Using GIS to Support National Census on Population Establishments, Its Use to support HS and SDGs

Eng. SONA ABUZAHRA
Head of Environment Statistics Division
Jordan

GIS (Introduction)

- A GIS is a tool enabling us to envision the geographic aspects of a body of data.
- Basically, it lets you query or analyze a database and receive the results in the form of map.
- Since many kind of data have important geographic aspects, a GIS can have many uses such as weather forecasting, sale analysis, population forecasting and land use planning….

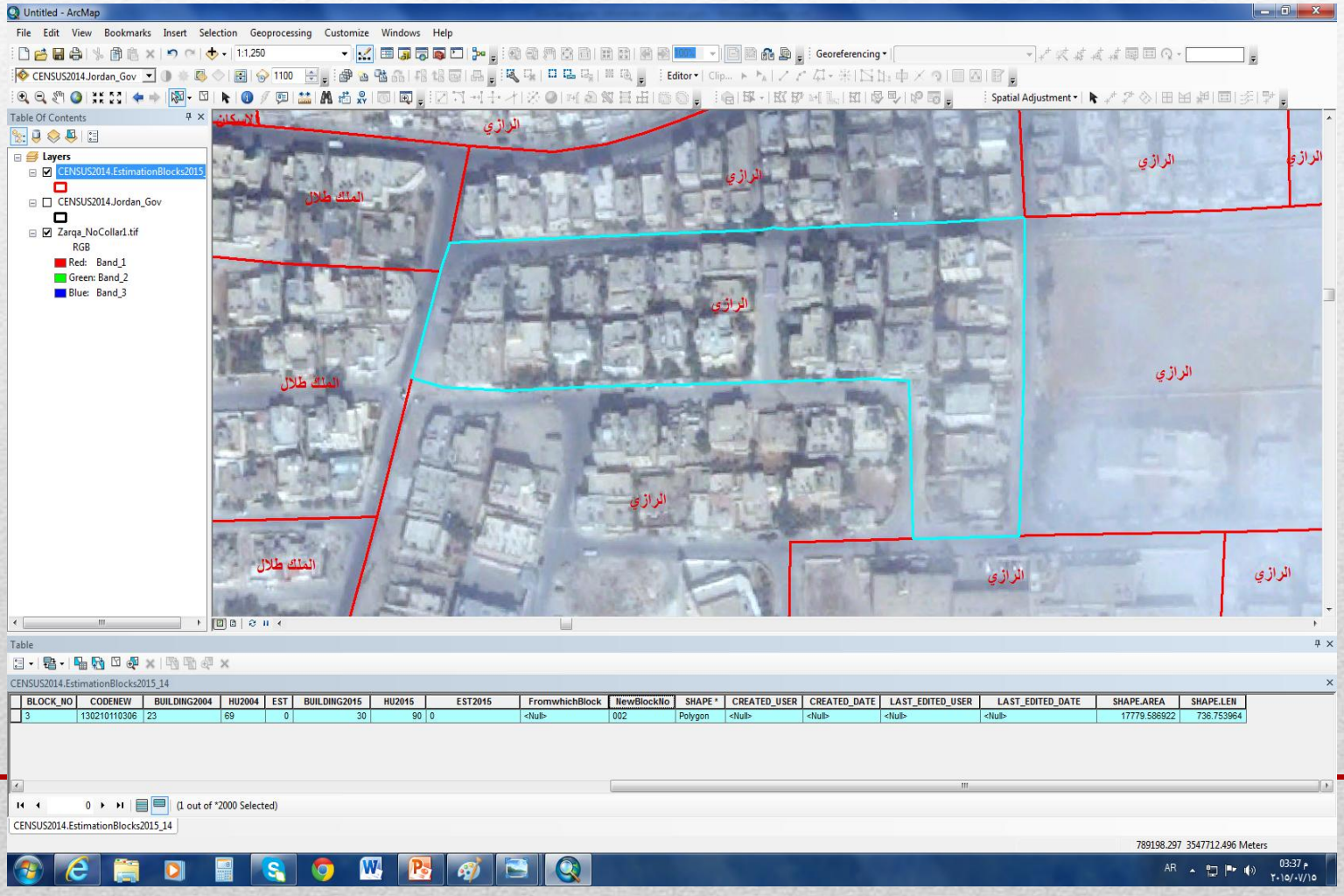
GIS

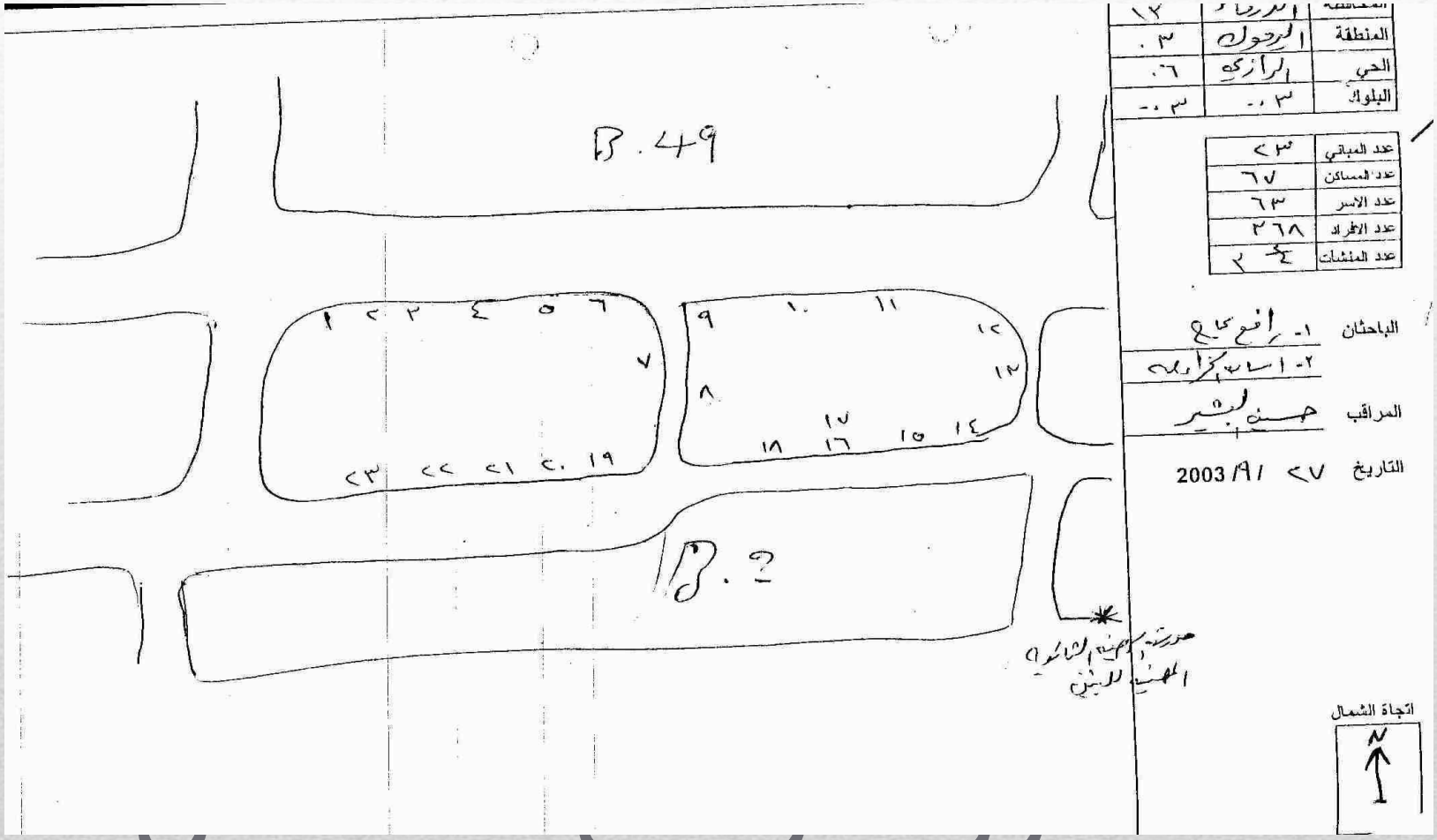
- GIS described in explicitly in terms of latitude and longitude or in term of implicitly such as street address or a river….
- GIS developers obtain the map data from public sources or companies that specialized in collecting and organizing geographical information.
- In the census we use already existing maps from Royal Geographic center and other sources.
- GIS accept geographic input in the form of scanned-in and digitized map images.

- The blocks were identified according to already existing maps.
- The projections for building were prepared in the office.
- The researchers in the field been located by satellite.
- They zoom in and out or change the boundaries of the blocks according to the field visits.

In the census

Image for a block




B.49
B.?
المنطقة الرحول ٠٣
الحي الرازكه ٠٦
البلوك ٠٣ ٠٠
عدد المباني ٣٠
عدد المساكن ٦٧
عدد الاسر ٦٣
عدد الافراد ٢٦٨
عدد المنشات ٢
الباحثان ١- رافع
٢- اسامه
المراقب حسين البشير
التاريخ ٢٧ /٩/ 2003
اتجاة الشمال
N

The importance of GIS in Census

- Adjust the field work.
- Adjust the data quality and ensuring the preservation against loss and accuracy.
- The integration of spatial information and metadata information in a single database.
- Documentation and confirm the data specifications.
- The ability to visual representation of spatial information.
- Access to statistical geographic database in the Kingdom .
- Publication of the census by linking the geographical unit with demographic data upon request by using **Geo codes**.

Advantages Using GIS

- Facilitate and save time and efforts.
- More accuracy.
- Have the ability to add, remove and update the data.
- Ability to analyze and making statistical measurements.
- Integrate different data sources.
- Prediction and Forecasting

The outcomes

- All stages and activities were designed and implemented using modern information technologies (geographical and field preparation using GIS).
- The Census form a quality transition in the methodologies and procedure of the work.
- Population data by size, administrative and geographical distribution, age-sex structure, marital status, education, functional disabilities, health insurance, economic activity rate, housing conditions, mortality and migration.

The outcomes

- population connected to waste-water network.
- The percentage of population relying on public network for drinking.
- The results could be disaggregated at blocks scale.
- All questions in the questionnaire give us information at block scale.
- The data that we can bind it from water Utilities must be in an Excel sheets and have a geo-codes 15 digits.

- Question 407 and 408 on water and sanitation?
- The water network coverage is around 98-99% of the population.
- The Question in the census was The main source for drinking water because a lot of people relay on filtered water for drinking and the full coverage of the network.

The outcomes

Potential Uses of census using satellite data

- Potential integrating the population and housing database with environmental databases (Dumping sites, treatment plants, wells, reserves….).
- Regional distribution across governorates.
- The industries that are considered water intensive.
- Potential having water resources layer such as wells and distribution and combine it with population distribution layer.

Potential Uses of census using satellite data

- Availability of updated frameworks for household survey and socio-economic studies.
- Availability of the framework for industrial, services and agricultural holdings.
- Facilitate environmental reporting in SOER, climate change and environmental account.

Opportunities

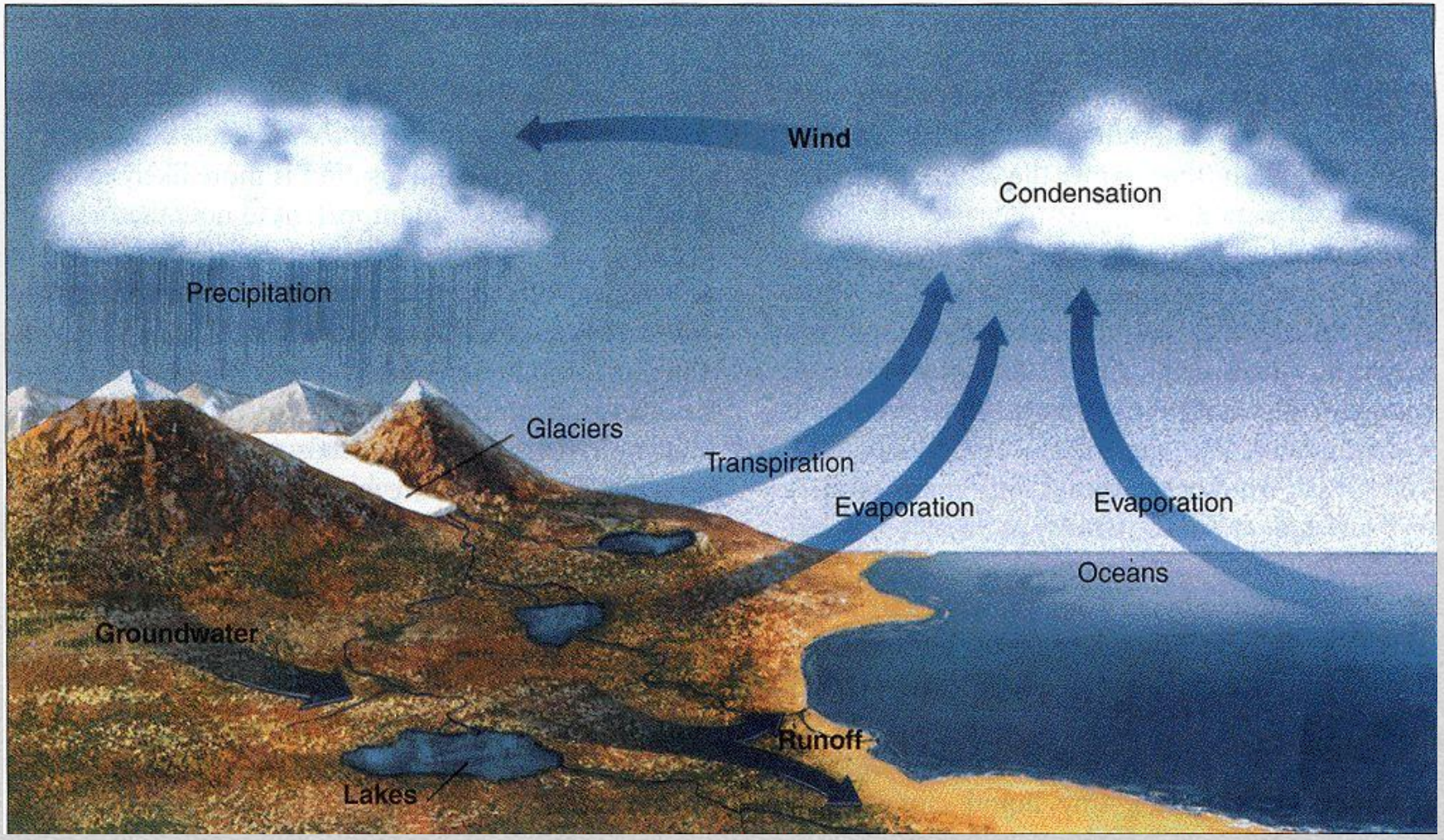
- Cooperation with other ministries and organizations.
- Development in environmental surveys.
- Potential establishment of shared environmental information system.

- Fresh Water Quality and Marine Water
- A. Nutrients and Chlorophyll (N, P, Chl)
- B. Organic Matter (BOD, COD)
- C. Pathogens (fecal)
- D. Metals (mercury, lead, nickel, arsenic..)
- E. Organic Contaminant (PCBs, furans..)
- F. Physical and Chemical Characteristics (PH, temp, salinity, Dissolved solids…)

Framework for Development of Environmental Statistics (FDES)

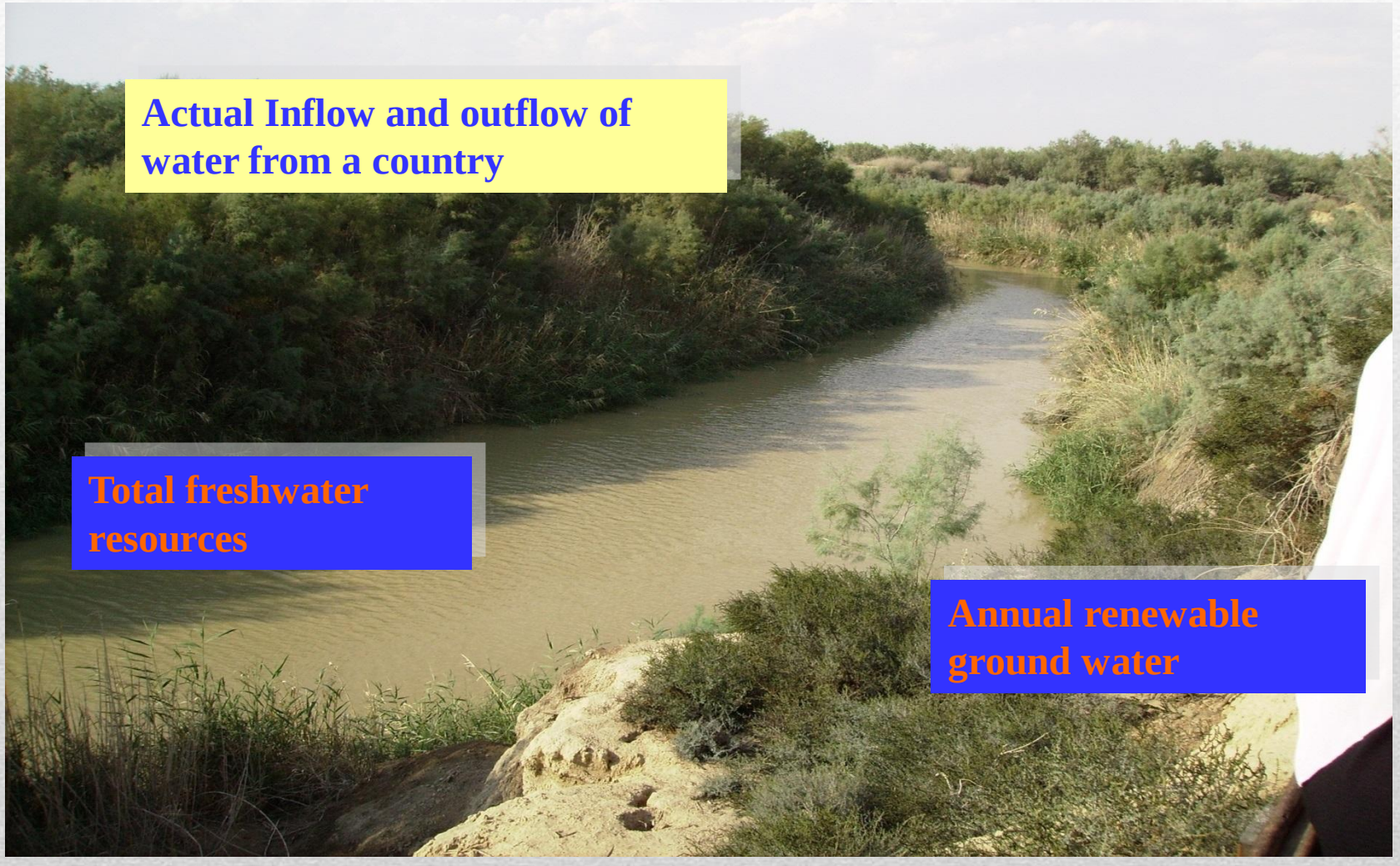
Water Resources

- A. Inflow of water to inland water resources
- B. Outflow of water
- Inland water stocks in artificial reservoirs

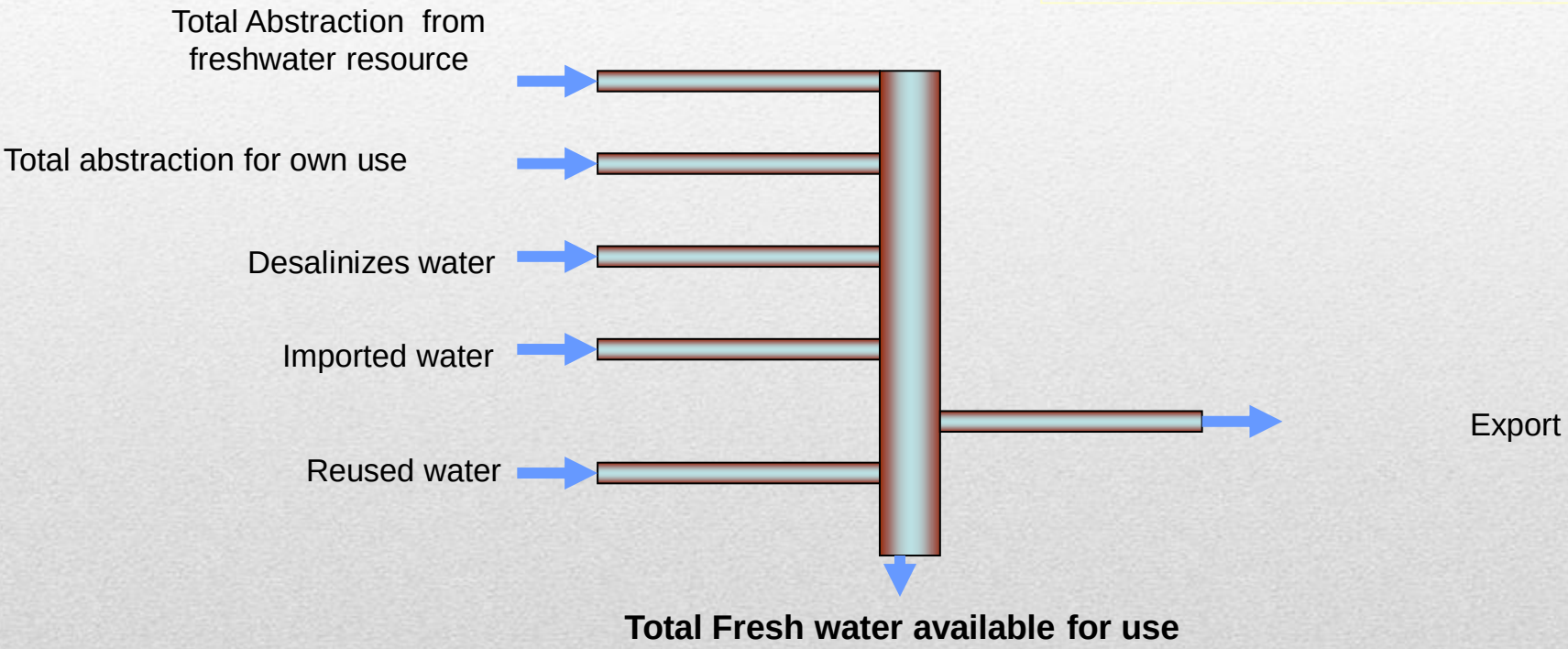

Wind
Condensation
Precipitation
Glaciers
Transpiration
Evaporation
Evaporation
Oceans
Groundwater
Runoff
Lakes

- A. Total water abstraction
- Water abstraction for own use
- Water abstraction for distribution
- B. Desalinized water
- C. Reused water
- D. Water Harvesting
- E. Losses
- F. Export and Import

Abstraction, Use and Returns


Actual Inflow and outflow of water from a country
Total freshwater resources
Annual renewable ground water

Water Resources



- A. Volume of wastewater generated
- B. Pollutants concentration
- C. Volume of wastewater collected
- D. Volume of wastewater treated
- Urban wastewater plants (No, capacity)
- Industrial wastewater plants (No, capacity)
- Total discharge with and without treatment
- Pollutant contents of discharge

Waste Water

SDGs-Water Indicators

- Goal 6: Ensure availability and sustainable management for water and sanitation
- **Indicators**
- 1. percentage of population using safely managed drinking water (Household survey)
- 2. Percentage of population using safely managed sanitation services (Census)
- 3. Percentage of bodies of water with good ambient water quality

- 4. Percentage change in water use efficiency
- 5. degree of integrated water resource management implementation
- 7. Amount of water and sanitation-related official development assistant (MWI, MOP).
- 8. Percentage of local administrative units with established and operational policies and procedure for participation of local communities in water and sanitation managements.

SDGs-Water Indicators

- SDG-3 Health
- **Mortality rate attributed to hazardous chemical water and soil pollution**
- SDG-11 Human Settlement
- **Cities with more than 100,000 inhabitants that implement urban and regional development plans integrating population projections and resource needs**

SDGs-Water Indicators

SDGs-Water Indicators

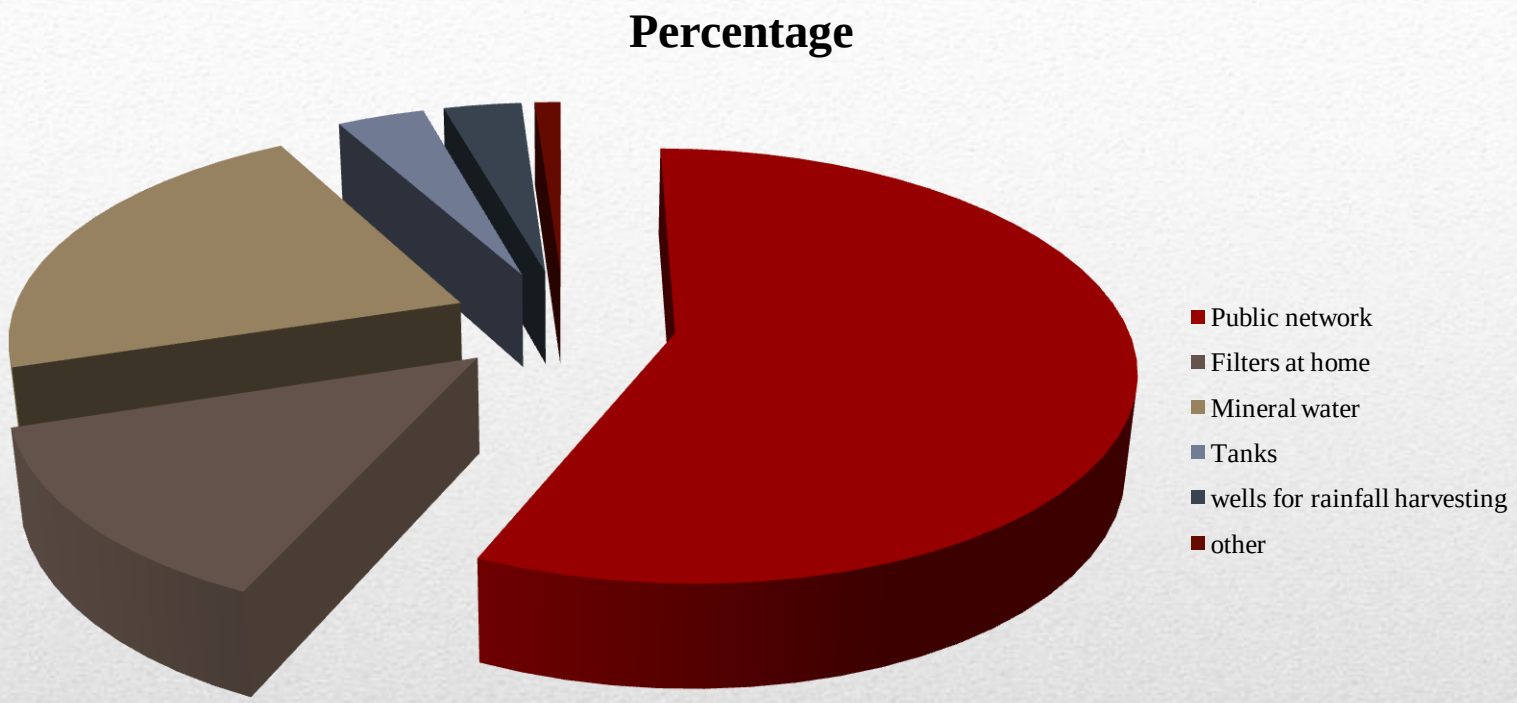
- SDG-12 Sustainable Consumption and Production
- **Material footprint (MF) and MF/capita**
- SDG-15 Ecosystems

Needs

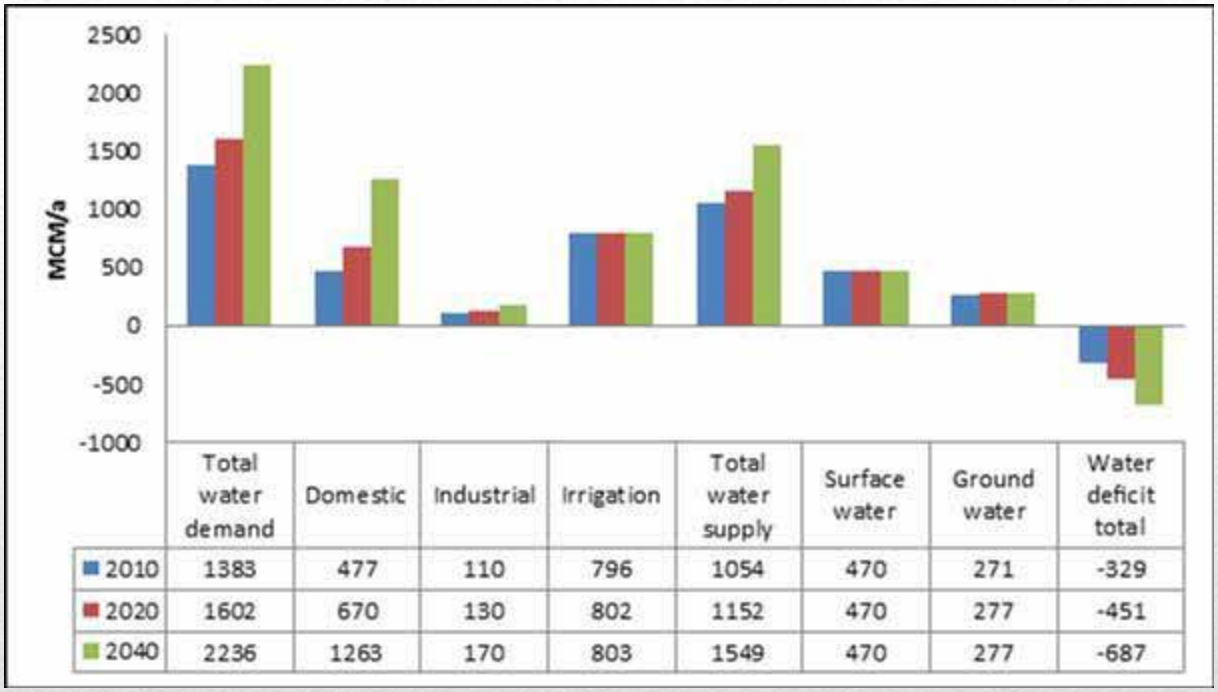
- Methodology for calculation for each indicator
- Adopting a regional strategy with enforcement for implementation.
- Financial assistant for the countries in order to form a national committee for indicators calculation and GAP analysis (reporting, responsibilities, flow of the data, auditing, quality and verification ….)

Environmental Statistics Report 2014

- The Classification FDES is used to determine the variable in the environmental statistics report 2014.
- Visiting all stakeholders that are responsible for environmental data.
- Full coverage of the industrial activities.



Census Results for distribution of drinking water sources



	Total water demand	Domestic	Industrial	Irrigation	Total water supply	Surface water	Ground water	Water deficit total
2010	1383	477	110	796	1054	470	271	-329
2020	1602	670	130	802	1152	470	277	-451
2040	2236	1263	170	803	1549	470	277	-687

Figure 5: Water demand, supply and deficit in Jordan (Source: MWI 2014)

Thank you for your attention