GIS APPLICATIONS IN DEMOGRAPHY

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Introduction

- Too much information is available to make decisions
- Variable research data requirements
- Decision making process requirements
- The huge demand on processed information to make decisions about industrial and business processes has lead to the establishment of decision support systems (DSS) which helps make decisions easier for the decision makers.
- Examples of these complex situations include: Marketing, Services, Infrastructure design and management,..etc.
- Cost effectiveness

The Geographic Dimension of Decision Making

- Geo spatial data systems
- Application requirements, e.g., Health: Select Hospital location with Minimum Distance to emergency services for Heart patients; Security: Best location for a Police station in a district
- Applications : EIA, Defense operations, Surveying Departments, Military Supply Headquarters, even Drug smugglers use GPS in their operations.

The Rise of Computer Aided Planning (CAP) Systems

- Satellite images processing
- RTV, Virtual terrain, What If?, GIS Arc Info, Arc View..
- Military Intelligence Applications
- Civilian Applications such as
  - Transportation Systems Design and Analysis
  - Land Use Application
  - Real Estate Management and Property Services
  - Land Development, Building Permits, & Auto CAD
  - Economic Feasibility Analysis Studies

Too Many Applications, Too Many Options, what to Do?

- Can not make decisions Without Accurate Data
- Can not make Decisions Without Geographic Linkages
- We need Geographically Referenced Data
- We need a Decision Support system (DSS)
- Decision Support Systems (DSS) originally evolved to help business environment decision making.
- Later customization to fit utilities and public works management environment created the IMS
- A DSS is an information system that ameliorates the time in which decisions can be made as well as the consistency and the quality of the decisions, expressed in characteristic quantities of the field of application

The Population Dimension

- Population is the most important production factor in industrial processes
- Different Population Cohorts give detailed pictures of the population structure (we will see that in the application HGIA at the end of the session)
- Better use of this Demographic Data allow us to better serve their needs
- Age specific data is used for, health such as vaccination programs, education, sales, marketing, etc.
- Better use of land for Humans can not be done well Without detailed Demographic Analysis on a geographically referenced data

Demographic Studies

- Proper planning needs demographic data for planning in:
- Education
- Health
- Transportation,Communication and telecommunication
- Infrastructure and utilities
- Facilities management and Maintenance
- Commerce and Trade and marketing in general
- Public relations and mass media
- Social services
- All must be based on cohorts or population data in details

The Location Dimension

- All of the above list can not do well in their planning efforts unless:
- A) All data must be geographically referenced (spatial data), so that it can be linked and used with location
- B) It is primarily processed data to fit for the detailed analysis
- Data ------> Information -----> Knowledge
- ---------- Intelligence ----------

The Statistical Analysis Dimension

- Statistics is the science of making sense out of numbers
- Abstract numbers give magnitude only!
- Direction is not there
- Reference to other elements is missing
- Local vs. Regional scope analysis is not possible
- Macro -- Micro scale impact
- Numbers and tables are Abstract pictures of reality
- Maps are frozen pictures of reality
- So, Maps are closer to reality than numbers
- Simulation is much closer to reality than all
- Let us see examples of that in the demonstration

Demographic Analysis Software Examples

- Dem-Lab Software
  - Accompanies the book DEM-LAB: Teaching Demography Through Computers, by Vivian Z. Klaff (Englewood Cliffs, NJ: Prentice Hall, 1992)
- FIVFIV/SINSIN
  - The Population Council, one Dag Hammerskjold plaza, New York, NY 10017
- Interactive population statistical system (IPPS) for Macintosh
  - PSRC Software, Bowling Green State University, Bowling Green, Ohio 43403
- VANPRO
  - Office of Population Studies, University of San Carlos, Cebu City 6000 Philippines
- Human Geography In Action (HGIA)
  - Accompanies the book Human Geography In Action by Michael Kuby, John Harner, and Patricia Gober (John Wiley and Sons Inc., 1998)
- CsPro 2.2 Designer
  - International Programs Center, US Census Bureau, Washington D.C, 20233-8860

Human Geography In Action (HGIA) Demonstration

- We will see now examples of what we said earlier about the power of demographic analysis when linked with geographic attributes
- We will also see a simulation case of the population growth and its impact geographically
- Finally remember that Only You can make the choice to be an average planner who has data and some information or a powerful planner who uses data to get knowledge and intelligence