

JAPAN INTERNATIONAL COOPERATION AGENCY

DAMASCUS CITY WATER SUPPLY AND SEWERAGE AUTHORITY
SYRIAN ARAB REPUBLIC

THE STUDY
ON
THE DEVELOPMENT OF WATER SUPPLY SYSTEM
FOR
THE DAMASCUS CITY

PHASE I

VOLUME III
FINAL REPORT
SUPPORTING REPORT
APPENDIX A, B, C

FEBRUARY 1997

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1135390(1)

ESTIMATE OF PROJECT COST

Estimate of Base Cost : as of September 1996 Price Level

Currency Exchange Rate : US\$1 = SL 42 = Yen 108

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ABBREVIATIONS

Organizations

ACSAD	- The Arab Center for the Studies of Arid Zone and Dry Lands
BRGM	- Bureau de Recherche Geologique et Minière, France
CBS	- Central Bureau of Statistics
CGE	- Compagnie Generale des Eaux, France
DAWSSA	- Damascus City Water Supply and Sewerage Authority
EDWSSR	- Establishment of Drinking Water Supply and Sewerage in the Rural Province of Damascus
EPEF	- Establishment Public Des Eau De Damas (Figeli)
HISAT	- Higher Institute of Applied Sciences and Technology
JICA	- Japan International Cooperation Agency
MOHU	- Ministry of Housing and Utilities
MOI	- Ministry of Irrigation
SAR	- Syrian Arab Republic
SPC	- The State Planning Commission
WHO	- World Health Organization

Others

EIA	- Environmental Impact Assessment
EIRR	- Economic Internal Rate of Return
GDP	- Gross Domestic Product
IEE	- Initial Environmental Evaluation
NPV	- Net Present Value
O&M	- Operation and Maintenance
PE	- Polyethylene
PVC	- Polyvinyl Chloride
SCADA	- Supervisory Control and Data Acquisition (System)
UFW	- Unaccounted for Water
VAT	- Value Added Tax

ABBREVIATIONS OF MEASUREMENT

Length

mm	=	millimeter
cm	=	centimeter
m	=	meter
km	=	kilometer

Area

cm ²	=	square centimeter
m ²	=	square meter
ha	=	hectare
km ²	=	square kilometer

Volume

cm ³	=	cubic centimeter
l	=	liter
m ³	=	cubic meter
MCM	=	million cubic meter

Weight

mg	=	milligram
g	=	gram
kg	=	kilogram

Time

s	=	second
min	=	minute
h	=	hour
d	=	day
y	=	year

Electrical Measurement

V	=	Volt
A	=	Ampere
Hz	=	Herz
W	=	Watt
kW	=	kilowatt
MW	=	Megawatt

Other Measures

%	=	percent
HP	=	horsepower
°C	=	Celcius degree

Derived Measures

l/s	=	liter per second
m ³ /s	=	cubic meter per second
m ³ /h	=	cubic meter per hour
m ³ /d	=	cubic meter per day
lpcd	=	liter per capita per day
kWh	=	kilowatthour
MWh	=	megawatthour
kVA	=	kilovolt ampere
mg/l	=	milligram per liter
µg/l	=	microgram per liter
meq/l	=	milliequivalents per liter
µS/cm	=	microsiemens per centimeter

Currency

US\$	=	US Dollar
SL	=	Syrian Pound

CURRENCY EQUIVALENT

(as of September 1996)

US\$ 1 = SL 42

TRANSLITERATIONS OF ARABIC PLACE NAMES (1/2)

عباسيين	Abasiyin	بيت جن	Beit Jenn
أبو زاد	AbuZad	بيت تيماء	Beit Tima
أشرفية	Achrafye	برزة	Berze
عين عوينات	Ain Awenad	بلودان	Bloudan
عين بداء	Ain Beda	بوقين	Boukein
عين حبيب	Ain Habib	دحداديل	Dahadil
عين حداد	Ain Hadad	دار المعلمات	Dar al Moalimat
عين حاروش	Ain Haroush	داريا	Daraya
عين حور	Ain Hour	دير مقرون	Deir Moukaren
عين عيسى	Ain Issa	دير العشائر	Deir al Ashayer Shahour
عين نورية	Ain Nourieh	حوض التشتيت	Dissipation Basin
عين رضوان	Ain Roudwan	دربل	Dourbol
عين صبا	Ain Saba	دسر	Dummar
عين صالح	Ain Saleh	عسالي	El Esaly
عين الباردة	Ain el Baradeh	الفوار	El Fawar
عين الحضرة	Ain el Khadra	الغرض	El Feid
عين المالح	Ain el Malha	حفيرة	El Hafirich
عين الصاحب	Ain el Salieb	الحامة	El Hame
عين التينة	Ain el Tinch	العرق	El Irk
أكراد	Akrad	الشواط	El Shuwat
جامع الفصاح	Al Aksab Mosque	عش الورور	Esh al Warwar
الضاحية	Al Dahia	فاسريا	Fasraya
الحضرة	Al Khadra	نبع الفيحة	Figh Spring
المشارع	Al Mashare	فراسكن	Fraskin
الغزاز	Al Qazzaz	الغوظة	Ghonta
السول	Al Sahl	حفير الفوفة	Hafir el Foka
عراطوز	Artooz	خاليا	Halaya
قدم عسالي	Asalie Kadam	حسبية	Hassibeh
الاعوج	Awaj	حسوية	Huseiniyeh
باب معلى	Bab Mosallah	ابن النفيس	Ibn Alnafas
باب شرقى	Bab Sharki	ابن عساكر	Ibn Assaker
باب السلام	Bab el Salam	جاناني	Janani
شارع بغداد	Baghdad Street	جرمانا	Jaramana
بردى	Barada	جمرايا	Jemarya
بساتين	Basateen	جوير	Jobar
بسيمة	Bassime	جوير عكاش	Jobar Akache

TRANSLITERATIONS OF ARABIC PLACE NAMES (2/2)

جوبر عمادية	Jobar Imadye	قطيفة	Qutayfeh
جوبر قباني	Jobar Kabani	رفكوس	Rankous
جرجانية	Jourjaniyeh	رأس الحاجب	Ras Hasib
كابون	Kaboon	رأس الوادي	Ras el Wadi
كادم	Kadam	الرازي	Razy
كفر سوسة	Kafar Souseh	ريحة	Rineh
كفر العواميد	Kafar el Awamid	ركن الدين	Ruku Aldyn
كنوات	Kanawat	سبع	Saasaa
كاسيون	Kassioun	صفصافة	Safsafi
قطنا	Katana	سردا	Sarada
الكروش	Kersh	ساروجة	Sarouja
خان الفندق	Khan el Founduk	صياحي	Sayafeh
خورشيد	Khorshead	سيبراني	Sebrani
كلسيا	Kudsaya	صيدنايا	Sednaya
كيوان	Kywan	شاغور	Shaghour
لوان	Lawan	شخاب	Shakhab
معاولا	Maaloula	ينابيع جانبية	Side Spring
معرونة	Maaroune	سومرية	Somareyeh
مضابيا	Madaya	سيرونكس	Syronics
مهدي بن بركة	Mahadi Bin Baraka	طبال	Tabbaleh
شارع الملكي	Malki street	طبية	Tabibiyeh
مزرعة	Mazraa	تضامن	Tadamoun
ميسلون	Meisalon	تقدم	Takadom
مميعج	Membej	تلمانية	Talmasieh
مزة	Mezze	تكية	Tekieh
ميدان	Midan	المدينة القديمة	The Old City
منين	Mnin	تشرين	Tishreen
مخيم	Mokhayam	المدينة الجامعية	University City
مهاجرين	Mouhajreen	وادي مروان	Wadi Marwan
السبع	Naboua	الوالي	Wali
نهر عيشة	Naher Eshel	ينفور	Yaafour
ناظم باشا	Nazem Basha	يرموك	Yarmouk
النبيك	Nebk	زيداني	Zabadani
أمية	Omayad		
أمويين	Oumawiyin		
منطقة الرئاسة	Presidential Area		

APPENDIX A
SOCIO-ECONOMY



APPENDIX A
SOCIO-ECONOMY

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1. LAND AND POPULATION

Syria is located on the Eastern Mediterranean. Its total land mass is 185,180 square kilometers. Its coastline line stretches for 193 km. Other borders are with Iraq (605 km), Jordan (375 km), Lebanon (375 km) and Turkey (822 km). The country's capital city is Damascus. Other large cities are Aleppo, Latakia, Homs, Hama and Dier Ezzor.

Most of Syria consists of a plateau, with the Syrian desert in the South-East of the country. In the West, a series of mountains including the Jabal Al Druze and the Anti Lebanon mountains run roughly parallel to the country's Mediterranean coast. Mount Hermon is the country's highest point at 2,815 m.

Over the past 25 years Syria has had one of the highest population growth rates in the world. Between the census years of 1981 and 1994, the average annual growth rate was 3.3%. The mid year population estimates for 1995 is 14.186 million. The annual growth rate in Syria follows the same high growth trends experienced in other Middle Eastern countries as shown in Table A-1.1. Over 90% of the population is Arab and Muslims account for almost 85% of the population. The remaining 15% are predominantly Christians. Syria's official language is Arabic. Armenian is used widely in Aleppo.

The population is concentrated in the Aleppo-Hama-Homs-Damascus strip running North to South in the west of the country, and on the coast in the provinces of Latakia and Tartous. The implementation of the Euphrates irrigation project has made the north-east more attractive and the government is trying to encourage the development of this neglected area.

The rate of urbanization is high, with an estimated 51% of the population living in cities in 1995. Government programs to limit the expansion of cities over the last ten years appear to be having a positive effect. The country's urban growth rate has been decreasing since 1960 from 5.3% to about 4% in 1994. The government has tried to promote the development of rural areas with an ambitious electrification program.

2. NATIONAL ECONOMY

2.1 Economic Policy

Since 1989 government policy has been aimed at strengthening the private sector. In 1991 Law No. 10 for the Encouragement of Investment was passed to stimulate more liberal private sector involvement. The new legislation offers a wide range of incentives, tax exemptions and regulatory privileges for productive investment in the country. The law is aimed primarily at foreign investors and is designed to create employment, promote import substitution and exports, produce economic growth and lead to the transfer of technology and management expertise.

The transition from a state controlled system to a free market economy has been cautious. The Syrian government believes that gradual change is required to avoid upsetting the social and political status quo. Since 1990 the economy has seen real growth at an average of 7-8% per annum. The oil industry has seen the biggest change in economic policy. Foreign oil companies have been offered areas for oil exploration under production sharing agreements. A number of these companies have taken up concessions. Local private sector activity has been limited to less regulated areas such as agriculture and tourism industries. Even traditional state run industries like cement manufacturing, electricity and petrochemicals are now seeing proposals for private sector investment.

2.2 National Account

The economy, stimulated by oil production, experienced steady GDP growth as shown in Table A-2.1, averaging 7.3% per year over the 1990-93 period. The exploitation of Syria's gas reserves and ongoing crude output coupled with the economic liberalization program should provide for a steady GDP growth in the medium term. A lack of major new oil finds is worrying for the long-term. In 1994 the GDP in current price was SL 496.5 billion which is a per capita GDP of SL 35,866. These figures are comparable to other non oil producing Middle East and North Africa (MENA) countries as shown in Figure A-2.1. The GDP, which has seen a continued real growth at an average of 7.5% per year from 1990 to 1994, is being eroded by a rapidly growing population. Per capita GDP has declined steadily over the same period in terms of real growth to reach a low of 2.8% over the 1993 to 1994 period.

The domestic economy relies heavily on seasonally fluctuating agricultural output which represented about 21% of GDP in 1994. Manufacturing in 1994 contributed to 27% of the GDP. The performance of export oriented food processing and textile industries has fluctuated sharply in response to changes in the primary sector inputs that support them. The basic

structure of GDP has not changed much since 1988 as shown by the comparison of GDP by sector origin from 1988 to 1994 presented in Table A-2.2. GDP growth by sector, presented in Table A-2.3 shows that transportation & communications is the fastest growing sector seeing real growth of 16.5% between 1993 and 1994. This is followed by the agricultural sector with a GDP growth of 7.4%.

2.3 Employment

Seasonal migration of workers seeking casual construction work tends to obscure the interpretation of employment statistics. Also, many government services employees have two jobs to supplement their income. Official Syrian statistics on unemployment are only available up to the year 1991. Unemployment figures published in the 1995 statistical abstract, presented in Table A-2.4, indicate that in 1991 a total of 6.8% of the population was unemployed. Figures for 1993 reported by the World Bank indicate that unemployment was about 5.5%. This is one of the lowest unemployment rates among MENA countries.

As shown in Table A-2.5, the services sector employs about one third of the total work force, followed by agriculture at 28% and manufacturing at 15%. Between 1990 and 1991 there was a large increase in the number of people employed by the agricultural sector. This increase corresponds to the return of Syrian expatriates from the gulf during the war in Kuwait. In general the domestic work force has been affected significantly by the loss of skilled workers to the Gulf States. An estimated 2 million Syrian's lived outside the country in mid 1990.

2.4 Prices

Official inflation statistics showing price trends since 1989 are presented in Table A-2.6. These are based on a basket of goods that is reportedly outdated and does not reflect the actual requirements of the average household. Based on consumer price indexes reported by the Central Bureau of Statistics (CBS), the annual inflation rates have increased from 11% in 1990 to 15% in 1994. Independent foreign analysts report that the actual inflation rate is probably closer to 20% which is more in line with historically high inflation rates in Syria. During the second half of the 1980's the inflation rate was high due to a chronic shortage of food and consumer goods. Following the government's liberalization program in the late 1980's consumer price increases slowed but continued to fluctuate because food subsidies were partial lifted and exchange rate adjustments devalued the Syrian pound. The government approves price levels for all goods and services. Moves toward a free market economy have not yet included the lifting of many price regulations.

2.5 Finance

As shown in Table A-2.7, the 1995 budget set total expenditures at SL 162 billion, a 12.5% increase over the 1994 level but a net reduction in real terms given the estimated inflation rate of 20%. The total amount allocated to investment spending was SL 74.1 billion which represents 45% of the total expenditures budgeted for 1995. The 1996 investment budget has increased by 23% to SL 91.1 billion. Local resources fund about 75% of the budget (SL 68.7 billion). External resources will be used to cover the balance of SL 22.4 billion. Details of the 1996 investment expenditures allocated to each sector are presented in Table A-2.8. Electrical utilities were allocated 22.4% of the investment budget closely followed by the services sector with 19.7%, irrigation with 15.2%, and converting industries with 12.5%.

The government's main sources of revenue are tax collection, foreign and internal borrowing as well as grants and concessionary loans. The national income for 1994 as reported in the 1995 statistical abstract was SL 475.8 billion resulting in a per capita income of SL 34,366. Outstanding debts to foreign countries are estimated at approximately US \$12 billion. About 75% of this debt is owed to the former Soviet Union.

2.6 Foreign Trade

In 1989, the merchandise trade balance recorded a surplus for the first time in 30 years as a result of growing oil revenue and a rise in non-oil and mainly private sector exports of textiles and industrial goods to the Soviet Union. In 1990, unexpected oil earnings resulting from the Gulf crisis combined with an increase in non-oil exports produced a trade surplus of SL 20.3 billion as shown in Table A-2.9. In 1992 imports rose by 26% while exports fell by 10% resulting in a merchandise trade deficit. The rise in imports will likely continue with increased private sector activity and government backed infrastructure construction programs. As shown in Table A-2.10, mining, oil, and quarrying accounted for 50% of total exports in 1994. In 1994 Syrian imports of manufactured goods was valued at SL 55,368 while exports were a much lower at SL 12,279. This large imbalance was only partially offset by a positive balance in the oil and mining sector.

In the late 1980's, Syria's strong links with Warsaw pact countries and Iran meant that 42% of exports were to those countries while exports to the European Community (EC) formed only 31% of trade. In 1990, the trend was reversed with east European countries buying 34% of Syrian exports and the EC about 42%. This trend has continued and in 1994 the European union accounted for 55.8% of Syrian trade. Trade with various countries as a percent of total is presented in Table A-2.11.

2.7 External Payment And Debt

Syria's current account has deteriorated sharply since the early 80's largely due to a drop in oil export earnings and a fall in Arab aid. The large inflow of concessionary funding from Gulf states which followed Syria's participation in the international coalition against Iraq stopped in 1993-94 because of budgetary constraints in those states. However, concessionary funds from non-Arab countries such as Japan and individual European countries, continue to offset the deficit in the current account, giving Syria a positive balance of payments.

Since January 1992 Syria has secured almost US\$ 4 billion in development aid, mainly from Arab countries and agencies, to finance infrastructure and industrial projects. In addition to bilateral Arab aid, Syria receives large sums from Arab agencies such as the Arab Fund for Economic and Social Development, the Kuwait Fund for Economic Development and the Saudi Fund for Development. These funds frequently cooperate with the World Bank and such organizations as the European Investment Bank and the International Fund for Agricultural Development. In 1986 Syria ceased servicing its debt to the World Bank and the accumulation of arrears caused the Bank to freeze disbursements of loan funds. According to the World Bank's classification, Syria is a severely indebted lower income country whose debt in 1992 had reached US\$ 20 billion. The former Soviet Union claims are estimated at US\$ 12 billion (including military debt). Syria's debt consists largely of long term bilateral liabilities (87.6% of total). Syria has now resumed payment in monthly installments of US\$ 6 million to cover the estimated US\$ 400 million in arrears owed to the World Bank. External debt figures for the years 1988 to 1993 are shown in Table A-2.12.

2.8 Foreign Exchange Rates

The exchange rate has changed continuously over the past five years as the government has gradually moved towards a unified rate. The process of unifying the rates began in the late 1980's with the devaluation of the Syrian pound from SL 3.925 to SL 11.225:US \$1 in 1988. Between 1988 and 1990 two other government rates were introduced, a promotion rate of SL 22:US \$1 and a neighboring countries rate (NCR) of SL 42:US \$1. Since then the government has gradually increased the number of transactions which are conducted at these lower rates.

3. ECONOMIC DEVELOPMENT PLANNING

3.1 General

Since 1961 formal development planning has been practiced through a series of Five Year plans. The first five year plan saw the nationalization of banks, insurance companies and most private industrial firms. Subsequent planning periods concentrated on the investment in public sector industries. The country's economic development was disrupted by the war with Israel in October 1973 and again during the military intervention in the 1976 Lebanon war. The fifth and sixth planning periods focused on developing self-sufficiency in agriculture and investment spending on irrigation and mid sized agricultural processing industries.

3.2 The Seventh Five-Year Planning Period (1990-1995)

The seventh Five Year plan is the most recently published. The basic principles of the plan include: liberalization of the economy, continued development of agriculture and irrigation, and self sufficiency in cereal production. Targets have been published for sectoral growth by the end of the planning period: the highest average annual growth rate was projected to be in utilities (water and electricity) at 9.2%, followed by financial & social services at 7.5% and 7% respectively. Output in agriculture was planned to grow annually by 5.6% and in manufacturing by 5%. The total investment expenditure planned for the period was set at SL 295 billion, more than double the amount that was actually spent during the previous planning period. Actual investment expenditures for the 1990-95 planning period are not available. Results of the last planning period are being reviewed by the Planning Commission and should be published by end of 1996. Actual expenditures & target levels for investment spending by sector for the previous five year plans are shown in Table A-3.1. Although the total investment spending targets have been met, investment spending has consistently been under the target levels set for the agricultural sector and over the target for the services sector.

3.3 The Eighth Five-Year Planning Period (1996-2000)

The development plan for 1995-2000 has not yet been published by the Planning Commission. Economic developments in coming years will depend on Syria's ability to accelerate the pace of on-going reforms and to solve a series of outstanding problems related to a high rate of population growth and a large external debt. Agriculture is one of Syria's economic success stories and will continue to provide stability for future economic growth. Infrastructure development projects in the utilities sector (water & electricity), roads and telecommunications are current investment spending priorities.

3.4 Investment in Water Supply Development

The renewed influx of foreign aid has given the government an opportunity to invest in large infrastructure development programs. The development of new water resources will be required to meet the needs of a growing population and an increasing demand from agriculture for irrigation. Details of the 1996 investment budget are shown in Table A-2.8. The water supply sector has been allocated SP 7.3 billion which is a relatively low 8.2% of the total investment budget. DAWSSA is allocated 4.6% of this amount. Damascus Rural Water Supply Authority is given priority and receives 55% of the water sector investment budget. Aleppo, which is the largest urban center, is the second priority and receives 12% of the water sector investment budget. Table A-3.2 shows the investment budgets allocated to each water supply authority.

As in all MENA countries, water resources management is a critical issue. With the continued expansion of industry, questions of pollution prevention will also need to be addressed. With the help of European Union financing, wastewater treatment plants are being built in Aleppo, Homs and Damascus. The 1996 national budget has identified the following drinking water investment priorities:

- maintenance and renewal of water networks to reduce water losses,
- economic investment in rural water projects by installing water distribution networks and water meters where possible,
- implementation of projects financed by external loans, particularly: the fourth water adduction project from Euphrates river to Aleppo and the third water adduction project from al-Sinn to Lattakia and the villages of the coast,
- increase the quantities of adducted water from 892 million m³/year during 1995 to 908 million m³/year in 1996 to meet consumption requirements of 180 lpcd in the Governorates and 105 lpcd outside the Governorates.

4. SOCIO-ECONOMY IN THE STUDY AREA

4.1 Administrative Boundary - DAWSSA

The existing DAWSSA service area includes: Damascus City Governate (including informal settlement areas), Ain El Figeih, Ain El Khadra, Bassimeh, Al Achrafei, Al Haneh, Jemrya, and Kudsaya. The other population centers around the City Governate form the Damascus Rural Governate and are not within DAWSSA's jurisdiction.

The City Governate covers 106 km² and is sub-divided into 15 districts. These districts are further sub-divided into 62 neighborhoods by the Central Bureau of Statistics for census purposes. DAWSSA has sub-divided Damascus Governate into 26 metering districts which overlap the neighborhood boundaries.

The responsibilities of Damascus Municipality are growing rapidly as people continue to settle in areas adjacent to its administrative boundary. These settlement areas which have mostly developed informally will eventually require the same administrative controls and infrastructure as those provided within the City Governate. Informal connections to the water distribution network have increased demands on the water supply system which have resulted in a reduction in the performance of the system and in the general level of service, especially during the peak demand summer months.

The Municipality is currently carrying out a master planning study which proposes to extend the administrative boundary to include these informal settlement areas. The master plan also proposes several new development sites: Kudsaya new town, Dummar new town, Assad town, Maaraba, Somareya, and Mouadamea. The new City Governate would cover 180 km². Under the proposed municipal master plan DAWSSA would be required to service all populations living within the new administrative boundary. DAWSSA must therefore consider the impact of the master plan on its administrative responsibilities and integrate the municipal master plan with its own planning process for the development of the future water supply system.

4.2 Population

(1) General

Damascus City Governate is the second largest urban center in Syria, Aleppo being the first. In the 1960's the Governate had the highest average annual growth rate in the country at 4.5%. Since 1970, the growth rate has been declining steadily and has been lower than the

growth rates experienced in the other large urban centers. Between the census years of 1981 and 1994, the CBS reported an average annual growth rate of 2.63%. The CBS estimates that the mid 1995 population reached 1.489 million representing 10.5% of the total Syrian population.

Just over 66% of the population is 29 years of age or less. The ratio between of males to females is practically even at 102. Over 90% of the population in Damascus is Arab. About 220,000 registered Palestinian refugees live in Damascus which is 67% of all refugees living in Syria. Most of the Palestinian refugees live in the informal settlement areas of Yarmouk, and Karfasousse. Muslims account for almost 85% of the population. The remaining 15% are predominantly Christians which live mostly in the Bab Sharqui and Bab Touma districts of the old city.

(2) Occupancy

According to the CBS, based on the 1994 census, there were 271,377 families living in Damascus Governate and a total of 233,859 occupied dwellings. The total population was 1,394,000. A breakdown of occupancy rates by census district is show in Table A-4.1. Based on 1994 census statistics there is an average of 6.0 persons per dwelling and an average of 5.1 persons per family. This is only slightly lower than the national average of 6.37 persons per dwelling.

The study team's survey of 600 households gives similar results with an average of 6 persons per family unit and 2.15 children per family. There is no apparent correlation between family size and income levels.

4.3 Education

In comparison with many other Arab countries, Syria has a reasonably well educated and trained labor force. The literacy rate in 1994 was estimated at 64% of adult males and 51% of adult females. In 1991, according to CBS, 90% of the children of the relevant age group (5-14) were enrolled in primary schools compared with 78% in 1965. The increase was particularly marked in the case of girls, of whom only 52% were enrolled in primary education in 1965 compared to 95% in 1991. The CBS figures show approximately 93% enrollment in secondary school (age 15-19) and 87% enrollment in university and intermediate institutes (age 20-24)

The 1995 statistical abstract reports that in 1994 in Damascus, there was 405 primary schools, 171 secondary and intermediate schools, 25 technical schools, 16 schools for

professional education, 1 teacher's college, and 1 university. The teacher-student ratio is relatively high at around 1 to 17. In 1994, there were 81,763 students enrolled at Damascus University.

4.4 Public Health and Hygiene

(1) Health

Health statistics reported by the Central Bureau of Statistics in the 1995 abstract are for Damascus Mohafazat which combines Damascus City and Rural Governates. CBS reports that in 1994 there was 3790 physicians in Damascus. The national average number of persons per physician has declined from 1,194 in 1989 to 972 in 1994. In Damascus the average number of persons per physician in 1994 was 792 which is substantially better than the national average.

CBS reports that in 1994 there was in Damascus 32 private hospitals providing 861 beds, and 19 public hospitals providing 3,919 beds and 2 sanitariums providing 3919 beds. The national average number of persons per bed has increased from 874 in 1989 to 920 in 1994. In Damascus, the average number of persons per bed was 540 which is much lower than the national average.

Given the large population increases in recent years, these numbers indicate that medical development is reasonably advanced. There has been an important improvement in the ratio of patients to physicians which indicates that the supply of trained physicians has kept pace with population growth. However the slight increase in the number of patients per bed indicates that the provision of new medical facilities may not be keeping pace with population growth. Given the young age distribution of the population the demand for new facilities is not urgent. There should be ample time to monitor this trend and plan for the construction of new medical facilities as required. Infant mortality rates and life expectancy continue to improve.

CBS reports that in 1994 life expectancy in Syria was 66.6 for men and 67.7 for women while infant mortality was 37 per 1000. Estimates for Damascus Governate are not available but generally are thought to be better than the national average given the better standard of living, access to clean drinking water and better health services coverage.

(2) Water and sewage

Most of the population (approximately 95%) are serviced with potable water supply and sewage collection. There is little demand for water haulers and use of communal taps is confined to a few small areas. Sewage in most areas is collected by a combined sewer system

which discharges without treatment into nearby surface drainage. Water pollution is one of the main causes for the incidence of disease. There are unconfirmed reports of diseases such as cholera, typhoid and diarrhea occurring predominantly in the informal settlement areas. The Ministry of Health samples well water and streams in Damascus and the surrounding area. Samples taken in surface flows indicate the presence of cholera is widespread. Cholera was also found in some well water samples in Damascus City area, namely: in Jormana & Jura (1993), and Zablatanee (1994). there were no reported incidences of cholera in 1995.

Informal connections to the water distribution system and frequent service interruptions especially in the summer can create vacuum conditions and increase the chance of contamination through leaks in the system. These areas are particularly susceptible to contamination because sewage often flows in shallow open drains in close proximity to water supply mains. Unfortunately the Ministry of Health has stated that statistics on the occurrence of water borne diseases in the study area are unavailable. Our household survey indicates that 10% of the households boil water before use. These households are located predominantly in low income and informally settled areas which suggests that the residents have experienced health problems in the past or are aware of the potential hazards of using water from informal connections. DAWSSA has made serious efforts to provide informal areas with water distribution networks and more recently has begun replacing informal connections with proper service connections.

A scheme to provide sewage treatment and improve sewage collection is currently under construction and should be completed in 1998. The scheme provides trunk sewers within the Governate to intercept existing combined sewer outlets. A 20 km trunk sewer will convey the intercepted sewage to a new secondary treatment plant in Adra where the treated effluent will be pumped into irrigation canals and used to feed 16,000 ha. of agricultural land in the Ghouta. The scheme does not provide for the improvement of local sewage collection in the informally settled areas in and around Damascus Governate.

4.5 Regional Economy

The most recent statistics available from the CBS indicate that in 1991 the total available manpower in Damascus Governate was 1.15 million which represented 75% of the Governate's population. Damascus is the nation's capital and as such, it is an important administrative center CBS reports that 175,000 people or 17% of the total work force are public service employees. About 25% of all government and public sector employees are located in Damascus City Governate. This represents the largest concentration in the country. The next largest concentration of public service employees occurs in Homs where 10% of the total are located.

The labor force is 85% male, and employs 450,000 people which represents about 40% of the total work force. According to CBS, unemployment among the labor force in 1991 was only 6% .

Approximately 183,000 persons, which is about 16% of the total work force, are employed in the manufacturing and industrial sectors. The Governate plays an important role in the national manufacturing and industrial sector since almost 39% all workers employed by the manufacturing sector are located in Damascus Governate. Manufacturing is mainly focused on textiles and food processing related to the agricultural output.

The remaining 38%, approximately 437,000 people, are employed in commerce & trade, transportation, and tourism. A breakdown by sector is not available. Tourism plays an important role in the local economy. Damascus receives the most number of foreign, Arab and local Syrian visitors of any city in Syria. The peak tourist month is August, followed by September then July. According to CBS, Damascus Governate received an estimated 54,264 tourists in August of 1994. An estimated 66% of these were Arab.

Trade & commerce also play an important role in the local economy. Damascus Governate contributes to 24% of the country's exports and consumes 16.5% of the country's imports. Based on a 1986 survey reported by CBS, the Governate was responsible for the movement of 320 M.ton.km. of goods transported to destinations inside and outside the country. This is the largest movement of goods in the country and is almost twice the amount moved by the next highest ranking city of Aleppo. Of the five airports in Syria, Damascus airport handles the most freight and the most passengers. Between 1993 and 1994 Damascus airport increased the amount of freight handled by a factor of 10 times.

4.6 Household Economy

(1) Household income distribution

A household income and expenditure survey was conducted in 1986 by CBS. Unfortunately the results were never officially published and remain unavailable to the study team. Therefore detailed statistics on household finances are not available. According to discussions with the CBS, the average family in 1994 spent SL 4,113 per month on food and SL 3,856 non food items for a total expenditure of approximately SL 8,000 per month.

The income levels of government and public sector employees is reported in the CBS's 1995 statistical abstract. The distribution of income is shown in Figure A-4.2. Approximately

85% of public service employees earn less than SL 4,000 per month. This is only half the income required to meet the average monthly expenditure.

The household survey of 600 families conducted for this study indicates that 25% of the residents surveyed earn less than SL 4000 per month. As shown in Figure A-4.3, a rather high 30% of the population receive less than 5,000 per month which is considered to be below the poverty level. About 60% of the families surveyed receive less than 10,000 per month and 80% receive less than 25,000 per month. Based on the survey, the average household income is SL 16,254 per month. The data collected from the survey indicates that a relatively small proportion of the population earns a disproportionate amount of the total income. Approximately 20% of the households earn 50% of the income. The implications of this skewed distribution need to be addressed when considering affordability since the use of traditional parameters such as mean or median household incomes will give misleading results.

TABLES

Table A-1.1 - Demographic Indicators for Countries of the Middle East and North Africa

	Population 1992 (millions)	Population projection 2020 (millions)	Crude birth rate (per 1000)	Crude death rate (per 1000)	Rate of natural increase*	Population growth rate** (%)	urban population (%)	Life expectancy at birth male/female (years)
Algeria	26.3	44.3	30	6	2.4	2.4	54	67/68
Bahrain	0.5	0.9	25	5	2.0	2.6	84	68/71
Egypt	54.7	81.7	28	9	2.0	1.9	44	60/63
Iran	59.6	116.7	32	7	2.5	2.5	58	65/66
Iraq	19.2	40.5	37	7	3.0	3.0	73	62/68
Jordan	3.9	8.1	38	5	3.3	3.3	69	68/72
Kuwait	1.4	2.6	28	3	2.5	3.6	96	73/78
Lebanon	3.8	5.5	28	8	1.9	1.9	86	64/68
Libya	4.9	11.6	42	8	3.4	3.5	84	62/65
Morocco	26.2	40.8	28	8	2.0	2.0	47	62/65
Oman	1.6	4.5	43	5	3.9	4.2	12	68/72
Qatar	0.5	0.8	22	4	1.9	2.3	91	68/73
Saudi Arabia	16.8	38.8	35	5	3.0	3.3	78	68/71
Syria	13.0	30.4	42	6	3.6	3.3	51	65/69
Tunisia	8.4	13.4	25	6	1.9	1.9	57	67/69
United Arab Emirat	1.7	2.6	22	4	1.8	2.4	82	70/74
Yemen	13.0	31.9	50	15	3.6	3.3	31	52/53

*Rate of natural increase: birth rate minus death rate

**Population growth rate:natural increase plus net migration

Source: World Bank population data base, World Bank publication "A population perspective on development: The middle East and North A

Table A-2.1 - Gross Domestic Product
(market prices)

	1988	1989	1990	1991	1992	1993	1994
Total (SL million)							
At current prices	186,047	208,892	268,328	311,564	371,630	413,755	496,504
At constant (1985) prices	91,313	83,133	89,485	95,883	106,031	113,103	120,159
Real change (%)	13.3	(9.0)	7.6	7.1	10.6	6.7	6.2
Per capita (SL million)							
At current prices	11.3	11.7	12.1	12.5	13.0	13.4	13.8
At constant (1985) prices	16,410	17,825	22,148	24,868	28,681	30,894	35,866
Real change (%)	9.6	(11.9)	4.1	3.6	6.9	3.2	2.8

Source: Central Bureau of Statistics

Table A-2.2 - Sectoral Origin of Gross Domestic Product
(current prices)

Sector	1988		1994	
	SL million	% of total	SL million	% of total
Agriculture, fisheries & forestry	21131	23	25388	21
Mining, manufact., electricity & water	18793	21	32516	27
Building construction	2676	3	2990	2
Wholesale & retail trade	23163	25	23581	20
Transport & communications	9107	10	13294	11
Finance & insurance	4028	4	5888	5
Social & personal services	1328	1	1837	2
Government services	11016	12	14552	12
Private, non-profit services	71	0	113	0
GDP at market prices	91313	100	120159	100

Source: Central Bureau of Statistics

Table A-2.3 - Growth in Gross Domestic Product by Sector
(% annual real change; constant 1985 prices)

Sector	1988	1989	1990	1991	1992	1993	1994
Agriculture, fisheries & forestry	-24.0	-29.8	20.0	6.9	19.3	3.8	7.4
Mining, manufacturing, electricity & water	33.9	22.0	15.3	4.3	7.3	8.5	1.6
Building construction	-11.3	-17.0	2.6	10.0	2.3	13.3	3.9
Wholesale & retail trade	5.0	-25.6	-6.5	9.2	22.1	2.6	6.7
Transport & communications	2.8	0.9	2.7	2.6	3.4	13.9	16.5
Finance & insurance	2.1	-10.4	10.5	5.3	15.0	14.8	6.8
Social & personal services	-10.3	-13.1	13.2	15.0	7.2	6.8	6.3
Government services	-3.8	10.5	0.0	13.1	-3.2	4.3	5.2
Private, non-profit services	5.4	11.9	4.5	8.7	8.7	10.4	4.4
GDP at market prices	13.4	-9.1	8.0	6.5	10.4	7.1	5.9

Source: Central Bureau of Statistics

Table A-2.4 - Population & Employment

Year	population (000's)	Labor force (000's)		% of total		
		total	% of population	employed	unemployed	% of total employed
1978	8,402	2,024	24.1	1,934	90	4.4
1979	8,723	2,174	24.9	2,092	82	3.8
1983	9,628	2,323	24.1	2,246	77	3.3
1984	9,616	2,356	24.5	2,246	110	4.7
1989	11,719	3,078	26.3	2,897	181	5.9
1991	12,529	3,486	27.8	3,250	236	6.8

Table A-2.5 - Employment by Sector
(000)

Sector	1988		1989		1990		1991		1992	
	(000)	% of total	(000)	% of total	(000)	% of total	(000)	% of total	(000)	% of total
Agriculture, & forestry	759	27.8	757	26.5	756	25.2	908	28.4	915	28.1
Mining	31	1.1	31	1.1	31	1.0	31	1.0	31	1.0
Manufacturing	380	13.9	414	14.5	452	15.1	453	14.2	456	14.0
Electricity, gas & water	30	1.1	30	1.0	30	1.0	30	0.9	9	0.3
Construction	317	11.6	311	10.9	304	10.1	320	10.0	334	10.3
Trade	295	10.8	316	11.1	338	11.3	342	10.7	367	11.3
Transportation	171	6.3	180	6.3	189	6.3	180	5.6	169	5.2
Finance	31	1.1	35	1.2	40	1.3	30	0.9	24	0.7
Services	714	26.2	784	27.4	861	28.7	901	28.2	953	29.3
Total	2,728	100.0	2,858	100.0	3,001	100.0	3,195	100.0	3,258	100.0

Source: State Planning Commission

Table A-2.6 - Trend in prices
(1990 = 100; annual averages)

	1989	1990	1991	1992	1993	1994
Wholesale prices (Laspeyres index)	82	100	109	109	125	148
Wholesale price inflation (%)	13.9	22.0	9.0	0.0	14.7	18.4
Wholesale prices (Paasche index)	82	100	114	117	127	145
Wholesale price inflation (%)	13.9	22.0	14.0	2.6	8.5	14.2
Consumer prices	90	100	109	121	137	158
Consumer price inflation (%)	15.4	11.1	9.0	11.0	13.2	15.3
<hr/>						
Wholesale building material prices (Laspeyres index)	73	100	109	144	174	178
Wholesale building material price inflation (%)		37.0	9.0	32.1	20.8	2.3
<hr/>						
Wholesale building material prices (Paasche index)	83	100	109	148	141	136
Wholesale building material price inflation (%)		20.5	9.0	35.8	-4.7	-3.5

Source: Central Bureau of Statistics

Table A-2.7 - Ordinary and Investment Budget
(SL billion)

	1994	1995	% increase	1996	% increase
Expenditure	144.2	162	12.3	188.1	16.1
Ordinary	76.2	87.9	15.4	96.6	9.9
Investment	68	74.1	9.0	91.5	23.5
Revenue	106.6	125.7	17.9	156.9	24.8
Ordinary	88	102.2	16.1	124	21.3
Investment	18.6	23.4	25.8	32.9	40.6
Balance	-37.6	-36.3		-31.2	

Source: State Planning Commission

Table A-2.8 Investment Projects for 1996 According to Sector
(millions of SL)

Sector	Local resources		External resources		Total	
		%		%		%
Agriculture & irrigation	15,319	22.6	2,611	11.8	17,930	20.0
-Agriculture	11,872	17.5	2,000	9.1	13,872	15.5
-Irrigation	3,447	5.1	611	2.8	4,058	4.5
Extraction industry	5,783	8.5	2	0.0	5,785	6.4
Converting industry	9,350	13.8	2,000	9.1	11,350	12.6
Electricity & water	8,954	13.2	14,758	66.9	23,712	26.4
-Electricity	3,182	4.7	13,187	59.8	16,369	18.2
-Water	5,772	8.5	1,571	7.1	7,343	8.2
Building & construction	1,045	1.5		0.0	1,045	1.2
Trade	1,938	2.9		0.0	1,938	2.2
Transport, communications & storage	8,079	11.9	725	3.3	8,804	9.8
Finance, insurance, & real estate	1,217	1.8		0.0	1,217	1.4
Services	15,997	23.6	1,960	8.9	17,957	20.0
Total	67,682	100.0	22,056	100.0	89,738	100.0

Table A-2.9 - Foreign Trade
(SL millions)

	1988	1989	1990	1991	1992	1993	1994
Exports fob	15,093	33,740	47,282	38,504	34,720	35,318	39,818
Public sector (% of total)	63	52	56	65	79	75	66
Private sector (% of total)	37	48	44	35	21	25	34
Imports cif	25,040	23,544	26,936	31,066	39,178	46,469	61,374
Public sector (% of total)	73	58	54	47	37	38	38
Private sector (% of total)	27	43	46	53	63	62	62
Balance	-9,947	10,196	20,346	7,438	-4,458	-11,151	-21,556

Sources: Central Bank of Syria, IMF

Table A-2.10 - Foreign Trade by Sector - 1994
(SL millions)

	Public	Private	Total	% of Total
Export				
Agriculture	2,817	4,485	7,302	18.3
Fishing	-	-	-	-
Mining & quarrying	20,225	13	20,238	50.8
Manufacturing	3,095	9,184	12,279	30.8
Electricity, gas & water	-	-	-	-
Construction	-	-	-	-
others	-	0	0	0.0
Total	26,137	13,681	39,818	100.0
Import				
Agriculture	205	4,367	4,572	62.6
Fishing	1	3	4	0.1
Mining & quarrying	315	21	336	4.6
Manufacturing	22,554	32,815	55,368	758.3
Electricity, gas & water	-	-	-	-
Construction	-	-	-	-
others	0	1,094	1,094	15.0
Total	23,074	38,300	61,374	840.6
Trade Balance	3,063	-24,618	-21,555	

Source: Central Bureau of Statistics

Table A-2.11 - Direction of Foreign Trade - 1994

	Value (SL millions)	% of total	% change from 93
Exports	39,819		12.6
Arab states	10,423	30.9	24.7
EU	22,199	65.8	3.0
West European countries	27	0.1	87.3
USA & Canada	569	1.7	46.4
East European countries	3,517	10.4	86.2
Rest of world	3,084	9.1	32.0
Imports	61,373		32.1
Arab states	3,842	6.3	32.9
EU	20,290	33.1	18.6
West European countries	1,968	3.2	30.7
USA & Canada	5,252	8.6	2.8
East European countries	9,052	14.7	12.0
Rest of world	20,969	34.2	66.6
Trade balance	-21,554		

Source: Central Bureau of Statistics

Table A-2.12 - External Debt

(\$ US million unless otherwise indicated; Debt stocks as at year-end)

	1988	1989	1990	1991	1992	1993
Total external debt	16,544	17,389	17,068	18,942	19,016	19,975
Long-term debt	15,095	15,693	14,917	16,353	15,912	16,234
Short term debt of which:	1,449	1,696	2,151	2,589	3,104	3,741
interest arrears on						
long-term debt	151	213	460	688	912	1,149
Use of IMF credit	-	-	-	-	-	-
Public & publicly						
guaranteed long-term						
debt	115,095	15,694	14,918	16,353	15,913	16,235
Official creditors	113,889	14,513	13,745	15,238	14,874	15,058
Multilateral	809	813	877	860	834	835
Bilateral	113,080	13,700	12,868	14,378	14,040	14,223
Private creditors	1,206	1,181	1,173	1,115	1,039	1,177
Banks	-	-	-	-	-	-
Bonds	-	-	-	-	-	-
Other private	1,206	1,181	1,173	1,115	1,039	1,177
Total debt service	394	927	1,272	477	305	284
Principal	272	798	1,137	338	139	102
Interest of which:	122	129	135	139	166	182
short-term debt	68	71	82	93	98	110
Ratios (%)						
Total external debt/GDP	98.9	90.7	68.8	59.9	11.3	102.2
Debt-service ratio*	26.7	27.3	28.9	16.1	21.3	20.9
Short-term debt/total						
external debt	7.4	7	9.1	11.4	13.2	18.7
Concessional long-term						
debt/total external debt	80.5	80.1	76.9	77.2	75.4	72.8

*Debt service as a percentage of earnings from exports of goods and services

Source: World Bank, World Debt Tables

Table A-3.1 - Investment spending by sector under five-year plans (SL millions)

	Agriculture & irrigation	% of total	Industry & energy	% of total	Transport & telecoms	% of total	Services	% of total	Total
First plan (1961-65)									
target	1,100	40.4	509	18.7	537	19.7	574	21.1	2,720
actual	601	19.1	707	22.5	454	14.5	1,378	43.9	3,140
Second plan (1966-70)									
target	1,393	28.2	1,000	20.2	894	18.1	1,658	33.5	4,945
actual	554	14.2	1,104	28.2	819	20.9	1,433	36.6	3,910
Third plan (1971-75)									
target	2,521	31.4	2,355	29.4	883	11.0	2,261	28.2	8,020
actual	1,657	13.0	4,955	38.9	1,878	14.7	4,253	33.4	12,743
Fourth plan (1976-80)									
target	12,938	23.9	19,375	35.8	5,635	10.4	16,218	29.9	54,166
actual	2,934	5.8	20,147	39.9	6,706	13.3	20,766	41.1	50,553
Fifth plan (1981-85)									
target	17,200	16.9	27,004	26.6	12,800	12.6	44,489	43.8	101,493
actual	8,001	9.3	20,602	23.8	11,142	12.9	46,722	54.0	86,467
Sixth plan (1986-90)									
target	23,609	19.0	38,268	30.9	11,264	9.1	50,859	41.0	124,000
actual	26,175	18.7	27,576	19.7	11,478	8.2	74,749	53.4	139,978
Seventh plan (1991-95)									
target	Data not available								
actual	295,000								

Source: Supreme Planning Commission

Table A-3.2 - Investment budget allocation for water supply authorities (Thousands of SL)

	1995			1996			% of total
	Local	External	Total	Local	External	Total	
Water Supply Authority							
Damascus City	276,000	3,000	279,000	324,700	10,300	335,000	448.17
Latakia	121,000		121,000	170,000		170,000	227.43
Aleppo	368,000	368,000	736,000	2,668,99	740,000	860,000	1,150.52
Homs	184,000		184,000	667.25	300,000	300,000	401.34
Hama	153,000		153,000	554.83	270,000	270,000	361.21
Idlib	153,000		153,000	554.83	280,000	280,000	374.59
Swaida	95,000		95,000	344.50	112,500	112,500	150.50
Raqqa	74,000		74,000	268.35	85,000	85,000	113.71
Dar'a	200,000		200,000	725.27	250,000	250,000	334.45
Deir-El-Zor	140,000		140,000	507.69	180,000	180,000	240.81
Tartus	117,000		117,000	424.28	125,000	125,000	167.23
Hama'ch	128,200		128,200	464.90	258,000	258,000	345.16
Damascus Rural	212,000	587,000	799,000	2,897.45	1,441,000	3,986,000	5,332.51
General Establishment for	33,000		33,000	119.67	45,000	45,000	60.20
Quneira	31,000		31,000	112.42	37,100	37,100	49.63
Total	2,285,200	958,000	3,243,200	11,760,95	1,571,300	7,293,600	9,757.45

Table A-4.1 - Population in Damascus City Governate by Census District 1994

Census District No.	Population (1)	Families	Occupied Dwellings	no. of persons per dwelling	no. of persons per family	Dwellings under construction
1	47,295	9,262	8,022	5.9	5.1	1,656
2	29,886	5,909	5,347	5.6	5.1	1,522
3	18,476	3,494	2,908	6.4	5.3	551
4	25,825	5,106	4,205	6.1	5.1	570
5	22,707	4,675	3,685	6.2	4.9	738
6	22,368	5,394	4,857	4.6	4.1	1,136
7	10,986	2,474	2,348	4.7	4.4	735
8	8,995	1,993	1,912	4.7	4.5	530
9	4,133	981	966	4.3	4.2	738
10	5,916	737	559	10.6	8.0	208
11	6,763	1,325	1,129	6.0	5.1	538
12	86,843	16,946	16,287	5.3	5.1	6,242
13	21,002	4,159	3,445	6.1	5.0	557
14	48,446	9,746	9,138	5.3	5.0	4,683
15	19,309	4,377	4,296	4.5	4.4	1,615
16	16,781	4,123	4,036	4.2	4.1	2,005
17	10,169	2,083	1,812	5.6	4.9	762
18	5,741	1,115	1,090	5.3	5.1	332
19	8,813	1,506	1,300	6.8	5.9	275
20	8,101	1,605	1,242	6.5	5.0	317
21	8,186	1,678	1,602	5.1	4.9	321
22	19,946	3,762	3,610	5.5	5.3	1,094
23	26,315	4,956	3,958	6.6	5.3	2,740
24	67,823	12,083	9,629	7.0	5.6	1,495
25	62,917	10,720	7,864	8.0	5.9	732
26	23,278	3,964	3,687	6.3	5.9	802
27	13,105	2,384	1,955	6.7	5.5	500
28	10,274	1,942	1,414	7.3	5.3	455
29	9,519	1,689	1,470	6.5	5.6	413
30	9,641	1,827	1,571	6.1	5.3	220
31	30,948	5,925	5,184	6.0	5.2	1,567
32	7,423	1,414	1,219	6.1	5.2	349
33	46,217	8,443	7,878	5.9	5.5	2,048
34	6,192	1,156	1,115	5.6	5.4	301
35	3,682	758	500	7.4	4.9	272
36	8,990	1,868	1,361	6.6	4.8	322
37	6,346	1,259	948	6.7	5.0	201
38	6,815	1,373	973	7.0	5.0	236
39	3,950	771	650	6.1	5.1	190
40	1,020	244	207	4.9	4.2	23
41	3,342	705	469	7.1	4.7	77
42	3,343	706	483	6.9	4.7	92
43	8,876	1,797	1,540	5.8	4.9	528
44	12,481	2,574	2,269	5.5	4.8	475
45	10,615	2,196	1,527	7.0	4.8	267
46	12,263	2,846	1,852	6.6	4.3	371
47	2,569	524	390	6.6	4.9	119
48	50,422	9,345	7,644	6.6	5.4	1,748
49	19,936	4,200	3,894	5.1	4.7	1,099
50	21,222	4,757	4,699	4.5	4.5	1,571
51	25,240	5,172	4,359	5.8	4.9	1,196
52	9,930	2,087	2,062	4.8	4.8	1,033
53	26,403	4,957	4,412	6.0	5.3	895
54	11,934	2,889	2,830	4.2	4.1	1,050
55	50,580	9,644	6,548	7.7	5.2	1,470
56	74,411	13,809	12,568	5.9	5.4	3,104
57	24,683	4,909	4,625	5.3	5.0	1,211
58	55,700	10,666	10,325	5.4	5.2	2,781
59	34,085	6,425	6,043	5.6	5.3	1,231
60	73,041	13,318	10,941	6.7	5.5	1,363
61	22,969	5,134	3,608	6.4	4.5	393
62	39,134	7,491	5,392	7.3	5.2	787
	1,394,122	271,377	233,359	6.0	5.1	62,852

(1) includes informal population

Table A-4.2 - Government Worker Income Distribution (1994)

Salary level	No. of employees	% of Total	Cumulative no. of employees	Cumulative % of total
1,700	40,257	5.5	40,257	5.5
1,950	39,126	5.4	79,383	10.9
2,200	53,359	7.3	132,742	18.2
2,450	60,503	8.3	193,245	26.5
2,700	73,849	10.1	267,094	36.6
2,950	79,352	10.9	346,446	47.5
3,200	88,161	12.1	434,607	59.6
3,450	87,407	12.0	522,014	71.6
3,700	55,442	7.6	577,456	79.2
3,950	43,134	5.9	620,590	85.1
4,200	33,332	4.6	653,922	89.7
4,450	27,086	3.7	681,008	93.4
4,700	16,262	2.2	697,270	95.7
4,950	14,852	2.0	712,122	97.7
5,200	4,821	0.7	716,943	98.4
5,450	5,785	0.8	722,728	99.1
5,700	2,411	0.3	725,139	99.5
>5700	3,805	0.5	728,944	100.0
	728,944	100.0		

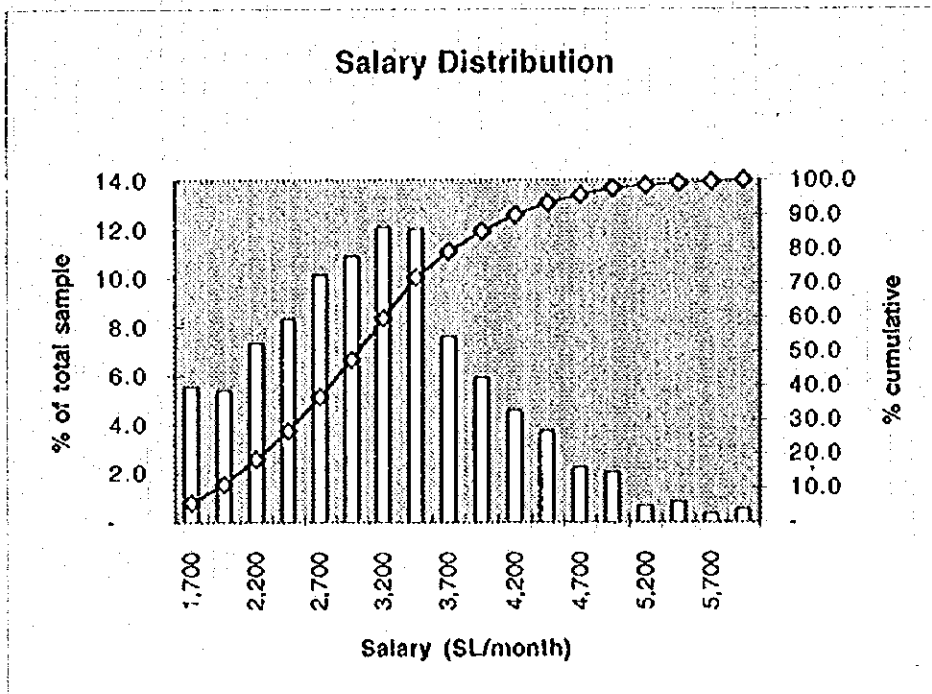
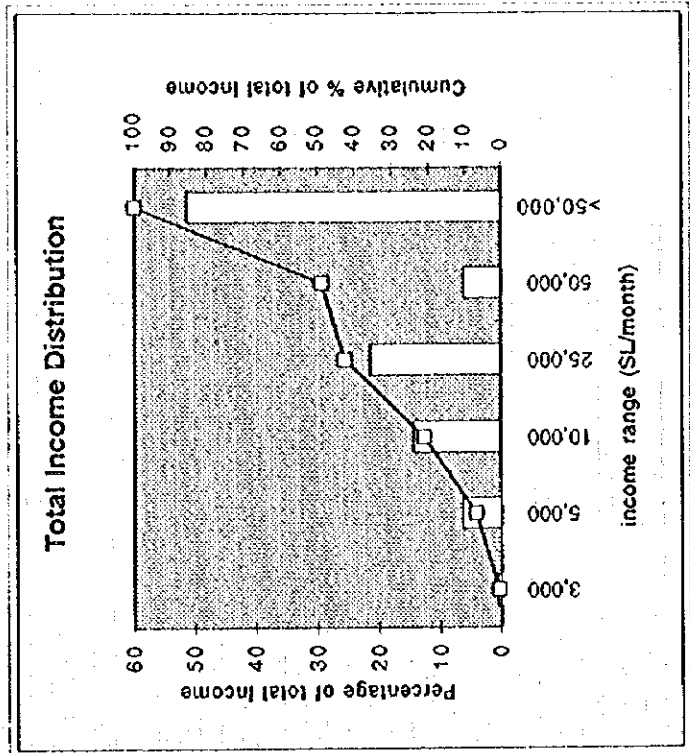
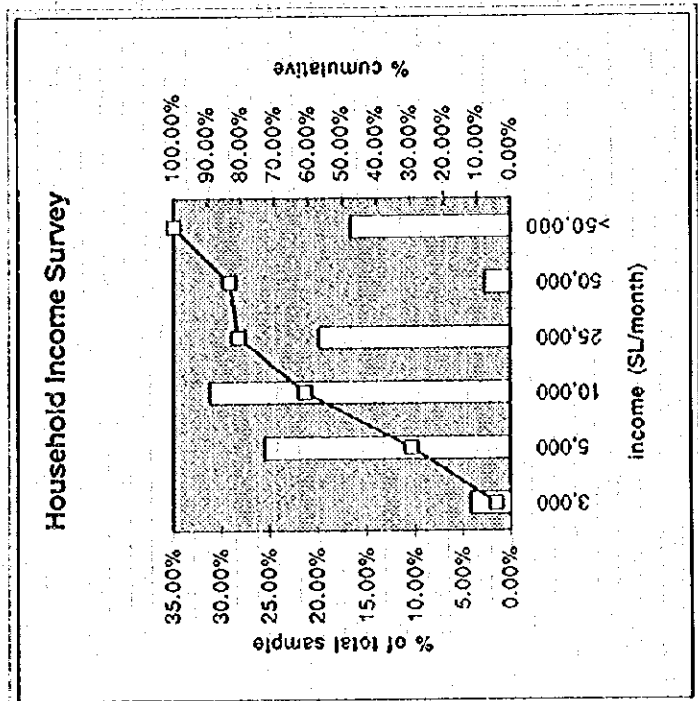
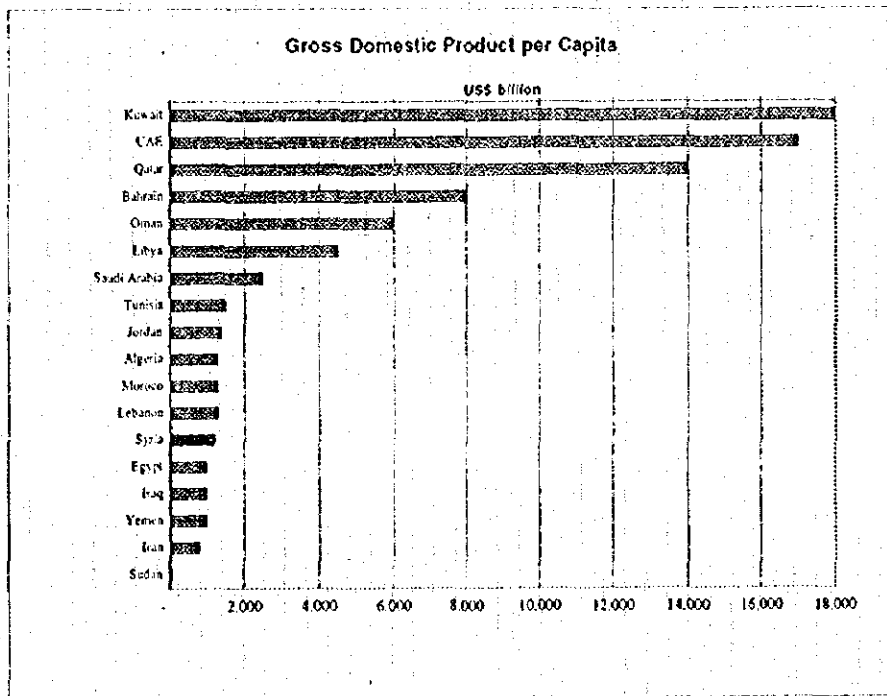
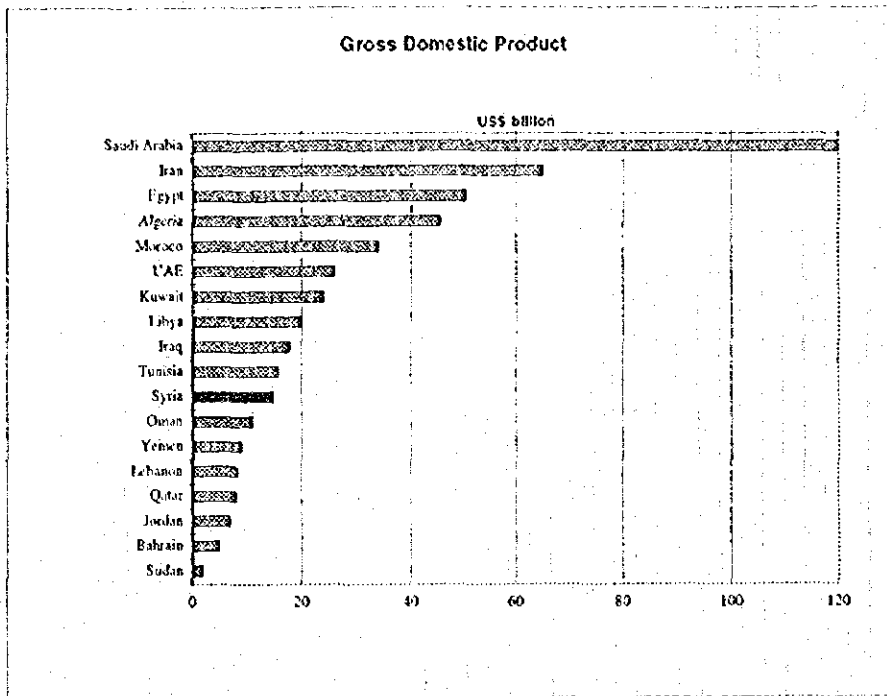


Table A-4.3 - Household Income Distribution

Monthly income level	No. of families	No. of families as % of total	Cumulative no. of families	Cumulative % of families as % of total	Total income	Total income %	Cumulative income	Cumulative income %
3,000	25	4.17%	25	4.17%	50,000	0.5	50,000	0.5
5,000	153	25.50%	178	29.67%	612,000	6.3	662,000	6.8
10,000	187	31.17%	365	60.83%	1,402,500	14.4	2,064,500	21.2
25,000	119	19.83%	484	80.67%	2,082,500	21.4	4,147,000	42.5
50,000	16	2.67%	500	83.33%	600,000	6.2	4,747,000	48.7
>50,000	100	16.67%	600	100.00%	5,000,000	51.3	9,747,000	100.0
Total			600		9,747,000			



FIGURES



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 THE STUDY ON THE DEVELOPMENT OF
 WATER SUPPLY SYSTEM FOR THE DAMASCUS CITY

Figure A-2.1 - GDP Comparisons to MENA Countries

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APPENDIX B

*URBAN DEVELOPMENT PLAN AND
LAND USE*

**APPENDIX B
URBAN DEVELOPMENT PLAN AND LAND USE**

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1. INTRODUCTION

The Syrian Arab Republic is divided administratively into 14 Mohafazas (Governates). Damascus City (the City) is the nation's capital and the country's administrative center. The City is also an important economic, academic and cultural center. Damascus constitutes by itself a separate Mohafaza, called the Damascus Governate. The Damascus Governate consists of two Governates, Damascus City Governate (the City Governate) and Damascus Rural Governate (the Rural Governate).

2. DAMASCUS CITY MASTER PLAN

2.1 Existing Master Plan

The current Urban Development Plan (UDP) was prepared in 1968 for the High Council for City and Villages Planning by the French firm Ecochard. The plan was intended to cover the period from 1968 to 1984 and is now somewhat outdated. The basic elements of the plan are summarized as follows and the corresponding land use plan is presented in Figure B-2.1:

- i) The planning period consists of 2 phases, from 1968 to 1974 and from 1975 to 1984.
- ii) The base population in 1967 is estimated at 660,000 including 64,000 refugees.
- iii) The population forecast for 1984 is 1,500,000.
- iv) The UDP covers an area of 112 km², divided into 14 districts.
- v) There are 10 categories for land use and these are shown in Figure B-2.1.
- vi) The UDP proposes to preserve the "Old City" as a cultural & historical asset as shown in Figure B-2.2.
- vii) Industrial zones are identified along the outskirts of the city in areas such as Homs Road, Daraa Road and Quneita Road. These are shown in Figure B-2.1
- viii) The UDP anticipates growing traffic problems and identifies a road network to alleviate congestion.
- ix) Monthly household income in 1966 is classified as follows;

Low class (less than SL 200)	: 51.23 %
Middle Class (SL 200 to SL 350)	: 30.97 %
High Class (more than SL 350)	: 17.80 %
- x) Types of house are identified as follows;

Low class :	Apartment (area per family less than 100 m ²)
	Detached house (area of less than 90 m ²)
	Detached house with open space (area of less than 80 m ²)
Middle class	Apartment (area per family less than 120 m ²)
	Detached house (area of less than 150 m ²)
High class	Apartment (area per family more than 150 m ²)
	Detached house (area about 250 m ²)

2.2 Existing Urban Development

In general the city has developed in accordance with the 1968 Master Plan. However, the administrative responsibilities of Damascus Governate are growing as more people settle in areas adjacent to its political boundaries. These settlements, which have developed informally, will eventually require the same administrative controls and infrastructure services as those found within the Governate. Informal connections to the water distribution network exert additional demands on water consumption which cannot be ignored when planning for the sustainable development of Damascus. The existing conditions are shown in Figure B-2.3.

Present urban development conditions for the study area are described as follows for each of the land use categories as shown in Figure B-2.3.

(1) Residential development zones

One of the key factors affecting the rapid urbanization of the study area is the increase in residential development. Core districts such as Old Damascus, Sarouja and Kanawat, shown in Figure B-2.3, have grown on all sides into new neighborhoods and districts such as Mouhajreen, Ruku Aldyn and Midan. New housing developments and some redevelopment are currently under way in the districts of Dunmar, Berze, Jobar and Kadam.

The informal settlements continue to grow uncontrolled as shown in Figure B-2.4. Number of population and area in the informal area are estimated in Table B-2.1. The number of informal residents is 26 % of total population in the City, and the informal area is 10 % of total area of the City. Now, Damascus Municipality has been starting the improvement works of the infrastructures in the informal areas, such as Mezze and Tabalhe areas.

(2) Industrial development zones

Industrial zones in the study area are identified in Figure B-2.3. Information on the type of factories located in these industrial areas is unavailable. The total number of workers located in the industrial districts in 1993 was estimated at 22,162. New industrial zones, located in rural areas, are being planned by the Damascus Governate. Number of the existing factories using DAWSSA's water supply are estimated 2,310 connections as shown in Table B-2.2. Total number of industrial establishment are classified at each industrial sector by the Central Bureau of Statistics as shown in Table B-2.3.

(3) Educational development

The number of educational facilities are estimated at 893 consisting of Kindergarten (148), Primary (397), Preparatory & Secondary (209), University (15) and Training institute (124). The number of pupils and students in 1993 is identified as shown in Table B-2.2. In general, the number of classrooms at each type is not enough for the actual number of students/pupils and more the location of education facilities is not dispersed moderately.

(4) Agricultural development

There are intensive farmlands in the city and number of workers for agricultural sector is estimated at 8,900 in 1993. Farmlands are located at Kafar Souse, Kadam, Shaghour and Kaboon and total area is approximately estimated at 10 km². Damascus municipality intend to expand the farmland in Damascus rural areas surrounding the city, since there is a limitation of land for expansion of the farmland within the city.

(5) Infrastructures development

Most of the existing infrastructure is meeting current peak demands and there is very little capacity for growth. Some modifications will be required in order to meet the demands of a growing population and maintain appropriate levels of service. Basic water and sanitation services are well developed except in informal areas. Electrical services are well developed however there are chronic power shortages caused by increasing demands on the network. Transportation networks outside the city are well developed but traffic inside the city is generally congested.

A sewerage system in the city has been constructed as shown in Figure B-2.5. The wastewater treatment plant is located at Adra and its capacity is 500,000 m³/d with BOD treated level of 25 ppm and a design population to be treated is 2.1 million. The project is financed by the Kuwait Fund for Arab Economic Development (KFAED).

(6) Health development

In 1995 there were 31 private hospitals providing 3,875 beds, and 18 public hospitals providing 31,900 beds. The average number of persons per bed was 39. Health services in Damascus are reasonably well developed and there is a general trend towards improved health care levels. Private hospitals are scattered throughout the Governate but a limited number of

people make use of them because of the high cost of hospitalization. The number of existing health facilities by type is shown in Table B-2.2.

There are hygienic issues in informal residents area, especially of sewerage and water supply, and so the municipality shall take a counter measure against waterborne disease, according to the information from the Damascus Municipality. The case of waterborne disease, however, is a few even in the informal area based on the results of the interview survey conducted by the Study Team during July and August in 1996. It is recognized that the residents in informal areas has some diseases occurred from low level of hygienic living standard, such as lack of toilet and no washing facilities.

(7) Tourism development

The tourism has been slow to develop. Recent economic reforms and more liberal trade policies are expected to provide Damascus with an opportunity to promote its tourism potential. In 1995, the number of hotel beds were estimated at 12,000 and the number of hotels by class is identified as shown in Table B-2.2.

(8) Others

The existing number of public facilities, such as Mosques, Churches and Public Tap is shown in Table B-2.2. The number of mosques consists of 450 of the existing one, 25 under construction, and 25 of Planning. The area each mosque is approximately 500 m².

2.3 Future Urban Development Plan

(1) General

The Damascus Municipality is currently working on a new master plan for Future Damascus City and Regional Area (hereinafter called the New Urban Development M/P) to promote sustainable growth to the year 2020. The study area is shown in Figure B-2.6. The planning exercise was started in 1992 and has been delayed because of the difficulty in collecting necessary data ; especially population data in the informal areas. The revised project schedule is as follows:

- i) Phase I for collection and analysis of the existing data
The progress report of Phase I was prepared in 1994. Phase I will be completed in 1996.

- ii) Phase II for regional study
The inception report is prepared on August in 1996. Phase II intend to be finished in 1997.
- iii) Phase III for planning and study : The schedule is not decided.
- iv) Phase IV for formulation of the Future Urban Development M/P : The schedule is not decided.

Conceptual plan of the New Urban Development M/P will be prepared by the middle of 1997 and the Future Urban Development M/P for the Damascus City is expected to be approved by the Syrian Government at the end of 1997.

(2) Outline of the City Master Plan in the year 2020

The Existing City is planned to be expanded from 106 km² to 180 km² in 2020 as shown in Figure B-2.7. The directions for the expansion are the eastern part along the Barada River, the northern part of the Kassioun Mountain, the eastern part along the Homes road and the southern part surrounding the special area zone along the Quncita road.

The area to be expanded is planned for the residential and Commercial use as shown in Figure B-2.7. As for industrial sector in the City, the existing condition will be stable, and the industrial sector will be developed outside the City. Agricultural sector will be limited in the City and Rural, and the agriculture area in the City will be decreased.

The outline of the City Master Plan is as follows ;

a) Study area and population projection

The total study area is 2,700 km² as shown in Figure B-2.6. The existing area of the City is estimated at 106 km². New development schemes are mainly located at the area enclosed with proposed ring road as shown in Figure B-2.6. Population projection is determined as follows;

	(1000 persons)					
	1995	2000	2005	2010	2015	2020
Damascus City	1,468	1,621	1,772	1,878	1,934	2,000
Area in the City (km ²)	(106)					(180)
Damascus Region	1,605	2,045	2,603	3,344	4,295	5,400
Total rea in the M/P Study (2,700 km²)						

(Source : Damascus Municipality)

The potential area for residential and commercial use is shown in Figure B-2.8.

b) Number of workers in 2020

A percentage of workers to population in 2020 is forecasted as follows;

	Percentage of Workers (%)	Number of Workers (x 1000)
Syria	29	
Damascus City	31	620
Damascus Region	30	1,620

(Source : Damascus Municipality)

c) Composition of workers in 2020

Workers is classified at each sector in 2020 as follows;

	(Unit : %)		
	Agriculture	Industry	Service
Syria	9	66	65
Damascus	4.5	27.5	68

(Source : Damascus Municipality)

d) Classification of service activities in 2020

The service activities in 2020 consists of Transport of 12 %, Commerce of 20 %, Administration of 27 % and Other sectors of 31 %.

e) Classification of income levels in 2020

Income levels in 2020 are classified as follows;

	1995*		2020**
	Damascus	(Syria)	Damascus
High Income	16.7 %	18 %	20 %
Medium Income	18.0 %	34 %	40 %
Low Income	39.5 %	48 %	40 %
Informal (Medium)	4.5 %	0 %	0 %
Informal (Low)	21.3 %	0 %	0 %

(Source : * JICA & DAWSSA, ** Damascus Municipality)

The above classification in 1995 is estimated by the JICA Study Team based on the result of the interview survey to grasp the present water use and household income in the City.

Income levels are assumed as following monthly income:

- High Income : more than SL 50,000
- Middle Income : SL 10,000 to SL 50,000
- Low Income : less than SL 10,000

(3) Conceptual plan for enlargement and development

The conceptual plan for enlargement and development is shown in Figure B-2.7. The expansion area aimed at the residential and commercial use, for instant, Kudsaya new suburb, Assad suburb and Assad city. The new area of enlargement and development is summarized as shown in Table B-2.5 and the directions for development are proposed as the following axis by the Damascus Municipality;

a) First axis

The first axis is located along the Barad River including the existing villages (Hame, Jemarya and Kudsaya) and the Kassioun mountain. The development plan for the Dummar new town and the extension area (1st phase) and the Kassioun new town are shown in Figures B-2.8 and B-2.9 respectively. The Kudsaya new suburb and the Dummar extension area (1st phase) are under construction. The Kassioun new town is supposed to be executed after 2015 for the difficulty of land acquisition.

b) Second axis

The second axis will be developed along the Homs Road. The Assad suburb (1st phase) has been constructed by the Ministry of Defense. This suburb is supplied water by itself from 5 wells located at the rural area. This axis will belong to the City after 2015.

c) Third axis

The third axis was planned along the Quneita Road by the 1968 Damascus Master Plan. The plan has not been executed due to the difficulty of the land acquisition. The purpose of this area is for the residential and commercial use. The third axis will be developed after 2015.

As the implementation schedule for the enlargement and development of the City is not prepared yet by Damascus Municipality, the JICA Study Team proposed tentatively the implementation schedule as shown in Table B-2.4. This schedule was basically approved by DAWSSA and Damascus Municipality.

(4) On-going development project and planned project

Some projects proposed by the City M/P are under construction or planned with detail design. Outline of each project are summarized below;

a) Kudsaya New Suburb

Implementation Schedule : completed the settlement in the year 2010

Total Area : 400 ha (Net area for residential & commercial : 300 ha)

Population Projection : 52,000 persons in 2010 (density : 130 persons/ha)

Main Facilities : Hotel, Hospital, Schools, Mosques, Sports Center, etc.

Water Supply : 20,000 m³/day from Wadi Marwan Well Field (13 wells)

b) Dummar New Town inside the City

Implementation Schedule : completed the settlement in the year 1997

Total Area : 350 ha (Net area for residential & commercial : 250 ha)

Population Projection : 9,000 persons in 1997 (density : 36 persons/ha)

Main Facilities : Hotel, Hospital, Schools, Mosques, Sports Center, etc.

Water Supply : Figh Spring at present, Dummar Well Field in the future

c) Dummar Extension Area (1st Phase)

Implementation Schedule : completed the settlement in the year 2000

Total Area : 124 ha (Net area for residential & commercial : 100 ha)

Population Projection : 6,000 persons in 2000 (density : 60 persons/ha)

Main Facilities : Hotel, Hospital, Schools, Mosques, Sports Center, etc.

Water Supply : Dummar Well Field

Layout plan for Dummar New Town and Dummar Extension Area (1st Phase) is shown in Figure B-2.8.

d) Kassioun New Town

Implementation Schedule : completed the settlement in the year 2020

Total Area : 650 ha consisting of 340 ha for residential & commercial area, 13 ha for industrial zone and others

Detail information is not available. Layout plan is shown in Figure B-2.9.

e) Assad Suburb (1st & 2nd Phase and Extension Area)

Assad suburb (1st Phase) is under construction. However, detail information is not available.

3 LAND USE

3.1 Administrative Boundary and Population

The water supply served area administratively consists of eight villages in Damascus Rural and fifteen districts in Damascus City. Administrative boundary in Damascus city is shown in Figure B-2.4. The districts in Damascus City is divided by neighborhoods and total number of neighborhoods is 60.

Table B-3.1 shows the area and population at each village and district. The existing population in Damascus City and village is estimated based the 1994 Census. Total area and population in the water supply served area are summarized as follows ;

	Area (ha)	Population	Population Density(per ha)
Damascus City	10,625	1,422,209	134
Villages & special area	483	98,991	205
Total	11,108	1,521,200	137

(Source : 1994 Census)

The existing administrative boundary will be changed soon according to the Damascus and Regional Master Plan in 2020 to be approved by the Government at the end of 1997. The detail information on the new administrative boundary is not available now.

3.2 Present Land Use

The present land use in the area is classified into eleven categories as shown in Figure B-2.3. The geographical features in the water supply served area is shown in Figure B-3.1. Slope inclines in the City is about 0 % to 10 %, the slope is increasing with 10 % to 30 % up to the Kassoun Mountain and slope in mountain area is more than 30 %, as shown in Figure B-3.2.

The composition of land use in Damascus City is presented below (the area at each type of land use is estimated roughly by measurement on the land use map with a scale of 1/50,000, prepared by the Damascus Municipality in 1996);

Major Land Use Type	Land Area (km ²)	%
Residential & Commercial Area	47.5	44.7
Administrative Area	3.0	3.0
Special Area & Airport Zone	3.6	3.4
Industrial Zone	2.2	2.1
Green & Park	3.6	3.4
Rural Agglomerated Area	4.1	3.9
Farmland	10.0	9.3
Afforestation Area	1.4	1.3
Kassioun Mountain	29.7	27.9
Reserved Area / Others	1.2	1.0
Total	106.3	100.0

The existing land use at each district in 1995 is estimated by Damascus Municipality as shown in Table B-3.2. The land use pattern of villages in this table is classified by the JICA Study Team based on the information from DAWSSA.

3.3 Future Land Use Plan

The future land use plan is not prepared yet by Damascus Municipality. There are not much changes in the Existing City according to the report of 2nd Phase on the study for the Damascus and Regional Master Plan.

The potentiality for the development at each land use categories, agricultural, industrial and residential uses, are shown in Figure B-3.3. The land use classification for the proposed new development area is forecasted tentatively by the JICA Study Team and DAWSSA as shown in Table B-3.2. The future land use pattern in the City and the surrounding area of the City will be not changed from the existing land use pattern. The new development area in the City is planned for residential and commercial use such as Kudsaya New Suburb, Dummar Extension Area and Assad Suburb. The composition of future land use in the City is estimated as follows:

Major Land Use Type	Land Area (km ²)	%
Residential & Commercial Area	86.01	47.8
Industrial Zone	2.39	1.3
Agricultural & Residential Area	4.14	2.3
Agricultural Area	10.06	5.6
Special Area Zone	3.55	2.0
Green & Park	10.33	5.7
Kassioun Mountain	26.46	14.7
Reserved Area & Others	37.06	20.6
Total	180.00	100.0

TABLES

Table B-2.1 List of Informal Connection Areas

No.	Name of Area	Population 1995	Area (ha)	Population Density (persons/ha)
1	Esh - Al Warwar	15,180	31.9	476
2	Kassioun Mountains Foot (Akrad) (Mouhajreen)	33,977	10.8 20.1	1,100
3	Tichreen	15,448	36.2	427
4	Jobar Surrounding - Al Aksab Mosque	25,704	63.7	404
5	East - West Tabbaleh (map)	12,669	135.2	94
6	Mokhayam Al Yarmouk (Tadamon & Zahera)	86,068	118.0	729
7	Naher Eshah - Dabhadil & Asalie Kadam Al Kadam A Al Kadam B Al Kadam C	37,005	60.5 31.5 78.4	217
8	Kafar Sousch Organisation	Non	Non	
9	Al Qazzaz & Shagour Bassateen	10,692	24.9 39.3	167
10	Mezze - Razy Kafar Sousch - Lawan	32,786 14,000	110.5 59.8	297 234
11	Mezze # 86	46,390	95.7	485
12	Somareya	4,590	37.6	122
13	Dummar - Wadi Al Mashare	14,841	41.9	354
14	Takadom	36,750	54.5	674
15	Kudsaya	20,800	50.0	416
	Total	406,900	1,050.5	387

Table B-2.2 Summary of Existing Facilities in Damascus

	Type of Facilities	Number			
		Facilities	Workers*	Students	Beds**
1	Factories	2,310	93,900		
1	Water Consumption more than 10 m ³ /d	38	18,924		
2	Water Consumption less than 10 m ³ /d	2,272	74,976		
2	School	893		491,817	
1	Kindergarten	148		24,373	
2	Primary	397		222,515	
3	Preparatory & Secondary	209		117,637	
	Preparatory	79			
	Secondary	91			
	Technical	21			
	Private	18			
4	University	15		83,087	
5	Training Institute	124		44,205	
3	Hospital	162	36,326		18,622
1	Public Hospital	18	24,984		13,824
2	Private Hospital	31	6,789		3,875
3	Sanatorium	1	950		650
4	First Health Care Center	109	3,488		
5	Special Health Care Center	3	115		273
4	Hotel	147	3,601		12,000
1	International Class	3	1,611		1,630
2	Deluxe Class	12	550		2,160
3	First Class	15	450		2,104
4	Second Class	30	450		1,916
5	Third Class	87	540		4,190
5	Others				
1	Mosque (500 m ² /unit)	500			
2	Charch	34			
3	Public Tap	115			

(Source : Ministries of Industry, Education, Helth, Tourism and DAWSSA)

REMARKS :

* Number of workes for Factories and Hospitals are estimated based on the result of the Interview Survey.

** Number of beds for Hospitals are estimated based on the result of the Interview Survey.

Table B-2.3 Number of Industrial Establishments in Damascus City

Industrial Sector	Total (1970)	Public Sector	Private Sector			Total
			Number of Employees	less than 5	5 to 9	
Food, beverages and tobacco	724	20	967	233	82	1,282
Textiles, wearing apparel and leather industries	3,873	21	4,036	289	114	4,439
Wood, wood products and furniture	1,638	2	1,702	53	7	1,762
Paper, paper products, printing and publishing	179	12	211	38	13	262
Chemicals, petroleum based products, coal, rubber and plastic products	222	12	311	31	19	361
Non-metallic mineral products	331	3	292	60	25	377
Basic metal industries	222					
Fabricated metal products, machinery and equipment	954		1,368	125	31	1,524
Others	244	2	356	11	1	368
Total	8,387	72	9,243	840	292	10,375

(Source : Central Bureau of Statistics in 1976)

Table B-2.4 Implementation Schedule for Expansion of Damascus City (Proposed by JICA & DAWSSA)

Name of Area	Year	Total Area (ha)	Year						
			1995	2000 1997	2005	2010	2015	2020	
1. Proposed Villages									
1.1 Hane		56			56				
1.2 Jemarya		5			5				
1.3 Kudsaya		108		108					
1.4 Special Area Zone (Military)		85		85					
1.5 Maaraba		75							75
Sub-total		330	0	193	62	0	0	0	75
2. Proposed New Development Area									
2.1 Kudsaya New Suburb		300			300				
2.2 Proposed Kudsaya New Suburb		200					100		100
2.3 Dumar Extension Area (1st phase)		124		124					
2.4 Dumar Extension Area (2nd phase)		216					216		
2.5 Kassouh New Town		340							340
2.6 Assad Suburb (1st phase)		40			12		28		
2.7 Assad Suburb (2nd phase)		193				128		64	
2.8 Assad Suburb Extension Area		298							298
2.9 Kaboon Green Area		530				530			
2.10 Assad City		655						655	
2.11 Proposed Assad City Extension Area (1)		200						100	100
2.12 Proposed Assad City Extension Area (2)		124							124
2.13 Proposed Assad City Extension Area (3)		575							575
2.14 Special Area Zone (State Factory)		25		25					
2.2 Others (Unclassified area)		3,227							3,227
Sub-total		7,045	0	149	312	686	1,135	1,135	4,763
3. Existing Damascus City									
3.1 Ruku Aldyn		437	437	437	437	437	437	437	437
3.2 Moubajreen		363	363	363	363	363	363	363	363
3.3 Mezze & Cafarouse		2,428	2,428	2,428	2,428	2,428	2,428	2,428	2,428
3.4 Kanawat		269	269	269	269	269	269	269	269
3.5 Kadam & Midan		596	596	596	596	596	596	596	596
3.6 Old City & Shaghour		716	716	716	716	716	716	716	716
3.7 Sarouja		349	349	349	349	349	349	349	349
3.8 Yarmouk		227	227	227	227	227	227	227	227
3.9 Jobar		642	642	642	642	642	642	642	642
3.10 Berze & Kaboon		1,170	1,170	1,170	1,170	1,170	1,170	1,170	1,170
3.11 Dumar		473	473	473	473	473	473	473	473
3.12 Kassouh Mountain		2,956	2,956	2,956	2,956	2,956	2,956	2,956	2,956
Sub-total		10,625	10,625	10,625	10,625	10,625	10,625	10,625	10,625
Total		18,000	10,625	10,967	11,341	12,027	13,162	13,162	18,000

(Remarks)

□ : Planning and Design

▨ : Land Acquisition

▩ : Construction

■ : Execution of Promotion for Living, Lot selling and Administrative reform

▼ : Approval of The Damascus City Master Plan by The Government in 1997

Table B-3.1 Water Service Area and Population (1995)

Name of Service Area	Number*1 of Subscribers (Connections)	Service Area (ha)	Population (persons)	Population Density (persons/ha)
1. Villages				
1.1 Figeih	726	44.30	3,975	90
1.2 Al Khadra	378	11.70	2,231	191
1.3 Bassime	648	17.50	468	27
1.4 Ashrafye Wadi	544	26.90	3,311	123
1.5 Judayde	689	53.20	4,464	84
1.6 Hame	1,170	56.20	21,570	384
1.7 Jemarya		5.30	2,034	384
1.8 Kudsaya	2,356	158.00	43,398	275
1.9 Special Area Zone (No.4) (No.1,2,3)	*2	85.00	14,040	165
1.10 Special Area Zone (State Factory)	*2	25.00	3,500	140
Sub-total	6,511	483.10	98,991.00	205
2. Damascus City				
2.1 Dummar	5,202	473.00	49,415	104
Kassioun Mauntain		2,956.00		
2.2 Mouhajreen	22,664	363.00	77,461	213
2.3 Ruku Aldyn	34,552	437.00	166,768	382
2.4 Berze	17,301	673.00	75,899	113
2.5 Jobar	20,119	642.00	104,106	162
2.6 Sarouja	27,260	349.00	117,617	337
2.7 Old City	5,359	145.00	18,493	128
2.8 Kanawat	15,765	269.00	66,761	248
2.9 Kadam	4,768	300.00	64,175	214
2.10 Shaghour	11,488	470.00	65,631	140
2.11 Midan	21,805	296.00	143,579	485
2.12 Mezze	15,702	1,328.00	110,002	83
2.13 Kaboon	4,905	497.00	51,592	104
2.14 Cafarsouse	7,486	1,200.00	96,021	80
2.15 Yarmouk	17,479	227.00	214,689	946
Sub-total	231,855	10,625.00	1,422,209	134
Total / Average	238,366	11,108.10	1,521,200	137

(Source : DAWSSA & JICA Study Team)

Remarks

*1 Number of billed connections is estimated with 214,533.

Total number includes 103,278 subscribers receiving a subsidy from DAWSSA. DAWSSA encourage of subscribers to install a water meter from 1924 to 1988 with an incentive free charge of water. Total water volume of free charge is estimated with 91,375 m³/year.

*2 It is a bulk water supply system to supply water from the Jemraya reserve vir facts through a water meter at the housing area in Judayde.

Table B-3.2 Land Use Classification

Name of Area	Land Use Classification (ha)								
	Total Area	Agricultural	Agriculture & Residential	Green & Park	Special Area & Airport	Industrial Zone	Residential & Commercial	Reserved / Others	Kassioun Mountain
I. Proposed Villages*									
1.1 Hame	56					2	54		
1.2 Jemaya	5						5		
1.3 Kudsaya	108					2	106		
1.4 Special Area Zone (Military)	85						85		
1.5 Maaraba	75						75		
Sub-total	330	0	0	0	0	4	326	0	0
2. Proposed New Development Area									
2.1 Kudsaya New Suburb	300						300		
2.2 Proposed Kudsaya New Suburb	200						200		
2.3 Dummar Extension Area (1st phase)	124						124		
2.4 Dummar Extension Area (2nd phase)	216						216		
2.5 Kassioun New Town (650 ha)**	340					13	274	363	-310
2.6 Assad Suburb (1st phase)	40						40		
2.7 Assad Suburb (2nd phase)	193						193		
2.8 Assad Suburb Extension Area	298						298		
2.9 Kaboon Green Area	530			530					
2.10 Assad City	655						655		
2.1 Proposed Assad City Extension Area (1)	200						200		
2.1 Proposed Assad City Extension Area (2)	124						124		
2.1 Proposed Assad City Extension Area (3)	575						575		
2.1 Special Area Zone (State Factory)	25						25		
2.2 Others	3,227							3,227	
Sub-total	7,045	0	0	530	0	13	3,222	3,590	-310
3. Existing Damascus City									
3.1 Ruku Aldyn	437			27			410		
3.2 Mouhajeen	363			53			310		
3.3 Mezze & Cafarsouse	2,428	605	256	47	355	12	1,037	117	
3.4 Kanawat	269						269		
3.5 Kadam & Midan	596	95				11	490		
3.6 Old City & Shaghour	716	89		21		28	577		
3.7 Sarouja	319			8			311		
3.8 Yarmouk	227						227		
3.9 Jobar	642	107	124	25		50	335		
3.10 Berze & Kaboon	1,170	110	33	229		121	677		
3.1 Dummar	473			93			380		
3.1 Kassioun Mountain	2,956								2,956
Sub-total	10,625	1,006	414	503	355	222	5,053	117	2,956
Total (ha)	18,000	1,006	414	1,033	355	239	8,601	3,707	2,646

(Source : Damascus Governorate & DAWSSA)

(Remarks)

* : Area of Villages is water served area due to lack of information on administrative area.

** : The development area of Kassioun New Town includes the area with 310 ha inside the Existing Damascus City.