



## Bethlehem 21 Project

### Environmental Sustainability for a Better Life: An Integrated Approach for Localizing Agenda 21 in the Bethlehem District

#### T3 "Creating Baseline Community Profiles"

#### Data Collection and Integration Report

Prepared by:



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## Data Identification: Pressure-State-Response (PSR) Framework

The conceptual framework of the Organization for Economic Co-Operation and Development (OECD): **Pressure-State-Response (PSR)** has been used to identify the data types required to analyze and assess the environmental and socioeconomic conditions of the localities targeted by Bethlehem 21 Project. **Table 1** outlines the information categories and data types required for the assessment, where the data types have been classified according to the PSR framework.

The PSR framework was used by the OECD to develop a core set of indicators for environmental performance reviews. The framework (Figure 1) is based on a concept of causality: human activities exert pressures (the "pressure" box) on the environment and change its quality and the quantity of natural resources (the "state" box). Society responds to these changes through environmental, general economic and sectoral policies (the "societal response"). The latter form a feedback loop to pressures through human activities. Accordingly, three broad types of indicators have been distinguished including the indicators of environmental pressures, indicators of environmental conditions and the indicators of societal responses. (Organization for Economic Co-Operation and Development, 1993)

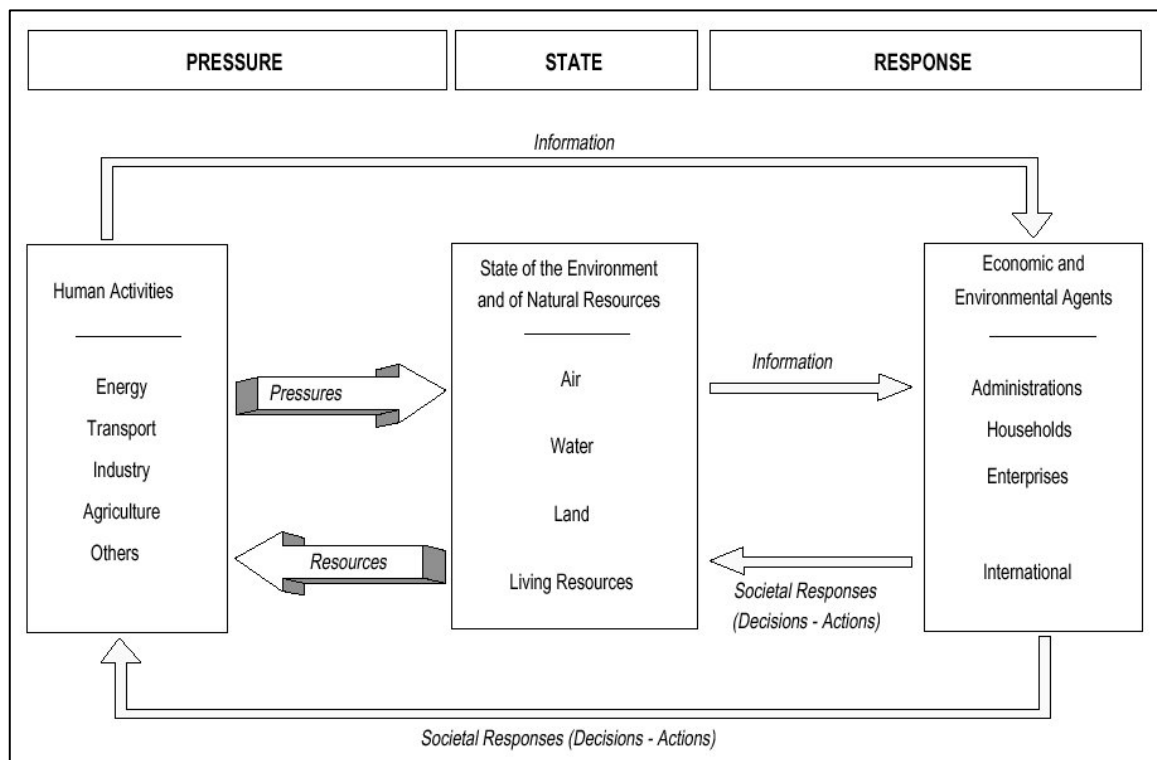


Figure1: Pressure-State-Response Framework

Table 1: The Information Categories and Data Types Required for the Assessment

Main Theme	Information Category "Theme"	Data Type	Data Category According to the PSR Framework	Expected Data Availability "Geographical Level"
Population & Society	Demography & population	Population growth rate	P	LL
		Fertility rate	R	DL
	Housing	Floor area per person	S	LL
	Standard of life, employment, & Poverty	Percent of population living below poverty line	S	DL
		Employment rate	R	LL
	Gender equality	Ratio of average female wage to male wage	R	DL
		Women per hundred men in the labor force	S	DL
		Ratio of literate women to men	S	DL
		Ratio of girls to boys in primary, secondary and tertiary education	S	LL
	Education & education facilities	School enrolment ratio in primary and secondary education	S	DL
		Adult literacy rate	S	DL
		Number of Schools and kindergartens	R	LL
		Student/teacher ratio in schools	S	LL
		Class density (average number of students per class)	S	LL
	Health	Infant mortality rate	S	NL & DL
		Life expectancy at birth	S	NL & DL
		Population with adequate sewage disposal facilities	R	LL
		Population with access to safe drinking water	R	LL
		Percent of population with access to primary health care facilities	R	LL
	Consumption and production patterns	Annual energy consumption per inhabitant	P	NL
		Number of passenger cars per 100 inhabitants	P	DL & LL
		Main telephone lines per 100 inhabitants	S	LL
	Economic Activities	Economy	Employment distribution per economic activity	S
Agriculture		Use of agricultural pesticides	P	LL
		Use of fertilizers per hectare of agricultural land	P	LL
		Share of irrigated agricultural land	P	LL
		Agriculture water demand per irrigated area	P	LL
		"Arable land" per capita	S	LL
Industry		Industrial releases into water	P	DL & LL
Energy		Share of consumption of	R	LL

		renewable resources		
	Transports	Density of the road network	S	LL
	Tourism	Number of nights per 100 inhabitants	P	LL
		Number of bed-places per 100 inhabitants	P	LL
		Number of international tourists per 100 inhabitants	P	LL
Lands & Areas	Land use and land cover	land uses		LL
	Forests	Forest area	S	LL
		Forest protection rate	R	LL
	Urban systems	Urbanization rate	S	LL
Loss of agricultural land due to urbanization		P	DL & LL	
Environment	Freshwater and wastewater	Annual withdrawals of groundwater as a percent of available water	P	DL
		Daily per capita domestic water consumption	P	LL
		Drinking water use efficiency	R	LL
		Concentration of faecal coliforms in freshwater	S	DL
		Biochemical oxygen demand in water bodies	S	DL
		Share of collected and treated wastewater by the public sewage system	R	LL
		Share of industrial wastewater treated on site	R	LL
	Soil, vegetation and desertification	Land use change	S	LL
		"Arable land" change	S	LL
	Biological diversity & ecosystems	Protected area as a percent of total area	R	DL & LL
		Total expenditure on protected areas management	R	NL
		Threatened species	S	NL
	Solid, industrial and hazardous waste	Generation of municipal solid waste	P	LL
		Generation of hazardous wastes	P	DL
		Generation of industrial solid waste	P	DL
		Distribution of municipal wastes	S	LL
		Collection rate of household wastes	R	LL
		Minimization of waste production	R	LL
		Destination of municipal waste (i.e. landfilling, incineration, composting and recycling)	R	LL
		Expenditure on waste management (collection and treatment)	R	LL
		Cost recovery index of municipal wastes	R	LL
	Air Quality	Emissions of greenhouse gasses	P	NL & DL

		Emissions of sulphur oxides	P	NL & DL
		Emissions of nitrogen oxides	P	NL & DL

P = Pressure, S= State, R = Response

NL= National Level, DL = District Level, LL= Locality Level

References: (United Nations, 2002) & (Blue Plan, 2000)

## Data Collection & Integration into GIS

ARIJ project team members in cooperation with the technical employees from the involved local authorities/councils who received the on-job training on the Geographic Information System (GIS) and its applications were responsible for the collection and integration of the identified data into a harmonized GIS. The needs and recommendations of the involved local councils were taken into consideration and a harmonized GIS based information system was developed for each council. The following presents the relevant comprehensive metadatabase as well as a screen shot of the developed GIS based information system for each local council.

### The Overall Metadatabase:

- **Data Format:**
  - a) Shapefile
  - b) Personal Geodatabase
  - c) Supporting Tables
- **Aerial Photos:**
  - a) Aerial Photo 2004, 1m Pixel Size, Full Coverage
  - b) Aerial Photo 2005, 25 cm /40cm Pixel Size, Partial Coverage
- **Projection:**
  - a) Cassini
  - b) Projected Coordinate System: Palestine Grid 1923
- **Data Sources:**
  - a) CAD Data
  - b) Aerial Photos Analyses
  - c) Reports and Statistics
  - d) Hard Copy Maps
  - e) Field Work
- **Production Date:** 30 October 2006 - 31 May 2007

## AL Khader Municipality: Metadatabase

<i>Al Khader Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Main Features	Point	ID	Long	19
			Name_En	String	
			Name_Ar	String	
			Type	String	
			Telephone	Long	
2.	Centerlines	Line	ID	Long	95
			Name_En	String	
			Name_Ar	String	
			Type	String	
			Width	Double	
3.	Houses	Polygon	Parcel_ID	Short	971
			Owner_Name	String	
			Code	String	
			Block_Number	Short	
			Block_Name	String	
			Parcel_Area	Double	
4.	Sheets Boundaries	Polygon	ID	Long	13
			Name	String	
			Area	Double	
5.	Municipal Boundary	Polygon	ID	Long	1
			Area	Double	
6.	Parcels	Polygon	Parcel_ID	Short	862
			Owner_Name	String	
			Code	String	
			Block_Number	Short	
			Block_Name	String	
			Parcel_Area	Double	
7.	Solomon's Pools	Polygon	ID	Long	3
			Area	Double	
8.	Roads (Right of Way)	Polygon	ID	Long	1
9.	Landuse/Land Cover	Polygon	ID	Long	
			Level 1	String	
			Level 2	String	
			Level 3	String	

			Area	Double	
					466
10.	Aerial Photos	Raster	25cm, 2005	Full	
			1m, 2004	Full	
11.	Industrial (industrial activities)	Point	Own.Name Ar.	String	
			Own.Name En.	String	
			Comp.Nam.Ar.	String	
			Comp.Nam.En.	String	
			Address	String	
			Street	String	
			Telephone	Long	
			Fax	Long	
			Sector	String	
			Activity Ar.	String	
			Activity En.	String	
			Commissioner	String	
			Class	String	
					7
12.	Kindergartens	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					2
13.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					8
14.	Socioeconomic Data	Polygon			
14.1	Population Projected		Locality Name	Text	

	End-Year population		Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
14.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
14.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	
					1
14.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
14.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	



			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
14.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	
			Number of Persons engaged - 2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					11
15.	Climate Data	Polygon	Locality Name	Text	
			Locality ID	Text	
			Station Name	Text	
			Station ID	Number	
			Station Type	Text	
			Year	Number	
			Rainfall_Oct (mm)	Number	
			Rainfall_Nov (mm)	Number	
			Rainfall_Dec (mm)	Number	
			Rainfall_Jan (mm)	Number	
			Rainfall_Fab (mm)	Number	
			Rainfall_Mar (mm)	Number	
			Rainfall_Apr (mm)	Number	
			Rainfall_May (mm)	Number	
					17
16.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste	Number	

			Generated_(ton)		
			Authority Responsible for Collection and Disposal of Solid Waste	Text	
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
17.	Water & Wastewater	Polygon			

	Management				
17.1	Water Supply and Consumption		Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1
17.2	Water Resources_Springs		Spring ID	Number	
			Spring Name	Text	
			Ground elevation	Number	
			Locality ID	Number	
			Locality Name	Text	
			District	Text	
			Aquifer	Text	
			Mean Discharge_(CM/Yr)	Number	
			X Coordinate_utm	Number	
	Y Coordinate_utm	Number			
					1
17.3	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater	Number	

			Collected by Sewage Network_(CM)		
			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
17.4	Public Sewage Networks		Locality Name	Text	
			Locality ID	Number	
			Availability of a Sewage Network	Text	
			Construction Year of the Sewage Network	Number	
			Length of the Sewage Network_(km)	Number	
			Diameter of Main Sewer Lines_(inch)	Number	
			Type of Sewage Collection System	Text	
			Status of the Sewage Network	Text	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
			The Outlet Pipeline of the Network Ends in	Text	
			X Coordinate of Pumping Station_utm	Number	
			Y Coordinate of Pumping Station_utm	Number	
			Daily Wastewater Inflow of the Pumping Station from Each Network_(CM)	Number	
			Final Disposal Method of the Effluent from the Pumping Station	Text	
					1
17.5	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
18.	Agriculture	Polygon			
18.1	Agriculture_Statistics		Locality Name	Text	

			Locality ID	Number	
			Area of agricultural land (Dunum)	Number	
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	
			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
18.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1

## A Screen shot of the Developed GIS Based Information System for Al Khader Municipality



## Battir Village Council: Metadatabase

<i>Battir Village Council: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Main Features	Point	ID	Long	11
			Name_Ar	String	
			Type	String	
			Telephone	Long	
2.	Centerlines	Line	ID	Long	95
			Name_En	String	
			Name_Ar	String	
			Type	String	
			Width	Double	
			Length	Double	
3.	Houses	Polygon	ID	Short	719
			Code	String	
4.	Boundary	Polygon	ID	Long	1
			Area	Double	
5.	Contour Lines	Line	ID	Long	1,013
			Elevation	Double	
6.	Roads (Right of Way)	Polygon	ID	Long	1
7.	Landuse/Land Cover	Polygon	ID	Long	998
			Level 1	String	
			Level 2	String	
			Level 3	String	
			Area	Double	
8.	Electric Poles	Point	ID	Long	228
9.	High Voltage Poles	Point	ID	Long	22
10.	Railway	Line	ID	Long	1
11.	Roads Edgelines	Line	ID	Long	748
12.	Aerial Photos	Raster	25cm, 2005	Full	
			1m, 2004	Full	
13.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	

			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					2
14.	Socioeconomic Data	Polygon			
14.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997- 2007) (%)	Number	
					1
14.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
14.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	



					1
14.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
14.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
14.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	
			Number of Persons engaged - 2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					8
15.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
			Authority Responsible for Collection and Disposal of	Text	

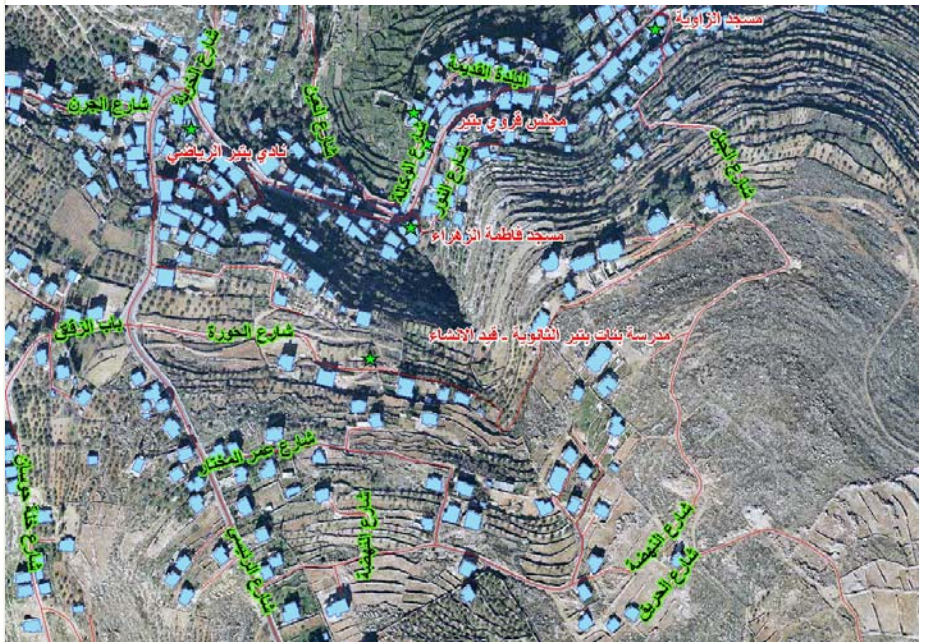
			Solid Waste		
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
16.	Water & Wastewater Management	Polygon			
16.1	Water Supply and		Locality Name	Text	

	Consumption		Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1
16.2	Water Resources_Springs		Spring ID	Number	
			Spring Name	Text	
			Ground elevation	Number	
			Locality ID	Number	
			Locality Name	Text	
			District	Text	
			Aquifer	Text	
			Mean Discharge_(CM/Yr)	Number	
			X Coordinate_utm	Number	
		Y Coordinate_utm	Number		
					2
16.3	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	

			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
16.4	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
17.	Agriculture	Polygon			
17.1	Agriculture_Statistics		Locality Name	Text	
			Locality ID	Number	
			Area of agricultural land (Dunum)	Number	
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	
			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
17.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1

## A Screen Shot of the Developed GIS Based Information System for Battir Village Council

- [-] **Layers**
- +  Schools
  - +  Main Features
  - +  Springs
  - +  E.P
  - +  H.V.P
  - +  Contour\_lines
  - +  Railway
  - +  Centerlines
  - +  Roads
  - +  Edgelines
  - +  Houses
  - +  Socioeconomic Data
  - +  Agriculture
  - +  Water and Wastewater
  - +  Solid Waste
  - +  Council Boundary - Suggested
  - +  Batteir\_LULC
  - +  tin
  - +  RectifyBatteir2005.tif
  - +  Rectifybatter.tif



## Za'tara Municipality: Metadatabase

<i>Za'tara Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Main Features	Point	ID	Long	14
			Name_Ar	String	
			Picture	String	
			Telephone	Double	
2.	Centerlines	Line	ID	Long	79
			Name_En	String	
			Name_Ar	String	
			Type	String	
			Width	Double	
			Length	Double	
3.	Houses	Polygon	ID	Long	1,277
			Owner_Name	String	
4.	Boundary	Polygon	ID	Long	1
			Area	Double	
5.	Contour Lines	Line	ID	Long	198
			Elevation	Double	
6.	Roads (Right of Way)	Polygon	ID	Long	8
7.	Landuse/Land Cover	Polygon	ID	Long	1,527
			Level 1	String	
			Level 2	String	
			Level 3	String	
			Area	Double	
8.	Electric Poles	Point	ID	Short	513
9.	High Voltage Poles	Point	ID	Short	14
10.	Roads Edgelines	Line	ID	Long	96
11.	Water Pipes Net. (water network)	Line	ID	Long	28
			Diameter	Float	
			Length	Short	
12.	Landuse	Polygon	ID	Long	83
			Type	String	

13.	Aerial Photos	Raster	1m, 2004	Full	
14.	Kindergartens	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					2
15.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					5
16.	Socioeconomic Data	Polygon			
16.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
					1
16.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
				Growth Rate 1998 (%)	Number

			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
16.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	
					1
16.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
16.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
16.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	



			Number of Persons engaged - 2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					7
17.	Climate Data	Polygon	Locality Name	Text	
			Locality ID	Text	
			Station Name	Text	
			Station ID	Number	
			Station Type	Text	
			Year	Number	
			Rainfall_Oct (mm)	Number	
			Rainfall_Nov (mm)	Number	
			Rainfall_Dec (mm)	Number	
			Rainfall_Jan (mm)	Number	
			Rainfall_Fab (mm)	Number	
			Rainfall_Mar (mm)	Number	
			Rainfall_Apr (mm)	Number	
			Rainfall_May (mm)	Number	
					7
18.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
			Authority Responsible for Collection and Disposal of Solid Waste	Text	
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	

			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
19.	Water & Wastewater Management	Polygon			
19.1	Water Supply and Consumption		Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1

19.2	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
19.3	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
20.	Agriculture	Polygon			
20.1	Agriculture_Statistics		Locality Name	Text	
			Locality ID	Number	

			Area of agricultural land (Dunum)	Number	
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	
			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
20.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1

## A Screen Shot of the Developed GIS Based Information System for Za'tara Municipality

- Layers
- Schools
- Main Features
- Trees
- HVP
- EP
- Water\_Pipes
- Centerlines
- Roads
- EdgeLines
- Contour
- Houses
- Socioeconomic Data
- Agriculture
- Climate
- Water and Wastewater
- Solid Waste
- Zatarata\_LULC
- Master Plan Boundary
- Landuse
- Rectifyzatarata-pal.tif



## Bethlehem Municipality: Metadatabase

<i>Bethlehem Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Parcels	Polygon	Parcel_ID	Short	6,133
			Owner_Name	String	
			Block_Name	String	
			Block_Number	Short	
2.	Centerlines	Line	ID	Long	453
			Name_En	String	
			Name_Ar	String	
			Length	Double	
3.	Houses	Polygon	Parcel_ID	Long	4,463
			Block_Name	String	
			Block_Number	Short	
4.	Boundary	Polygon	ID	Long	1
			Area	Double	
5.	Contour Lines	Line	ID	Long	
			Elevation	Double	
6.	Roads (Right of Way)	Polygon	ID	Long	1
7.	Landuse	Polygon	Type	String	8
			Area	Double	
8.	Electric Network	Line	Type	String	
9.	Blocks	Polygon	Block_Name	String	36
			Block_Number	Short	
			Area	Double	
10.	Main Features	Point	Name	String	130
			Type	String	
11.	Al-Mahed Houses	Polygon	Socioeconomic data at household level and data related to waster, wastewater and solid waste management		129
12.	Al-Mahed Companies	Point	Name	String	24
			Owner	String	
			Type	String	
			Telephone	Long	
			Fax	Long	

13.	Hotels	Point	Name	String	
			Owner	String	
			Classification	String	
			Beds_number	Long	
			Street	String	
			Rooms_num.	Long	
			Telephone	Long	
			Fax	Long	
					15
14.	Banks	Point	Name	String	
			Owner	String	
			Street	String	
			Telephone	Long	
			Fax	Long	
					8
15.	Churches	Point	Name	String	
			Community	String	
					19
16.	Christian Cemeteries	Point	Name	String	
					4
17.	Kindergartens	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					14
18.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					17
19.	Pharmacies	Point	Name	String	
			Official Name	String	

			Telephone	Long	
					17
20.	Laboratories	Point	Name	String	
			Official Name	String	
			Telephone	Long	
					15
21.	Monasteries	Point	Name	String	
					3
22.	Islamic Cemeteries	Point	Name	String	
					2
23.	Hospitals	Point	Name	String	
			Official Name	String	
			Telephone	Long	
			Fax	Long	
			Services	String	
			Beds	Short	
			Owner	String	
					4
24.	Careers	Point	Name	String	
			Owner Name	String	
			Trade Name	String	
			Telephone	Long	
25.	Containers	Point	Number	Short	
			Validity	String	
			Quantity	String	
					24
26.	Landuse/ Land Cover	Polygon	ID	Long	
			Level 1	String	
			Level 2	String	
			Level 3	String	
			Area	Double	
27.	Sub District	Polygon	ID	Short	
28.	Traffic Signals	Point	Type	String	
			Number	Long	
29.	Aerial Photos	Raster	25cm, 2005	Part	
			1m, 2004	Full	
30.	Socioeconomic Data	Polygon			
30.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	



			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
					1
30.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
30.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	
					1
30.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
30.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
30.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-	Number	

			1997		
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments- 2006	Number	
			Number of Persons engaged - 2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					13
31.	Climate Data	Polygon			
31.1	Climate Data_B1 (rain gauge)		Locality Name	Text	
			Locality ID	Text	
			Station Name	Text	
			Station ID	Number	
			Station Type	Text	
			Year	Number	
			Rainfall_Oct (mm)	Number	
			Rainfall_Nov (mm)	Number	
			Rainfall_Dec (mm)	Number	
			Rainfall_Jan (mm)	Number	
			Rainfall_Fab (mm)	Number	
			Rainfall_Mar (mm)	Number	
			Rainfall_Apr (mm)	Number	
			Rainfall_May (mm)	Number	
					7
31.2	Climate Data_B2 (metrological station)		Locality Name	Text	
			Locality ID	Text	
			Station Name	Text	
			Station ID	Number	
			Station Type	Text	
			Year	Number	
			Month	Text	
			Rainfall (mm)	Number	
			Wind Speed (m/s)	Number	
			Wind Direction (Degree)	Number	
			Temperature (°C)	Number	
			Relative Humidity (%)	Number	
					51
32.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste	Number	

			Generated_Calculated_(ton)		
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
			Authority Responsible for Collection and Disposal of Solid Waste	Text	
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal	Number	

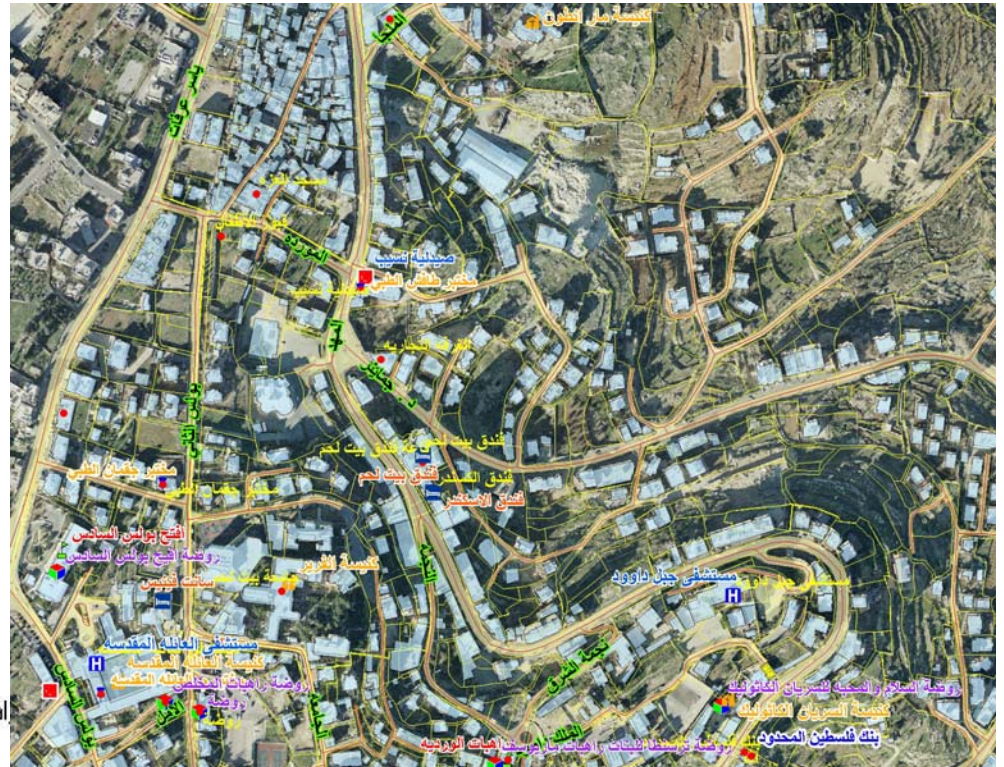
			Fees_(NIS/ton)		
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
33.	Water & Wastewater Management	Polygon			
33.1	Water Supply and Consumption		Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1
33.2	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	
	Daily Volume of Wastewater	Number			

			Collected in Cesspits_(CM)		
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
33.3	Public Sewage Networks		Locality Name	Text	
			Locality ID	Number	
			Availability of a Sewage Network	Text	
			Construction Year of the Sewage Network	Number	
			Length of the Sewage Network_(km)	Number	
			Diameter of Main Sewer Lines_(inch)	Number	
			Type of Sewage Collection System	Text	
			Status of the Sewage Network	Text	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
			The Outlet Pipeline of the Network Ends in	Text	
			X Coordinate of Pumping Station_utm	Number	
			Y Coordinate of Pumping Station_utm	Number	
			Daily Wastewater Inflow of the Pumping Station from Each Network_(CM)	Number	
			Final Disposal Method of the Effluent from the Pumping Station	Text	
					2
33.4	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
34.	Agriculture	Polygon			
34.1	Agriculture_Statistics		Locality Name	Text	
			Locality ID	Number	
			Area of agricultural land	Number	

			(Dunum)		
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	
			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
34.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1

## A Screen Shot of the Developed GIS Based Information System for Bethlehem Municipality

- Layers**
- Blocks
  - Hospitals
  - Hotels
  - Main Features
  - Banks
  - Churches
  - Christian Cemetry
  - KinderGartens
  - Heritage\_Sites
  - Islamic Cemetry
  - Monastery
  - Medical Laboratories
  - Pharmacies
  - Schools
  - contour\_Clip1
  - Subdistrict
  - Centerline
  - Almahed\_Shops
  - Mahed\_Companies
  - Souvenir\_Shops
  - Garbages\_Mahed
  - Tourism\_Offices
  - Almahed\_Houses\_Final
  - Roads
  - Houses
  - Segregation Wall
  - Landuse
  - Stairs
  - ELE
  - Parcels
  - Agriculture
  - Socioeconomic Data
  - Climate
  - Water and Wastewater
  - Solid Waste
  - Municipal Boundary
  - LULC
  - tin
  - RectifyBethlehem2005.tif
  - RectifyBethlehem2004.tif



## Beit Sahour Municipality: Metadatabase

<i>Beit Sahour Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Parcels	Polygon	Parcel_ID	Short	2,222
			Owner_Name	String	
			Code_Number	String	
			Block_Number	Short	
			Landuse	String	
			Area	Double	
			Site	String	
2.	Road Network	Line	ID	Long	409
			Name	String	
			Width	Double	
			Length	Double	
			Condition	String	
3.	Buildings	Polygon	Owner Name	String	2,377
			Date of Built	String	
			No. of Build.	String	
			Threatened	String	
			Area	Double	
			Z-Condition	String	
			Height-Floor	Double	
			House Number	String	
			Code Number	String	
			Landuse	String	
			Elevation	Double	
			Photos	String	
House Code	String				
4.	Boundary	Polygon	ID	Double	1
			Area	Double	
5.	Contour Lines	Line	ID	Long	10,059
			Elevation	Double	
6.	Roads (Right of Way)	Polygon	ID	Long	1
7.	Landuse	Polygon	Type	String	66
			Area	Double	
8.	Updates Buildings	Polygon	Same As Buildings	String	306
9.	Blocks	Polygon	Block_Number	Double	25
			Area	Double	
10.	Garbage Bins	Point	ID	Long	



			Type	String	
					106
11.	Water Pipes	Line	ID	Short	
			Diameter	Long	
					334
12.	Designed Roads	Line	Same As Roads		
					16
13.	Illegal Jerusalem Border	Line	ID	Short	
					1
14.	Military Streets	Line	ID	Short	
					2
15.	Industrial Area	Polygon	ID	Double	
			Area	Double	
					1
16.	Electric Cupboard	Point	ID	Double	
			Type	String	
			X Coordinate	Double	
			Y Coordinate	Double	
					6
17.	High Tension Electric Towers	Point	X Coordinate	Double	
			Y Coordinate	Double	
					19
18.	Transformers	Point	X Coordinate	Double	
			Y Coordinate	Double	
					5
19.	High Voltage Electric Poles	Point	X Coordinate	Double	
			Y Coordinate	Double	
					63
20.	Low Voltage Electric Poles	Point	X Coordinate	Double	
			Y Coordinate	Double	
			Type	String	
					1,139
21.	High Voltage Over-head Electric Net.	Line	Length	Double	
					100
22.	Low Voltage Over-head Electric Net.	Line	Length	Double	
					558
23.	High Voltage Underground Cable	Line	Length	Double	
					415
24.	Proposed Electric Line Panel	Polygon	Name	String	
			Kind	String	
			Position	String	
					18
25.	Natural Blocks	Polygon	Area	Double	
			Number	Double	
			Area Included	Double	
					15
26.	Proposed Streets	Line	ID	Double	
					20
27.	Sewage Lines	Line	Name	String	

			Diameter	Double	
			Length	Double	
			Existence	String	
					206
28.	Manholes	Point	ID	Double	
			Main Manhole	String	
					1,500
29.	Proposed Sewage Lines	Line	ID	Double	
					5
30.	Proposed Manholes	Point	ID	Double	
			Diameter	Double	
			Line Number	Double	
					100
31.	Pumping Stations	Polygon	Name	String	
					2
32.	Social Services	Point	ID	Double	
					78
33.	Social Services	Polygon	Area	Double	
			Z-Condition	String	
			Height-Floor	Double	
			House Number	String	
			Code Number	String	
			Type	String	
			Photos	String	
					81
34.	Designed Roads	Line	Length	Double	
			Type	String	
			Name	String	
			Width	Double	
			Area	Double	
			Condition	String	
					16
34.	Water Valves	Point	ID		
					3
35.	End Cap.(Pressure Zoning)	Point	ID		
					4
36.	TIN	Raster			
37.	Slope	Raster			
38.	Hill-shade	Raster			
39.	Flow Direction	Raster			
40.	Flow Accumulation	Raster			
41.	Watershed	Raster			
42.	Aerial Photos	Raster	25cm, 2005	Part	
			1m, 2004	Full	
43.	Socioeconomic Data	Polygon			
43.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	

			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
					1
43.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
43.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	
					1
43.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
43.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	

					12
43.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	
			Number of Persons engaged -2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					11
44.	Climate Data	Polygon	Locality Name	Text	
			Locality ID	Text	
			Station Name	Text	
			Station ID	Number	
			Station Type	Text	
			Year	Number	
			Rainfall_Oct (mm)	Number	
			Rainfall_Nov (mm)	Number	
			Rainfall_Dec (mm)	Number	
			Rainfall_Jan (mm)	Number	
			Rainfall_Fab (mm)	Number	
			Rainfall_Mar (mm)	Number	
			Rainfall_Apr (mm)	Number	
			Rainfall_May (mm)	Number	
					17
45.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
Authority Responsible for Collection and Disposal of Solid Waste	Text				

			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
46.	Water & Wastewater Management	Polygon			
46.1	Water Supply and		Locality Name	Text	

	Consumption		Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
46.2	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
46.3	Public Sewage Networks		Locality Name	Text	

			Locality ID	Number	
			Availability of a Sewage Network	Text	
			Construction Year of the Sewage Network	Number	
			Length of the Sewage Network_(km)	Number	
			Diameter of Main Sewer Lines_(inch)	Number	
			Type of Sewage Collection System	Text	
			Status of the Sewage Network	Text	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
			The Outlet Pipeline of the Network Ends in	Text	
			X Coordinate of Pumping Station_utm	Number	
			Y Coordinate of Pumping Station_utm	Number	
			Daily Wastewater Inflow of the Pumping Station from Each Network_(CM)	Number	
			Final Disposal Method of the Effluent from the Pumping Station	Text	
					1
46.4	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
47.	Agriculture	Polygon			
47.1	Agriculture_Statistics		Locality Name	Text	
			Locality ID	Number	
			Area of agricultural land (Dunum)	Number	
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	

			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
47.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1



## A Screen Shot of the Developed GIS Based Information System for Beit Sahour Municipality

-  **Layers**
- Land Marks
  - Segregation Wall
  - Water Network
  - Electric Network
  - Sewage Network
  - Designed Roads
  - Garbage Dumps
  - Roads CenterLines
  - Roads
  - Social Services
  - Houses
  - Houses Updated 2005
  - Parcels
  - Contour Lines
  - Agriculture
  - Socioeconomic Data
  - Climate
  - Water and Wastewater
  - Solid Waste
  - OldCore
  - Antique Area
  - Beitsahour\_Bethlehem\_Bor
  - Industrial Area
  - Natural Blocks
  - Blocks
  - Organized BeitSahour
  - BeitSahour Border
  - Extended BeitSahour
  - LULC
  - Land Use
  - RectifyBeitSahor2005
  - RectifyBeitSahor2004



## Ed Doha Municipality: Metadatabase

<i>Ed Doha Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Main Features	Point	ID	Long	19
			Name	String	
			Telephone	Long	
			Picture	String	
2.	Centerlines	Line	ID	Long	104
			Name	String	
			Width	Double	
			Length	Double	
3.	Houses	Polygon	Parcel_ID	Short	1,266
			Owner_Name	String	
			Code	String	
			Block_Number	Short	
			Block_Name	String	
			Parcel_Area	Double	
4.	Blocks	Polygon	ID	Long	8
			Area	Double	
5.	Municipal Boundary	Polygon	ID	Long	1
			Area	Double	
6.	Parcels	Polygon	Parcel_ID	Short	1,200
			Owner_Name	String	
			Code	String	
			Building Area	Double	
			No. of Floors	Short	
			Parcel_Area	Double	
7.	Roads (Right of Way)	Polygon	ID	Long	1
8.	Landuse/Land Cover	Polygon	ID	Long	578
			Level 1	String	
			Level 2	String	
			Level 3	String	
			Area	Double	
9.	Manholes	Polygon	Name	String	502
			Diameter	Long	
			Depth	Long	
			Type	String	

10.	Sewage Pipes	Line	Pipe Name	String	
			Diameter	Long	
			Length	Long	
			Slope	Long	
					1,060
11.	Industrial (industrial activities)	Point	Own.Name Ar.	String	
			Own.Name En.	String	
			Comp.Nam.Ar.	String	
			Comp.Nam.En.	String	
			Address	String	
			Street	String	
			Telephone	Long	
			Fax	Long	
			Sector	String	
			Activity Ar.	String	
			Activity En.	String	
			Commissioner	String	
			Class	String	
					44
12.	Kindergartens	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					3
13.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					5
14.	Aerial Photos	Raster	25cm, 2005	Part	
			1m, 2004	Full	

15.	Socioeconomic Data	Polygon			
15.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
					1
15.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
			Growth Rate 2004 (%)	Number	
			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
	Growth Rate 2007 (%)	Number			
					1
15.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
	Females - 2007	Number			
					1
15.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
	Number of Females	Number			

					4
15.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
15.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	
			Number of Persons engaged -2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	
			Number of Females engaged - 2006	Number	
					12
16.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
			Authority Responsible for Collection and Disposal of Solid Waste	Text	
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	

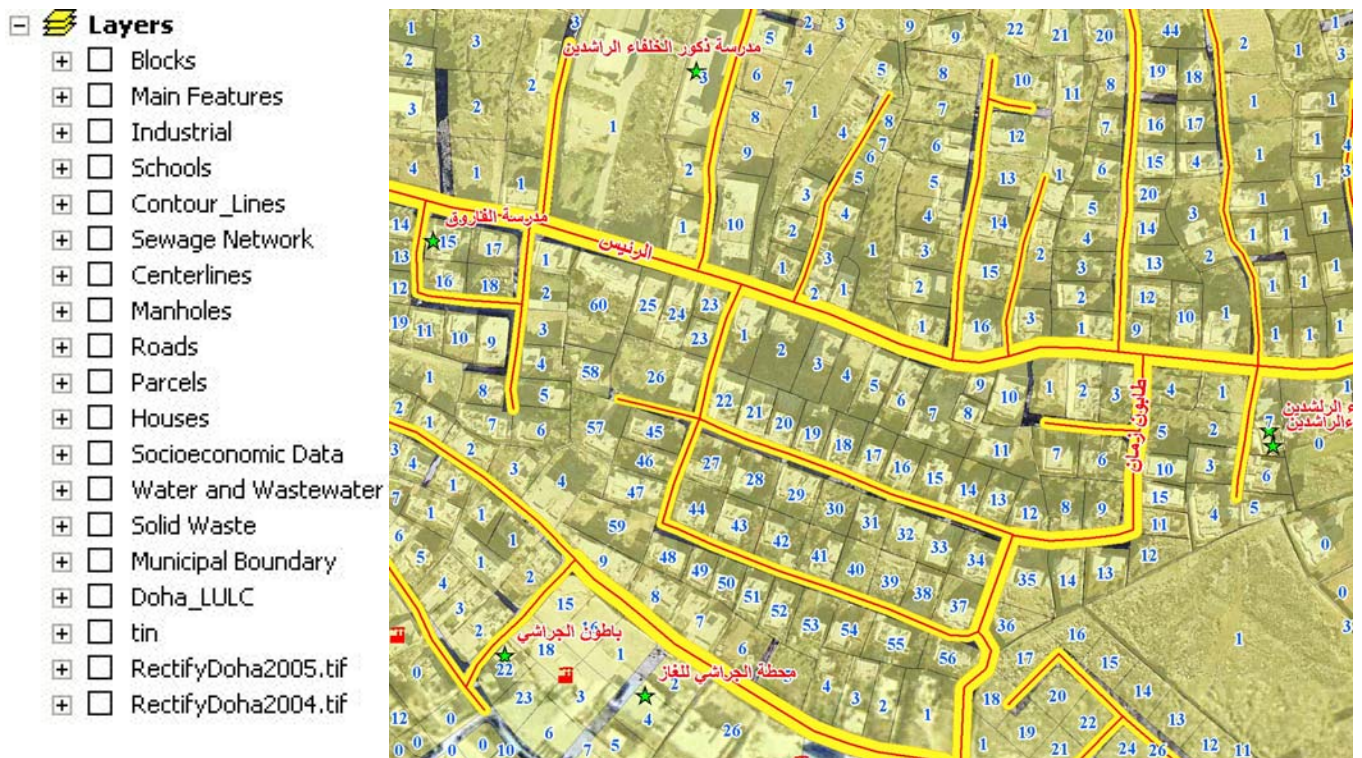
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins (Small 0.75 - 1.1 CM)	Number	
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
17.	Water & Wastewater Management	Polygon			
17.1	Water Supply and Consumption		Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage	Number	

			2007_(% of Population)		
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1
17.2	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage Network	Number	
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
17.3	Public Sewage Networks		Locality Name	Text	
			Locality ID	Number	
			Availability of a Sewage Network	Text	
			Construction Year of the Sewage Network	Number	

			Length of the Sewage Network_(km)	Number	
			Diameter of Main Sewer Lines_(inch)	Number	
			Type of Sewage Collection System	Text	
			Status of the Sewage Network	Text	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
			The Outlet Pipeline of the Network Ends in	Text	
			X Coordinate of Pumping Station_utm	Number	
			Y Coordinate of Pumping Station_utm	Number	
			Daily Wastewater Inflow of the Pumping Station from Each Network_(CM)	Number	
			Final Disposal Method of the Effluent from the Pumping Station	Text	
					1
17.4	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	
			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1



## A Screen Shot of the Developed GIS Based Information System for Ed Doha Municipality



## Beit Jala Municipality: Metadatabase

<i>Beit Jala Municipality: Metadatabase</i>					
ID	Layer Name	Type	Fields		No. of Records
			Name	Type	
1.	Parcels	Polygon	Parcel_ID	Short	2,738
			Owner_Name	String	
			Landuse	String	
			Block_Number	Short	
2.	Centerlines	Line	ID	Long	346
			Name_En	String	
			Name_Ar	String	
			Length	Double	
			Type	String	
			Telecommun.	String	
			Seawage	String	
			Electricity	String	
			Pavement	String	
			MasterPlan	String	
			Width	Double	
3.	Houses	Polygon	Parcel_ID	Long	9,816
			Block_Name	String	
			Block_Number	Short	
			Financial Data	String	
4.	Houses Licenses	Polygon	Street Name	String	2,832
			H-Code	String	
			TOP	String	
			LOP	String	
			Status	String	
			Landuse	String	
			Condition	String	
			Area	Double	
5.	Boundary	Polygon	ID	Long	1
			Area	Double	
6.	Contour Lines	Line	ID	Long	3,470
			Elevation	Double	
7.	Roads (Right of Way)	Polygon	ID	Long	1
8.	Landuse	Polygon	Type	String	67
			Area	Double	
9.	Blocks	Polygon	Block_Name	String	
			Block_Number	Short	

			Area	Double	
					35
10.	Tourism & Recreation Areas	Point	Name	String	
			Type	String	
					8
11.	Education	Point	Name	String	
			Type	String	
					11
12.	Gas Stations	Point	Name	String	
			Type	String	
					2
13.	Medical Centers	Point	Name	String	
			Type	String	
					6
14.	Religious Areas	Point	Name	String	
			Type	String	
					9
15.	Sport	Point	Name	String	
			Type	String	
					1
16.	Social Services	Point	Name	String	
			Type	String	
					9
17.	Israeli Occupation	Point	Name	String	
			Type	String	
					4
18.	Segregation Wall	Line	Name	String	
					19
19.	Kindergartens	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	
			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					7
20.	Schools	Point	Name	String	
			Telephone	Long	
			Fax	Long	
			P.O.Box	Long	
			Teachers (M)	Short	
			Teachers (F)	Short	
			Students (M)	Short	
			Students (F)	Short	
			Directors (M)	Short	

			Directors (F)	Short	
			School Area	Double	
			Building Area	Double	
			Playground Ar.	Double	
			Class	String	
					11
21.	TIN (Triangulated Irregular Network)	Raster	Elevation		
22.	Aerial Photos	Raster	25cm, 2005	Part	
			1m, 2004	Full	
23.	Industrial (industrial activities)	Point	Own.Name Ar.	String	
			Own.Name En.	String	
			Comp.Nam.Ar.	String	
			Comp.Nam.En.	String	
			Address	String	
			Street	String	
			Telephone	Long	
			Fax	Long	
			Sector	String	
			Activity Ar.	String	
			Activity En.	String	
			Commissioner	String	
			Class	String	
					34
24.	Socioeconomic Data	Polygon			
24.1	Population Projected End-Year population		Locality Name	Text	
			Locality ID	Number	
			Projected Population 1998	Number	
			Projected Population 1999	Number	
			Projected Population 2000	Number	
			Projected Population 2001	Number	
			Projected Population 2002	Number	
			Projected Population 2003	Number	
			Projected Population 2004	Number	
			Projected Population 2005	Number	
			Projected Population 2006	Number	
			Projected Population 2007	Number	
			Population Increase (1997-2007) (%)	Number	
					1
24.2	Population Growth Rate		Locality Name	Text	
			Locality ID	Number	
			Growth Rate 1998 (%)	Number	
			Growth Rate 1999 (%)	Number	
			Growth Rate 2000 (%)	Number	
			Growth Rate 2001 (%)	Number	
			Growth Rate 2002 (%)	Number	
			Growth Rate 2003 (%)	Number	
		Growth Rate 2004 (%)	Number		

			Growth Rate 2005 (%)	Number	
			Growth Rate 2006 (%)	Number	
			Growth Rate 2007 (%)	Number	
					1
24.3	Population_Distribution of Population by Sex		Locality Name	Text	
			Locality ID	Text	
			Locality Type	Text	
			Total Population - 1997	Number	
			Males - 1997	Number	
			Females - 1997	Number	
			% of Males	Number	
			% of Females	Number	
			Sex Ratio (male per 100 females)	Number	
			Projected Population - 2007	Number	
			Males - 2007	Number	
			Females - 2007	Number	
					1
24.4	Population_Distribution of Population by Age Group and Sex		Locality Name	Text	
			Locality ID	Number	
			Age Group	Number	
			Total Population-1997	Number	
			% of Population	Number	
			Number of Males	Number	
			Number of Females	Number	
					4
24.5	Population_Distribution of Households by Household Size		Locality Name	Text	
			Locality ID	Number	
			Household Size	Number	
			Number of Households-1997	Number	
			Number of Population-1997	Number	
			% of Population	Number	
			Average Household Size - 1997	Number	
					12
24.6	Economic Establishments	Polygon	Locality Name	Text	
			Economic activity	Text	
			Number of establishments-1997	Number	
			Number of Persons engaged - 1997 (Both Sexes)	Number	
			Number of Males engaged - 1997	Number	
			Number of Females engaged - 1997	Number	
			Number of establishments-2006	Number	
			Number of Persons engaged -2006 (Both Sexes)	Number	
			Number of Males engaged - 2006	Number	

			Number of Females engaged - 2006	Number	
					11
25.	Solid Waste Management	Polygon	Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Projected Population 2007	Number	
			Daily Per Capita Solid Waste Generation Rate_(Kg)	Number	
			Daily Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Daily Quantity of Solid Waste Generated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Generated_(ton)	Number	
			Authority Responsible for Collection and Disposal of Solid Waste	Text	
			Solid Waste Collection Rate	Number	
			Frequency of Collection	Text	
			Annual Quantity of Solid Waste Collected_Calculated_(ton)	Number	
			Annual Quantity of Solid Waste Collected_(ton)	Number	
			Solid Waste Composition_Percentage of Plastic	Number	
			Solid Waste Composition_Percentage of Paper and Cardboard	Number	
			Solid Waste Composition_Percentage of Organic Materials	Number	
			Solid Waste Composition_Percentage of Metals	Number	
			Solid Waste Composition_Percentage of Glass	Number	
			Solid Waste Composition_Percentage of Others	Number	
			Number of Collection Vehicles/Trucks (1 - 11 Tons)	Number	
			Number of Collection Vehicles/Trucks (18 - 24 CM)	Number	
			Number of Collection Bins	Number	

			(Small 0.75 - 1.1 CM)		
			Number of Collection Bins (Large)	Number	
			Final Disposal of Collected Solid Waste	Text	
			X Coordinate of the Disposal Site_utm	Number	
			Y Coordinate of the Disposal Site_utm	Number	
			Waste Management Practice	Text	
			Frequency of Disposal	Text	
			Solid Waste Disposal Fees_(NIS/ton)	Number	
			Solid Waste Collection and Disposal Monthly Fees_(NIS per household)	Number	
			% of Population Who Pay the Fees	Number	
					1
26.	Water & Wastewater Management	Polygon			
26.1	Water Supply and Consumption		Locality Name	Text	
			Locality ID	Number	
			Locality Type	Text	
			Water Supply Utility	Text	
			Projected Population 2007	Number	
			Water Network Coverage 2007_(% of Population)	Number	
			Total Water Supply_Bulk Meters_(CM)	Number	
			Daily Per Capita Water Supply_(L)	Number	
			Physical Water Losses	Number	
			Daily Per Capita Water Consumption_(L)	Number	
					1
26.2	Wastewater Generation		Locality Name	Text	
			Locality ID	Number	
			Locality Type		
			Projected Population 2007	Number	
			Daily Per Capita Water Consumption_(L)	Number	
			Daily Volume of Wastewater Generated_(CM)	Number	
			Annual Volume of Wastewater Generated_(CM)	Number	
			Daily Per Capita Wastewater Generation_(L)	Number	
			Percentage of Population Connected to Sewage Network	Number	
			Number of Population Connected to Sewage	Number	

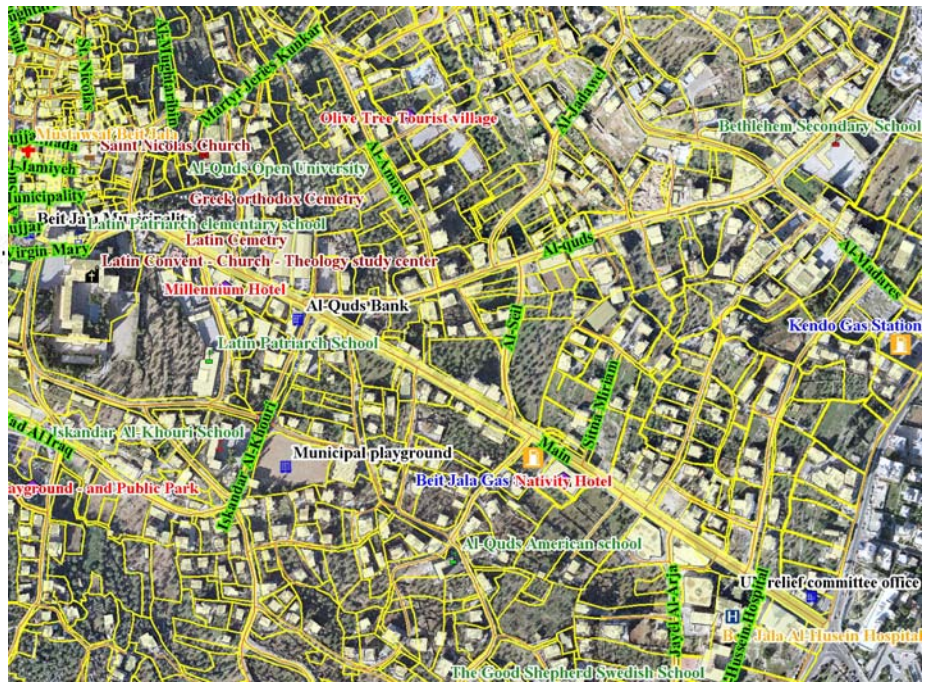
			Network		
			Number of Population Unconnected to Sewage Network	Number	
			Percentage of Population using Cesspits for Wastewater Disposal	Number	
			Daily Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Annual Volume of Wastewater Collected by Sewage Network_(CM)	Number	
			Daily Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Annual Volume of Wastewater Collected in Cesspits_(CM)	Number	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
					1
26.3	Public Sewage Networks		Locality Name	Text	
			Locality ID	Number	
			Availability of a Sewage Network	Text	
			Construction Year of the Sewage Network	Number	
			Length of the Sewage Network_(km)	Number	
			Diameter of Main Sewer Lines_(inch)	Number	
			Type of Sewage Collection System	Text	
			Status of the Sewage Network	Text	
			Daily Wastewater Outflow of the Sewage Network_(CM)	Number	
			The Outlet Pipeline of the Network Ends in	Text	
			X Coordinate of Pumping Station_utm	Number	
			Y Coordinate of Pumping Station_utm	Number	
			Daily Wastewater Inflow of the Pumping Station from Each Network_(CM)	Number	
			Final Disposal Method of the Effluent from the Pumping Station	Text	
					1
26.4	Disposal of Wastewater Collected in Cesspits		Final disposal method of wastewater collected in cesspits	Text	



			Name of the wadi/valley	Text	
			X Coordinate of the Discharge Point_utm	Number	
			Y Coordinate of the Discharge Point_utm	Number	
			Locality location in Relation to Groundwater Recharge Areas	Text	
			Discharge Point Location in Relation to Groundwater Recharge Areas	Text	
					1
27.	Agriculture	Polygon			
27.1	Agriculture_Statistics		Locality Name	Text	
			Locality ID	Number	
			Area of agricultural land (Dunum)	Number	
			Area of cultivable land (Dunum)	Number	
			Area of plastic houses (Dunum)	Number	
			Farming area (Dunum)	Number	
			Area of Vegetables(Dunum)	Number	
			Area of Almonds (Dunum)	Number	
			Area of Nuts (Dunum)	Number	
			Area of Apples (Dunum)	Number	
			Area of Olives (Dunum)	Number	
			Area of Grapes (Dunum)	Number	
			Area of Figs (Dunum)	Number	
					1
27.2	Agriculture_Livestock		Locality Name	Text	
			Locality ID	Number	
			Number of Sheep	Number	
			Number of Goat	Number	
			Number of broiler farms	Number	
			Number of Broilers (thousand bird)	Number	
			Number of layer farms	Number	
			Number of Layers (thousand bird)	Number	
			Number of Beehives	Number	
					1

## A Screen Shot of the Developed GIS Based Information System for Beit Jala Municipality

-  **Layers**
- Tourism & Recreation
  - Educational
  - Gas\_Station
  - Kindergarten
  - Industrial
  - Israeli\_Occupation
  - Medical
  - Religious
  - Social Services
  - Sports
  - SegregationWall\_BeitJala
  - Centerlines
  - Houses\_licences
  - Roads\_Poly
  - Houses
  - Socioeconomic Data
  - Agriculture
  - Water and Wastewater
  - Solid Waste
  - MP\_Landuse
  - Municipality Boundary
  - Blocks
  - Proposed\_Landuse
  - roads
  - Parcels
  - LULC
  - tin
  - RectifyBeitJala2005.tif
  - RectifyBeitJala2004.tif



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United Nations. (2002). Indicators of Sustainable Development: Guidelines and Methodologies. Retrieved Nov. 2006, from the UN Department of Economic and Social Affairs: Division of Sustainable Development Website: [http://www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table\\_4.htm](http://www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table_4.htm)

Organization for Economic Co-Operation and Development (OECD). (1993). OECD Core Set of Indicators for Environmental Performance Reviews. Paris.