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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 2
Master Plan Report**

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

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

Final Report

Volume 2: Master Plan Report

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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

Chapter 1 Introduction

1.1 Background

(1) Urbanization in Syria

The historical development of Syria, extending over some 5,000 years, has been led almost always by international trade, which has been supported by the urban development and strengthening relationships between cities. Comparative importance of cities changed by age under various regimes such as cities on the Mediterranean coast, Aleppo and Palmyra, but Damascus has always been the most important center of the international trade at least since the Arab empire under the Umayyad dynasty established its capital there in the year 661. Damascus continued to develop as a center of the Islam under the succeeding regimes.

Reflecting the historical development of cities as bases of international trade encompassing the large expanse of land from the East to the West, the urbanization in Syria proceeded from ancient times. The urbanization ratio in Syria was 53.7% in 2004, considerably higher than in countries of comparable economic levels in other parts of the world. Of the total urban population of 9.6 million in 2004, 1.55 million or 16% lived in the Damascus governorate.

(2) Damascus metropolitan area

The total population in the Damascus metropolitan area (DMA), defined here as the combined jurisdictions of the Damascus governorate and the Rural Damascus governorate, was 3.82 million in 2004, of which some 79% or 3.02 million is urban, accounting for 31% of the total urban population in Syria. The population growth in the DMA, however, has decelerated in recent years. Still, Rural Damascus is the largest receiving area of internal migration in Syria.

The first master plan for Damascus was prepared in 1930's by a French firm. Subsequently, a master plan for the target year of 1985 was prepared during 1964-68 by a team of experts led by Ecochard and Banshoya. The third attempt to prepare a master plan started in 1991, and a draft map showing the plan in 1 to 10,000 was published in 2001. The Damascus governorate, under the direction of the Ministry of Local Administration and Environment (MOLAE), employed the General Company for Engineering Services and Consulting to prepare a regional plan for the DMA and its structure plan. These are now in review and have not been finalized yet.

According to the project manager engaged in the latest master planning, these plans are not sufficient to deal with the issues facing the DMA in the following aspects (Municipal

Administration Modernization Project in Syria, Identification Report, October 10, 2003).

- 1) The land ownership and cadastral system would constrain the implementation of the master plan;
- 2) Many of the potential urban development areas in the DMA are still under the military control;
- 3) Planning for water supply and sewerage is not included;
- 4) The transportation infrastructure is planned, but a separate plan for subway exists;
- 5) No proposal is made for changes in the administrative boundaries of the DMA; and
- 6) Detailed urban plans do not cover any informal housing areas.

The urbanization in the DMA has proceeded without a formal and effective master plan, since the Ecochard-Banshoya plan has been outdated and recent plans have not been adopted formally. As a result, various urban problems have emerged. Most serious problems are the following.

- i) Informal housing has been expanding rapidly, especially on the southern slope of the Mt. Qassyoun and in the traditional greenery with farmland called Al Ghouta extending in the southern suburbs of the Damascus city.
- ii) The living environment has been degrading due to the rapid population increase, represented by increasing solid wastes, degrading water quality, and tightening water demand and supply balance.
- iii) The traffic congestion in the city center has been worsening together with related pollution and traffic safety problems.

(3) Study authorization

To guide the urbanization of the DMA, addressing to the existing and anticipated urban problems, an integrated urban development plan needs to be prepared for strategic and sustainable development of the DMA. The Government of the Syrian Arab Republic, therefore, made a request to the Japanese Government for technical cooperation to prepare such an urban development master plan for the DMA. In response, the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of the technical cooperation program of the Japanese Government, has decided to conduct the Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area in Syria Arab Republic (the “Study” hereinafter).

1.2 Study Area and Objectives

(1) Study area

The Study will be conducted encompassing the three levels: (1) Syria as a whole, (2) the Damascus metropolitan area (DMA), and (3) a district within the DMA. First, the medium to long term development scenario for the Syrian socio-economy will be conceived, and the position of the DMA to support it clarified. Second, an urban development master plan is prepared for the DMA defined tentatively as the territory of the Damascus city and its vital surrounding area in the Rural Damascus governorate within the 30km radius from the city center, more or less. The exact area of the DMA will be determined through the discussions with the Syrian side during the Study. Third, a specific district will be selected within the DMA for preparation of a detailed urban plan.

(2) Study objectives

Based on the scope of work agreed between the Syrian side and JICA, the objectives of the Study are defined as follows:

- 1) To propose the long-term scenario for sustainable socioeconomic development of Syria;
- 2) To prepare the urban development master plan for the Damascus metropolitan area (DMA); and
- 3) To effect the capacity development of the Syrian counterpart personnel through the planning.

1.3 Work Progress

(1) First year

A team of experts led by RECS International Inc. in association with Yachiyo Engineering Co., Ltd. was nominated by JICA to undertake the Study. The JICA Study Team started preparatory works in Japan and compiled the Inception Report in September 2006. The first fieldwork started upon the arrival of the first group of the JICA Study Team in Syria on September 20, 2006. The JICA Study Team had a series of discussions with the counterpart organizations on the scope of work for the Study based on the Inception Report. The first meeting of all the counterpart experts took place on September 21, and the first Steering Committee meeting convened on September 24.

Upon the request by the JICA Study Team, core members of the Syrian counterpart team were selected to work with the JICA Study Team on the daily basis more or less. The office of the JICA Study Team was established within the Damascus governorate, and the Syrian counterpart team established its office next to it.

The Syrian/JICA joint team conducted data collection and analyses, field survey and other works together as much as realistically possible. To supplement readily available data and study report, a few surveys were undertaken during the initial period. They are (1) environmental baseline survey, (2) traffic survey, and (3) existing land use mapping with GIS data compilation.

To effect the joint work exchanging ideas and sharing experiences between the JICA Study Team and the Syrian counterpart team, several seminars and workshops were conducted. The Syrian counterpart team provided briefings to the JICA Study Team on urban and architectural heritage, ongoing master planning by Syrian experts, and urban planning institutions in Syria. A series of seminars were carried out by the GIS expert of the JICA Study Team, covering software, database, application to urban planning and other aspects of GIS. Problem identification and analysis workshops were conducted by the public consultation expert of the JICA Study Team on December 11 and 20, participated by some 15 members of the Syria/JICA joint team. The core problem facing the DMA was identified, problem interactions analyzed, and the problem tree elaborated by the participatory approach.

The Syrian/JICA joint team visited all the service departments in the Damascus city and most districts (Nahiya) in Rural Damascus together to clarify the existing conditions and characteristics of different parts of the DMA. Of the field visits to all the governorates in Syria for comparative analysis, the visit to the Eastern region was participated by selected counterpart experts as well.

A stakeholder meeting was held on January 29, 2007 participated by all the counterpart experts and other experts and officials representing related government agencies and private organizations. At the meeting, the JICA Study Team presented the outcomes of the Study, starting from the macro analysis on the Syria's socio-economy, followed by frameworks for the DMA urban development including the three planning concepts of economic efficiency, human security and cultural city established based on the participatory problem analysis. Various comments were received from many participants.

Subsequently, urbanization potentials of different areas in the DMA were analyzed, and directions of the DMA urban development examined. These were elaborated through discussions with decision makers of the counterpart organizations as well as the Syrian counterpart experts. The survey conducted by Syrian experts contracted with the JICA Study Team were completed.

A draft Progress Report was translated into Arabic, and distributed to related organizations on the Syrian side at the beginning of March. Based on it, the second meeting of the Steering Committee was convened on March 7, in the presence of the JICA head office

mission that visited Syria. The contents of the Progress Report were generally endorsed by the Steering Committee. To discuss technical aspects contained in the draft Progress Report in more detail, a technical meeting was held on March 11.

(2) Second year

The fieldworks for the second year resumed in late April 2007, after the contract between JICA and the Consultant was renewed. At the beginning of the second fieldwork period, the JICA Study Team had a series of discussions with the counterpart agencies to clarify the scope of works for the Study during this period and confirm the expectation for the Study and need to involve other related agencies, particularly those providing comments on the Progress Report submitted in March, in the Study.

Responding to the request by the Syrian side, JICA decided to support the supplemental work for existing land use analysis covering the area not covered during the first fieldwork period. This work was entrusted to the same local consulting team in early May, and the results were obtained in June. Incorporating these results as well, land use analysis and planning have been conducted by using a GIS.

Planning for urban development has been undertaken jointly by the JICA Study Team in cooperation with the Syrian side, particularly the Master Plan Department of the Damascus governorate and the General Company for Engineering and Consulting (GCEC) as well as other counterpart experts. The urban development plans have been prepared not only for the Damascus city and its vicinities but also for a few urban centers planned to be developed in the outer suburbs.

Throughout the period, regular weekly meetings have been held by the Syria/JICA joint team. Most meetings were operated as working sessions to plan and check various works and discuss and resolve pending issues. In addition to joint planning works, two specific works were conducted by the initiative of the Syrian counterpart team. First, a survey, called a photo voice survey, was conducted to clarify the perception of residents, officials and others on the value and utility of Old Damascus. Second, a series of community workshops were conducted for some informal housing areas.

Areas for detailed planning have been selected also jointly by the JICA Study Team and the Syrian side. In particular, a task force was formed within the Syrian counterpart team to examine and select candidate areas with the JICA Study Team. The final decision was made at weekly meetings of the Syria/JICA joint team.

Compiling the results of all the works undertaken during the first half of the second fieldwork period, the Interim Report was prepared. The Report contained the first draft of the

Master Plan for the DMA urban development. The third meeting of the Steering Committee was convened on September 1 to discuss on the Interim Report, and the first seminar was organized on September 2 to disseminate proposals contained in the Report and receive initial comments. Both meeting turned out to be quite successful in terms of attendance and substantive discussions that took place.

The Study proceeded immediately after the submission of the Interim Report into the final stage through December. The works in this stage were suspended during the Ramadan period except surveys entrusted to Syrian consultants and training programs in Japan. Four members of the Syrian counterpart team received a customized training, and additional four members received training in three group training courses in Japan.

Main works for this stage were related to detailed planning for the areas selected as described above. A task force was formed for joint planning works by Syrian and JICA experts for each of the three selected areas. Planning has been conducted in a participatory way to the extent possible under the time and resource constraints. In particular, community workshops were conducted for the selected informal settlement and urban heritage areas.

The results of the surveys entrusted to Syrian consultants were obtained during October through November. They were examined by the Syria/JICA joint team, and used for sector planning and detailed planning. Initial environmental examination (IEE) was conducted for the three selected areas for the detailed planning.

Throughout this final stage, regular weekly meeting have been held by the Syria/JICA joint team. A series of special sessions were organized to share the experiences of selected Syrian experts participated in the training in Japan. The trainees made presentations on their experiences, and discussions followed, facilitated by the JICA Study Team.

Extensive comments were received on the Interim Report from many related organizations and individuals. They were reviewed carefully by the JICA Study Team, and the response to them was conveyed formally in writing to MLAE. Some comments were found to be beyond the scope of the Study, although they present some important subjects for follow up studies after the Study.

The results of all the works were compiled into the Draft Final Report (DFR). The comments received on the Interim Report were reflected in the DFR as relevant. The fourth meeting of the Steering Committee was convened on December 5 to confirm the progress of the Study. The JICA study Team reported the progress of the Study including the clarification of how the comments on the Interim Report were reflected and the preview of detailed plans being prepared for the three selected areas. To present the contents of the Draft Final Report widely and receive comments, the second seminar was organized on December 16.

Extensive comments on the Draft Final Report were received from 17 organizations by February 15, and transmitted to the JICA Study Team after translation. All the comments were reviewed carefully, and it was made clear that most comments were proposing follow-up activities after the Study. Other comments have been reflected in the Final Report produced in Japan. The Final Report consists of the four volumes as listed:

- 1) Executive Summary,
- 2) Master Plan Report,
- 3) Report on Detailed Plans, and
- 4) Sector Report.

1.4 Structure of the Master Plan Report

This report represents Volume 2: Master Plan Report. The remaining part of the Report is structured in the following way. In Chapter 2, existing conditions and prospects are analyzed at the macro level of Syria and at the meso level of regions. First, the present socio-economy of Syria is briefly reviewed, and issues for further socio-economic development clarified. Second, the results of the diagnostic analysis of the five regions in Syria, except the DMA itself, are presented. For each region, existing conditions are described, major constraints to development identified, and main prospects for further development indicated. In Chapter 3, the macro frameworks and development scenario of Syria are presented to set a broad framework for the development of the DMA. Chapter 4 presents the basic conditions to be satisfied for the DMA urban development. In Chapter 5, the objectives and strategy for the DMA urban development are established.

In Chapter 6, frameworks and scenario for the DMA urban development are presented. The frameworks consist of socio-economic framework covering population, employment and GRDP, and spatial framework to indicate urbanization pattern and distribution of population and employment opportunities in the future. Chapter 7 presents a revised master plan for the DMA urbanization, consisting of the land use plan, development plan by sector, and development programs and projects. Institutional measures for the DMA urban development are proposed separately in Chapter 8. In Chapter 9, an implementation program is proposed. First, development phasing is clarified based on the analysis on possible budget allocation by the governments. Second, an indicative investment schedule is worked out within the financial framework specified by the development phasing.

Chapter 2 Macro and Meso Level Analyses on National and Regional Socioeconomies

2.1 Socioeconomy of Syria

2.1.1 Overview of recent performance

(1) Performance in recent years

The socio-economy of Syria is summarized in Table 2.1 by selected indices. The Syrian economy developed after the independence in 1946, supported mainly by the trade and related services activities and agriculture in the Mediterranean coast and the Orontes river basin in the west and the Euphrates river basin in the east. The economic structure has been changing as the petroleum production increases in the Eastern region, particularly since the discovery of the oil reserves in 1984. Oil production increased in 1990's, and natural gas reserves were found near Palmyra to further support the economic growth. The Syrian Government introduced the new Investment Law in 1991 to encourage the private sector activities and promote foreign direct investments.

The Syrian economy, however, stagnated during 1990's. This is presumably due mainly to the continued security expenses necessary to maintain peace in the region, unstable agricultural production and slow progress of the economic reform such as the delay in improvement of foreign exchange system.

The growth of the Syrian economy has been slow in 2000's, and the average growth of the GDP was 2.9% per annum during 2000-05. The modest growth has been led mainly by the oil production and agriculture, each of which claims about a quarter of the GDP, respectively. The GDP growth due to the oil production after 2005, however, depended on the escalated oil prices, while the oil production stagnated.

The gross capital formation in Syria has been at relatively high levels in recent years, corresponding to 25% of the GDP, more or less. The gross saving to the GDP has been at the 30% level also in the recent years. Even the modest economic growth during 2000's helped to turn the trade and current account balance positive in 2004. While both foreign direct investments and grant-in-aid have been decreasing, the Syrian macro economy is supported by the steady export performance. The debt service ratio to the export value has stayed at the 5% level.

Syria ranks at the average level of the lower middle income countries by most social indices. The infant mortality rate and the malnutrition rates are lower than the respective

averages, while the adult literacy rate is lower than the average for the income category. The poverty incidence is reported to be 20%, and the HIV infection rate less than 0.1% of the total population.

Table 2.1 Selected Macro Economic and Social Indicators of Syria

	Unit	1984	1994	2001	2002	2003	2004	2005	Sources
Gross domestic product	current US\$ billion	17.5	20.1	21.2	23.0	22.9	24.9	27.3	(1) 2001-05;(2) 1984-94
GDP	real % p.a.			3.7	3.7	1.0	3.1	2.9	(1)
GDP structure- Agriculture	%	19.5	27.8			23.5	23.5		(2)
Industry		22.8	17.9			28.6	27.1		
Services		57.7	54.2			47.9	49.4		
Per capital GDP	real US\$					1,265	1,339	1,468	
Population	million					18.1	18.6	18.6	(3) 2003-04;(4) 2005
Export (total fob)	US\$ million	1,850	3,300			5,593	4,823	6,344	(2);(4) 2005
Mineral fuels& lubricants		1,176	2,000						
Manufactured goods						263	266		
Import (total CIF)	US\$ million					5,001	5,177	5,973	
Fuel &energy		1,402							
Capital goods			2,125			2,369	2,450		
Trade balance	US\$ million	-2,246	-1,023			-354	495	371	
Net current transfer		0	591			487	499		
Current account balance		-2,023	-852			-477	514	1,097	
GDP deflator	%			2.9	7.1	-1.2	8.2	10.1	(1)
Social development indices									
Life expectancy at birth						73.4	73.6	70.3	(3) 2003-04;(4)2005
Total fertility						3.4	3.3	3.4	
Infant mortality rate	per1,000 live births						15.0	28.6	
Child mortality rate	per 1,000						16.4		(3)
Literacy rate							79.6		
Primary school enrollment	%gross					122.1	122.9		
Malnutrition rate	%of children under 5			(6.9)					
Poverty incidence	%						20		(4)
HIV infection rate	%of people			0.1					
Gross fixed capital formation	%of GDP	25.5	30.0	-	-	23.7	23.1		(2)
Gross domestic saving	%of GDP	13.7	17.6	-	-	30.9	29.9		
Foreign direct investment	US\$ million	0	251	-	-	150			
Grant-in-aid assistance	US\$ million	641	118	-	-	83			
Debt service ratio	%of export value	45.3	5.7	-	-	4.6			

Sources: (1) IMF, Staff Report for the 2006 Article IV Consultation, July 2006
(2) World Bank, Syrian Arab Republic at a glance, August 2005
(3) World Bank, Syrian Arab Republic Data File, April 2006
(4) CIA, The World Fact Book - Syria, September 2006

(2) Comparison with neighboring countries

To further clarify the characteristics of the Syrian macro economy, the comparison with neighboring countries by selected indices are presented in Table 2.2 and Table 2.3. As shown in Table 2.2, Syria ranks low among the neighboring countries by the per capita GDP, but the per capita GDP by purchasing power parity is reported to be US\$3,900 in 2005 (CIA, op. cit.). Syria has the longest life expectancy of all the countries compared, and the adult literacy rate is at the comparable level. There exist, however, gender variance with 89.7% literacy rate for male and 64% for female (estimates for 2003).

Table 2.2 Comparison of Syria with Other Countries by Macro Indices, 2004

Country	Population (million)	Land area (1,000km ²)	GDP (US\$ billion)	Per capital GDP (US\$)	Life expectancy at birth (years)	Adult literacy rate (%)
Syria	18.6	185	23.1	1,242	74	83
Lebanon	4.6	10	21.8	4,739	71	-
Jordan(1999)	4.7	98	7.5	1,596	71	89
Turkey	71.3	779	302.8	4,207	69	88
Egypt	68.7	1,001	75.1	1,093	69	-
Saudi Arabia	23.2	2,150	250.6	10,802	73	79
Japan	127.8	378	4,623.4	36,177	82	99

Source: World Bank, _____ at a glance for each country

The ratio of fixed capital formation to the GDP in Syria is the second highest next only to Turkey in 2004, and the ratio of gross domestic saving to the GDP in Syria is also the second highest next only to Saudi Arabia both in 1994 and 2004. It is interesting to note that in these countries, foreign direct investment and grant-in-aid assistance are not significant sources of gross capital formation. In Syria, the reduction of large financial support from Saudi Arabia during 1980's and stagnant foreign direct investments have changed the structure of capital formation in recent years. The latter may have much to do with the misperception that Syria is a high risk country.

Table 2.3 Comparison of Investment and Saving Structure, Syria and Other Country

Country	Gross capital formation (% to GDP)		Gross domestic saving (% to GDP)		Foreign direct investment (% to GCF)	Grant -in- aid assistance (% to GCF)		
	1994	2004	1994	2004	1994	2004	1994	2004
Syria	30.0	23.0	17.6	29.9	8.3	2.2*	3.9	1.2*
Lebanon	32.4	21.2	-25.1	1.2	0.8	7.7*	3.3	2.3*
Jordan**	23.7	22.5	5.0	2.8	-0.1	3.2	22.2	-
Turkey	21.6	25.7	22.5	19.9	0.2	2.4	0.6	0.2
Egypt	16.6	17.0	11.4	14.8	14.5	1.7	13.8	3.9
Saudi Arabia	19.9	18.9	27.8	46.7	-	-	-	-
Japan	28.2	24.0*	30.2	25.6	0.8	0.6*	-	-

*2003;**comparison between 1989 and 1999

Source: Same as Table 2.2

2.1.2 10th Five Year Plan

The Syrian Government characterizes the 10th Five Year Development Plan (2006-10) as a transitional plan from the centrally planned economy to the social market economy. Other main characteristics of the Plan are:

- (1) indicative plan rather than a definitive plan,
- (2) adoption of participatory approach to development,
- (3) regional and local plans within the national plan,
- (4) adoption of poverty mapping to effect social justice, and
- (5) clarification of roles in plan implementation by different stakeholders such as the Central Government, local governments, the private sector and citizens' groups.

Through the Plan implementation, Syria envisions to pursue the realization of mature, modernized, well-educated and cultivated society. Thus, Syria would play important roles in the Arab and the regional societies, adopting an open socio-economy, while achieving welfare and equity within its own society.

Three strategic pillars of the Plan are:

- (i) sustainable development,
- (ii) good management of public goods and institutions, and
- (iii) balanced development of regions through planning.

Related to the third point, the Plan particularly emphasizes the development of the Eastern region. The following initiatives defined for the Eastern region represent the basic policy of the Government for regional development:

- 1) Creation of such economic environment that would attract investments and increase the private sector contributions;
- 2) Development of individual and institutional capacities through training and administrative development;
- 3) Enhancement of value-added sectors to generate income and reduce poverty such as agro-industries, trade and transport, and tourism; and
- 4) Provision of improved education and health services, environmental quality and economic infrastructure.

To attract foreign direct investments throughout regions, the Government is determined to undertake the legislative and administrative reform, enact a new labor law, and introduce investment promotion measures.

The Plan presents alternative scenarios for economic development of Syria, by which the economic growth in the range of 1.2-7% per annum is examined. Under any alternative, the

industrial sector is considered the main driving force for economic development, while different scenarios are examined for agriculture. Under any scenario, the contribution of the oil and mineral resources sector is expected to decline. Banking and insurance, trade and other services are expected to attain the highest growth.

The Plan sets various targets to be attained during the five year period, other than the economic growth rate up to 7% per annum. The unemployment rate is to be reduced to below 8% (12.3% estimated for 2004), budget deficit and the trade deficit to be controlled within 5% of the GDP, respectively. To support such economic growth, the total investment should maintain levels higher than 25% of the GDP, of which 70% may be supported by the public sector and 30% by the private sector. This implies that the investment efficiency to attain the 7% annual growth of the GDP should be better than the capital-to-output ratio of 3.6.

2.1.3 Issues for Socioeconomic Development of Syria

Given the recent performance of the Syrian socio-economy as outlined above 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 socio-economy may be 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.

2.2 Development Diagnosis by Region

A simple diagnostic analysis is conducted on different regions in Syria based on the statistics and other readily available materials as well as limited field surveys and interviews. The purpose of the analysis is to clarify the position of the DMA in the Country in relation to other regions. For the purpose of the analysis, the definition of regions follows the one commonly adopted in the national plan.

Basic data on the regions are summarized in Table 2.4. More detailed data on some aspects are given in Table 2.5 through 2.7. For each of the five regions, except the DMA,

existing conditions are clarified for various aspects, major constraints to development identified, and prospects for development indicated. Based on the analysis in this section as well as field surveys and discussions with stakeholders, the position of the DMA will be clarified in Section 4.4.

2.2.1 Northwestern region

(1) Existing conditions

1) Overview

The northwestern region, consisting of Aleppo and Idleb, has the combined land area of 22,242km² (12.0% of the national land) and the total population of 5,303,575 (29.6% of the national population) in 2004. It is bordered on Turkey in the north, and links the coastal areas with the inland by railways to the north, south, east and west centered on the city of Aleppo as well as highways. The link with the Mediterranean region will be improved by the Ariha - Lattakia highway under construction.

The city of Aleppo is considered a functional capital of the entire northern Syria. The people in the region include Moslem and Christian people, and large Kurd and Beduin population. The region is considered one of oldest inhabited areas in Syria.

Highland areas of Idleb have mild summer and very cold and rainy winter, but the climate in Aleppo is largely continental with hot summer and very cold winter.

Table 2.4 Basic Data on Six Regions of Syria, 2004

		Northwestern	Mediterranean	Southern	Central	Eastern	DMA
Land area	km ²	24,600	4,180	11,140	51,100	76,020	18,140
Total population	1,000	5,304	1,581	1,223	2,914	3,073	3,825
Population density	/ km ²	216	378	110	57	40	211
Urban population	% of total	55.4	41.1	39.7	45.9	38.8	79.0
Working age population	% of total	54.5	65.0	56.1	56.9	53.5	56.9
Population increase (1994-2004)	% p.a.	3.2	1.7	2.8	2.3	3.0	2.3
Internal migration (1995-2005)							
In migrants		11,237	18,830	9,232	12,788	4,445	82,717
Out migrants		17,131	10,473	11,096	14,988	18,136	67,423
Net migration		-5,896	8,358	-1,865	-2,201	13,690	15,294
All establishments	no.	168,532	66,783	36,352	103,758	65,621	159,995
Large establishments employing over 50	no.	60	12	4	30	2	99
Industrial establishments	no.	35,073	7,701	4,402	15,285	7,362	29,878
Land use	%						
Forest		5.2	27.8	1.8	2.5	1.9	3.1
Steppe and pastures		11.1	1.2	22.7	58.9	45.0	72.7
Uncultivable		19.5	17.7	23.7	22.6	20.2	12.6
Cultivable		64.1	53.3	51.8	15.9	33.0	11.6
Cultivated		54.8	50.5	26.5	8.0	27.2	7.1
Wheat cultivated area	ha	416,834	26,503	100,623	123,434	1,058,186	17,470
Wheat production	ton	1,130,927	53,829	172,500	355,233	2,870,030	66,884
Wheat yield	ton/ha	2.71	2.03	1.71	2.88	2.71	3.83
Important crops (share in national production)	%	olive(57.6) barley(47.0) lentil(47.2) potato(51.3) pistachio(57.5)	tomato pulses other vegetables citrus	apple other fruits vegetables	barley(17.9) sugarbeat(16.6) pistachio(41.4) potato(24.7)	wheat(58.4) barley(34.0) lentil(44.0) cotton(68.6)	
Cattle population		116,416	83,642	64,353	150,395	300,934	189,326
Sheep population		2,942,964	27,384	721,948	4,123,351	3,836,258	1,328,079
Urban centers (population in 2004)	1,000	Aleppo(2,132) Idleb(99) Manbage(99)	Latakia(384) Tartus(114)	Dara'a(98) Sweida(74)	Homs(653) Hama(313) Salameya(67)	Derezor(212) Raqqqa(220) Qamishli(184) Hasakeh(192)	Damascus(1,552) Duma(111) Sut Zenab(136) Jaramana(114) Harasta(69) Daraya(79) Hajar Aswad(85)

Sources : 2004 Census

Marwan Khawaja, Internal Migration in Syria : Finding from a national survey, 2002

CBS, Statistical Yearbook 2005

CBS, Results of Establishment Survey 2004

2) Land and water recourses

Aleppo has the second largest cultivable area of all the governorates next only to Al Hassakeh, accounting for 66% of the governorate land. Over 80% of the cultivable land is already cultivated, but still some 20,000ha land is available for agricultural development. It has limited land for livestock raising with steppe and pastures occupying only 12.3% of the total land.

In Idleb, close to 60% of the land is cultivable, which is practically all used already. The forest area covers 13% of land or 790 km², the third largest following Al Hassakeh and Lattakia. Steppe and pastures cover only 8% of land.

Table 2.5 Urban and Rural Population, and Working Age Population by Governorate, 2004

Governorate	Population		Total	Working age population	Ratio (%)	Ratio of population below 14yrs.old (%)
	Urban	Rural				
Damascus	1,551,906	-	1,551,906	976,409	62.9	32.2
Rural Damascus	1,469,557	803,516	2,273,073	1,201,201	52.8	38.6
Homs	821,594	707,807	1,529,401	867,993	56.8	37.5
Hama	516,067	868,885	1,384,953	789,629	57.0	39.5
Aleppo	2,579,578	1,465,571	4,045,149	2,223,433	55.0	42.4
Idleb	357,262	901,165	1,258,426	664,920	52.8	43.9
Lattakia	452,045	427,496	879,541	572,816	65.1	29.9
Tartous	198,098	503,287	701,385	454,760	64.8	29.6
Dara'aa	389,674	453,794	843,468	451,635	53.6	43.5
Al Sweida	96,084	217,147	313,231	203,038	64.8	29.4
Al Quneitra	-	66,627	66,627	32,019	48.1	41.4
Al Hassakeh	454,616	820,502	1,275,117	712,369	55.9	41.0
Deir-Ezzor	437,957	566,780	1,004,737	509,295	50.7	46.7
Al Raqqa	299,912	493,592	793,504	421,908	53.2	44.3
Syria	9,624,350	8,296,169	17,920,519	9,917,020	55.3	39.4

Source: 2004 census

Table 2.6 Internal Migration by Governorate, 1995-2005

Governorate	In migrants	Out migrants	Net migration	Annual net migration (%)
Damascus	17,308	56,076	-38,768	-5.33
Rural Damascus	65,409	11,347	54,062	6.17
Homs	5,357	9,713	-4,357	-0.70
Hama	7,431	5,275	2,156	0.40
Aleppo	5,592	11,254	-5,663	-0.38
Idleb	5,645	5,877	-233	-0.05
Lattakia	9,735	6,472	3,264	0.85
Tartous	9,095	4,001	5,094	1.76
Dara'aa	5,615	2,900	2,715	0.91
Al Sweida	3,495	3,804	-310	-0.24
Al Quneitra	122	4,392	-4,270	-16.70
Al Hassakeh	1,747	10,719	-8,972	-1.74
Deir-Ezzor	1,964	2,084	-120	-0.03
Al Raqqa	734	5,333	-4,598	-1.68

Source: Mawan Khawaja, Internal Migration in Syria : Findings from a national survey, Fafo-report 375,2002

Table 2.7 Number of Economic Establishments by Governorate

Governorate	Total no. of establishments	share (%)	No. of private establishments			Large establishments employing over 50	share (%)
			Urban	Rural	Total		
Damascus	78,946	13.1	75,632		75,632	17	8.2
Rural Damascus	81,049	13.5	56,651	20,271	76,922	82	39.6
Homs	57,532	9.6	36,353	17,152	53,505	20	9.7
Hama	46,226	7.7	24,104	18,137	42,241	10	4.8
Aleppo	134,454	22.4	109,414	16,771	126,185	52	25.1
Idleb	34,078	5.7	15,066	15,202	30,268	8	3.9
Lattakia	35,772	6.0	24,011	9,030	33,041	7	3.4
Tartous	31,011	5.2	13,192	15,143	28,335	5	2.4
Dara'aa	21,713	3.6	11,347	8,031	19,378	4	1.9
Al Sweida	12,706	2.1	5,833	5,194	11,027	0	0.0
Al Quneitra	1,933	0.3	468	1,037	1,505	0	0.0
Al Hassakeh	28,301	4.7	14,758	9,038	23,796	1	0.5
Deir-Ezzor	20,816	3.5	13,299	4,405	18,204	1	0.5
Al Raqqa	16,504	2.7	9,641	4,291	13,932	0	0.0
Syria	600,993	100.0	410,229	143,702	553,971	207	100.0

Source: CBS, Results of Establishment Survey 2004

Water availability is generally favorable in the Northwestern region. Aleppo benefits from the water from the Assad reservoir drawn at 16m³/sec, which is used for irrigation and industrial purposes as well as domestic water. The fertile land extends also along the Afrin river for irrigated agriculture. Idleb benefits from the ample water of the Orontes river as well as fertile soil.

3) Economy

Main crops commonly produced in both of the governorates include wheat, olives, cotton and various fruits. Characteristic crops produced in Aleppo are pistachio and watermelon, and Idleb has over 7 million fruit trees consisting of cherries, apricot, plum, pomegranate and others. Olives are found mostly on slopes in the region, and pistachio is dominant in areas closer to the city of Aleppo. The fertile land along the Afrin river is used mainly for orchards. An extensive experimental farm of the International Center for Agricultural Research in Dry Areas (ICARDA) exists in Aleppo.

The Northwestern region is the most important area for olive production in Syria, and produce 57.6% of olives in 2003. Other crops having dominant shares in the national production include barley (42.0%), lentils (47.2%), potato (51.3%) and pistachio (57.5%). Also, three crops controlled by the Government have large shares in the region: wheat with 23.0%, cotton 20.0% and sugar beet 29.8%. Reflecting the limited grazing land, the livestock population has much smaller shares: cattle with 12.4% and sheep 19.2%

Aleppo is the industrial center of Syria with 134,454 industrial establishments in 2004, accounting for 22.4% of the total in Syria. Idleb adds 34,078 establishments or 5.7%. Textile and related industries are most dominant industries in Aleppo. Other industries include glass making, ceramics, cement and some heavy industries started recently including steel bars and

aluminum products based on imported materials. A special area exists in the south for tanneries. Idleb has a government sugar factory and olive oil mills.

The Shaikh Najjar industrial city is newly developed in the south of the Aleppo city by the Industrial City Authority. Environmental concerns of the governorate are reflected in the development. Of the total area of 4,200ha, some 1,000ha are devoted to greenery. Priority sub-sector industries expected to establish is food processing, chemical products, engineering and textile. The water drawn from the Assad lake will be utilized for industrial water. Also, the establishment of a free trade zone along the northern border has been negotiated with Turkey.

Being one of the oldest inhabited areas in Syria, the northwestern region abounds in archeological sites dating back to millennia B.C. In Idleb, one of the most important archeological sites exists in Ebla, and Mwa'arrat Annoman has many archeological sites and museum. Tourism recourses in the city of Aleppo are led by the Aleppo citadel considered as the most impressive historical monument and the great Umayyad mosque (Jamie Zakariyyah). The city is known also for its Christian quarter of Armenians. The Aleppo city is considered the third most important city in the Islamic world because of many mosques and schools (Madrasseh). Other important archeological sites in the region include the Basilica of St.Simon in Qala'at Sama'an and Ain Dara in the Afrin valley in Aleppo, and ruins of ancient Roman cities in Bara and Sarjella of Idleb. The silk road festival is organized annually, linking with Damascus, Palmyra and other sites.

The Jabboul marsh in Aleppo is semi-wet land registered under the Ramsar convention. It offers habitats of many migratory and sedentary birds and plants tolerant to salinity. A protected area is expected to be established. Sulfuric springs of Hammam Shaikh Issa and a spa resort at Jabal AL Arbaeen are additional tourist attractions in Idleb as well as the city of Ariha for a summer resort.

4) Social and demographic aspects

The population growth has been decelerated in both Aleppo and Idleb. The inter-censuses population growth was 2.35% in Aleppo and 3.35 % in Idleb annually during 1994 -2004. Internal migration is generally low in Syria, but particularly in Aleppo, practically no in-migration is observed during 1995-2005, while Idleb received some in-migrants from the Damascus city and the Rural Damascus governorate. Some Idleb people out-migrated to the southern governorates of Al Sweida and Dara'aa as well as the Damascus city during the same period.

The ratio of working age population is much lower in Idleb (52.8% in 2004) than the national average (55.3%), while the population growth is much higher in Idleb than in Syria as a

whole (2.66% inter-senses growth). This reflects comparatively large in-migrants of younger families with many children. The population below 14 years old has a 43.9% share in Idleb, much larger than the ratio of 39.4% in Syria.

The ratio of working age population in Aleppo was 55.0%, similar to the national average, but the urban-rural disparity is large: 56.6% in Urban and 51.3% in rural areas. This reflects the rural to urban migration within the governorate to seek better employment opportunities, driven by the wide spread poverty in rural areas. The poverty incidence was 19.9 in Aleppo in 2003/04, the highest of all the governorates. The poverty incidence in Idleb was 9.81 in 2003-2004, lower than the national average of 11.4.

(2) Constraints to development

Land availability is a constraint to crop production in Idleb and livestock activities in Aleppo and Idleb are constrained by limited area of steppe and pastures. Agricultural land use is well established in the Northwestern region with crops suitable for topographic, soil and climatic conditions, and there may be little room to enhance the agriculture productivity with changes in cropping patterns. The land for suburban agriculture around the city of Aleppo has been encroached by residential and industrial development.

Urban problems in the city of Aleppo constrain the development of the governorate, particularly in view of the large urban-rural disparities. Air pollution by automobiles and industries is already serious, and the traffic congestion is aggravating by increasing density of population and buildings. Water pollution in the Quaiq river caused by discharges of industrial wastewater is alleviated by the diversion of water from the Assad reservoir for river flow augmentation at 2m³/sec. Garbage collection and landfill site are expected to be improved by Japan's grant-in-aid. Of 22 informal settlements in the city, eight slum areas are expected to be developed first by the city government. The development of sewerage in expansion areas in the suburbs is also planned.

The city of Idleb, being smaller with mostly middle income people, suffers much less from urban problems. There exists practically no industry except small workshops and oil and feed mills. The city has a problem with sewage. The tourism development in Idleb is constrained by insufficient facilities as there exists only one 4 stars hotel in the city.

(3) Prospects for development

Aleppo has high potentials for industrial development due to its existing industrial agglomeration and favorable location with the artery network. The most dominant textile industry is already based on imported raw materials including synthetic fibers as well as local cotton production. Steel and aluminum products industries were recently established to

process imported materials into final products for domestic markets. Increasing number of industries will establish based on materials imported and transported from the Lattakia port.

For further development of industries and related services particularly in the city of Aleppo, the infrastructure development holds a key. The new industry city in Shaikh Najjar would provide much needed industrial land with essential infrastructure outside the city center to avoid the urban problems. For the development of related services, the urban infrastructure of the Aleppo city needs to be much improved. Creation of employment opportunities in the services sector would be effective in alleviating the poverty with the large urban-rural disparities.

Tourism development should be strategically pursued for the Northwestern region as a whole. In addition to major archeological sites, clean and quiet atmosphere of Idleb and the Jabboul marsh in Aleppo should be effectively utilized to diversity the tourism in the region. The Thawra dam with hydropower and the Assad reservoir may also be used more effectively. City beautification should be important part of tourism development in Aleppo, justified by the major tourism resources within the city and the gateway functions for eco-tourism in the Jabboul marsh area. The Aleppo airport may be upgraded to receive more international tourists directly or from the Damascus city avoiding tedious land access.

Idleb has good potentials for rural tourism combining rich rural landscape with orchards and mountains and abundant archeological sites. In particular, the ancient Roman cities would present unique opportunities for rural tourism due to their magnitude and location in orchards. Picnic areas may be provided, and trails established linking two sites in Bara and Sarjella and through villages. Utilization of local resources and products is an important condition for the success of rural tourism. Agricultural production for various fruits may be directed to tourists, and local handicraft and dishes (e.g. meat with cherries in Ariha) may be developed into attractive tourism products. Participation of local communities is another essential conditions for successful rural tourism.

2.2.2 Mediterranean region

(1) Existing conditions

1) Overview

The Mediterranean region consists of Lattakia and Tartous, and has the combined land area of 4,180km² (2.26% of the national land) and the population of 1,580,926 (8.8% of the national population) as of 2004. These are the only coastal governorates in Syria. The region is located between Turkey in the north and Lebanon in the south. Lattakia has the main port of Syria as the transshipment base for inland all the way to Iraq and other foreign countries. A

new port was established also in Tartous for the transshipment to the capital region and elsewhere. Highway and train links are well established between the two governorates, and to the east and the south.

The region has varied topography ranging from coastal plains to mountains. The climate is generally Mediterranean, but the mountainous areas have much lower temperature and high rains.

2) Land and water resources

Lattakia has some 10,000ha cultivable land, of which 90% is already cultivated. It has the second largest forest area covering 8,500ha, next only to Al Hassakeh. Practically, no grazing land exists in Lattakia.

In Tartous, close to two-thirds of land is cultivable and already cultivated. Agricultural land use is very intensive with many greenhouses for vegetable production. Forest areas cover 3,100ha or 16% of land. Practically, no grazing land exists in Tartous as well. Despite the small land area, close to 20% of the forest area in Syria exist in the Mediterranean region.

Due to its topography and geological formation, the region is very rich in water resources. Several rivers derived from the eastern mountains drain the region and develop coastal plains with fertile soil. Many springs exist particularly in areas close to the borders between the two governorates, and trans-basin diversion of water to supply the Damascus city has been contemplated.

3) Economy

The Mediterranean region is the high productivity agricultural area. Other than wheat and olives, citrus in Lattakia and greenhouse tomato in Tartous are characteristic crops in the region. The citrus and orange production in the region accounts for 98.3% and 98.9%, respectively of the national production. Tartous has more than 50,000 greenhouses, accounting for 98.5% of the total in Syria. Of all the greenhouses in Tartous, 80% are used for tomato production and the rest for other crops such as eggplant, cucumber, pepper and pulses. The greenhouse tomatoes are mainly for domestic markets, but some are exported to Europe, Turkey and Gulf countries.

Other crops are also cultivated in the field, often under sprinkler irrigation. The Al Kabeer Al Shamali river develops large coastal plains in Lattakia, where citrus, sunflower and vegetables are cultivated under irrigation as well as wheat and olives. Livestock activities are minimal due to the lack of grazing land, and in particular, the sheep population in the region accounts only for 0.2% of the total in Syria (2004). Coastal fisheries are commonly practiced, and fish is marketed mostly at local markets.

Lattakia has the largest free zone in the port area occupying 75ha. Port activities are supported by 1,700m long pier, cold storage facilities, 90,000m² warehouses and 35,000ton grain silos. A free zone and grain silos exist also in the port area of Tartous.

A crude oil pipeline reaches near the city of Tartous for shipping and refining. A new refinery was established in Banyas, following the expansion of the older refinery in Homs. With a major cement factory and a thermal power plant as well as the refinery, Banyas is considered a most polluted city in Syria. Phosphorus from Palmyra transported by train is shipped from the port of Tartous.

Despite the rich agricultural production, agro-processing is very limited in the region. There exist a tomato paste factory in Jableh, but it is not properly operated. Only a few small orange juice factories exist in the city of Lattakia. Some small olive oil mills also exist. Only major agro-processing is by a Government tobacco factory in the city of Lattakia, employing some 6,000, based on raw materials from other parts of the Country. Other manufacturing industries include textile, food, home appliances and steel bars manufacturing newly established based on imported materials.

The region has a variety of tourism resources, including beach resorts, mountain resorts and many archeological sites. Ugarit in Lattakia is considered one of most important archaeological sites in Syria. Other major archeological sites include Qala'at Salah Eddin in Lattakia, and Safita with the white castle, Crac des Chevaliers and Qala'at Al Marqab of Banyas in Tartous. The Arwad island is the only island in Syria known for the old citadel and tradition well preserved.

Lattakia has the Ras Shamra beach resort near Ugarit, and new beach resorts are developed in Tartous by a foreign company and also by the Tartous municipality. Lattakia has a protected area of 5,000ha in the mountains of some 1,800m altitude, and Tartous also has mountain areas suitable for tourism.

4) Social and demographic aspects

The population growth has been decelerated in the past 20 years in both Lattakia and Tartous. The inter-census population growth was 1.65% per annum in Lattakia and 1.79% per annum in Tartous during 1994-2004. Both Lattakia and Tartous experienced net immigration during 1995-2005 though in small scale, receiving people mainly from Damascus city and Rural Damascus, and additionally from Homs, Hama and Aleppo for Tartous. Out-migration is very limited for both governorates.

The ratios of working age population are the highest in Lattakia (65.1% in 2004), followed by Tartous (64.8%). This implies, considering also the low population growth rates,

these governorates have more mature societies with respect to population structure. The ratios of population below 14 years old are below 30% in Lattakia and Tartous, among the lowest of all the governorates.

There exists some variance in employment and poverty between the two governorates. It is reported that there are some 100,000 unemployed persons registered in Lattakia, one of the largest in Syria. This corresponds to 25% unemployment rate more or less as the labor force is estimated to be some 400,000. In Tartous, poverty and unemployment are reported to be insignificant. The poverty incidence was 11.6% in Lattakia, higher than the national level (11.4%), and 6.9% in Tartous in 2003/04.

The city of Lattakia has a Palestinian settlement and some slum areas near the coast together with military areas. The city has a national hospital and the national university of Tishreen. The city of Tartous also has a national hospital with over 300 bed capacity, and a national university was established in 1980's.

(2) Constraints to development

Agriculture in the Mediterranean region is already well established with high productivity and characteristic crops suited to local conditions. With limited cultivable land largely utilized already, there seems little room for further agricultural development. Citrus faces marketing problems, and farmers complain about low process of their products. Traditional oil mills pose environmental problems with both residues and wastewater.

Sewage treatment and solid wastes management are major concerns of cities in the two governorates. The recent law of 2005 has introduced the polluter-pays-principle, but its enforcement is difficult due to procedures involved. The sewerage system in the city of Lattakia covers 100% of residents, but one of four sewage treatment plants is not operational yet. The open dumping sites along the southeastern coast have been closed, but a new landfill site inland is not fully operational yet. In Tartous, it is difficult to find landfill sites without sacrificing productive agricultural land, and pollution of groundwater by leachates is reported for a new landfill site.

Degradation of coastal environment is a matter of serious concern. The Integrated Coastal Management Program, a joint program of Syria and Lebanon supported by EU has identified four protection areas. The Ministry of Tourism has acquired a 300m band of land along the Syrian coast since 1970, but the lack of clear policy constrain effective use and management of coastal areas.

The two main industries existing in Lattakia, tobacco and textile, may be constrained by the lack of local production of raw materials if they are exposed to competition. Further

development of industries to process imported materials into final products for domestic market may be constrained by insufficient industrial land and inadequate infrastructure.

(3) Prospects for development

Potentials for further agricultural development in the Mediterranean region are very limited. A possible exception may be expansion of greenhouse agriculture with crop diversification utilizing slope areas at the foot of, and between mountains. Opportunities may exist to produce leafy vegetables for export, partly in chilled form by air, if regular services are established from the Lattakia international airport.

Agro-processing has limited opportunity to develop. To overcome the marketing problems for citrus, more products may be processed into juice for value-added. Crop diversification for greenhouse agriculture may expand opportunities for agro-processing as well.

Industries to process imported materials into final products may further develop, conditional on the provision of industrial land with adequate infrastructure. To avoid the encroachment on limited cultivable land and the degradation of coastal environment, a few industrial zones should be designated, where common wastewater treatment and solid wastes management facilities should be provided.

Tourism development in the region would need strategic planning and proactive marketing instead of piecemeal actions as currently taken. Capitalizing on a variety of tourism resources, several tourism circuits should be developed by combining different kinds of resources strategically targeting at specific market segments of domestic and international tourism, respectively. Each governorate should take the initiative in planning and proactive marketing consistently for each circuit rather than individual tourism sites. Mobilization of local tourism agents and linkage with international agents would hold a key for successful marketing based on strategic planning.

Beautification of the cities of Lattakia and Tartous as tourism bases is another essential condition for tourism development in the Mediterranean region. In particular, the coastal road and main streets of both cities should be improved by the concept of tourism road with plants, pedestrian ways and various street furniture and monuments. Adequate standards should be established for summer houses of non-residents. Local residents may be mobilized for their maintenance.

2.2.3 Central region

(1) Existing conditions

1) Overview

The Central region is defined here as the combined jurisdictions of the governorates of Homs and Hama. It has the total land area of 51,106km² (27.6% of the national land) and the 2004 census population of 2,914,354 (16.3% of the Syrian population). Its territory contains the large desert/semi-desert area in the eastern part of Homs. The western part of the region occupies the upper-middle basin of the Orontes river, which originates in Lebanon having borders with Homs.

The city of Homs is centrally located between Damascus and Aleppo, and at the opening between the northern and the southern mountain ranges. Accordingly, the city has developed as the center of east-west and north-south traffic. It has the largest bus terminal in Syria and a major railway station for passengers and cargoes. Hama is part of most ancient inhabited areas in the Middle East.

The people in the region are mostly Moslem, but the Christian population also exists as well as the large Beduin population. In the Hama city, new districts are developing in the west.

2) Land and water resources

In Hama, close to a half (46%) of the land is cultivable, of which over 80% is already cultivated, leaving some 9,000ha for further agricultural use. The forest, and steppe and pastures areas cover 39% of the land in Hama. In Homs, only 8% of the land is cultivable as the extensive desert/semi-desert area exists in the east. Most (86%) of the cultivable area is already cultivated. Homs has the largest steppe and pastures area of all the governorates occupying 26,920km² or 66% of the governorate land, which accounts for 32.5% of the national land in this category.

The western part of the Central region is favorably endowed with water resources. The areas along the Orontes river are developed for high productivity agriculture under irrigation. The Qateeneh lake with the surface area of some 60km² is used for irrigation in 20,000ha farmland as well as the source of water supply for the Homs city. Many small dams exist in Hama on slopes of the northern mountains. From the Hama city, the Orontes river flows broad through agricultural areas and feeds into the fertile Al Ghab plain, which occupies the northwestern corner of the governorate.

3) Economy

The Central region is a livestock and dairy center, supported, among others, by the large Beduin population mainly in the eastern part of the region. In particular, the sheep population in the region exceeds 4 million, accounting for 27.0% of the total in Syria (2003). The cattle population accounts for 16.9% of the total in Syria.

The crop production in the region is well diversified. In addition to wheat commonly cultivated, the region is a major producer of barley, contributing to 17.9% of the national production (2003). Large grain silos exist in Homs. Cotton is produced under irrigation by using the water from the Qateeneh lake, but its contribution to the national production is only 3.2%. Sugar beet, another government-controlled crop, has a significant share of 16.6% in the national production, and processed at the government sugar refinery in Homs. In addition to olives cultivated dominantly on slopes, the production of pistachios increases particularly in the northern part of Homs around Mureka. The total production of pistachios in the region corresponds to 41.4% of the national production. Potato is another crop having a large share of 24.7% in the national production.

The Central region had over 100,000 industrial establishments in 2004, accounting for 17.3% of all the establishments in Syria. In particular, Homs has 20 large establishments employing more than 50. This number is the third largest among all the governorates, following Rural Damascus and Aleppo. Textile and its upstream and downstream industries are the major sub-sectors, including silk and rayon spinning and clothing. Other than the government sugar refinery, agro-industry in the region is represented by several oil mills based not only on olives but also on sunflower recently established. Several feed mills also exist.

Several larger industries are established in the city of Homs capitalizing on its locational advantage. The largest oil refinery in Syria exists in the west of the city to process domestic oil from the Eastern region, and the government fertilizer factory is located on the Qateeneh lake, employing over 3,000, to process phosphorus from Palmyra and other raw materials into phosphate and nitrate fertilizer. Metal products industries have been established recently.

A new industrial zone is developing in Hasya in the south of Homs, where the Government is providing incentives for private investors. A new thermal power plant has been established to serve the zone. Wood products industry is characteristic in Hama.

The power supply in Homs is supported mainly by the two thermal power plants established with JBIC loans and a hydropower plant in Rastan. Also, windmill power generation started in the south, to tap the dominant wind from the west.

Tourism in the Central region is supported by diversity of topography and landscape encompassing plains, mountains and deserts as well as archeological sites. The rich and

distinct archeological sites in the region are represented by the world heritage of Palmyra, Crac des Chevalier and Khaled Ibn al Waleed mosque in Homs and other less significant ones in Hama. The city of Hama with the famous waterwheels (norias) on the Orontes river is a base for various tourism in surrounding areas such as Salamiyeh, Mhardeh, Rastan, Al Sqailbiyeh and Misyaf.

4) Social and demographic aspects

The population growth has been decelerated in both Homs and Hama. The inter-census population growth was 2.31% in Homs and 2.35% in Hama annually during 1994-2004, lower than the growth rate of national population at 2.66%. Hama experienced net in-migration, while Homs experienced net out-migration during 1995-2005, but the migration rates for both governorates are quite low even by the Syrian standard.

The ratios of working age population are 56.8% in Homs and 57.0% in Hama, slightly higher than the national average of 55.3%. This fact, together with the decelerated population growth and the low migration rates, indicates that these governorates have more mature societies and yet active economies.

The poverty incidence was 9.02 in Homs in 2003/04, lower than the national average of 11.4, but 11.6 in Hama. It is interesting to note that the poverty incidence in Hama is at the similar level in its urban (11.20) and rural (11.74) areas. The variance exists in Homs with 7.92 in its urban and 10.30 in rural areas.

(2) Constraints to development

The further agricultural development in the Central region is constrained by the limited cultivable land, while water availability for irrigation is generally favorable. Crop production is well diversified, but with grains, olives and pistachios as dominant crops, the room for enhancing productivity may be limited.

The degrading environmental quality in and around the city of Homs is a serious constraint to the development of the governorate as a whole. Air pollution caused by the large oil refinery and the fertilizer plant in the western part of the city affect the city's environment due to the dominant wind from the west. Water quality of the Qateeneh lake has been degraded by effluent discharges by the refinery and the fertilizer plant. Problems with solid wastes management in the city are expected to be alleviated by the Japan's grant-in-aid.

To avoid the encroachment on the rich agricultural land extending in the north of the Homs city and in Hama, the development of the region may be guided to the south of the Homs city, centering on the Hasya industrial zone. Infrastructure constraints need to be resolved there, particularly for water supply. The presence of large military areas with two airports in

the south and the southwest of the city may be a constraining factor for the development of the southern part of the region.

Despite the central location, decent accommodations have been started to be provided only recently in the cities of Homs and Hama, and insufficient tourism facilities may constrain the tourism development in the region. The Homs city is surrounded by greens, but the green area is rather limited in and around the Hama city.

(3) Prospects for development

The major advantages of the Central region are (1) its central location on the crossroad between the east-west and the north-south traffic, and (2) its diversified economy with rich and diversified agriculture and industrial agglomeration in the cities of Homs and Hama. Based on these, the most promising direction for further development of the region is trade and tourism related services.

The city of Homs is a major distribution center for goods from all over the Country to the capital region and elsewhere. Capitalizing on this function and the existing industrial agglomeration, more industries may be developed to process materials from other regions, including some imported from the Tartous port, into final products for supply to the capital region and inland areas. For some products, the market may go beyond the national borders.

The city of Hama is a good base mainly for domestic tourism. It is located in the middle of rich agricultural area away from major cities, but yet within the range of a day trip from them. The surrounding areas have diverse topography and landscape, and abound in archeological sites and mountain resorts within easy reach from the city. The Hama city itself has several heritage objects and maintains cozy and peaceful atmosphere, symbolized by the ancient waterwheels, but its urban parks need to be further enhanced for both residents and visitors. Also, the city should be surrounded by greens like the Homs city.

These prospects mentioned above would not undermine the agricultural development in the region, which continues to be the main stay of the region's economy. Pistachios of the export quality and other agro-products should be utilized effectively as attractive tourism products with local brands as well as traditional craftsmanship for wood products and others.

Although the room for enhancing the agricultural productivity and further crop diversification may be limited, oil crops may be expanded for sunflower and possibly for temperate oil crops such as safflower as well in the highland areas. Additional oil mills may be established for high value edible oils, and residues used to make quality feed for the dairy industry.

2.2.4 Southern region

(1) Existing conditions

1) Overview

The Southern region consists of the three governorates of Al Sweida, Dara'aa and Quneitra. The combined land area of the region is 11,140km² (6.0% of the national land), including the most part of the Golan heights occupied by Israel. The total population is 1,223,326 as of the 2004 census (6.8% of the Syrian population), of which the population in Quneitra of 66,627 is all rural as the city has been left uninhabited since the destruction by the Israeli attack in 1967.

The region as a whole and in particular, Dara'aa are the southern gate of Syria. People from Jordan and Saudi Arabia enter Syria through Dara'aa, and the transit traffic between Lebanon and Jordan/Saudi Arabia passes through the region. Quneitra has been a strategic position along the transit route to/from Palestine, Jordan, Lebanon and Syria historically.

Apart from the desert/semi-desert area in the eastern part of Al Sweida, the region has extensive land between the volcanic Arab mountains in the east and the Golan heights in the west with the highest peak of Mt. Al Haramoun (2,814m above the sea). The western part of Al Sweida has mild climate with the annual rainfall of some 600mm due to the Arab mountains. Climate in Dara'aa is drier, cool in winter and hot in summer.

2) Land and water resources

Land in Sweida and Dara'aa is extensively covered by gravels of volcanic origin, but the cultivable area in these governorates amounts to 421,000ha, of which 270,000ha or 64% are already cultivated. Quneitra has additional 156,000ha of cultivable land largely unused.

Al Sweida has a large steppe and pastures area occupying 2,100km² or 38% of the land mostly in the eastern part of the Arab mountains. The steppe and pastures area is very limited in Dara'aa and Quneitra.

The Southern region is not rich in water resource endowments, but water availability is relatively favorable. The rainfalls in the Arab mountains feed the groundwater aquifers that generally flow in the western direction. In addition to several springs throughout the rural area, major springs in the northwest of the Dara'aa city creates the Mzairieb lake serving as the source of water to the city. Also, Yadudeh nearby is famous for mineral water.

In rural areas of al Sweida and Dara'aa, groundwater and many small ponds are combined for domestic and irrigation water. Strict regulation exists for groundwater use to avoid archeological sites. It is reported that excessive use of agro-chemicals in Al Sweida is causing

soil contamination and pollution of small ponds.

Al Quneitra has been known for abundant water, ranging from snowfalls on Mt. Al Haramoun in the north to hot mineral waters in Al Hemmeh in the south. The governorate is drained into the Tabariya lake, and further into the Yarmouk and the Jordan rivers.

3) Economy

Agriculture in Al Sweida and Dara'aa is well established. In addition to wheat and olives widely produced throughout the governorates, grape production in vineyards is the characteristic activities. Al Sweida is known for production of quality apples partly exported, and in Dara'aa, watermelon has been recently introduced. Other fruit produced in the governorates include peach, fig and pomegranate. Vegetable production is led by tomato, followed by eggplant, pepper, zucchini, cabbage, pumpkin and others. New water saving irrigation has been experimented by using groundwater distributed by PVC pipes.

Based on ample production of grapes and traditional culture of the dominant people, wine and araq production is commonly practiced in Al Sweida. It is undertaken as cottage industries throughout the governorate. Al Sweida is famous for traditional handicrafts such as carpets and rugs, embroidery, straw baskets and various plates. The region has 6.0% of industrial establishments in Syria, mostly in Dara'aa and Al Sweida, but only four in Dara'aa employ more than 50.

In Dara'aa, a newly developing area exists near the border with Rural Damascus. Several factories have been established along the highway, including chemical and ceramic products industries. They prefer to establish in Dara'aa to avoid strict regulation in the Rural Damascus governorate. One factory producing raw materials for detergent was forced to close down by the opposition of local residents. The American European University has been recently established in the area.

The region is a major tourism area in Syria. Among the most significant tourism objects are the archeological museum in the Al Sweida city considered one of the best in Syria, Shahba as the birthplace of a Roman emperor with famous mosaic, and Bosra with the largest Roman amphitheater accommodating 15,000 people. In particular, Bosra is one of the oldest cities in Syria, and its ancient Roman city is well preserved as another main attraction. A major festival takes place every two years in September at the amphitheater, and the Hijaz railway stops there. A new international hotel (Cham Palace) opened recently.

Al Sweida also has a small but well preserved amphitheater as well as Roman hammam, citadel and other archeological sites. A new tourism information center has been established in Al Sweida, and various festivals and exhibitions take place such as annual exhibition of vines

and apples in September. The city of Dara'aa has also a tourism information center as well as many hotels and restaurants. The city, however, does not have any significant archeological site except another Roman amphitheater.

4) Social and demographic aspects

The population growth has been decelerated in the past 20 year in Al Sweida, Dara'aa and Al Quneitra. The inter-census population growth was 1.56% in Al Sweida, 3.35% in Dara'a and 3.17% in Al Quneitra annually during 1994-2004. Only Dara'a experienced net in-migration during 1995-2005, while Al Quneitra experienced significant out-migration. In Sweida, out-migration exceeded in-migration only slightly during the same period. Main destinations of out-migrants from Al Sweida and Al Quneitra are the Damascus city and Rural Damascus. It is interesting to note that Al Sweida received significant in-migrants from Lattakia and Idleb.

There exists significant variance among the three governorates in the ratios of working age population. The ratio in Al Quneitra is 48.1%, the lowest of all the governorates in Syria, reflecting high birth and out-migration rates. The ratio in Al Sweida is 64.8%, among the highest in Syria, reflecting stable societies established in Al Sweida. The ratio of working age population in Dara'aa is 53.6%, slightly lower than the national average, but interestingly the ratios are almost the same in rural and urban areas. This may imply that the rural area in Dara'aa is as attractive as the urban area in job availability, presumably due to favorable water availability and productive agriculture. In fact, the rural area in Dara'aa contains some high density villages.

In addition to Durouz Christian communities, some Christian villages exist in Dara'a as well such as Baseer and Khabas. The poverty incidence was 17.7% in Al Sweida, 15.4% in Dara'aa and 14.9% in Al Quneitra in 2003/04, all higher than the national average (11.4%).

(2) Constraints to development

The agricultural land in Al Sweida and Dara'aa is extensively covered by gravels of volcanic origin in the middle and the southern parts. Gravels are removed and often used for hedges to create farmland. Still, soil fertility is not very high in most areas. Further agricultural development in the Southern region depends on improved land and water management.

Water resources would become the major constraint to the overall development of the Dara'aa governorate. While the availability of groundwater is relatively favorable, owing to the rainfalls in the Arab mountains, its allocation needs to be carefully planned. Over-extraction of groundwater in upstream villages may undermine the water availability in

the city of Dara'aa. The success of water saving irrigation currently experimented holds a key for balanced rural-urban development in Dara'aa. Also, the water supply for the newly developing area in the north should be planned carefully within the overall water balance in the governorate.

Based on a sewage study by the General Company for Engineering and Consulting, installation of sewers and pumping stations started for the city of Dara'aa, and a sewage treatment plant is planned for 300,000 population. Reuse of treated sewage should be part of planning for water distribution throughout the governorate.

Tourism in the Southern region is well established for both domestic and international tourists. Further tourism development in the region may be constrained by inadequate distribution of tourism facilities and their management. While a new tourism information center has been established in the city of Al Sweida, the city lacks adequate accommodations and its museum needs some rehabilitation. The city of Dara'aa lacks character to function as the tourism base despite the presence of a tourism information center as well as many hotels and restaurants. Some roads linking tourism sites and also railway links may need to be further improved as well.

(3) Prospects for development

The Southern region as a whole is a significant tourist destination by international standard, although it is less known than Palmyra, Aleppo and other major destinations. This is supported, among others, by many and well preserved archeological sites representing the Roman empire and rich cultural heritage and a variety of traditional handicrafts. The proximity to the Damascus metropolitan area and neighboring territories of Lebanon, Jordan and the Palestine adds to the advantage of the region for international and domestic tourism. These potentials are not fully realized yet.

More resources should be devoted to the tourism development in the region. They include rich agricultural products, unique culinary culture and traditional handicrafts. Fresh vegetables and fruits, and local wine and araq would make attractions by themselves if presented properly. For handicrafts, competitive approach may be taken to create a champion in each field in order to improve the product quality to fit to tastes of international tourists and to develop new products using traditional skills and design.

Private international tourism agents may be invited to link with local agents to undertake proactive marketing under the guidance of the governorates of Dara'aa and Al Sweida as well as the Ministry of Tourism. Local tourism associations may be formed to support such initiative, consisting not only of hotels and restaurants but also of producers of fruits and vegetables, and wine and araq supplying to the tourism market, and local craftsmen for handicrafts.

The intensification of agricultural land use (i.e. vertical expansion) by groundwater irrigation during the dry season would undermine water supply for domestic, industrial and other uses. Therefore, further agricultural development in the region should be by increase in cultivated area (i.e. horizontal expansion) mainly during the wet season under supplemental irrigation. Water saving irrigation should be further pursued in existing agricultural land and expansion areas. Fresh fruits and vegetables have expanding urban and export markets as well as for tourism as mentioned above.

The new development in the northern part of Dara'aa should be based on water supply from within the governorate. Some water may be transferred from sources in the south. Common wastewater treatment facilities should be established to treat industrial effluents, and treated sewage should be reused for industrial or irrigation purposes.

2.2.5 Eastern region

(1) Existing conditions

1) Overview

The Eastern region, consisting of three governorates of Deir-Ezzor, Al Hassakeh and Al Raqqa, is by far the largest of the six regions with the combined land area of 76,020km², accounting for 41.1% of the national land. The total population at the 2004 census was 2,943,882, corresponding to 16.5% of the total population in Syria. It occupies largely the Euphrates river basin, including its major tributaries of the Khabour and the Balikh rivers and small area of the Tigris river basin in the eastern-most Syria.

The region shares long borders with Turkey to the north and Iraq to the east and southeast. Main points of access to Turkey are Tall Abyad in Al Raqqa and Ras Al Ain, Ad Dirbassiyeh and Al Qamishli in Al Hassakeh. The access from the capital region particularly to the southern part of the region is limited, separated by the vast desert/semi-desert areas.

2) Land and water resources

The Eastern region as a whole has 25,060km² cultivable land, accounting for 42.4% of the land in Syria in this category. The distribution of cultivable land varies widely between the governorates. Al Hassakeh has the largest cultivable land of all the governorates occupying 14,670km² or 62.9% of the governorate land. Al Raqqa follows with 8,350km² cultivable land, but in Deir-Ezzor, the cultivable land occupies only 6.2% of the total land. In Al Hassakeh and Deir-Ezzor, some 90% of the cultivable land is already cultivated, while Al Raqqa has over 250,000ha of cultivable land still to be developed as of 2004. Additional 150,000ha are available in Al Hassakeh for agricultural development.

Deir-Ezzor has large steppe and pastures area occupying 57.0% of the governorate land, the second largest next only to Homs. Al Raqqa also has large steppe and pastures area occupying 48.2% of the total land in the governorate. The Eastern region as a whole has the steppe and pasture area of 34,180km², of which over a half is in Deir-Ezzor. Al Hassakeh has the forest area of 1,180km², the largest of all the governorates. Al Raqqa has some forest areas, including 3,000ha of forestation, but Deir-Ezzor has practically no forest area.

The Eastern region is relatively favorable in water resources endowment, but water availability is highly biased. Water availability is most favorable along the Euphrates river and its tributaries of the Khabour and the Balikh rivers, and reasonably favorable in limited areas with good groundwater potentials. In the remaining vast areas, water availability is critically limited. In some areas, small ponds and seasonal streams are used for limited agricultural activities.

3) Economy

The Eastern region is called the bread basket of Syria, producing wheat, barley and other food crops in its vast agricultural land. The region is the largest producer of the three strategic crops of Syria. Crops having dominant shares in the respective national production include cotton (68.6% share in the national production in 2003), wheat (58.4%), barley (34.0%), and lentil (44.0%). In Al Raqqa, maize is also produced dominantly as a fodder crop. Olives have been introduced relatively recently in agricultural areas of lower productivity.

The irrigated area increased particularly after the completion of the Thawrah dam in 1978. In Deir-Ezzor, over 45,000ha are irrigated. The irrigation in 640,000ha are planned by extracting the water from the Assad lake, and 170,000ha have been realized, consisting of 100,000ha in Al Raqqa and 70,000ha in Aleppo. The application of water saving irrigation techniques is developing throughout the region. Instead of inundation irrigation, furrow irrigation is practiced in some areas, particularly for cotton. Even for irrigation with river water, PVC pipes are increasingly used as well as concrete-lined irrigation canals. For groundwater irrigation, the use of PVC pipes is common, sometimes combined with sprinkler irrigation, particularly in Al Hassakeh and Al Raqqa. New crops have been introduced under irrigation, including rice, groundnuts and fruits. Rice production tried in Al Raqqa, however, is considered a failure, resulting in soil degradation.

With the large area of steppe and pastures, livestock activities are widespread in the region. The region as a whole has over 300,000 cattle accounting for 32.1% of the total cattle population in Syria, and 6 million sheep contributing to 39.7% of the total in Syria. In particular, Deir-Ezzor contributes to 16.2% of cattle and 21.8% of sheep in the respective total in Syria. Al Raqqa has some 2 million sheep population or 12.8% of the national total, but

contributes only to 1.5% of the cattle population. Livestock population is relatively small in Al Hassakeh, but improved breed is dominant based on imported breed. Buffaloes in Al Qamishli and camels in Al Raqqa are kept for social reasons.

The Eastern region has 65,621 industrial establishments, accounting for 10.9% of the total in Syria, but only a few large ones exist except oil companies. Al Hassakeh has the largest number of industrial establishments, including those to process the three strategic crops. Small industries and workshops exist within the city of Al Qamishli, while a new industrial area has been planned to relocate them. Deir-Ezzor has sugar and textile factories. The paper factory established in Deir-Ezzor in 1980 produces only pulp. Al Raqqa also has a sugar factory, but only cotton ginning is practiced in the governorate. To support the land reclamation projects for irrigated agriculture based on the water from the Assad lake, the Government established a fabricated concrete manufacturing plant in Al Raqqa. Industrial investment by the private sector has been encouraged since the 1991 Investment Law, and a textile factory for threads was established. Also, 60-70 small workshops exist in Al Raqqa for plastic, textile and other products.

Oil and natural gas production has been undertaken in Deir-Ezzor and Al Hassakeh, and natural gas production has started in Al Raqqa as well. The oil production is decreasing in recent years, and stands around 550,000-600,000bbl/day. The Syrian Petrol Company, operating in Al Hassakeh, produces 180,000bbl/day, Shell company in Deir-Ezzor and Al Bukmal contributes about 300,000bbl/day, and 100,000 bbl/day produced by other companies. The refining capacity is 150,000bbl/day in Deir-Ezzor and 70,000bbl/day in Al Hassakeh, and new refineries are planned in these governorates.

Many civilizations thrived in the Eastern region, taking advantage of rich water resources of the Tigris and the Euphrates rivers and vast and fertile land. It is reported that the first stone apartment was built on the bank of the Euphrates as far back as 9,000 B.C. The Mari kingdom established around 1,300 B.C. is considered one of the most important kingdoms established anywhere. The Islamic civilization came later, and during the Caliph Haroun Al-Rasheed regime, Al Raqqa was the summer capital of the Islamic empire. Reflecting the long and diversified history, some 900 historical sites are identified in the Eastern region. The cultural tourism based on such heritage, however, is not much developed. Deir-Ezzor has highly important archeological sites such as castles in Halabya and Zalabya, Qala'at Rahta at Mayadeen, Dora Europos and Mari. Important archeological heritage in Al Hassakeh is represented by many hills (Tel) of ruins, and in Al Raqqa by Qala'at Ja'abar in the Assad lake and the old walls of the Al Raqqa city.

Al Raqqa has opportunities for alternative tourism with the Assad lake with the reserved

area on island with 600ha. The reserved area has a variety of flora and fauna, including deer, gazelle, fox, water birds and some reptiles. Widely varied land encompassing lake and dessert within a 30km range is another advantage of Al Raqqa for tourism development.

Trading activities in the Eastern region are based on 16 urban centers, five in Al Hassakeh, three in Al Raqqa and eight in Deir-Ezzor. Al Hassakeh is the regional trade center for a wide range of goods, including agricultural products and daily necessities. A large truck yard exists on the outskirts for long-haul transportation. A bypass has been constructed to handle the through traffic. Many grain storage facilities exist throughout the region, and large grain silos are provided in production centers such as Al Hassakeh, Ras Al Ain, Ad Dirbassiyeh and Al Raqqa. Tall Abyad in Al Raqqa and Ras Al Ain, Ad Dirbassiyeh and Al Qamishli in Al Hassakeh are bases for trade with Turkey, although activities are not high at present. Southern towns in Deir-Ezzor are agricultural centers or bases of oil production.

4) Social and demographic aspects

The Eastern region as a whole is most significant out-migrating area. Out-migration from Al Hassakeh is dominantly to Rural Damascus and the Damascus city, while out-migration from Al Raqqa is mainly to Rural Damascus and Aleppo. Due to the out-migration and the lowest birth rate of all the governorate, Al Hassakeh has a low population growth with the average of 2.23% during 1994-2004. On the contrary, Deir-Ezzor has the highest birth rate of all the governorates and the population growth is also high, averaging 3.51% annually in 1994-2004. The population growth in Al Raqqa was also high during 1994-2004 due to in-migration associated with the land reclamation projects.

The ratio of working age population is relatively low in the three governorates, reflecting limited employment opportunities. Particularly in Deir-Ezzor, the ratio is 50.7%, the second lowest next to Al Quneitra. Out-migration from Deir-Ezzor, however, is relatively low, and 46.7% of the population is below 14 years old. These facts imply that there exist a dominant number of young families having many children.

Poverty incidence in Deir-Ezzor is reported to be 4.7% in 2003/04, the lowest of all the governorates, while it is 17.6% in Al Raqqa, the third highest following Aleppo and Al Sweida. Poverty incidence is 10.1% in Al Hassakeh, below the Syria's average, but large disparity exists between urban and rural areas.

The population in the Eastern region contains many ethnic groups. They include Asshurian, Armenian, Kurd and Beduin as well as Arabic population.

(2) Constraints to development

As mentioned above, the water availability is very skewed in the Eastern region. Even

in areas with more favorable water endowment, water balance is tight at present. Especially in the Khabour river basin, the available water satisfies only some 60% of the water use according to the Initial Assessment Study of Water Management (Joint Assessment Team of Syria-Germany, 2004). As over 90% of the water use is for agriculture, however, the water balance would be significantly improved if the water saving irrigation technology is fully developed and applied. Thus, the water availability may not be the most critical constraint to development if water resources are properly managed. Lack of institutions for comprehensive management of water resources in the Euphrates basin may be the real constraint.

More serious problems related to water may be the water pollution due to municipal wastewater discharges and agricultural drainage, and over-extraction of groundwater causing land corrosion and depression in some areas. Over-extraction of groundwater has caused some soil salinization in limited areas, but this problem should be minimized by the adoption of water saving irrigation technology. The sewage from the Al Hassakeh city is discharged to the Jaqjaq river, a tributary of the Khabour river, which causes pollution of the lake in the downstream. It is reported that the BOD levels in the river exceed 100mg/l seasonally. In the upstream of the Jaqjaq river, the sewage from Al Qamishli is discharged into this seasonal river causing foul smells and health problems. The discharge of wastewater from Turkey in the further upstream aggravates the problem. The sewage discharged from the Deir-Ezzor city into the branch of the Euphrates river passing through the city without treatment is also a matter of increasing concern.

Due to increased water use in Turkey, the extraction of groundwater in the downstream area of Ras Al Ain increased, resulting in the corrosion of subsurface geological regime and land depression. This has affected infrastructure such as roads and sewerage, and forced relocation of local residents. The same problems are reported in Al Raqqa as well.

Despite the many grain storage facilities existing throughout the region, the total storage capacity is clearly insufficient as there are many grain bags stacked under cover, which tend to increase post-harvest losses. It is reported that some grain storage facilities are mis-located. As the Eastern region continues to develop as the bread basket of Syria, the capacity and the distribution of grain storage facilities, particularly large grain silos, would need to be optimized.

Relatively small urban population in the vast territory poses a constraint to the regional development. Although the number of urban centers and their average size in the Eastern region are comparable to other regions except the Northwestern region and the DMA, they are not adequate to cover the vast territory. The urban population and areas should be expanded to support the regional development, but lack of proper urban planning may be a constraint. Also to cover the vast area more effectively, airport facilities may need to be upgraded particularly

for the Deir-Ezzor and Al Qamishli cities, and a new airport established for the Al Raqqa city which at present has only a military airport.

The Eastern region is not much benefited from its strategic location neighboring on Turkey and Iraq. This is partly due to security reasons. Trading and some agro-processing activities are constrained by the lack of communications with, and access to export markets in these countries.

(3) Prospects

With the declining oil production, the further development of the Eastern region would have to base more on other economic activities. Agriculture will continue to be the main stay of the regional economy, but the overall productivity needs to be enhanced. This would involve, under the tight water conditions, the introduction of more drought-tolerant crops and livestock breed, increase in value-added through local processing of agro-products, and better management of rain-fed agriculture. These activities need to be oriented to changing market conditions. For example, the expansion of olive production as recently undertaken may be directed to organic olive oils production. Lean buffalo meat appeals to a particular market segment of health conscious people in the developed world. In this connection, continued production of sugar beet is rather questionable, although it has some social importance. Some oil crops may deserve serious consideration for expansion such as groundnuts, sesame and possibly sunflower.

At present, the Eastern region stays largely as a resource supplying region serving industries in other regions, including crude oil, raw hides and skins, raw cotton and even live animals. These and other raw materials should be processed within the region as much as possible to retain the value-added in the region. This, in fact, is one of the basic ideas of regional development. To realize this, it is desirable that processed goods would find sizable markets in the vicinities, preferably within the region. Development of existing urban centers in the region will serve the purpose. Larger urban centers would offer market outlets for fresh vegetables and fruits, and thus contribute to crop diversification and value-added production as well.

Increased trade and communications with the neighboring countries would present major opportunities for the Eastern region development. In the immediate future, the trade and communications with Turkey would be more important than with Iraq. Al Raqqa has the best opportunity for complementary development with Turkey, as it is linked to the city of Urfa through Tall Abyad. Urfa is the functional capital of the Southeastern Anatolia region in Turkey, where the most significant national project, the GAP project, has been implemented since 1980's. Consequently, Urfa is one of the fastest growing urban centers in Turkey,

supported, among others, by the new irrigation development in the Urfa-Harran plain. Irrigation of the Urfa-Harran plain with the water diverted from the Attaturk dam may improve the water availability in the Balikh river basin. Also, Urfa and the GAP region may offer promising market outlets for specialized products to be produced in the land newly reclaimed and irrigated by the water from the Assad lake. A cooperation program should be formulated jointly for complementary development of the both sides of the border.

Contrary to the Raqqa area, the Ras Al Ain area has been so far negatively affected by the development on the Turkish side, suffering from the wastewater discharge and depletion of river water. On the opposite side of the border is the Ceylanpinar farm, one of the largest state farms in Turkey. The Ras Al Ain area may benefit from the experiences accumulated at the farm over years for enhancing agricultural productivity under the similar climatic and soil conditions. The increased trade and communications with Turkey through Al Qamishli and Ras Al Ain would strengthen the position of the Hassakeh city as the regional distribution center.

The Eastern region should be transformed from the resources supply region to the agro-processing and trade center in Syria. Two most important conditions to realize this potential are the establishment of links with Turkey and Iraq and the development of urban centers. First steps are to strengthen the urban planning capability so that improved urban areas and functions would attract more people to stay or migrate in the region, and to establish a proper institution to work out a cooperative program with Turkey first as undertaken already in the Northwestern region as well as continued efforts to enhance the agricultural productivity and pursue agro-processing opportunities.

In planning for the urban development in the Eastern region, functional division between different urban centers should be established. Al Hassakeh city should be developed as the regional distribution center as already mentioned. The Deir-Ezzor city would be the functional capital of the region, as such should offer some higher order services such as advanced education and research and specialized health care. It should also serve as the tourism gateway and base for tour itineraries in the region linked with neighboring regions and countries. The Raqqa city may be strengthened as the culture center of the region, and the base for alternative tourism, combining eco-tourism on the Assad lake and experience-oriented tourism with cultural tourism based on the archeological heritage. The mixed population in the region and cities with multiple cultures should be seen as the source of vitality for the regional development, contributing to the realization of mixed culture society in the region as a whole comparable even to the Damascus city.

Chapter 3 Macro Frameworks and Development Scenario for Syria

3.1 Socioeconomic Framework for Syria

3.1.1 Present socio-economy of Syria

The estimated gross domestic product (GDP) of Syria varies depending on sources, but the recent IMF estimate is adopted for the Study as reported in Table 3.1. The GDP in 2004 is estimated to be US\$24.9 billion in current prices. With the national population of 17.9 million at the 2004 census, the per capita GDP is calculated to be US\$1,391. The GDP structure by broad sector is 23.5% for agriculture, 27.1% for industry and 49.4% for services in 2004 according to the World Bank estimate.

The latest estimates of the GDP and the employment by sector are summarized in Table 3.1. The GDP per employment calculated by sector is also shown..

Table 3.1 GDP and Employment in Syria by Sector, 2005

Sector	GDP (million Syrian pounds)	Employment (1,000)	GDP/employment (thousand Syrian pounds)
Agriculture	257,958	945	273.0
Industry	296,760	638	465.1
Construction	32,508	660	49.3
Services	527,667	2,450	215.4
Total	1,114,893	4,693	237.6

Sources: Statistical Abstract 2006

The working age population in Syria is 10,528,550 at the 2004 census to make the labor force coefficient 58.7%, relatively low by international standard. The unemployment rate is reported to be 12.3% in 2004, and with the employment of 4.49 million, the total labor force is calculated to be 5.12 million. This implies the labor participation rate of 48.6%, significantly low reflecting presumably the very low participation of women in the labor force.

3.1.2 GRDP estimate by region

The composition of the GDP by governorate or region is not available in Syria. 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 3.2.

Table 3.2 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
GDRP: (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 population in the DMA is 3,824,979, and the working age population is 2,448,847 to make the labor force coefficient 64.0%, considerably higher than the national average reflecting the more active economy and the resultant net immigration seeking employment. The labor force is reported to be 1,119,038, indicating the labor participation rate of 45.7%, considerably lower than the national average. The unemployment is recorded at 66,852, representing the unemployment rate of 6.0%. The total employment is 1,052,186.

A few assumptions are introduced to estimate the GRDP of the DMA. The employment structure is roughly estimated to be 5% agriculture, 20% industry and 75% services. The labor productivity is assumed to be higher in the DMA for agriculture and services than the national averages, respectively. Based on these assumptions, the GRDP of DMA are estimated by broad sector as summarized in Table 3.3

Table 3.3 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

As seen from Table 3.3, the GRDP of the DMA is 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.

The GRDP estimates for the six regions are compared in Table 3.4 for agricultural, non-agricultural and total GRDP. The total agricultural GRDP estimated for the six regions represents a slight underestimation as compared with the Syria's agricultural GDP, while the

is water availability, which tends to constrain the development of a few regions. A macro water balance, therefore, is also described by major water basin. These analyses provide the basis to establish the strategy to strengthen the spatial structure of Syria.

3.2.1 Urban axes

As part of effort to evaluate the spatial distribution of development, alternative urban axes are compared with respect to the concentration of urban population along the respective axes. The urban population in any city is taken here as a proxy of the development representing the concentration of economic activities in respective urban centers. Higher concentration of urban population along any axis implies higher development potential through active interactions of economic activities between the urban centers as well as within each urban center.

For the analysis, 11 alternative urban axes are defined as shown in Figure 3.1. For each urban axis, the total road length, urban population in major cities and all the cities along the axis, and the corresponding population concentration per km of road length are calculated as summarized in Table 3.6. The following is obvious from the table.

- (1) Of the 11 axes compared, the Aleppo - Homs - Damascus - Dara’a axis is by far the most significant urban axis with the highest concentration of urban population (13,968/km). In fact, about three quarters of the non-agricultural GDP concentrates along this axis, as analyzed in Section 3.1. The Damascus - Quneitra link is considered as a branch to this major axis.

More detailed comparison by section of different axes (not shown in Table 3.6) reveals the following.

- (2) Of the three east-west axes between the Mediterranean coast or Damascus and Deir-Ezzor, the Lattakia-Aleppo-Al Raqqa- Deir-Ezzor axis is most significant (6,424/km), followed by the Damascus-Palmyra-Deir-Ezzor axis (5,784/km), and the Tartous-Homs-Palmyra-Deir-Ezzor axis least significant (2,445/km).
- (3) The Deir-Ezzor -Al Bukmal axis linked to Iraq is more significant (3,213/km) than the Deir-Ezzor -Al Hassakeh-Al Qamishli axis linked to Turkey (2,187/km).

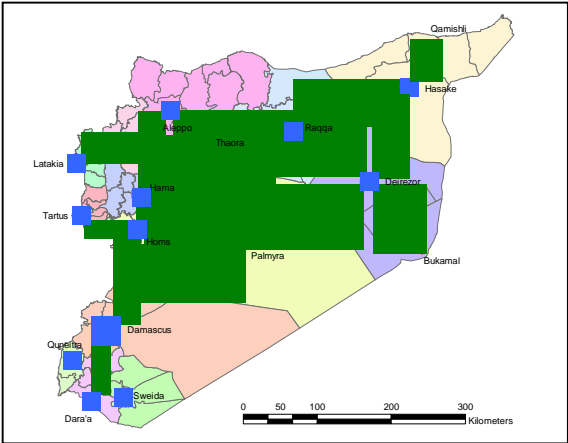


Figure 3.1 Definition of Urban Axes with Urban Centers in Syria

- (4) Of the two alternative accesses from the Mediterranean coast to the inland, the Lattakia-Aleppo access is about 1.7 times as significant (15,282/km) as the Tartous-Homs access (8,865/km).
- (5) Of the two alternative links to Homs from Aleppo and Tartous, the Aleppo link is about 1.7 times as significant (15,013/km) as the Tartous link (8,865/km), although the latter provides an important import/export axis.
- (6) Along the most significant urban axis from Aleppo through Damascus to Dara'aa, the southern link between Damascus and Dara'a is considerably more significant (24,663/km) than the northern link between Damascus and Aleppo (15,373/km).

Table 3.6 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: Lattakia - Idleb - Aleppo - Raqqa - Hassakeh - Qamishli
 2: Lattakia - Idleb - Aleppo - Raqqa - Deir-Ezzor - Hassakeh - Qamishli
 3: Tartous - Homs - Hama - Aleppo - Raqqa - Deir-Ezzor - Hassakeh - Qamishli
 4: Tartous - Homs - Palmyra - Deir-Ezzor - Hassakeh - Qamishli
 5: Damascus - Homs - Hama - Aleppo - Raqqa - Deir-Ezzor - Hassakeh - Qamishli
 6: Damascus - Homs - Hama - Aleppo - Raqqa - Deir-Ezzor - Bukmal
 7: Damascus - Homs - Raqqa - Deir-Ezzor - Hassakeh - Qamishli
 8: Damascus - Homs - Raqqa - Deir-Ezzor - Bukmal
 9: Damascus - Palmyra - Deir-Ezzor - Hassakeh - Qamishli
 10: Aleppo - Hama - Homs - Damascus - Dara'a
 11. Lattakia - Tartous

Implications

The simple analysis above indicates the following.

- (i) The strength of Aleppo is significant as all the axes containing Aleppo have comparatively large concentration of urban population. Hama is more strongly linked to Aleppo than Al Raqqa, 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.

- (ii) The Southern region is strongly linked to the capital city and its vicinities.
- (iii) Deir-Ezzor is in an important position as its development would affect the urban population concentration of eight axes out of 10 examined above. Its development would strengthen the east-west axes and also links to Iraq and Turkey.
- (iv) 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.

3.2.2 Macro water balance

Syria is divided into seven water basins as shown in Figure 3.2. Macro water balance was worked out by the Syria-Germany joint assessment team, and the results are summarized in Table 3.7. These basins correspond with the regional division of Syria as follows. The Barada and Awaj basin coincides largely with the DMA. The Khabour and Tigris basin and the eastern part of the Euphrates and Aleppo basin correspond to the Eastern region. The Orontes basin is shared by the western part of the Central region occupying the upper middle catchment area, and the western part of the Northwestern region constituting the lower middle catchment area. The Coastal basin corresponds largely to the Mediterranean region, and the Yarmouk basin to the Southern region. The Steppe basin corresponds largely to the vast eastern part of the Central region.

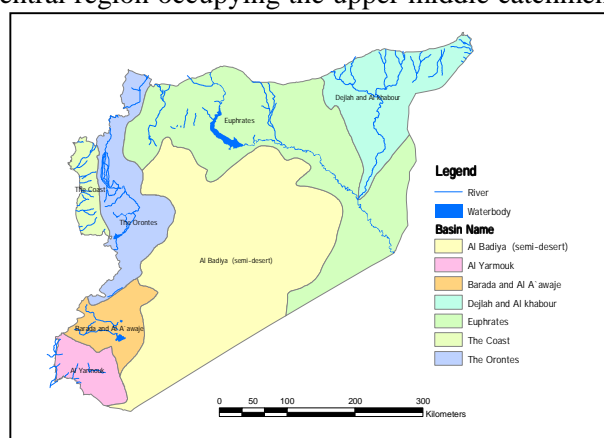


Figure 3.2 Water Basins Division in Syria

Table 3.7 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

As seen from Table 3.7, only one basin, Coastal, have ample water resources endowment. Three basins, Barada and Awaj, Khabour and Tigris and Orontes, already have water shortages, and in three other basins, Euphrates and Aleppo, Yarmouk and Steppe, water use is close to the limit of water endowment. In all the basins, agriculture is the dominant use of water. To improve the water balance, the water saving irrigation technology has been investigated and applied in some areas. The agricultural water use may be reduced by 30% or even more in most basins by adopting the water saving irrigation technology.

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 Orontes, Coastal and Steppe basins have excess water available but land availability is the constraint to further agricultural development.

3.2.3 Strategy for spatial development of Syria

Combining the comparative analysis on the six regions in subsection 3.1.2 and the spatial analyses in the previous subsections, the following observations may be made for different regions.

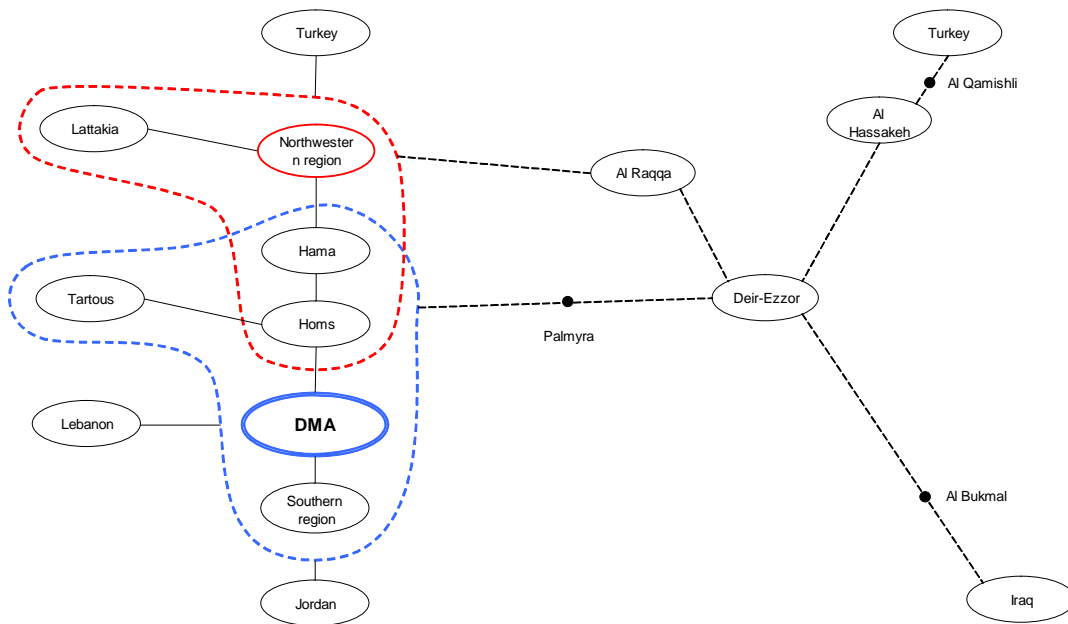
- (1) The Eastern region is the least developed economically, and the use of the Euphrates water in its western part is critically important for its development as the Khabour and Tigris basin in its eastern part faces very tight water balance. The urban development in general holds a key for the development 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, 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 no constraint in water and land 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.

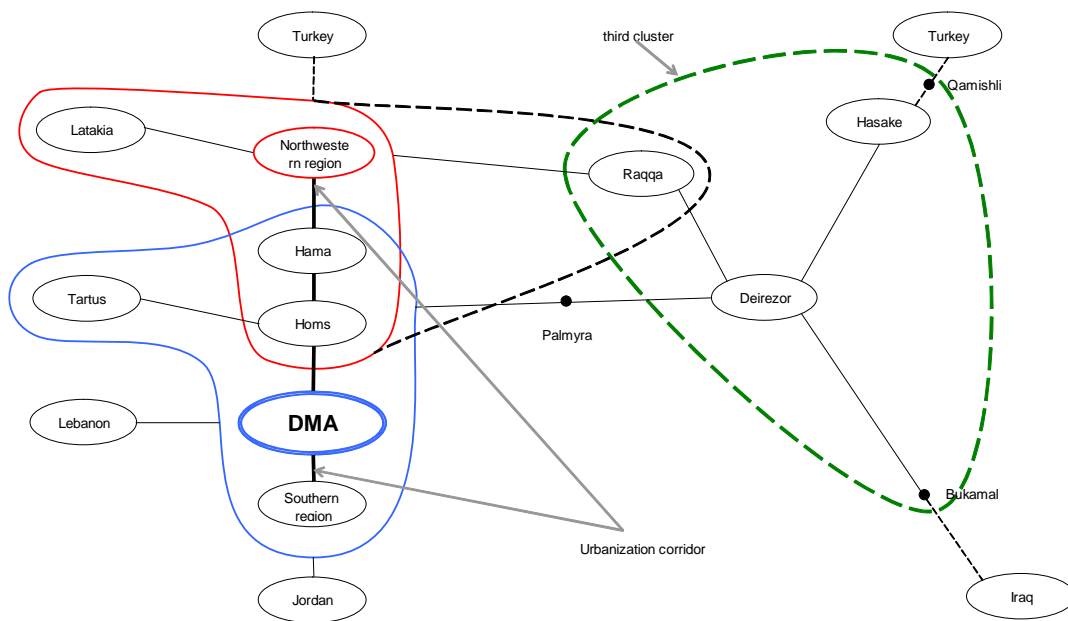
- (5) The Northwestern region would continue to develop as a self-reliant region, supported by the strong urban functions of Aleppo and the high agricultural potentials in the hinterland. As the region develops further, economic links with the neighboring regions would be strengthened.
- (6) The DMA 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 Southern region may become integrated with the DMA economically, but the Central region would hold a unique position affected equally by the Northwestern region.

Based on these observations, the strategy for spatial development of Syria may be established with the following components as illustrated in Figure 3.3.

- (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'aa.



(1) Spatial structure at present



(2) Spatial structure in the future

Figure 3.3 Strategy for Spatial Development of Syria

3.3 Development Scenario for Syria

A series of activities to develop and events to take place over the planning period up to 2025 is described here as the development scenario for Syria. There exist naturally various uncertainties involved in drawing up a development scenario for any country or region. This is particularly true for Syria as it has been undergoing reforms in administrative, financial, trade and other sectors. The difficulty is further compounded by declining prospects for its oil reserves as well as uncertain and volatile political environment in and around the Middle East.

These macroeconomic and political uncertainties are not directly treated in the development scenario of Syria presented here. It is expected that the ongoing reforms would be steadily continued, the political stability in the Country and the region would be improved, and consequently, more open economy and more liberalized trade and financial sectors would be realized in the medium term.

To describe the development scenario for Syria, the planning period is divided broadly into three phases: Phase 1 up to 2013, Phase 2 for 2014-19, and Phase 3 for 2020-25. The expected performance of the Syria's socioeconomic and spatial development in each phase is described.

3.3.1 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.

As projected in sub-section 3.1.3, the GDP of Syria may grow at modest rates of up to 5% annually during the initial part of this phase, and accelerate to attain over 6% growth toward the end of the phase. Supported by the improvement in social safety nets as well as the steady economic growth, the population increase would slow down. It may still be slightly higher than 2.0% per annum.

(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 increase 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 3.8 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 3.8 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 in sub-section 3.2.3. 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.

3.3.2 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. The GDP is expected to grow at 7% per annum more or less, and it may overshoot to exceed 8-9% as projected in sub-section 3.1.3. The population increase would become lower than 2.0% per annum for the first time in the modern history of Syria.

(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 3.8 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.

3.3.3 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.

Chapter 4 Basic Conditions for DMA Urban Development

4.1 Carrying Capacity with Respect to Water Availability

4.1.1 Water resources endowment and availability

(1) Past works

Water availability is definitely the most critical constraint to further urban development of the DMA. Trans-basin water diversion schemes have been contemplated to increase the water availability, and studies are conducted for the two options of the diversion from the Euphrates and the Coastal basins. Until the viability of these schemes is established, the DMA urban development should be planned on the basis of water availability in the Barada and Awaj basin.

There have been more than a few attempts to analyze the water balance for the DMA or the Barada and Awaj basin where the DMA is located. A recent study reviewed these analyses and presented an alternative approach to solving the problems of water shortages for DMA residents in the future (Elie Elhaj, *The Domestic Water Crisis in Syria's Greater Damascus Region*, Occasional Paper No 47, Water Issues Study Group, School of Oriental and African Studies, King's College, University of London, February 2003).

The study proposes to divert the irrigation water to domestic water as the priority, followed by industrial water. Then, it has clarified that the treated sewage would be sufficient to irrigate almost the same area presently irrigated by groundwater. The study compared the unit costs of water supply from alternative sources, and has established that the diversion of irrigation water to domestic and industrial uses is by far the least cost solution with the estimated unit cost of US\$0.15/m³. Inter-basin water transfer would involve significantly higher costs: US\$0.44/m³ from the Euphrates and US\$1.22/m³ from the Mediterranean. The study concedes, however, that the diversion of irrigation water to domestic and industrial uses may not be politically feasible. Besides, uncertainties are involved in the extent of irrigation water that can be technically diverted for use as sources of the piped water supply for the DMA.

(2) Macro estimates

The annual precipitation varies widely within the Barada and Awaj basin and fluctuates also widely over years. The mountainous area of the basin, occupying some 3,000km², receives the annual average precipitation in the range of 400-800mm, generally larger at the higher altitude. In the plain area with some 5,600km², the average annual precipitation ranges in 150-400mm in the western part, and 150mm or less in the eastern part. The average annual precipitation near the Fijeh springs is 530mm over 1986-2005, and is taken to represent the

mountainous area of the basin. The annual average precipitation in the Damascus city is 110mm over 1998-2004 and taken to represent the plain area. Then, the total water resources endowment is estimated to be approximately 2,200 million m³ annually in the Barada and Awaj basin, corresponding to 256mm average annual precipitation (Table 4.1).

This estimate corresponds very well to the available estimate based on more detailed analysis. The Ministry of Irrigation in charge of water resources management in Syria established the Water Resources Information Center (WRIC) supported by the Japanese government. WRIC worked out a model simulation of water balance in the Barada and Awaj basin, and as part of it, estimated the total annual precipitation in the basin at 2,268 million m³ or 265.3mm on average.

Table 4.1 Estimate of Water Endowments in the Barada and Awaj Basin

	Land area (km ²)	Average annual precipitation (mm)	Approximate water endowment (million m ³ /year)
Mountainous area	~3,000	530	~1,590
Plain area	~5,600	110	~600
Barada and Awaj basin	~8,600	256	~2,200

Source: JICA Study Team

Most precipitation in the basin seeps into the ground with smaller amount running off or evaporated. It is estimated that about 40% of the water resources endowed as the precipitation or 850 million m³ would be available annually mainly as springs and groundwater. The precipitation data near the Fijeh springs indicate that during the drought year that happens once in five years on average, the endowment itself is reduced to some 60% of the average. That is, the exploitable water resources in the 20% probable drought year, which may be called the firm yield, are calculated to be 500 million m³/year. This corresponds to 15.9m³/sec.

4.1.2 Water demand

(1) Existing water supply system

Water demand is increasing as the population growth continues in the DMA. According to the 2004 census, the Damascus city has the population of 1,551,906. The urbanization has proceeded into the neighboring districts of Rural Damascus, particularly the nine districts of Erbeen, Kafar Batna, Jaramana, Al Mlaiha, Babbila, Sahnaya, Al Hajar Al Aswad, Daraya and Qudsaya, largely constituting the Ghouta east and the Ghouta west. The total population of these districts is 1,174,027, including the urban population of 815,346 as of the 2004 census.

Damascus City Water Supply and Sewerage Authority (DAWSSA) supplies piped water not only to the Damascus governorate but also to some parts of the Rural Damascus governorate. The latter locate along the Barada river and between the springs serving as sources of the water

supply, and include Al Fijeh, Al Khadra, Bassimeh, Ashrafiyet Al Wadi, Al Jdaydeh, Al Hameh, Jamraya, Qudsaya, Ma'araba and Al Assad suburbs. Although the Department of Customers' Affairs of DAWSSA recognizes at least 1,800 illegally connected families, the water supply coverage is practically 100% in the recent 10 years.

Establishment for Drinking Water and Sewerage of the Rural Damascus (EDWSSR or R-DAWSSA as commonly referred to) is in charge of water supply in the Rural Damascus governorate with 39 water units. R-DAWSSA estimates the service coverage in the governorate at 89% in 2003, 91% in 2004 and 92% in 2005.

(2) Current water supply and demand

The average daily water production and service population by DAWSSA and R-DAWSSA are summarized in Table 4.2. These are based on the data provided by the respective authority and confirmed by the JICA Study Team as representing the real situation. The unit production is calculated to be in the range of 280-290ℓ/cap/day for DAWSSA and approximately 170ℓ/cap/day for R-DAWSSA.

Table 4.2 Water Production by DAWSSA and R-DAWSSA, 2004 and 2005

	Unit	DAWSSA		R-DAWSSA		Total	
		2004	2005	2004	2005	2004	2005
Average water production	1000m ³ /day	542	540	351	370	893	910
Service population	1000	1,860	1,928	2,106	2,217	3,966	4,145
Unit production	ℓ/cap/day	291	280	167	167	225	220

Source: Analysis by the JICA Study Team based on the data provided by DAWSSA and R-DAWSSA

The water production varies seasonally, but the annual production by DAWSSA has been at the similar level in the past 10 years, averaging 545,000m³/day. As measures to reduce the unaccounted for water (UFW) have been taken recently, the amount of water production by DAWSSA tends to decrease, while the service population increases.

On the other hand, the water production by R-DAWSSA has been increasing steadily along with the rapid population increase in the governorate. The amount of water production by R-DAWSSA increased from 160,000m³/day in 1996 to 370,000m³/day in 2005.

The unit water demand in the Damascus city was estimated by the JICA Water Master Plan Study in 1997. The domestic water demand was estimated to be between 170 and 250ℓ/cap/day, and the total average demand between 285 and 289ℓ/cap/day for 2005. The Kuwait Water Master Plan of 2004 put the estimate of domestic water demand at 65-150ℓ/cap/day, and the total unit water demand at 253ℓ/cap/day including the UFW. Reflecting this result, DAWSSA has a commendable policy to keep the total unit demand of 250ℓ/cap/day in planning for its water supply system expansion.

4.1.3 Carrying capacity of the DMA population

If the gross unit water demand remains at 250ℓ/cap/day, the total amount of water safely exploitable over years, estimated above 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.

The treated sewage to be generated would be 370 million m³/year, assuming 70% of the water produced can be treated. In 2005, the amount of sewage flowing into the Adra Sewage Treatment Plant was recorded to be 138,087,000m³, while the amount of water consumption by the DAWSSA system was 153,246,000m³ annually, representing 90% treatment ratio. Compared with the water production, 70% was treated at the plant.

If the treated sewage is used entirely for irrigation, almost 25,000ha of land can be irrigated at the current unit irrigation water use of 15,000m³/ha/year (Elie Elhadj, op. cit.). If the unit irrigation water use is reduced to 7,000m³/ha/year by the adoption of water saving irrigation technology, over 50,000ha of land may be irrigated. A portion of this water may be used indirectly for water supply to rural settlements.

If the piped water supply for the DMA depends only on the firm yield of the Barada and Awaj basin or about 500million m³/year, 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 4.1).

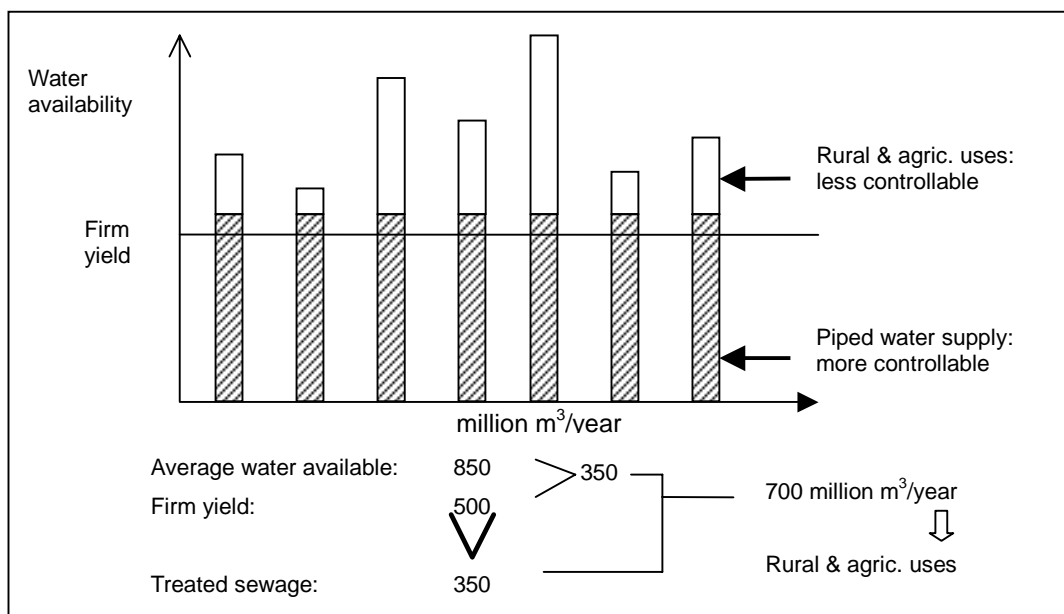


Figure 4.1 Concepts of Water Allocation in Barada and Awaj Basin

4.2 Definition of the DMA

4.2.1 Scope of work for the Study

According to the Scope of Work for the Study on Urban Planning for Sustainable Development of Damascus Metropolitan Area in the Syrian Arab Republic, the Study Area shall cover the Damascus governorate and its suburban area in the vital surrounding territory of the Rural Damascus governorate for urban development planning. The vital surrounding area is indicated as the area within the 30km radius from the city center, more or less, and expected to be determined more exactly through the discussions with the Syrian side during the Study.

The vital surrounding area may be defined in either of the following:

- 1) area vital for sustainable urban development in and around the Damascus city, and
- 2) area vital for controlling the further urbanization of the Damascus city.

The former definition implies that the area would support the urban development of the Damascus city with complementary functions such as resources provision and socioeconomic functions. That is, the area is considered integral part of the Damascus Metropolitan Area (DMA). The latter definition implies that the area would be self-reliant, more or less, and develop on its own to reduce the urbanization pressure on the Damascus city.

4.2.2 Study by the General Company for Engineering and Consulting

The General Company for Engineering and Consulting (GCEC) prepared a regional plan for the DMA and its structural plan. It analyzed the sphere of influence for the Damascus city based on population growth. It identified all settlements having population growth higher than the average in Syria as the growth areas affected by the Damascus city. They include the entire townships of Babbila, Jaramana, Erbeen, Qudsaya, Al Kissweh, Kafar Batna and Mlaiha, the entire area of Daraya, and most part of the Rural Damascus governorate except Yabroud and Al Nabik. Also, Douma, Al Zabadani, Qatana, Al Qutayfeh and Al Tall had higher population growth than the national average. The GCEC study identified the sphere of influence for the Damascus city covering some 2,700km² (The Third Stage Report, March 1997).

According to the GCEC third stage study, the 1968 plan by Ecochard-Banshoya designated four settlements of Kissweh, Al Ghizlaniyeh, Dair Al-Asafeer and Al Qasmiyeh for accelerated development. The plan expected that the urban development would be guided to the areas outside the Ghouta area. The plan, however, did not provide for measures to support the development of these outer areas nor to protect the Ghouta area. Consequently, more significant population increase took place in other settlements in Ghouta along the peripheries of the urbanized area of the Damascus city. They include Harasta, Daraya, Erbeen, Zamalka and Babbila. Combined population in these settlements increased by 900,000 during 1968-94.

The GCEC study examined three alternatives for guiding the urban development of the Damascus city by the planned development of expansion areas. Four expansion areas were identified based on the land availability (i.e. vacant land) and the location not interfering with agricultural land. They are the Qudsaya-Al Sabboura area, Mu'adamiyeh-Qatana area, the Qassyoun new city and the north district in Qassyoun. Encompassing these expansion areas, the extended jurisdiction of the Damascus city were suggested (Report on the Final Structure Plan, April 1999). The area thus defined is smaller than the sphere of influence for the Damascus city as defined above, and cover some 1,500km². The suggested jurisdiction extends mostly to the north and the west.

4.2.3 Alternative definitions 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.

The urbanization has been proceeding to peripheries of the Damascus city along the main highways, and the districts close to the city are almost completely or dominantly urbanized. These districts are *de facto* part of the DMA. If the coterminous area with administrative boundaries of these districts is taken to be within the DMA, 22 districts are included. The districts of Madaya and Ain Al Fijeh are included as they are between Al Tel and Qudsaya having dominant urban population, and Al Zabadani which is all urban by definition. The district of Demas is included to avoid the isolation of this district from the rest of the Country. The total area is approximately 3,200km², and the population in 2004 is 3.44 million, of which 1.89 million is in the Rural Damascus governorate. The population density is 10.7/ha.

The entire area of the Al Zabadani zone (mantiqa) may be excluded from the DMA as it is largely rural with only the district of Al Zabadani having urban population. The third definition of the DMA consists of 17 districts with the total area of approximately 2,400km². The population in 2004 is 3.33 million, of which 1.78 million is in the Rural Damascus. The population density is 13.9/ha.

The smallest definition of the DMA may include only the districts in the old Ghouta area and the northern extension area of the Damascus city. This area contains 11 districts with the total area of about 980km² and the population of 2.76 million in 2004. The population density is 28.1/ha.

The four alternatives of the DMA are summarized in Table 4.3, and illustrated in Figure

4.2. Appropriate definitions of the DMA would depend on whether the DMA is defined as a study area, planning area or administrative area. For most analyses in the Study, Alternative 1 is taken as the Study Area, while the combined jurisdictions of the Damascus city and Rural Damascus are taken in their entirety for some aspects for which no detailed data are available other than the governorate level data. The urban planning area for the Study is taken to be either Alternative 2 or Alternative 3, depending on where the DMA urbanization should be guided to.

Table 4.3 Alternative Definitions of the DMA

Alternative	Approximate area (km ²)	No. of districts	Estimated population in 2004	Population density (/ha)
1	4,700	28	3,643,000	7.8
2	3,200	22	3,444,000	10.7
3	2,400	17	3,333,000	13.9
4	980	11	2,755,000	28.1

Source: Defined by JICA Study Team

The eastern part of the Rural Damascus governorate is excluded as the urbanization potentials there are low with extensive agriculture and semi-desert areas. The areas to the further northeast are excluded from the DMA as they are expected to pursue self-reliant development.

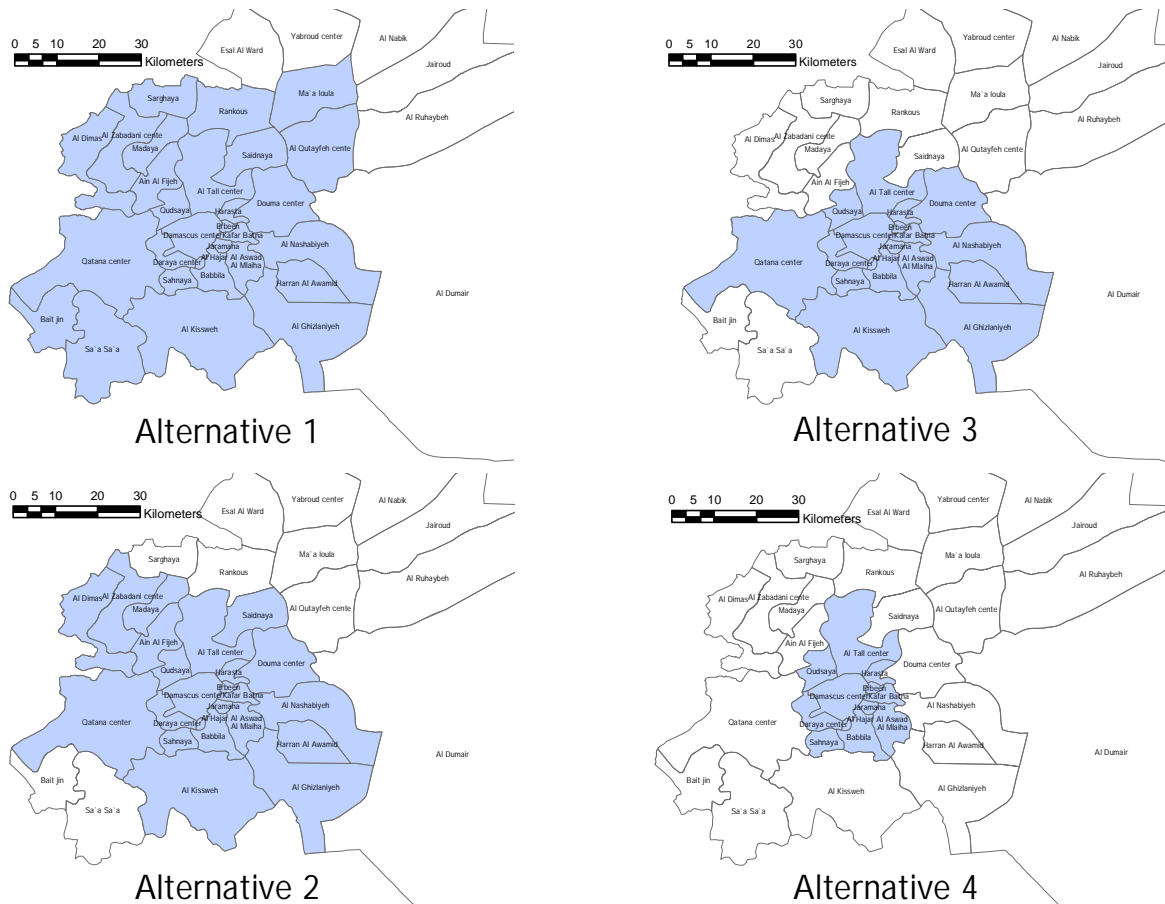


Figure 4.2 Alternatives Definitions of the DMA

4.3 Spatial Development Directions and Macro Zoning

4.3.1 Spatial development directions

(1) Urbanization patterns

The urbanization has been proceeding from the Damascus city to Rural Damascus in the recent past. Population growth rates have changed significantly in the past decades. In the Damascus city, the population growth decelerated consistently from 2.62% per annum in 1970-81, through 1.75% in 1981-94 to 1.08% in 1994-2004. During this period, the population growth rates were consistently higher in Rural Damascus with 3.56% in 1970-82, 4.62% in 1981-94 and 3.31% in 1994-2004.

The degree of urbanization varies in different areas of Rural Damascus. Urbanization trend and potential are compared by district (nahiya) based on available population data. Specifically, a simple method for the urban hierarchical analysis is applied to compare districts in Rural Damascus. Six criteria are used for the comparison, and all the districts except

hinterland districts of Saba'a Biyar and Al Dumair are classified by each criterion according to the following classification.

Criterion	Class				
	1	2	3	4	5
Population (1,000)	over 100	50~99	30~49	12~29	0~11
Population density (/ha)	over 100	10~99	2~9	0.7~1.99	below 0.69
Population growth (% p.a.)	over 3.3	2.30~3.29	1.40~2.29	0.10~1.39	below 0.10
Population growth trend*	A	M	D	S	X
Urbanization ratio (%)	100	70~99	40~69	1~39	0
No. of urban centers	4	3	2	1	0

A: accelerated; M: Mixed trend; D: decelerated; S: significantly decelerated;

X: extra-significantly decelerated

The results of the analysis are presented in Table 4.4. Based on the classification of districts by six criteria, the districts in Rural Damascus are classified into five classes for urbanization potential as shown also in the table as the overall class. Figure 4.3 shows the overall classification of the districts. As seen from Figure 4.3, the seven districts neighboring on the Damascus city constitute an urbanization belt, where the urbanization pressure is the highest. Several urbanization axes of varying strength may be identified as shown in Figure 4.4. The axis going to the south seems to be the strongest, followed by the axes to the northeast and the northwest/west.

Table 4.4 Classification of Districts in Rural Damascus for Urbanization Potential

(Classification by each index in parentheses)

District	Land area (km ²)	Population 2004 -1,000	Population density (/ha)	Pop-growth 1994-2004 (% p.a.)	Pop-growth trend*	Urbanization ratio (%)	No. of urban centers	Total score	Overall class**
Babbila	98.1	316.0 (1)	32.0 (2)	3.6 (1)	M (2)	78.5 (2)	4 (1)	9	I
Jaramana	6.5	115.3 (1)	178.6 (1)	5.2 (1)	A (1)	100.0 (1)	1 (4)	9	I
Erbeen	8.5	88.6 (2)	104.0 (1)	3.7 (1)	M (2)	100.0 (1)	2 (3)	10	I
Qudsaya	64.5	54.2 (2)	8.4 (3)	0.5 (4)	X (5)	60.7 (3)	1 (4)	22	IV
Al Kissweh	489.6	129.6 (1)	2.6 (3)	4.5 (1)	A (1)	52.8 (3)	2 (3)	12	I
Kafar Batna	30.8	99.6 (2)	32.3 (2)	2.5 (2)	M (2)	47.1 (3)	2 (3)	14	II
Mlaiha	58.1	167.7 (1)	28.9 (2)	14.2 (1)	A (1)	31.8 (4)	1 (4)	13	I
Al Tall	252.5	87.9 (2)	3.5 (3)	2.4 (2)	D (3)	73.9 (2)	2 (3)	15	II
Saidnaya	198	19.0 (4)	1.0 (4)	1.0 (4)	S (4)	0.0 (5)	0 (5)	22	IV
Rankous	280	11.5 (5)	0.4 (5)	1.5 (3)	D (3)	0.0 (5)	0 (5)	26	V
Daraya	70.8	101.6 (1)	18.6 (2)	2.8 (2)	S (4)	100.0 (1)	1 (4)	14	II
Al Hajar Al Aswad	3.7	86.2 (2)	235.9 (1)	3.7 (1)	D (3)	100.0 (1)	1 (4)	12	I
Sahnaya	47.6	31.7 (3)	6.7 (3)	3.3 (1)	D (3)	63.7 (3)	1 (4)	17	II
Douma	167.8	154.2 (1)	8.7 (3)	0.6 (4)	X (5)	97.7 (2)	2 (3)	18	III
Harasta	20.6	77.8 (2)	37.8 (2)	1.9 (3)	S (4)	83.4 (2)	1 (4)	17	II
Al Nashabiyeh	198.9	51.6 (2)	2.6 (3)	2.9 (2)	D (3)	0.0 (5)	0 (5)	20	III
Harran Al Awamid	203.8	34.2 (3)	1.7 (4)	2.7 (2)	D (3)	0.0 (5)	0 (5)	22	IV
Al Ghizlaniyeh	413.3	35.1 (1)	0.9 (4)	3.0 (2)	M (2)	0.0 (5)	0 (5)	21	III
Al Zabadani	161.8	37.4 (3)	2.3 (3)	0.9 (4)	D (3)	100.0 (1)	1 (4)	18	III
Al Dimas	71.9	11.0 (5)	1.5 (4)	0.8 (4)	X (5)	0.0 (5)	0 (5)	28	V
Ain Al Fijeh	126.8	18.6 (4)	1.5 (4)	1.6 (3)	D (3)	0.0 (5)	0 (5)	24	IV
Madaya	136.5	13.5 (4)	1.0 (4)	0.8 (4)	D (3)	0.0 (5)	0 (5)	25	IV
Sarghaya	116.3	11.4 (4)	1.0 (4)	1.7 (3)	D (3)	0.0 (5)	0 (5)	24	IV
Qatana	482.6	131.6 (1)	2.7 (3)	1.5 (3)	X (5)	71.1 (2)	3 (2)	16	II
Mazra'at Bait jin	180.5	16.6 (4)	0.9 (4)	2.7 (2)	A (1)	0.0 (5)	0 (5)	26	III
Sa'a Sa'a	323.8	43.0 (3)	1.3 (4)	2.3 (2)	D (3)	0.0 (5)	0 (5)	22	IV
Al Qutayfeh	1,254.30	44.7 (3)	0.4 (5)	1.8 (3)	S (4)	61.3 (3)	1 (4)	22	IV
Jairoud	369.2	30.7 (3)	0.8 (4)	2.5 (2)	D (3)	76.2 (2)	1 (4)	18	III
Ma'aloula	224	13.4 (4)	0.6 (5)	1.5 (3)	D (3)	0.0 (5)	0 (5)	25	IV
Al Ruhaybeh	48.6	30.4 (3)	6.3 (3)	2.7 (2)	M (2)	100.0 (1)	1 (4)	15	II
Al Nabik	644.7	50.3 (2)	0.8 (4)	2.1 (2)	D (3)	66.2 (3)	1 (4)	18	III
Dair Attiyeh	618.1	28.7 (4)	0.5 (5)	1.4 (3)	D (3)	0.0 (5)	0 (5)	25	IV
Yabroud	383	39.3 (4)	1.0 (4)	2.5 (2)	A (1)	70.3 (2)	1 (4)	17	II
Esal Al Ward	273.5	8.9 (5)	0.3 (5)	0.6 (5)	X (5)	0.0 (5)	0 (5)	30	V

* A: accelerated; M: mixture of acceleration and deceleration; D: decelerated; S: significantly decelerated; X: extra-significantly decelerated

** I: highest potential; II: high potential; III: medium potential; IV: low potential; V: lowest potential

Source: JICA Study Team

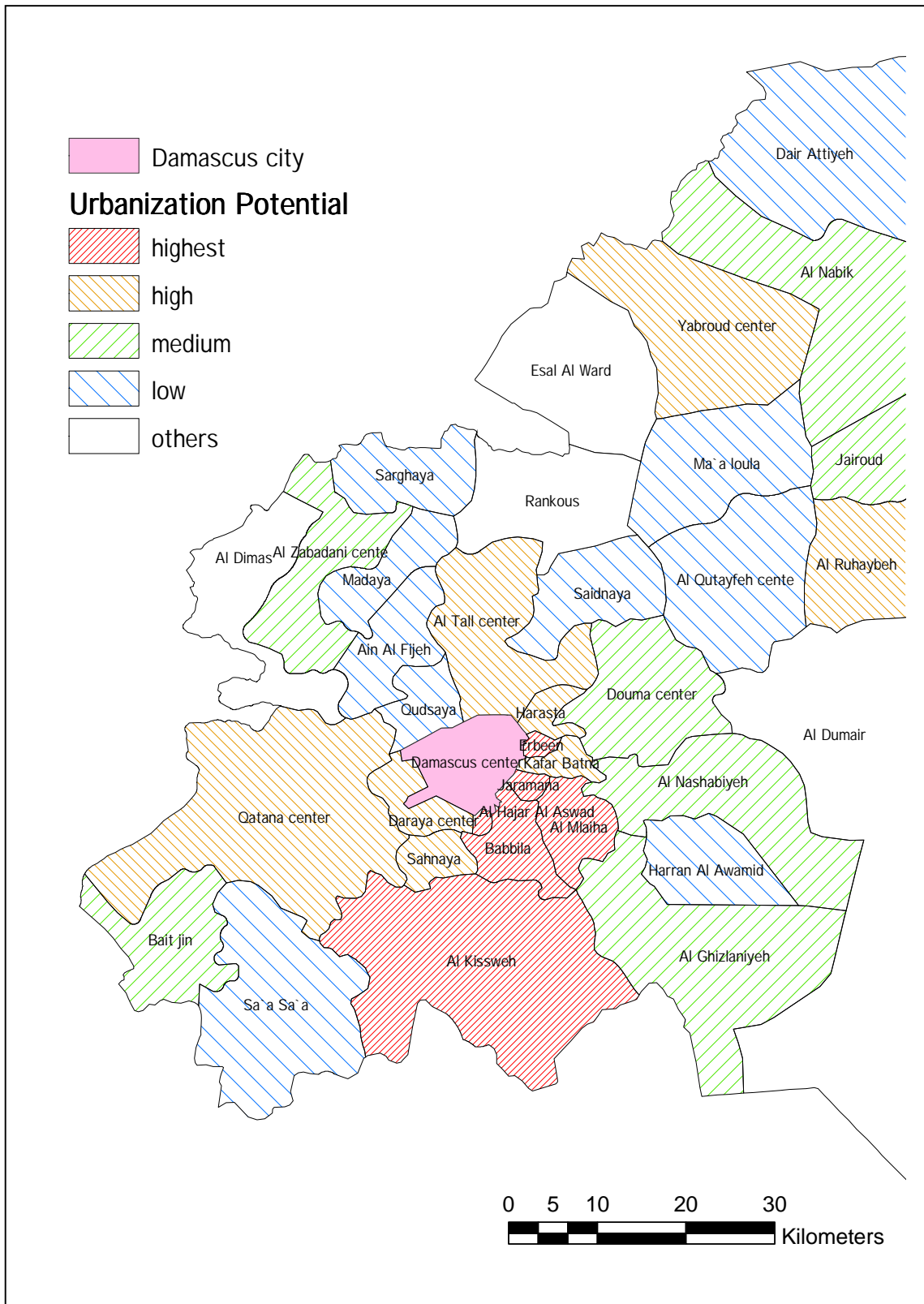


Figure 4.3 Urbanization Potential by District in Rural Damascus

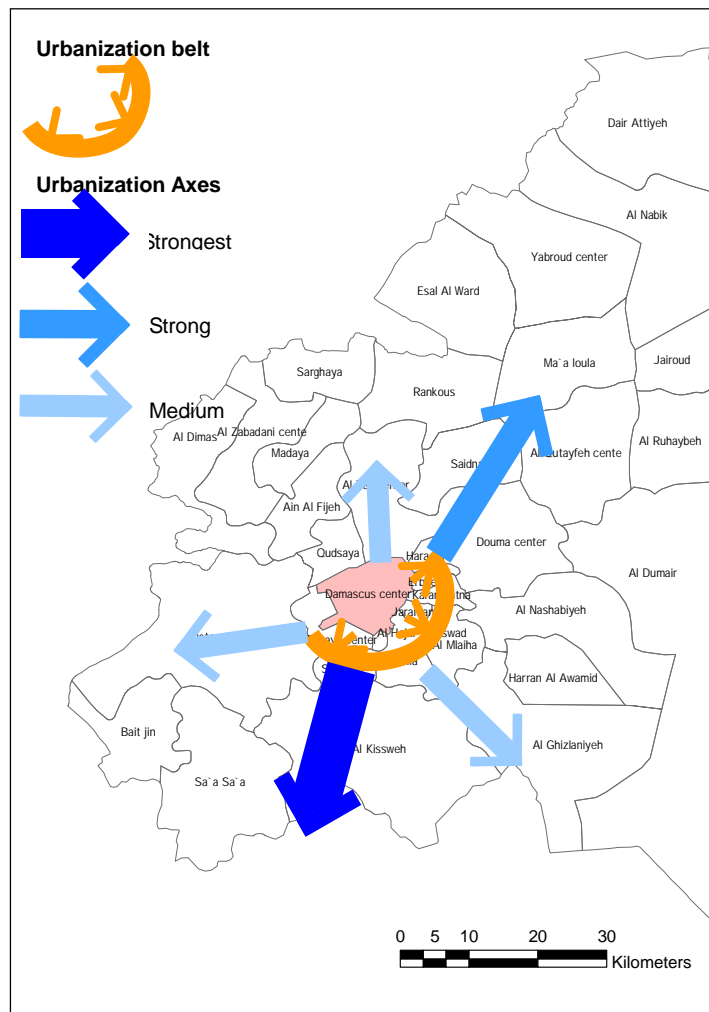


Figure 4.4 Urbanization Belt and Axes Extending from Damascus City

(2) Spatial development directions

1) General directions

The Damascus city at present faces various urban problems including traffic congestion, high and unaffordable housing costs in the center, increasing commuting time, informal settlements with poor living conditions, housing shortages and decline of old built-up areas with dilapidated facilities. To solve these problems, more orderly urbanization should be pursued with more balanced distribution of residential areas and employment opportunities particularly in the outer central Damascus and the inner suburbs to reduce the urbanization pressure in the city and the inner central Damascus.

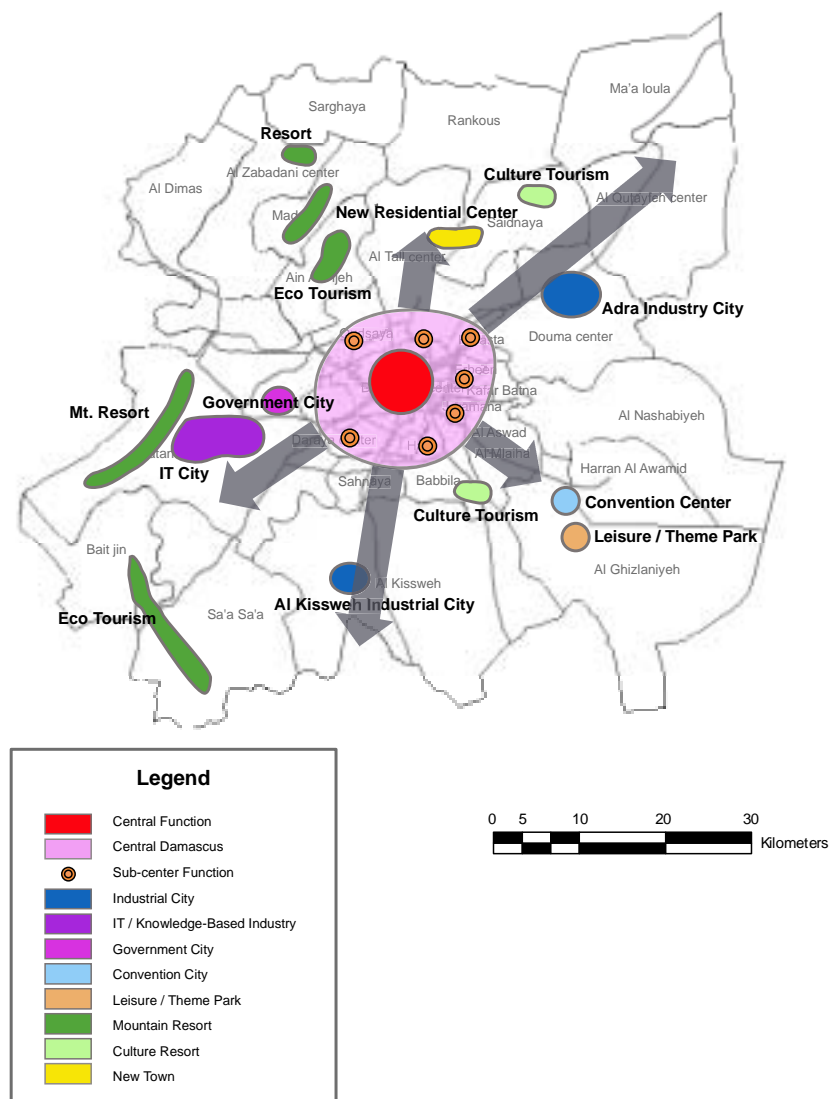
In the Damascus city and its conurbation area, the location policy should be selective, and focus on advanced and higher-order functions. In the Damascus city itself, urban redevelopment or renewal is necessary to revitalize declined areas. Also, the urban heritage should be properly restored and used to create better urban spaces particularly in Old Damascus

and its peripheries and some parts of Midan and Qanawat.

In the outer suburbs, it is essential to build and strengthen growth centers. Each center should have distinct characteristics reflecting local conditions, respectively and become self-reliant as much as possible. It is also important to link these growth centers by roads to promote their complementary development.

These and other developments should, in principle, be undertaken primarily by the private sector initiative rather than by the direct public investment. The roles of the public sector are mainly facilitation and guidance for effective utilization of the private sector resources and dynamism.

More specific development directions are described in the following. The development directions are illustrated in Figure 4.5.



Note: Locations are only indicative

Figure 4.5 Development Directions Conceptualized for the DMA

2) Urban renewal in the central Damascus

The central Damascus areas are over-concentrated with various functions and facilities, resulting in traffic congestion and other urban problems. It is urgently necessary to relocate polluting industries to the Adra industrial city or other outer areas. The areas made available by the relocation should be utilized for urban renewal. These areas are located mainly in the southeastern part of the outer central Damascus: Al Qadam, Al Midan, Al Shaghour, Jobar and Qaboun. The central Damascus is expected to attract more sophisticated and IT-equipped functions including financial services such as banking, insurance and securities, business and private services such as law firms, trading houses, fashion and culture, consulting and information processing. The mixed use of residential and commercial functions should be pursued for achieving compact land use and better amenity for residents.

Old Damascus should be maintained as pleasant urban living space through constant renewal and renovation of its infrastructure. It is also important to harmonize buildings and landscape in the surrounding areas with the heritage of Old Damascus to realize unified urban spaces and landscape. The district in Al Midan designated by the Ministry of Culture as a historical preservation area should be much improved through restoration and rebuilding. The old area in Qanawat should also be redeveloped to increase its value and prevent urban disasters. It is ideally located for effective urban redevelopment, close to the Damascus University campus, commercial centers of the city and another redevelopment area of former international trade center.

3) Sub-center development in the Damascus conurbation area

To relieve the urbanization pressure in the inner central Damascus, sub-centers should be developed in the Damascus conurbation area. Six sub-centers are proposed as commercial cores: 1) Harasta-Erbeen-Douma, 2) Jaramana-Babbila-Kafar Batna, 3) Daraya-Sahnaya, 4) Mu`adamiyeh-Artouz, 5) Qudsaya, and 6) Al Tal.

Harasta is the location for the future offices of Rural Damascus. Associated with it, some functions currently over-concentrated in the city would be relocated, following the retail and exhibition functions already established in Harasta. Erbeen and Douma constitute twin cities flourished already with industrial and neighborhood commercial center functions. Commercial functions should be much strengthened to serve as the alternative to the city center. Jaramana is also urbanizing rapidly, converting agricultural lands for residential and industrial activities. Commercial functions should be strengthened to make it more self-reliant.

Babbila constitutes a part of the conurbation area neighboring on the Damascus city. Existing industries are moving out of the city, and new residential developments are taking place. Commercial sub-center functions should be strengthened in Babbila. Daraya is

famous for furniture industries, and related factories and exhibition facilities are mixed with residential functions in the existing city center. The industrial production functions should be segregated from residential and commercial functions for viable urban development.

The urbanization is proceeding from the city into the neighboring areas in Al Tal. Attractive commercial functions should be established in urban settlements to make them more self-reliant. Planned new town development is taking place in Qudsaya. To make it a balanced suburban center, its commercial and cultural functions should be strengthened.

4) New growth centers development in the outer suburbs

To reduce the urbanization pressure on the city, the Damascus mono-centric structure needs to be changed by creating several growth centers in the outer suburbs within 20-30km distance from the city center. The districts falling in this range are: Qatana, Al Kissweh, Douma Center, Al Qutayfeh, Saidnaya, Al Ghizlaniyeh, Harran Al Awamid, Al Nashabiyeh and Al Tal. The new growth centers should provide new employment opportunities as well as accommodating spill-over population from the city.

Each growth center should have distinct characteristics based on local resources including locational conditions. These characteristics would allow to pursue diversified objectives of urban development along different development axes and help to give depth to the regional economy of the DMA. Also, each growth center is expected to be self-contained as much as possible.

The Adra industrial city, currently implemented with the total area of 7,000ha to be developed in six stages, may be geared to a new city development with larger areas allocated to residential and commercial functions. Its plan needs to be reviewed also from environmental points of view, covering the issue of bearing capacity of land. The sources and the quality of water available in the northeastern area need to be confirmed, including possible use of treated sewage.

Al Kissweh is situated along the south extension of the national development axis linking Damascus and Aleppo, and various sub-sector industries are already located there. The city of Kissweh has prepared an urban development master plan. While the Adra industrial city is making efforts to attract more equipment-intensive industries such as chemical products and heavy machinery, the industrial center in Al Kissweh may be specialized more in urban-based and market-oriented industries.

Qatana is favorably endowed with water and land resources. Flat land extends at the foot of Mt. Shiek and Mt. Haramoun. The development in Qatana should be environment-friendly without undermining the natural beauty offered by the view of the mountains. Thus, Qatana

may be developed as an IT city by attracting software development companies, high-tech research facilities, computer science faculties, and other knowledge-based enterprises. Residential areas with high amenity should be created for high-tech engineers and computer scientists together with up-market shopping centers.

In the southeastern part of the outer suburbs, water shortages would constrain the urbanization. At the same time, the water shortages are forcing increasing numbers of farmers to give up farming in Al Ghizlaniyeh, Al Nashabiyeh and Harran Al Awamid. It is necessary, therefore, to create alternative job opportunities, in addition to the airport and the Tishreen power station, so that ex-farmers and their families would not move into the city. Associated with the airport, related functions should be established such as exhibition, information exchange, international conferencing and trade. In recent years, amusement and entertainment facilities have been constructed by foreign investors from Saudi Arabia and Dubai near the airport and along the expressway linking the airport to the city. Capitalizing on these, a convention center may be built which accommodates international exhibition facilities, trade mart, hotels, sporting complex and theme park.

Al Tal is suitable for residential development as it is close to the central Damascus. To alleviate the over-concentration in the city, the suburban development in Al Tal should create a self-reliant town by providing other functions for offices, shops, culture and entertainment. GCEC is conducting preliminary studies for residential development in Al Tal and Saidnaya. Al Qutayfeh and Ma'aloula, further out from Adra in the northeastern direction, should develop residential areas to complement the Adra industrial city development. GCEC is currently setting a strategic vision for the development in Ma'aloula.

5) Nature preservation and resort development

The northwestern part of the outer suburbs is rich in nature and abundant in water resources, which should not be undermined by the urbanization. The areas in Zabadani, Madaya and Al Dimas offer opportunities for weekend resorts and second house development for residents in the Damascus city. They may be developed further for eco-tourism for foreign and domestic tourists, provided that the watershed areas of the Fijeh springs are protected. GCEC has recently prepared a development plan for the Barada valley region covering these areas.

4.3.2 Macro zoning

The DMA is divided into several zones to highlight the location specific economic characteristics. This macro zoning is a working tool to organize regional economic information spatially, and used to guide the formulation of regional development scenarios. It

is used also to allocate socio-economic values spatially in order to guide the formulation of a framework plan.

The DMA is divided into the following eight zones for the planning purposes (Figure 4.6).

- 1) Damascus city (DC): Damascus governorate
- 2) Damascus urban conurbation corridor (DUC): Harasta, Erbeen, Kafar Batna, Jaramana, Al Mlaiha, Babbila, Sahnaya, 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 Dimas, Madaya, Sarghaya 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 Saidnaya

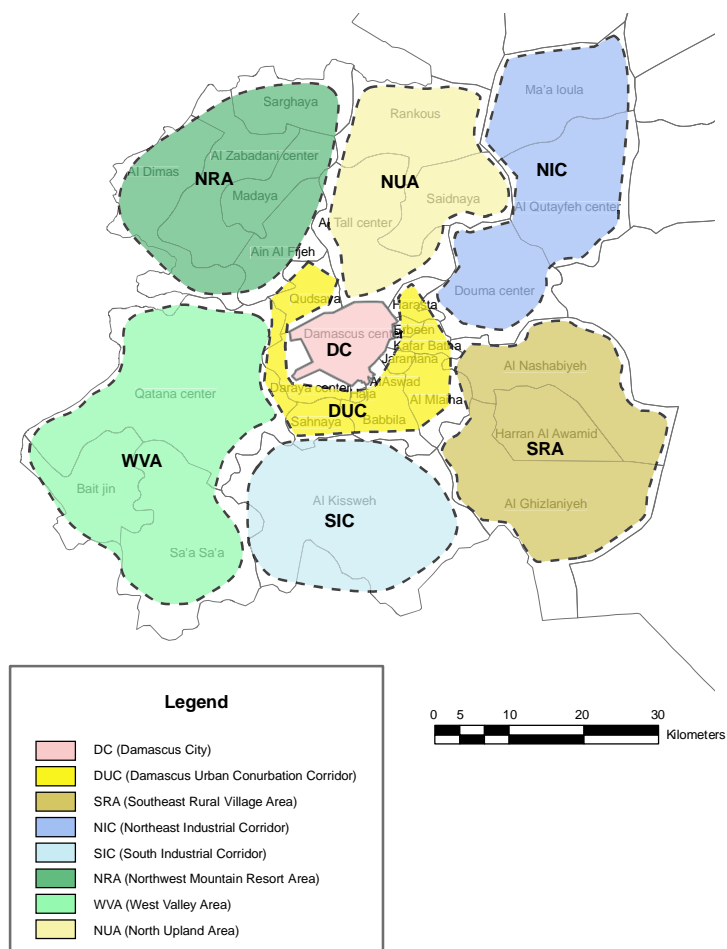


Figure 4.6 Macro Zoning of the DMA

Profiles of these zones are summarized in Table 4.5.

Table 4.5 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, Salhien and Old Damascus	Damascus Governorate with 16 service departments	Built-up areas extending from the central area to surrounding service departments of Mazzeh, Dummar, Barzeh, Qaboun, Jobar, Shaghour, 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, Qaboun, 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 Tishreen 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 Ghizlianiyeh	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 Tishreen power plant offering new employment opportunities; also several research institutions and land fill sites located in Al Ghizlianiyeh	"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 Ma'aloula	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'aa and Sweida along the highways, centering on the city of Kissweh	Composed of the Kissweh district, south of Babbila and Sahnaya	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, Sarghaya 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

4.4 Position of the DMA in Syria's development

4.4.1 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 (Volume 4: Sector Report). The shares of the DMA in Syria with respect to selected indices are summarized in Table 4.6. The main points to be noted are described.

Table 4.6 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 indust 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 : Tables 4.1~4.4

JICA Study Team for the DMA shares of GDP

The population growth in the Damascus city has decelerated in recent years with the average annual growth decreased from 1.80% in 1981-94 to 1.08% in 1994-2004. The city has been a net out-migrating area. The population growth in Rural Damascus also decelerated from the annual average growth of 4.59% in 1981-94 to 3.28% in 1994-2004. Still Rural Damascus is the largest receiving area for internal migration, including in-migrants from the Damascus city. The DMA as a whole is a net in-migrating area. The total population in the DMA accounts for 21.3% of the national population and the urban population has a larger share of 31.4% in the national total, respectively in 2004, while the land area of the DMA accounts only for 9.8% of the national land even if the vast semi-desert area is included.

The cultivable land in the DMA is 2,290km², accounting for only 3.9% of the total land area in this category in Syria. Crop production is insignificant, but the productivity is generally higher presumably due to higher irrigation rate and input use. Also, Rural Damascus is a significant producer of specialized crops including some fruits and fodder crops such as alfalfa and millet. Livestock raising is comparatively more important, practiced in the vast

hinterland of Rural Damascus. The productivity is higher than the national average as reflected in the larger share of cattle population than the share of sheep population in the respective national total.

There exist some 160,000 industrial and commercial establishments in the DMA, accounting for 26.6% of the total number of establishments in Syria. In particular, the DMA accommodate 99 large establishments employing over 50 or 47.8% of the total number, 207. Of these, 82 are located in Rural Damascus, reflecting the recent industrial development.

The GRDP of the DMA accounts for almost 30% of the Syria's GDP. In particular, the non-agricultural GRDP contributes to 35% of the corresponding GDP of Syria. The per capita GRDP of the DMA, as estimated, is 39% higher than the per capita GDP of Syria.

4.4.2 Prospects

As clarified in Section 3.1, the water availability poses a critical constraint to the further urban development of the DMA. It is also clear that 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 Hisya 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.

Chapter 5 Development Objectives and Strategy for the DMA

5.1 Problem Analysis and Planning Concepts

5.1.1 Participatory problem analysis

A series of problem analysis workshops were conducted during December 2006 with the participation of the Syria/JICA joint team by using the method of project cycle management (PCM). The problem analysis was commenced by setting up a core problem: "Urban functions of the DMA are deteriorating." Many aspects are reflected in the core problem: economic, social, environmental and other. Two more important aspects identified as more important through the workshops are:

- (1) Economic development potentials are not realized, and
- (2) Social/living environment is deteriorating.

Various problems identified through the workshops have common root causes. These root causes may be expressed as follows based on the workshop outcomes:

- i) continued high population growth,
- ii) limited water resource endowments, and
- iii) inadequate law and institutions to control the urbanization.

In addition to the economic and social value of the DMA urban functions as identified above, the third value, i.e. cultural value, may be introduced in consideration of the unique nature of the DMA that has evolved through its millennia long history. The problem of the DMA urbanization related to this aspect may be expressed as follows:

- (3) Cultural value is degrading.

Typical problems related to each of the three kinds of value are extracted from the participatory problem analysis as summarized in the table below. Many of these problems are inter-related through cause-effect relationships to constitute a problem structure.

Stagnation of economic activities	Deterioration of social/living environment	Degradation of cultural value
1.1 Water shortages	2.1 Reduced availability of good quality water	3.1 Worsening traffic congestion and air pollution
1.2 Traffic congestion	2.2 Reduction in farmland and greenery	3.2 Inadequate private spaces
1.3 No effective urban plan to guide the industrial location	2.3 Deteriorating urban landscape	3.3 Insufficient communication spaces and facilities
1.4 Illegal construction	2.4 Increasing health hazard	3.4 Inadequate management of urban and architectural heritage
1.5 Encroachment on farmland	2.5 Worsening air pollution	3.5 Deteriorating urban landscape
1.6 Poor maintenance of cultural and touristic value	2.6 Traffic congestion and lack of parking spaces	3.6 Increasing health hazard

5.1.2 Planning concepts

Corresponding to the three kinds of value identified above, 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. Urban planning, in short, is to pursue the agglomeration economy, while minimizing the external diseconomy.

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 as well as improved traffic management.

Compact urbanization pattern may also contribute to the economic efficiency for the DMA by realizing more efficient use of limited water resources by piped water supply systems. This, in turn, would leave larger area for productive greenery as well as agriculture in the vast hinterland of the urbanized area. Knowledge-based industries and service-oriented development mentioned in Chapter 4 would contribute to economic efficiency for higher value-added and smaller water use.

(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 fora, 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. The social safety net consists of basic education and health care and other social services.

(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. For instance, urban patios may be used as “agora” for communications and also entrance to closed private spaces. Cultural centers with multiple functions may also support this function.

The DMA as the international conference center and tourism gateway as suggested in Section 4.3 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.

5.2 Objectives for DMA Urban Development

Objectives for the DMA urban development may be established based on the participatory problem analysis. Regional development objectives are usually defined to address to the most significant problems observed that should be resolved or alleviated through planned development efforts. They are established typically for economic, social and environmental

aspects.

The three most significant problems identified through the participatory problem analysis may guide the establishment of the objectives for the DMA urban development. These problems are: (1) economic development potentials are not realized; (2) social/living environment is deteriorating; and (3) cultural value is degrading.

Thus, the following three objectives may be established for the DMA urban development:

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

5.3 Strategy for DMA Urban Development

5.3.1 Basic strategy

Basic strategy for regional development is established usually based on more fundamental problem factors that are at the root of many and varied problem phenomena observed. The three more fundamental problems identified by the participatory problem analysis are: (1) limited water resources, (2) high population growth, and (3) institutional problems.

The limited water resources endowment is an inherent problem constraining the DMA urban development. The high population growth is caused, among others, by high natural growth of population, population inflow due to limited job opportunities in other regions, and increasing immigrants, including refugees due to the unstable political conditions in neighboring countries. The institutional problems include: 1) lack of proper urban planning, 2) inadequate legal framework for urban planning, 3) improper enforcement of related law, and 4) shortages of qualified staff for urban planning and management.

Corresponding to these problem factors, the basic strategy for the DMA urban development may be established with the following components:

- (1) Pursuing more service-oriented development to suppress the water demand while realizing comparatively larger value-added;
- (2) Reducing population pressure on the central part of the DMA by encouraging the development of outer areas as well as other regions; and
- (3) Effecting broad capacity development at individual, organizational and institutional/social

levels for effective urban and regional planning.

The first component corresponds naturally to the fundamental problem (1) of limited water resource. The second component corresponds to the fundamental problem (2) of high population growth. To support these, people's awareness needs to be raised for the importance of orderly urban development and service-oriented development, and the need for water saving lifestyles. The third component addresses the fundamental problem (3) of weak legal and institutional system for urban planning, and insufficient human resources for urban planning and management.

5.3.2 Spatial development strategy

Based on the water availability analyzed in Section 4.1 and the urbanization pattern and potentials analyzed in Sections 4.3, the following strategy may be 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 widely adopted 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 or residential 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.

Chapter 6 Frameworks and Scenario for DMA Urban Development

6.1 Socioeconomic Framework for the DMA

6.1.1 Population projection

(1) Alternative population projections

The population increase in large urban centers generally follows the similar pattern: from modest growth, through accelerated growth and then decelerated growth, to stable growth often followed by population decline. The population in the Damascus city experienced the accelerated growth during 1960's and 70's, followed by the decelerated growth, and its growth is now more or less stable and expected to start declining. The population in Rural Damascus is still growing rapidly, but the growth has started to decelerate recently.

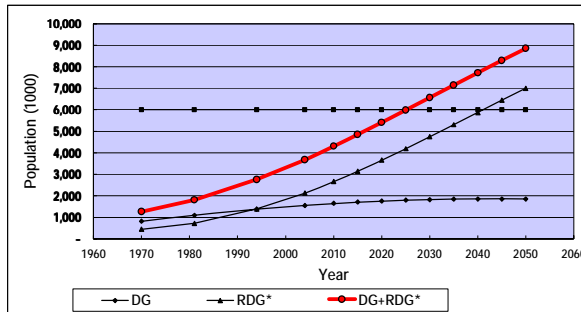
Three alternative cases are examined for the population growth in the DMA: (1) trend growth, (2) ideal growth and (3) planned growth. The trend growth represents the case that the current high population growth will continue for some time before it starts to decelerate. In general, total fertility is very high in most Middle Eastern countries generally over 3.0 for every woman in reproductive age (15-49 years old), and 3.2 in Syria in 2006. In addition, social increase of population will continue to be high in the DMA. In this case, the population in the DMA may reach the sustainable level of 6.0 million in 2025, and definitely exceed it by 2030 as shown in Table 6.1.

Table 6.1 “Trend” Projection

Population projection result and the sustainable limit

	1970	1981	1994	2004	2010	2015	2020	2025	2030	2035	2040	2045	2050
Sustainable limit	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
DG	820	1,091	1,373	1,543	1,645	1,705	1,755	1,794	1,821	1,839	1,848	1,850	1,850
RDG*	441	720	1,387	2,130	2,664	3,143	3,655	4,193	4,745	5,306	5,871	6,436	7,001
DG+RDG*	1,261	1,811	2,760	3,673	4,309	4,848	5,410	5,986	6,567	7,145	7,719	8,286	8,851

Population Projection, 2010-2050



	1970-1981	1981-1994	1994-2004	2004-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
DG	2.89	1.79	1.17	1.08	0.71	0.58	0.44	0.31	0.19	0.10	0.02	0.00
RDG*	5.03	5.17	4.38	3.80	3.36	3.07	2.78	2.51	2.26	2.04	1.85	1.70
DG+RDG*	3.69	3.30	2.90	2.70	2.38	2.22	2.04	1.87	1.70	1.56	1.43	1.33

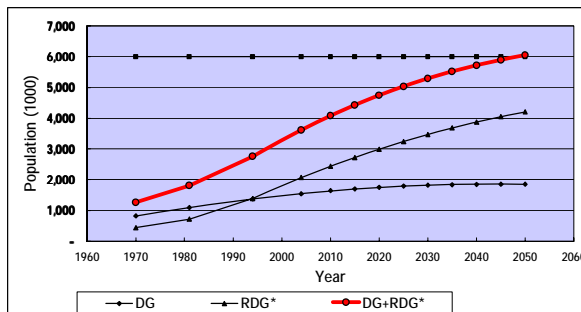
Source: Projection by JICA Study Team

The ideal growth assumes that the population in the DMA will gradually approach the sustainable level of 6million towards 2050, while the population in 2025 will be around 5million as shown in Table 6.2. This may be ideal but unrealistic, as this represents the average annual population growth at only 1.7% during 2004-25. It is risky to plan for urban development on such an ideal assumption. Besides, in the DMA the actual population could be substantially higher than the census population as revealed by interviews with many mayors and service department heads in the DMA.

Table 6.2 “Optimistic and Ideal” Projection

	1970	1981	1994	2004	2010	2015	2020	2025	2030	2035	2040	2045	2050
Sustainable limit	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
DG	820	1,091	1,373	1,543	1,645	1,705	1,755	1,794	1,821	1,839	1,848	1,850	1,850
RDG*	441	720	1,387	2,067	2,439	2,722	2,989	3,239	3,470	3,682	3,875	4,050	4,205
DG+RDG*	1,261	1,811	2,760	3,610	4,085	4,427	4,744	5,032	5,291	5,521	5,724	5,900	6,056

Population Projection, 2010-2050



	1970-1981	1981-1994	1994-2004	2004-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
DG	2.89	1.79	1.17	1.08	0.71	0.58	0.44	0.31	0.19	0.10	0.02	0.00
RDG*	5.03	5.17	4.07	2.80	2.22	1.89	1.62	1.39	1.19	1.03	0.88	0.76
DG+RDG*	3.69	3.30	2.72	2.08	1.62	1.39	1.19	1.01	0.85	0.72	0.61	0.52

Source: JICA Study Team

(2) 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 6.3. 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 6.3 Planned Population Growth

Planned population		Unit: '000				
	Current 2007	2010	2015	2020	2025	
DG	1,600	1,650	1,710	1,760	1,800	
RDG*	2,360	2,670	3,200	3,700	4,200	
DG+RDG*	3,960	4,320	4,910	5,460	6,000	

Increase rate per annum of planned population		Unit:%			
	2007-2010	2010-2015	2015-2020	2020-2025	
DG	1.03	0.72	0.58	0.45	
RDG*	4.20	3.69	2.95	2.57	
DG+RDG*	2.94	2.59	2.15	1.90	

Source: Planned by JICA Study Team

6.1.2 GRDP and employment

The GRDP of the DMA is projected by sector as follows. The agricultural GRDP may grow at 3% per annum to the year 2025, if the productivity increases with shift to more high value crops including horticultural crops serving the growing urban market of the DMA and quality fodder crops and adoption of better managed livestock raising as suggested in Section 6.3. The industry sector will continue to be the driving force of the DMA economy with the development of the industrial city in Adra and shift to more knowledge-based industries of high value-added as suggested also in Section 6.3. The annual average grow at 7% is assumed for the industrial GRDP. As the DMA is expected to pursue more services oriented growth, the service GRDP may grow at the highest rate, and 7.5% is assumed.

The labor productivity will increase to support the GRDP growth, and the following are assumed. The labor productivity as measured by the sector GRDP per employment is assumed to increase at the average annual rates of 3% for agriculture and 3.5% for industry and services to the year 2025. The projected GRDP by sector is converted to sector-wise employment by applying the projected labor productivity. The projection of the GRDP, labor productivity and

employment is summarized in Table 6.4.

As seen from Table 6.4, 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 in Section 2.1. 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 6.4 Projection of the GRDP and Employment in the DMA by Sector

	GRDP (US\$ million)		GRDP growth rate 2004-25 (% p.a.)	GRDP/employ ment (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

6.1.3 Macro consistency

The consistency between the projected GRDP, employment and population is checked as follows. The working age population as commonly taken in Syria to be the population of 15years or older was 2,448,847 in the DMA or 64.0% of the total population in 2004. This ratio defined as the labor force coefficient is relatively low in Syria and the DMA, and expected to increase slightly in the future. The ratio of economically active population, 1,119,033 in the DMA in 2004, to the working age population or the labor participation rate was 45.7% in the DMA in the same year, considerably low by the international standard. This is expected to increase significantly as more women enter the labor force.

With the total population of 6.0 million in 2025, the working age population may be 3.90 million in the DMA if the labor force coefficient is assumed to be 65% in 2025. By assuming the labor participation rate at 55% in 2025, the total labor force in the DMA is projected to be 2.15 million in 2025. This is consistent with the projected employment of 2.13 in 2025.

With the projected population and the GRDP, the per capita GRDP in 2025 is calculated to be US\$5,183 in the DMA. This is 36% higher than the projected per capita GDP of Syria, and represents the annual average increase at 4.8% during 2004-25.

6.2 Spatial Framework

A spatial framework for the development of any region specifies main directions for urban expansion, primary and secondary development axes, settlement hierarchy and other conditions related to spatial distribution of socio-economic activities. Of various factors affecting the spatial development of any region, most important factors for development

planning are (1) distribution of urban centers and other settlements, (2) artery transport network, and (3) land use and capability. The spatial framework for the DMA urban development is established with respect to these factors, after conceptual urbanization patterns are analyzed to propose a desirable pattern.

6.2.1 Urbanization pattern

(1) Spatial development models

Of the three main factors prescribing the spatial development, the distribution of urban centers and transport arteries linking them are taken to define spatial development models. Two most typical models are (1) growth pole, and (2) urban cluster (Figure 6.1). The growth pole model represents the mono-centric urbanization pattern, whereby the urbanization is pursued through the development of the central city and its extension into neighboring areas. The urban cluster model pursues the complementary development of smaller cities linked to share urban functions on the network to counter the central city together. These two models may be combined to realize spatially more balanced development with clusters of smaller cities, while effectively utilizing the central city for higher order urban functions. This may be called the dispersed concentric model.

These three models are based on the presence of the central city. In some regions, no central city is identified or relationships with neighboring regions or cities are more important than inter-city relationships within the region. For such a region, another model has been proposed, called the multiple access model, whereby the links with neighboring regions and cities are effectively utilized to create a core of spatial development within the region (Figure 6.1).

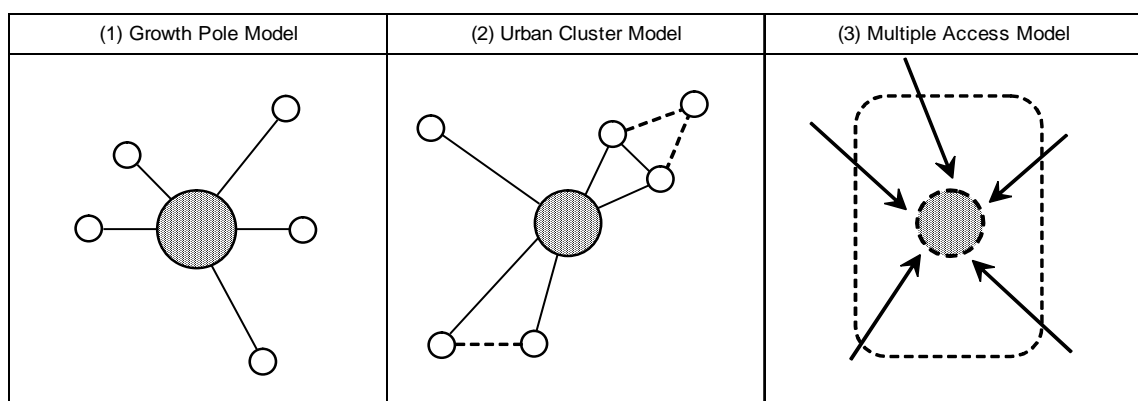


Figure 6.1 Alternative Models for Urbanization/Spatial Development

(2) Alternative forms of urban development and control

Urban development takes widely different spatial forms. A typical form is the urban sprawl or spontaneous extension of urban development directly from the existing urban area into its neighboring areas. Without any deliberate control of urban development, this is the most commonly observed form of urban development, which takes place mainly along the radial roads extending from the existing urban center but also between the roads under high urbanization pressure.

Other forms of urban development include the corridor development, dispersed development, and various combinations of these forms to result in the cluster development, polycentric development and others. The corridor development is linear expansion of urbanized areas along transport arteries. The cluster development may be realized by the development of smaller cities and the corridor development along the roads linking them. The polycentric development may be realized by the development of relatively large urban centers having high potentials comparable to the central city.

(3) Methods to control urban development

Attempts to control the urban development throughout the world in the past have resulted in a variety of control methods with varying effectiveness. Direct control by legal measures combines land use zoning and a set of conditions imposed on each land use category to enforce designated land use and development by the private sector. Direct developments by the public sector are becoming less popular throughout the world as a method to realize desirable urban land uses as planned. More cost-effective way is to encourage and utilize private investments under the guidance provided usually by a master urban development plan.

Another effective way to guide the private sector for urban development is to provide key infrastructure facilities by the public sector as another form of incentives to promote private investments in some designated way and area. Such physical measures commonly used to guide or control the urban development include the provision of green belts or zones, artery roads and new towns. Effectiveness of these interventions would vary as outlined.

Empirical evidences show that the provision of a green belt is not effective in controlling the urban development. Without strong legal measures that can be enforced, urban sprawl and corridor development proceed into the green belt and beyond. A green belt maintained by strong legal enforcement, on the other hand, represents inefficient use of precious urban land, causing also escalating land prices in immediate vicinities of the green belt.

The provision of artery radial roads tends to encourage the corridor development extending from the central city. This by itself would increase progressively the cost of

providing urban infrastructure. The new town development aims to reduce the urbanization pressure on the central city, but it often results in the creation of a dormitory town relying on the central city for employment opportunities, often creating serious traffic congestion for commuting. Such a town may not have sufficient vitality to develop as a self-reliant city. The development of several new towns along ring roads around the central city may lead to either dispersed concentric or cluster development. If not successful, it may result just in dispersed development.

(4) Urbanization pattern and control needs of the DMA

The existing urbanization in the DMA causes various related problems both in the Damascus city and outside the city. Problems in the city include traffic congestion, expanding informal housing, degrading living environment, and increasing economic transaction costs. Also, land prices are escalating to make the availability of housing beyond the affordability of most people. Improper land value assessment in urban fringes tends to encourage illegal land transactions for development by private investors, resulting, among others, in the encroachment of farmland in Ghouta.

As the urban development proceeds beyond the city boundaries, costs of providing urban infrastructures and services tend to increase progressively. This applies particularly to piped water supply, which relies on limited water sources located mainly in the areas to the west of the city. Increased water use for urban purposes has decreased water availability for agriculture in Rural Damascus. It is of prime concern to guide the further urban development to areas of better water availability.

For effective control of the DMA urbanization, the existing urbanization pattern should be analyzed to clarify directions of changes. The urbanization in the DMA may be characterized by the following:

- 1) The Damascus city has very strong primacy;
- 2) The urban sprawl is already significant due to high urbanization pressure, resulting in the formation of the conurbation especially in the east and the southeast of the city;
- 3) Some efforts have been made to reduce the urbanization pressure on the city such as the Adra industrial city and other smaller initiatives to develop/strengthen urban centers in outer areas;
- 4) No significant corridor or cluster development is observed; and
- 5) The Ghouta areas have been encroached upon significantly and they do not serve as green belts to regulate the urbanization.

(5) Desirable urbanization pattern for the future urbanization of the DMA

Given the existing urbanization pattern outlined above, directions of changes are clarified to realize a more desirable urbanization pattern of the DMA. Three conditions are considered particularly important in the future urbanization of the DMA: (1) decongesting the Damascus city, (2) securing sufficient green areas, and (3) promoting efficient water use. To satisfy these conditions, the following directions are suggested for the further urbanization of the DMA.

To decongest the Damascus city, several urban centers should be developed in outer areas. To make them more viable as self-reliant cities, each of them should have distinct characteristics with urban functions complementary to one another. To strengthen their complementarity, they should be linked to one another by an effective road network.

To secure sufficient green areas, the urban sprawl from the existing conurbation areas should be suppressed to prevent further encroachment into the Ghouta areas. For this purpose, the corridor development along the main radial arteries extending from the city should be encouraged together with the development of urban centers in outer areas, which should be mutually linked by a ring artery for the complementary development as mentioned above. If successful, this would create such an urbanization pattern that would leave sizeable green zones surrounded by the urbanized areas. Such green zones in the Ghouta areas should become productive greenery such as tourism orchards or ranches or outdoor recreation areas for city residents to visit during weekends. The resultant urbanization pattern is illustrated in Figure 6.2.

To promote efficient water use, a compact urbanization pattern is desirable. While the expansion of the conurbation areas is suppressed, the piped water supply should serve only the continuously urbanized area for its efficient service coverage. Other areas, including the urban centers to be newly developed, should be served in principle by separate supply systems with local water sources, where available. The development of new urban centers in areas of better water availability is all the more important in realizing the desirable urbanization pattern.

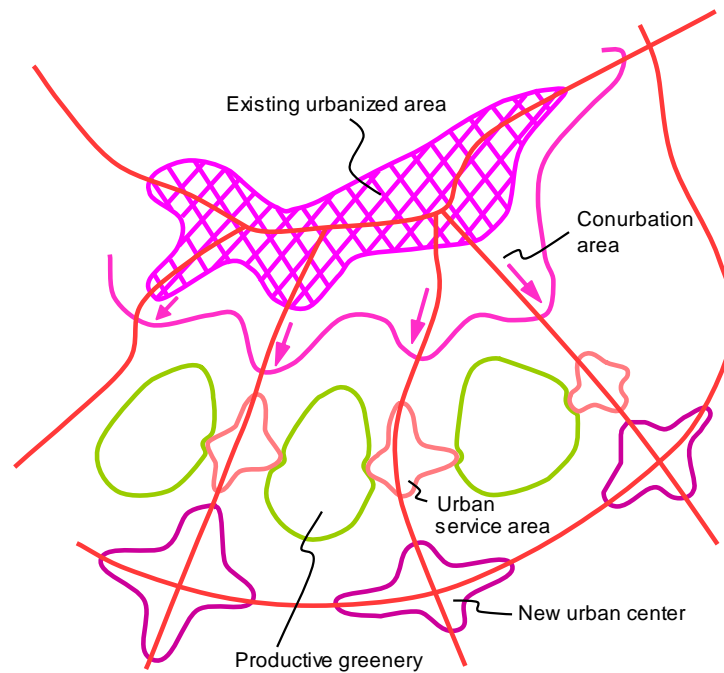


Figure 6.2 Desirable Urbanization Pattern of the DMA

6.2.2 Distribution of urban centers and sub-centers

(1) DMA urban development frameworks

The socio-economic framework for the DMA urban development is to decongest the city center by creating viable urban centers and sub-centers outside the city to realize more balanced and viable urban socio-economy as a whole. The spatial framework for the DMA urban development is to change the urbanization pattern from the mono-centric one at present to the dispersed concentric pattern.

(2) Sub-centers and new cities

To realize the desirable urbanization pattern within the DMA development frameworks outlined above, six sub-centers are proposed in the urban conurbation area of more or less 10-15km distance from the city center, and four new cities are planned to be established in the 20-30km distance from the city center as follows (Figure 6.3).

Sub-centers

- 1) East sub-center: Harasta-Douma Center-Erbeen
- 2) Southeast sub-center: Jaramana-Babbila
- 3) South sub-center: Daraya
- 4) Southwest sub-center: Mu'adamiyeh -Jdaidet-Artouz
- 5) Northwest sub-center: Qudsaya-Al Hameh

6) North sub-center: Ma`araba -Al Tall

New cities

- 1) Adra industrial city
- 2) Government city (Diplomatic town)
- 3) Qatana IT city
- 4) Al Kissweh industrial city

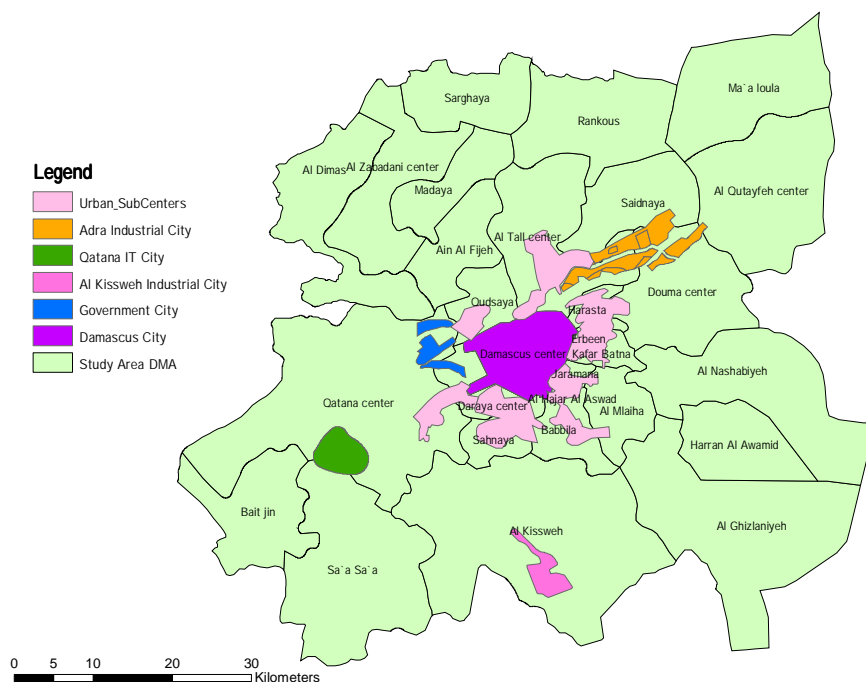


Figure 6.3 Location of Six Sub-centers and Four New Cities

(3) Artery transport network

The structure of the DMA urban transport system should be changed to support the realization of the urbanization pattern proposed above. This would change the traffic patterns. At present, the traffic pattern in the DMA is centering on the Damascus city for commuting, shopping, and various access to social and other services. Also, through traffic passes through the Damascus city as the southern bypass has not been completed.

An outer ring road is proposed to link the proposed new cities to help them develop into self-sustained urban centers through complementary functional division, respectively, and also to serve as a bypass for the through traffic including the international traffic. Some sections of the existing radial roads should be improved to increase the road capacity. Also, inner ring roads should be strengthened to serve the proposed sub-centers better. The proposed artery transport network would help to reduce the urbanization pressure on the city, and change the traffic pattern from the one centering on the city to a concentric pattern.

6.2.3 Population and employment distribution

(1) Population planning and distribution by zone

Method

The projected population of the DMA is distributed by zone to service departments in the Damascus city and nahiya in Rural Damascus. First, the census population of 1970, 1981, 1994 and 2004 are taken by zone, and the land area in each zone is determined by a GIS to calculate the population density by zone in each census year. Then, the distribution of the projected population is carried out as follows.

- 1) The inhabitable land area is determined by zone based on the analysis on topographic and other physical conditions and the current land use.
- 2) The maximum population density is determined by zone based on the urbanization trend and prospects.
- 3) The curve regression model is applied by which the population shall approach the level of the maximum density over time.
- 4) The following exceptions are made to reflect the planning conditions:
The population within the Damascus city, where it is decreasing, is adjusted to make its changes smooth; and
For the proposed new cities, the planned population is applied.

Population distribution

The results of the population distribution are summarized in Table 6.5. The total population is planned to reach 6.0million by 2025, consisting of 1.8million in the Damascus city and 4.2million in Rural Damascus.

Table 6.5 Changes in Population Distribution by Zone

Population by zone, past(1970,1981,1994 and 2004) and planned (2010, 2015, 2020 and 2025)									
No.	Name of zone	Population				Planned population			
		1970	1981	1994	2004	2010	2015	2020	2025
	DG+RDG within DMA	1,260,758	1,922,947	2,922,727	3,608,006	4,236,300	4,783,500	5,372,300	6,000,000
	Damascus governorate	820,205	1,090,764	1,373,223	1,552,161	1,625,800	1,691,800	1,749,100	1,800,000
1	Rukin Eddin	62,181	82,692	95,657	92,646	93,500	94,300	95,000	95,800
2	Al-Muhajreen	52,855	70,290	63,263	55,510	56,500	57,300	58,200	59,000
3	Mazzeih	55,512	73,824	114,608	123,313	133,000	137,800	141,600	144,500
4	Barzeh	52,020	69,180	100,814	107,596	116,000	120,200	123,600	126,300
5	Jobar	48,679	64,736	75,662	83,245	87,400	90,000	92,200	94,000
6	Sarouja	75,939	100,989	87,921	83,814	86,200	88,100	90,100	92,000
7	Old Damascus	29,167	38,788	28,957	24,721	25,700	26,600	27,400	28,300
8	Qanawat	61,115	81,275	68,975	58,053	58,600	59,100	59,500	60,000
9	Midan	110,392	146,807	169,806	177,636	181,100	182,800	184,000	184,800
10	Shaghour	45,269	60,202	78,101	139,229	142,900	145,900	149,000	152,000
11	Dummar	12,551	16,691	48,446	96,961	111,000	130,000	145,000	158,000
12	Qadam	34,773	46,244	62,917	95,944	97,300	102,100	105,800	108,600
13	Kafar Souseh	48,078	63,938	94,138	113,968	130,100	142,800	155,500	167,900
14	Qaboun	34,216	45,503	62,514	89,974	94,800	101,900	108,300	113,900
15	Salhiyeh	52,695	70,077	67,841	72,303	74,200	75,300	76,100	76,900
16	Yarmouk	44,762	59,528	153,603	137,248	137,500	137,600	137,800	138,000
	Rural Damascus governorate	440,553	832,183	1,549,504	2,055,845	2,610,500	3,091,700	3,623,200	4,200,000
	Center	160,633	312,063	597,418	902,216	1,132,200	1,331,300	1,537,800	1,751,000
	Al Kissweh	25,860	46,262	82,137	112,095	162,600	200,800	246,500	300,500
	Babbilia	39,356	86,352	220,291	341,625	425,800	493,400	552,300	600,400
	Jaramana	24,117	46,404	64,305	114,363	114,700	127,600	139,500	149,900
	Miaiha	14,051	23,439	40,452	56,652	76,500	92,100	109,900	129,900
	Kafar Batna	25,929	41,880	77,219	123,474	138,200	159,400	180,300	200,300
	Erbeen	19,800	27,632	61,354	89,595	100,300	108,700	115,400	120,400
	Qudsaya	11,520	22,193	51,660	64,412	114,100	149,300	193,900	249,600
	DOUMA	79,764	177,248	324,148	407,132	546,000	640,100	742,100	848,900
	Douma center	23,848	81,263	145,568	181,934	292,500	359,200	429,600	500,000
	Harasta	21,176	32,399	64,251	88,816	112,700	137,100	166,000	199,700
	Al Dumair								
	Al Nashabiyeh	13,374	20,813	38,664	76,814	80,000	82,000	84,000	86,000
	Harran Al Awamid	11,478	15,862	26,008	22,853	23,200	23,600	23,800	24,000
	Al Ghizlaniyeh	9,888	12,096	25,974	36,715	37,600	38,200	38,700	39,200
	Al Saba'a Biyar								
	Al Tall	40,563	61,926	95,903	115,937	162,400	213,400	280,700	370,000
	Al Tall center	27,090	41,903	68,929	85,933	121,700	164,400	222,100	300,000
	Saidnaya	8,512	12,119	17,157	18,846	25,000	29,500	34,400	40,000
	Rankous	4,961	7,904	9,817	11,158	15,700	19,500	24,200	30,000
	Al Zabadani	44,285	61,250	82,235	105,342	117,600	125,400	132,800	140,300
	Zabadani center	19,767	27,338	34,216	40,613	47,300	51,500	55,800	60,200
	Al Dimas	4,302	6,605	10,159	21,978	23,000	23,900	24,700	25,500
	Ain Al Fijeh	7,498	10,896	15,851	19,584	21,400	22,800	23,900	24,900
	Madaya	8,153	9,952	12,388	13,692	16,400	17,600	18,700	19,900
	Sarghaya	4,565	6,459	9,621	9,475	9,500	9,600	9,700	9,800
	Qatana	54,239	79,700	159,643	207,245	269,000	337,100	423,800	534,300
	Qatana Center	34,783	51,655	112,871	146,344	197,800	255,200	329,300	425,000
	Bait Jin	7,121	9,127	12,661	15,668	21,100	26,100	32,300	40,000
	Sa'aSa'a	12,335	18,918	34,111	45,233	50,100	55,800	62,200	69,300
	Daraya	40,594	107,439	241,481	260,961	310,300	359,000	406,700	440,500
	Daraya center	30,191	73,146	159,050	131,501	172,000	213,000	253,000	280,200
	Sahnaya	6,563	10,730	22,753	44,512	52,000	58,500	65,000	70,400
	Al Hajjar Al Aswad	3,840	23,563	59,678	84,948	86,300	87,500	88,700	89,900
	Qutayfeh	20,475	32,557	48,676	57,012	73,000	85,400	99,300	115,000
	Qutayfeh Center	13,901	23,244	37,213	44,820	58,100	67,700	78,400	90,200
	Jairoud								
	Al Ruhaybeh								
	Ma'aloula	6,574	9,313	11,463	12,192	14,900	17,700	20,900	24,800

Note: Al Dumair, Al Saba'a Biyar, Jairoud and al Ruhaba are not included in DMA.

Source: JICA Study Team for The Planned Population

(2) Employment at residence

Data on current conditions

The census provides the data on employment by zone (service department of the Damascus city and nahiya of Rural Damascus) and by industry (primary, secondary and tertiary).

The employment structure in the Damascus city is 0.7% primary, 28.0% secondary and 71.3% tertiary as of 2004. The employment at residence in the city totals 450,000, accounting for 29% of the total population. The primary industry accounts for less than 1.0% in most service departments, except Kafar Souseh (3.8%) and Qadam (1.4%). The shares of the secondary industry range mostly in 20-40%, and the tertiary industry in 60-80%.

The employment structure in Rural Damascus is 7.7% primary, 36.5% secondary and 55.9% tertiary as of 2004. In most nahiyas, the ratio of the employment at residence to the population is in the range of 22-27%. The shares of the primary industry exceed 10% in Al Kissweh (13.5%), Mlaiha (12.2%), Al Nashabiyeh (31.2%), Al Ghizlaniyeh (11.0%), Rankous (32.0%), Zabadani Center (17.6%) and Al Dimas (12.8%).

Projection

The employment at residence is projected to 2025 by assuming the following.

1) Damascus city

- i) The ratio of working age population will increase from 27% in 2004 to 37% by 2025, as the young population has a large share at present.
- ii) The employment in the primary industry will decrease to a half of the 2004 employment.
- iii) The share of the tertiary industry is set by service department based on the recent trend and prospect.
- iv) The share of the secondary industry is calculated as the balance between the total employment and the employment in the primary and tertiary industries.

Consequently, the employment structure will change to 0.3% primary, 24.1% secondary and 75.6% tertiary in 2025.

2) Rural Damascus

- i) The ratio of working age population will increase from 27% in 2004 to 36% in 2025.
- ii) The primary industry will maintain its employment for each nahiya.
- iii) The share of the tertiary industry is set by nahiya based on the recent trend and prospect.
- iv) The share of the secondary industry is calculated as the balance between the total employment and the employment in the other industries.

Consequently, the employment structure will change to 2.5% primary, 34.8% secondary and 62.7% tertiary.

Results

The results of the projection for the year 2025 are summarized in Table 6.6. For the DMA as a whole, the employment structure will change to 1.9% primary, 31.5% secondary and 66.6% tertiary.

Table 6.6 Distribution of Workers at Residence by Zone in 2025

Number of workers at residence 2025									
No.	Name of zone (service department / nahiya)	2025 breakdown by sector				2025 breakdown by sector (%)			
		Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
	DG+RDG within DMA	39,118	684,026	1,443,356	2,166,500	1.8	31.6	66.6	100
	Damascus governorate	1,666	160,773	503,561	666,000	0.3	24.1	75.6	100
1	Rukin Eddin	53	7,027	28,320	35,400	0.1	19.9	80	100
2	Al-Muhajreen	26	4,334	17,440	21,800	0.1	19.9	80	100
3	Mazzeh.	125	7,900	45,475	53,500	0.2	14.8	85	100
4	Barzeh	188	9,152	37,360	46,700	0.4	19.6	80	100
5	Jobar	53	10,387	24,360	34,800	0.2	29.8	70	100
6	Sarouja	45	5,055	28,900	34,000	0.1	14.9	85	100
7	Old Damascus	11	2,614	7,875	10,500	0.1	24.9	75	100
8	Qanawat	55	4,385	17,760	22,200	0.2	19.8	80	100
9	Midan	86	20,434	47,880	68,400	0.1	29.9	70	100
10	Shaghour	67	16,793	39,340	56,200	0.1	29.9	70	100
11	Dummar	27	11,673	46,800	58,500	0	20	80	100
12	Qadam	189	11,871	28,140	40,200	0.5	29.5	70	100
13	Kafar Souseh	574	18,056	43,470	62,100	0.9	29.1	70	100
14	Qaboun	72	10,453	31,575	42,100	0.2	24.8	75	100
15	Salhiyeh	37	7,088	21,375	28,500	0.1	24.9	75	100
16	Yarmouk	58	15,272	35,770	51,100	0.1	29.9	70	100
	Rural Damascus Governorate	37,452	523,253	939,795	1,500,500	2.5	34.8	62.7	100
	Center	12,360	246,320	371,720	630,400	2	39.1	59	100
1	Al Kissweh	3,761	44,929	59,510	108,200	3.5	41.5	55	100
2	Babbila	2,534	94,711	118,855	216,100	1.2	43.8	55	100
3	Jaramana	627	12,873	40,500	54,000	1.2	23.8	75	100
4	Maiha	1,828	21,572	23,400	46,800	3.9	46.1	50	100
5	Kafar Batna	1,432	34,618	36,050	72,100	2	48	50	100
6	Erbeen	1,742	15,578	25,980	43,300	4	36	60	100
7	Qudsaya	436	22,039	67,425	89,900	0.5	24.5	75	100
	DOUMA	8,874	112,001	181,725	302,600	2.9	36.6	60.5	100
8	Douma center	3,740	68,260	108,000	180,000	2.1	37.9	60	100
9	Harasta	927	24,238	46,735	71,900	1.3	33.7	65	100
	Al Dumair								
10	Al Nashabiyeh	2,732	11,868	14,600	29,200	9.4	40.6	50	100
11	Harran Al Awamid	466	1,994	5,740	8,200	5.7	24.3	70	100
12	Al Ghizlaniyeh	1,009	5,641	6,650	13,300	7.6	42.4	50	100
	Al Saba'a Biyar								
	Al Tall	1,926	44,034	85,840	131,800	1.5	33.4	65.1	100
13	Al Tall center	755	37,045	70,200	108,000	0.7	34.3	65	100
14	Saidnaya	298	3,782	9,520	13,600	2.2	27.8	70	100
15	Rankous	873	3,207	6,120	10,200	8.6	31.4	60	100
	Al Zabadani	4,819	13,661	29,320	47,800	11.3	28.6	60.1	100
16	Zabadani center	1,844	6,356	12,300	20,500	9	31	60	100
17	Al Dimas	734	1,441	6,525	8,700	8.4	16.6	75	100
18	Ain Al Fijeh	269	2,281	5,950	8,500	3.2	26.8	70	100
19	Madaya	1,386	2,354	3,060	6,800	20.4	34.6	45	100
20	Sarghaya	586	1,229	1,485	3,300	17.8	37.2	45	100
	Qatana	6,492	48,998	134,710	190,200	3.4	25.8	70.8	100
21	Qatana Center	2,667	35,583	114,750	153,000	1.7	23.3	75	100
22	Bait Jin	1,117	4,323	8,160	13,600	8.2	31.8	60	100
23	Sa'a Sa'a	2,708	9,092	11,800	23,600	11.5	38.5	50	100
	Daraya	2,376	50,604	105,620	158,600	1.5	31.9	66.6	100
24	Daraya center	1,752	33,563	65,585	100,900	1.7	33.3	65	100
25	Sahnaya	226	6,099	18,975	25,300	0.9	24.1	75	100
26	Al Hajar Al Aswad	398	10,942	21,060	32,400	1.2	33.8	65	100
	Qutayfeh	605	7,635	30,860	39,100	1.5	19.5	78.9	100
27	Qutayfeh Center	385	5,755	24,560	30,700	1.3	18.7	80	100
	Jairoud								
	Al Ruhaybeh								
28	Ma'aloula	220	1,880	6,300	8,400	2.6	22.4	75	100

Source: JICA Study Team

(3) Employment at workplace

The census provides the number of workers at residence but not at workplaces. The statistics on establishments are used to estimate the number of workers counted at workplaces by zone and by industry. The following assumptions are made for the projection.

- 1) The number of workers at workplace is larger than the workers at residence in the Damascus city as there exists net inflow of commuters, while it is smaller in Rural Damascus.
- 2) The number of workers at workplace in the primary industry is the same as the workers at residence in the primary industry.
- 3) The ratio of workers at workplace to the population is assumed by service department of the Damascus city for 2004 and set to increase by 2025 except in Old Damascus.
- 4) The share of the workers at workplace in the tertiary industry is assumed to increase by 2025 for all the service departments of the city.
- 5) The ratio of workers at workplace to the population is assumed by nahiya of Rural Damascus for 2004 and set to change by 2025.
- 6) The share of the workers at workplace in the tertiary industry is assumed to increase by 2025 for all the nahiyas of Rural Damascus except Al Hajar Al Aswad.

The results of the projection for 2025 are summarized in Table 6.7. For the DMA as a whole, the ratio of the workers at workplace to the population will increase from 29% in 2004 to 38% in 2025. The number of workers at workplace will increase from 1.04million in 2004 to 2.27million in 2025.

Table 6.7 Distribution of Workers at Workplace by Zone in 2025

Number of workers at workplace 2025									
No.	Name of Zone (service department / nahiya)	2025 breakdown by sector				2025 breakdown by sector (%)			
		Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
	DG+RDG within DMA	39,118	579,482	1,654,100	2,272,700	1.7	25.5	72.8	100
	Damascus governorate	1,666	179,914	695,320	876,900	0.2	20.5	79.3	100
1	Rukin Eddin	53	4,252	24,395	28,700	0.2	14.8	85.0	100
2	Al-Muhajreen	26	8,234	33,040	41,300	0.1	19.9	80.0	100
3	Mazzeh	125	6,385	36,890	43,400	0.3	14.7	85.0	100
4	Barzeh	188	5,497	32,215	37,900	0.5	14.5	85.0	100
5	Jobar	53	14,047	32,900	47,000	0.1	29.9	70.0	100
6	Sarouja	45	13,755	78,200	92,000	0.1	14.9	85.0	100
7	Old Damascus	11	7,069	63,720	70,800	0.0	10.0	90.0	100
8	Qanawat	55	8,945	51,000	60,000	0.1	14.9	85.0	100
9	Midan	86	27,634	64,680	92,400	0.1	29.9	70.0	100
10	Shaghour	67	22,733	53,200	76,000	0.1	29.9	70.0	100
11	Dummar	27	7,083	40,290	47,400	0.0	15.0	85.0	100
12	Qadam	189	10,661	32,550	43,400	0.4	24.6	75.0	100
13	Kafar Souseh	574	7,826	33,600	42,000	1.4	18.6	80.0	100
14	Qaboun	72	11,328	34,200	45,600	0.2	24.8	75.0	100
15	Salhiyeh	37	10,723	43,040	53,800	0.1	19.9	80.0	100
16	Yarmouk	58	13,742	41,400	55,200	0.1	24.9	75.0	100
	Rural Damascus governorate	37,452	399,568	958,780	1,395,800	2.7	28.5	68.7	100
	Center	12,360	144,420	427,820	584,600	2.1	24.7	73.2	100
1	Al Kissweh	3,761	44,319	72,120	120,200	3.1	36.9	60.0	100
2	Babbila	2,534	45,506	192,160	240,200	1.1	18.9	80.0	100
3	Jaramana	627	11,373	48,000	60,000	1.0	19.0	80.0	100
4	Maiha	1,828	11,172	13,000	26,000	7.0	43.0	50.0	100
5	Kafar Batna	1,432	14,608	24,060	40,100	3.6	36.4	60.0	100
6	Erbeen	1,742	7,898	38,560	48,200	3.6	16.4	80.0	100
7	Qudsaya	436	9,544	39,920	49,900	0.9	19.1	80.0	100
	DOUMA	8,874	112,376	201,850	323,100	2.8	34.7	62.5	100
8	Douma center	3,740	76,260	120,000	200,000	1.9	38.1	60.0	100
9	Harasta	927	23,043	55,930	79,900	1.2	28.8	70.0	100
	Al Dumair								
10	Al Nashabiyeh	2,732	7,588	15,480	25,800	22.8	17.2	60.0	100
11	Harran Al Awamid	466	3,374	5,760	9,600	2.6	37.4	60.0	100
12	Al Ghizlaniyeh	1,009	2,111	4,680	7,800	11.2	28.8	60.0	100
	Al Saba'a Biyar								
	Al Tall	1,926	15,674	56,400	74,000	2.6	21.2	76.2	100
13	Al Tall center	755	11,245	48,000	60,000	1.3	18.7	80.0	100
14	Saidnaya	298	2,902	4,800	8,000	3.7	36.3	60.0	100
15	Rankous	873	1,527	3,600	6,000	14.6	25.5	60.0	100
	Al Zabadani	4,819	15,631	20,450	40,900	13.2	36.8	50.0	100
16	Zabadani center	1,844	7,206	9,050	18,100	10.2	39.8	50.0	100
17	Al Dimas	734	3,116	3,850	7,700	12.4	37.6	50.0	100
18	Ain Al Fijeh	269	2,831	3,100	6,200	4.3	45.7	50.0	100
19	Madaya	1,386	1,614	3,000	6,000	23.1	26.9	50.0	100
20	Sarghaya	586	864	1,450	2,900	24.9	25.1	50.0	100
	Qatana	6,492	55,458	129,950	191,900	3.4	28.9	67.7	100
21	Qatana Center	2,667	48,333	119,000	170,000	1.6	28.4	70.0	100
22	Bait Jin	1,117	2,883	4,000	8,000	14.0	36.0	50.0	100
23	Sa'a Sa'a	2,708	4,242	6,950	13,900	19.5	30.5	50.0	100
	Daraya	2,376	45,114	110,810	158,300	1.5	28.5	70.0	100
24	Daraya center	1,752	31,878	78,470	112,100	1.6	28.4	70.0	100
25	Sahnaya	226	8,234	19,740	28,200	0.8	29.2	70.0	100
26	Al Hajar Al Aswad	398	5,002	12,600	18,000	2.2	27.8	70.0	100
	Qutayfeh	605	10,895	11,500	23,000	2.6	47.4	50.0	100
27	Qutayfeh Center	385	8,615	9,000	18,000	2.1	47.9	50.0	100
	Jairoud								
	Al Ruhaybeh								
28	Ma'aloula	220	2,280	2,500	5,000	4.4	45.6	50.0	100

Source: JICA Study Team

6.3 Scenario for DMA Urban Development

A series of activities to be undertaken and events to take place in the DMA over the planning period up to 2025 are described here as the development scenario for the DMA. Just like the development scenario for Syria presented in Section 2.2, the planning period is divided into three phases: Phase 1 up to 2013, Phase 2 for 2014-19, and Phase 3 for 2020-25. Expected socio-economic characteristics and spatial development in each phase are described.

6.3.1 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. The economic efficiency should be realized at the highest possible level for the capital region to support the sustainable socio-economic development of Syria in the globalizing economy. The human security would ensure the DMA urban spaces offer comfortable living environment for all the residents and visitors. The cultural city should be realized through active communications between peoples of different backgrounds, which should be made possible by sufficient spaces and atmosphere for such communications.

These concepts should be made widely known and accepted by all the residents. While the master plan itself has technical elements not easily understood and accepted 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 facilities, including golf courses. Mixed farming combining fruit trees and vegetable production under the shade may be allowed. With more productive uses promoted under the subsidies, the Ghouta area would be protected from further encroachment by housing and other developments. 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. Urbanization would be allowed only in limited areas delineated by the master plan.

The Adra industrial city will continue to develop, but 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 either the Adra industrial city or outside Rural Damascus. 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 in the southwestern part of Rural Damascus.

The private sector will take the stronger initiative for tourism development during this phase. Local tourism agencies will associate with international agencies 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.

The population in the Damascus city would reach its maximum within the present administrative boundaries by the end of the phase with some 1.7million at the average density of 140/ha. Additional population may spill over to the neighboring areas. The population in the Ghouta area would be suppressed by the measures to encourage the productive use of the land as mentioned above. Incremental population will be guided more to the outer areas of Rural Damascus.

(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 as described above. They include new districts in Al Assad and Qudsaya. With the suppressed population increase in the Ghouta area as mentioned above, most incremental population would have to be accommodated in the outer areas of Rural Damascus. For this purpose, planned urban development 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.

6.3.2 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. Both the rural population and the agricultural land area would be maintained throughout the phase, while the productivity is consistently enhanced.

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 as well as the Damascus city. More knowledge-based industries will establish together with related service establishments 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.

During this phase, the population in the Ghouta area will approach its maximum

including the spill-over population from the Damascus city. Most increase in urban population will be accommodated by urban centers in the outer areas of Rural Damascus. The overall population increase, however, should decelerate to 2.5% per annum more or less by 2019.

(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.

6.3.3 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.

With the maximum population of 1.7million in the Damascus city, some 200,000 population will spill over into the neighboring areas. In the Ghouta area and Harasta,

1.98million population would be accommodated including the spill-over from the city, while preserving good portions of Ghouta as productive greenery. Therefore, some 2.40million population would have to be accommodated in the outer areas of Rural Damascus. About one-third of the incremental population of 1.19million would be accommodated in the Adra industrial city, and most of the rest in the few selected urban centers. The hierarchical structure of urban centers will be established with functional division among all the urban centers at different tiers of the hierarchy.

Following the trend in the recent past, the population in Rural Damascus may increase at 3.3% per annum to reach 4.5million by 2025. Including the maximum population of 1.7million in the Damascus city, the total population in the DMA could be 6.2million in 2025. Suppressing the population at 6.0million by planned urban development, therefore, is quite manageable. More important would be to realize the better distribution of the population for economic efficiency, human security and cultural city, and to maintain the population level thereafter.

The DMA would become the first sustainable mega-city in the modern world based on the Barada and Awaj water, land and human resources. In the sustainable city, the development means not the population growth or the expansion of urban territory but rather 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.