participatory planning should be undertaken for the Old Damascus and its peripheral heritage area (PHA), other historical areas, and informal housing areas. Through the participatory management planning for the Old Damascus and the PHA, a unified entity should be established for the continued management of the integrated area. The participatory planning for historical and informal housing areas should be conducted in steps as the planning capacity of officials is enhanced through the planning and implementation of the plans one after another.

(5) Legislative measures

Existing laws may provide for the private sector-led urban development to some extent

such as Law 9 of 1974 to allow land sub-division and development by the private sector. Another way to promote the private sector-led urban development may be to apply strict building code to protect remaining greenery through use, while providing some incentives to ensure adequate profitability for the private sector. The introduction of some incentives may need legislative measures such as subsidies for investment costs or tax reduction.

Legislative measures need to be taken to reform the legal and institutional system for urban planning, development and control for more extensive and substantive public-private partnership. The revised system should provide a broad framework, within which the municipalities should have various options to take for joint development, preparation of development plans, and implementation by applying various methods and tools.

(6) Pilot projects implementation

The Master Plan recommends more substantive public-private partnership and private sector-led urban development. Also, participatory planning should be taken for heritage and informal housing areas. These new concepts and approaches can not take root in a short period of time. They should be applied early and successfully. The initial success would provide momentum for the continued application of new concepts and approaches to different areas.

9 Detailed Plans for Selected Districts

Three different types of areas were selected for more detailed planning through collaborative works of the Syria/JICA joint team. They are: (1) the Qaboun informal settlement area, (2) Qanawat urban heritage area, and (3) Qatana new city. The plans for these areas are presented below. The scope and depth of the planning vary for the three areas.

9.1 Qaboun Informal Settlement

Informal settlement areas in the Damascus city should be formalized as a matter of principle, supported by the new Law 46 of 2004. They should be integrated into the urban fabric of the city with the same quality of living conditions. The formalization of the Qaboun informal settlement area should provide a model case for the application of participatory approach to the formalization.

In association with residential improvement, better public facilities should be provided to serve the residents in the neighboring areas as well. The project should contribute to the improvement of living conditions in the entire Qaboun area.

The Qaboun informal settlement formalization is planned on the land of 54.85ha for the population of 23,800 at the density of 400/ha in 2025. The land use plan is shown in Figure 18.

The perspective of the project development is shown in Figure 19.

For the smooth implementation of the project, the existing vacant or agricultural land should be utilized for the first phase development. After the completion of the first phase, residents in the next phase development area will move into the first phase area. In this way, the disruption of daily life by construction will be minimized. Considering the ongoing development in the northern adjoining area, the development in the project area should proceed from the west to the east.

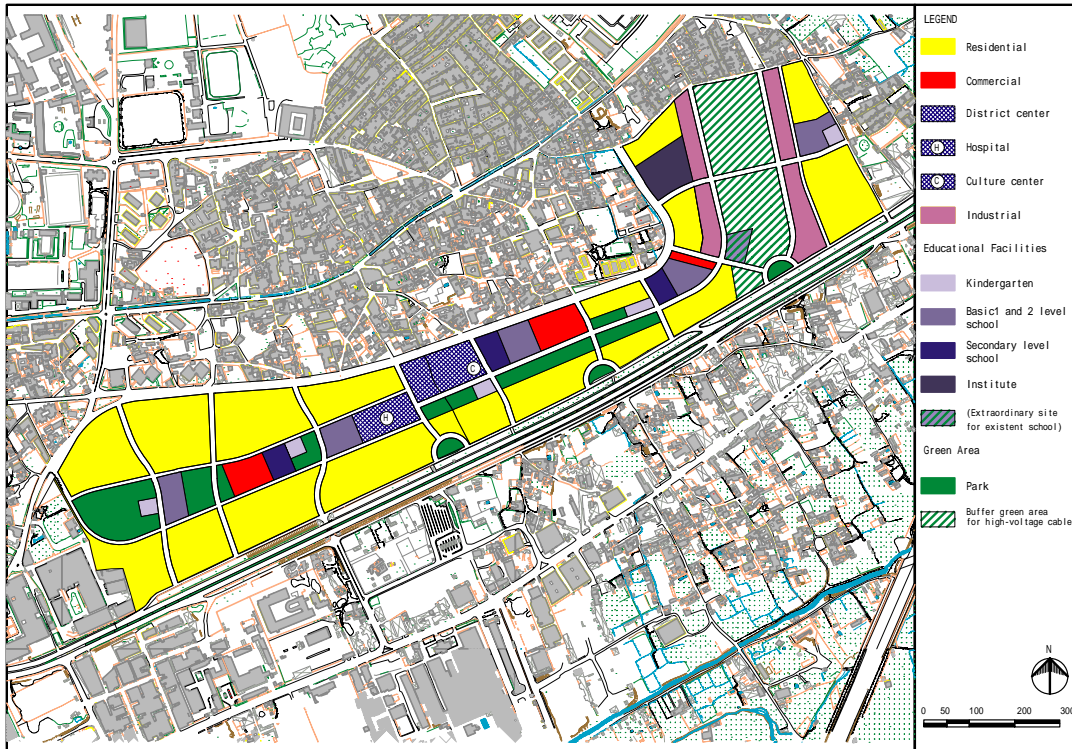


Figure 18 Land Use Plan for the Project

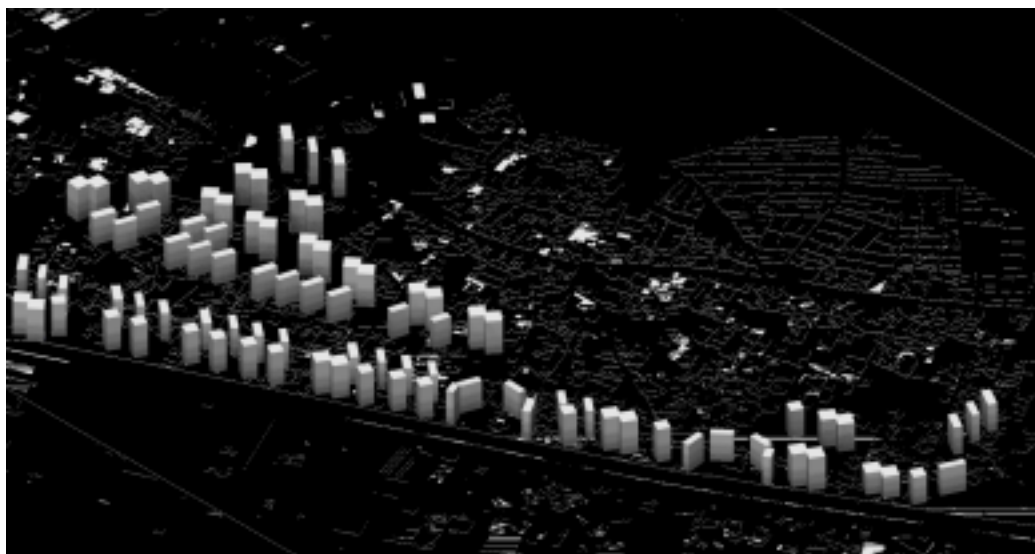


Figure 19 Perspective of the Project Development