Working with Census Operations
Case Study from KSA

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The Kingdom of Saudi Arabia lies at the furthermost part of southwestern Asia. It is bordered to the west by the Red Sea, to the east by the Arabian Gulf, United Arab Emirates and Qatar, to the north by Kuwait, Iraq and Jordan, and to the south by Yemen and Oman. The Kingdom lies between 16 22 46 and 32 14 00 North, and 34 29 30 and 55 40 00 East.

The Kingdom of Saudi Arabia occupies about four-fifths of the Arab Peninsula, with a total area of around 2,000,000 square kilometers.

The Kingdom of Saudi Arabia is divided into 13 regions. In addition to the headquarters of the region (emirate), each region is divided into a number of governorates.
Sector of statistics and information in the Kingdom of Saudi Arabia consists of the Central Department of Statistics and Information (Central Agency for Statistics) and multi Suit of statistical centers and units formed within the administrative structures of government agencies and some private sector institutions under a technical supervision done by the Central Department of Statistics and Information (CDSI).

CDSI draws out its statistical information from two main sources representing the core of national statistics system, namely:

1. General statistics of censuses, field surveys, research and statistical studies conducted by the CDSI.

2. Administrative records (administrative data) derived from the records, bulletins and statistical reports issued by the statistical units and information centers in government agencies and institutions in its capacity as responsible for providing the service concerned.
CDSI Objective

Improving, enhancing and facilitating the Process of Census Operation to deliver not only data but also Knowledge.
Census Operation Timeline in KSA

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>7,009,466</td>
</tr>
<tr>
<td>1992</td>
<td>16,948,388</td>
</tr>
<tr>
<td>2004</td>
<td>22,678,262</td>
</tr>
<tr>
<td>2010</td>
<td>27,136,977</td>
</tr>
</tbody>
</table>
Understanding Census Operation

**WHAT**

Population Census is defined as the entire operation of collecting demographic, economic and social data with reference to population in a specific period of time. It includes the counting of every individual alive inside the borders of a specific country at a particular point in time. It also means the registration of the individual's social and economic characteristics at that point in time. These characteristics are recorded for every member of the family.

**WHY**

1. Provide the state, planners and researchers with the basic data on population and housing necessary for development planning.
2. Set up an up-to-date frame for all specialized statistical research being undertaken in accordance with the sample method such as research related to: labor force, consumption expenditures, fertility, mortality, migration and environment, housing features, etc.
3. Set up a wide database to help in undertaking various demographic studies required for social and economic planning.
4. Periodically make available data and indices required to measure the change in demographic profile, make comparisons and make future projections.

**WHERE**

All persons inside the Saudi borders (whether Saudis or non Saudis) are covered by the census operation whether those persons are staying permanently or temporarily in the Kingdom.

The census includes the following categories as well:

1. Saudi diplomats living abroad. The counting of those diplomats is undertaken in coordination with the Ministry of Foreign Affairs.
2. Other Saudis living abroad for various reasons (such as business, tourism, medical treatments, etc.)
### The Roles of CDSI-Mapping Unit in Census Operation

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production and preparing maps for census operation and statistical tasks in KSA</td>
<td>Build CDSI spatial database repository (multi-layer)</td>
</tr>
<tr>
<td>Build CDSI spatial database repository (multi-layer)</td>
<td>Build the base-map for census operation to be available in and out CDSI</td>
</tr>
<tr>
<td>Building capacity of field surveyors and researchers</td>
<td>Disseminate the census results (Geo-Distribution) for experts and public (Atlases – Portal – Reports)</td>
</tr>
</tbody>
</table>
Preparing the Census Operation
Pre-Phase
Using Maps in Census Operation

**Post -Census**
- Updating Process
- Working with Results
- CDSI Web Mapping Portal
- Census Atlas Preliminary Results
- Census Atlas Detailed Results

**Pre-Census**
- Production of Maps for Census Operation
- Field Maps
  - Supervisors Maps
    - +327
- City Numbering Maps
- Settlements Numbering Maps
- Regions Maps
  - +13
- Detailed Maps (City Level)
  - +430
- Detailed Maps (District Level)
  - +6500
- Governorates Maps
  - +118
- Observers Maps
  - +7300
- Collecting Updated Maps from local Authorities
- GPS Data
- Build CDSI Spatial Database Repository

More Than 16000 Pre-Census Field Work Maps
Types of Maps in Census Operation

**Settlements Maps**
- Regions Level
- Governorates Level
- Inspectors Level
- Observers Level

**City Maps**
- City Level
- Districts Level
- Inspectors Level
- Observers Level
Producing Maps for Census Operation

Producing (City – District – Sector) Maps

Producing Inspector or Markup Map for any Selected City

Producing Settlement Maps for any selected governorate or region

CDSI-Mapping System
District Map

City Maps

Production of Cities Maps

District Boundaries

Sector Boundaries

Block Number

City Name
No of Districts
City ID
NO of Sections

City Maps
Supervisor Map
Each Observer has a Different Color
Observer Map

<table>
<thead>
<tr>
<th>Sector_no</th>
<th>District_no</th>
<th>Observer_no</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>62</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>63</td>
<td>1</td>
</tr>
</tbody>
</table>
Working with Results
Post-Phase
Producing Census Atlases

Detailed Results

Preliminary Results
Census Atlas - Preliminary Results
(Level 1)

Housing Distribution
- Houses distribution by Regions
- Houses distribution by cities
- Houses distribution by Governorates
- Houses Distribution by governorates of each region

Population distributions
- Population distribution by Regions
- Population distribution by cities
- Population distribution by Governorates
- Population Distribution by governorates of each region

Administrative divisions
- KSA Regions
- KSA Governorates
**KSA Administrative Boundaries**

**Location:**
The Kingdom of Saudi Arabia lies at the furthest part of southwestern Asia. It is bordered in the north by Kuwait, Iraq, and Jordan, in the east by the Arabian Gulf, United Arab Emirates, and Qatar, in the south by Yemen and Oman, and in the west by the Red Sea.

**The Kingdom General Location**

**Kingdom Administrative Division**

The Kingdom of Saudi Arabia is divided into 13 regions (muhafazas). In addition to the headquarters of the regions, each region is divided into a number of governorates. The following table shows the regions (muhafazas) of the kingdom.

<table>
<thead>
<tr>
<th>No. of Gov.</th>
<th>Region</th>
<th>No of Provinces</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Ar Riyad</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Makkah</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Al Madinah</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Al Qassim</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Eastern Region</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Asir</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tabuk</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hail</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Northern Frontier</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Jazan</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Najran</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Al Baha</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Al Jurf</td>
<td></td>
</tr>
</tbody>
</table>
Administrative Boundaries– Governorates Level

**Location:**
The Region of Makkah Almukarramah is located in the western part of the Kingdom. It is bordered in the north by the region of Aradnah Almunawarah, in the east by a part of Ardash region, in the south by the regions of Asir and Alabah, and in the west by the Red Sea.

**Governmental Boundaries:**
Makkah Almukarramah Region is divided into the emirate quarter and eleven governorates. The following table shows Makkah Almukarramah’s governorates:

<table>
<thead>
<tr>
<th>Governorate</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makkah Almukarramah</td>
<td>0</td>
</tr>
<tr>
<td>Jeddah</td>
<td>1</td>
</tr>
<tr>
<td>Mekkah</td>
<td>2</td>
</tr>
<tr>
<td>Alqunfiah</td>
<td>3</td>
</tr>
<tr>
<td>Alith</td>
<td>4</td>
</tr>
<tr>
<td>Alqamah</td>
<td>5</td>
</tr>
<tr>
<td>Aljumum</td>
<td>6</td>
</tr>
<tr>
<td>Khulays</td>
<td>7</td>
</tr>
<tr>
<td>Alkaml</td>
<td>8</td>
</tr>
<tr>
<td>Alkharunah</td>
<td>9</td>
</tr>
<tr>
<td>Ranyah</td>
<td>10</td>
</tr>
<tr>
<td>Turakhan</td>
<td>11</td>
</tr>
</tbody>
</table>

*Emirate Quarters*
Population Distribution – Regions Level

Population: Total Population
Males, Females and the Total Population distributed by Regions

Total No. of Males

- Less than 225,001: 380,000 - 225,001
- 900,000 - 380,001: 1,915,000 - 900,001
- More than 1,915,000: 3,220,000 - 1,915,001

Total No. of Females

- Less than 250,001: 455,000 - 250,001
- 795,000 - 455,001: 1,450,000 - 795,001
- More than 1,450,000: 2,580,000 - 1,450,001
Population Distribution – Cities Level

There are about 212 cities in the Kingdom of Saudi Arabia with total population exceeding 5000 people, the map illustrates the distribution of Saudis in these cities.

Population: Saudis

Saudis in cities with total population more than 5000 people

City | Total   | Male | Female | Males % | Females %
--- |---------|------|--------|---------|---------
Riyadh | 2,689,506 | 1,276,061 | 1,413,445 | 47.3% | 52.7%
Jeddah | 1,429,761 | 741,157  | 688,604  | 51.8% | 48.2%
Dammam | 724,160  | 366,907  | 357,253  | 50.4% | 49.6%
Al-Khobar | 620,646  | 326,013  | 294,633  | 52.3% | 47.7%
Dammam | 478,987  | 257,939  | 221,048  | 53.9% | 46.1%
Abha | 401,166  | 203,332  | 197,834  | 50.7% | 49.3%
Taif | 363,773  | 182,753  | 181,020  | 50.1% | 49.9%
Jeddah | 361,727  | 148,457  | 163,270  | 41.6% | 58.4%
Bierun | 295,145  | 146,339  | 148,806  | 49.7% | 50.3%
Medina | 230,626  | 114,355  | 116,271  | 49.9% | 50.1%
Bir Saad | 232,605  | 156,065  | 136,540  | 67.0% | 33.0%
Al-Qatif | 218,169  | 111,825  | 106,344  | 52.1% | 47.9%
Hail | 196,018  | 95,580   | 100,438  | 48.8% | 51.2%
Najran | 195,862  | 97,360   | 98,502   | 49.7% | 50.3%
Hofuf | 185,489  | 72,173   | 113,316  | 38.9% | 61.1%
Al-Asir | 180,051  | 75,873   | 104,178  | 42.3% | 57.7%
Al-Khobar | 184,844  | 81,833   | 103,011  | 44.3% | 55.7%
Population Distribution – Governorates Level

Saudi and Non Saudi population distributed by governorates of the Kingdom of Saudi Arabia

Governorates

Population:
Total Saudi and Non Saudi Males and Females

Central Department of Statistics & Information

مصلحة الإحصاءات العامة والعلومات
Census Atlas - Detailed Results

(Level 2)

- Distribution By Governorates
  - Demographic Characteristics
  - Education Characteristics
  - Economic Characteristics
  - Disability
  - Housing & Household Characteristics
- Distribution By Regions
  - Demographic Characteristics
  - Education Characteristics
  - Economic Characteristics
  - Disability
  - Housing & Household Characteristics
- Administrative divisions
  - KSA Regions
  - KSA Governorates
Education Characteristics – Governorates Level
This architecture consists of three separates tiers, namely:The presentation tier, The application logic tier and the data tier.
Population Distribution
Statistical Analysis
The Proposed CDSI Mapping Portal Architecture (Open Source Vision)
MashUp Technique