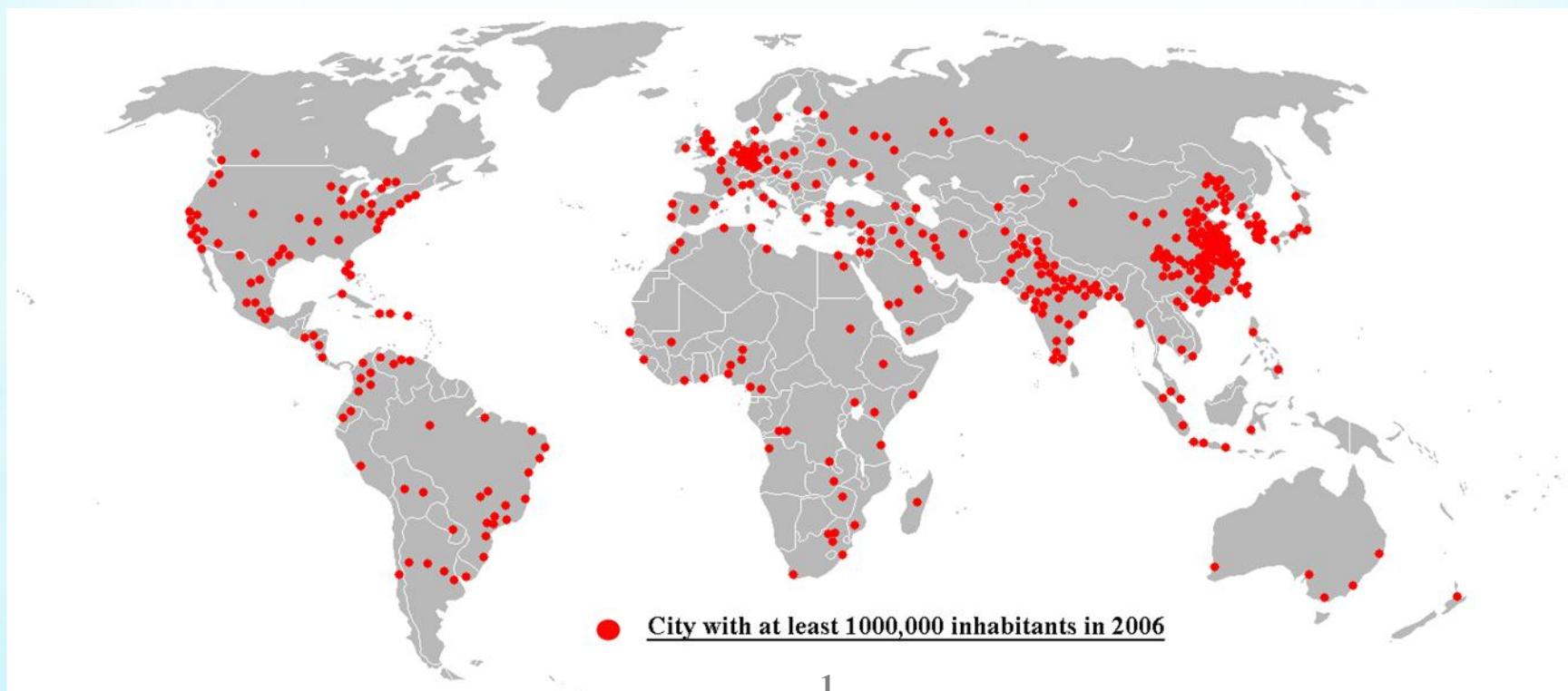


# Mega-City



Mega cities are overcrowded and environmentally stressed

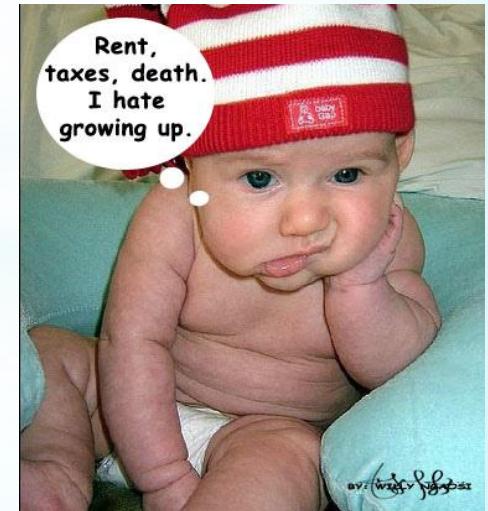


# Challenges:

- The demographic challenges are population growth, aging population, youth bulge and migration.
- The main environmental challenges are air, water, landscape consumption, and climate change impact.
- The economic and social challenges are social segregation, lack of housing and infrastructures, unemployment and informality.
- The administration challenges are lack of governance, multilevel political administration, technical approaches, lack of de-central structures and private involvement.



2





Challenges



# From Brain Storm to Conceptual Model

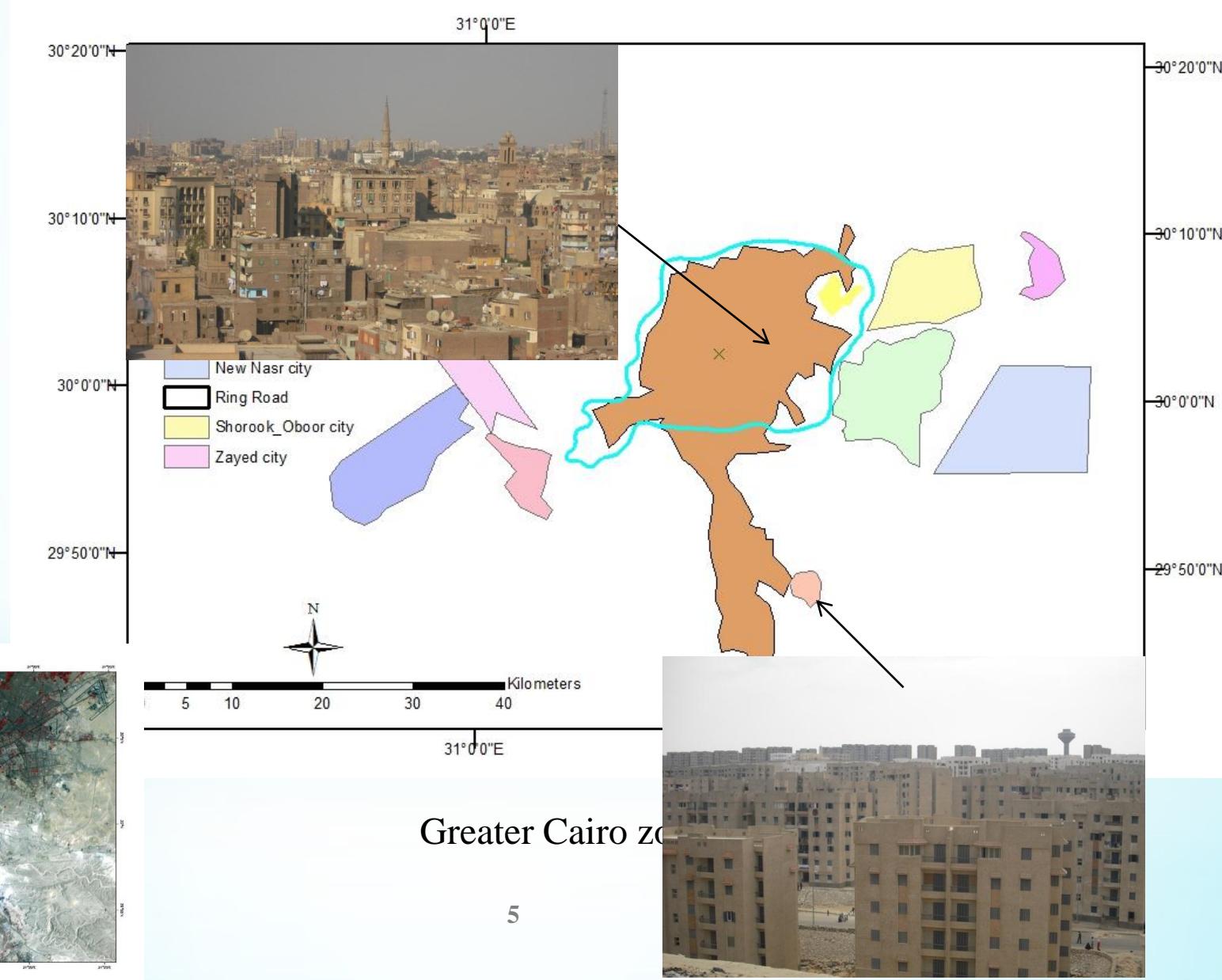
```
graph TD; A[Driving Forces] --> B[Pressures]; B --> C[States]; C --> D[Impacts]; D --> E[Responses];
```

The diagram illustrates a flow from Driving Forces to Responses, passing through Pressures, States, and Impacts.

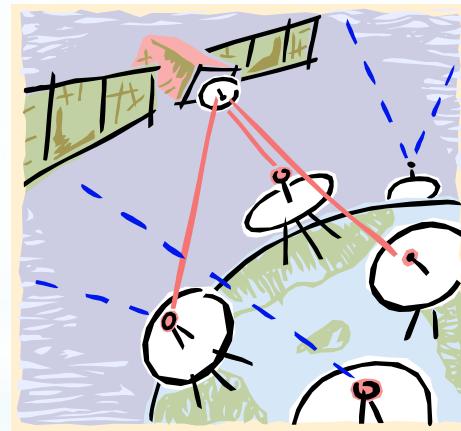
- Driving Forces**
  - population growth
  - Investments
- Pressures**
  - Urbanization
  - Agriculture
  - Industry
- States**
  - Fertile soil distribution
  - housing type
  - Geo-state
  - Water quality
  - Air quality
- Impacts**
  - Reduced crop yield
  - Informal buildings and low life quality
  - Geo-hazards
  - Air and water pollution
- Responses**
  - Environmental management
  - Suitable policy and strategy



# Greater Cairo Metropolitan



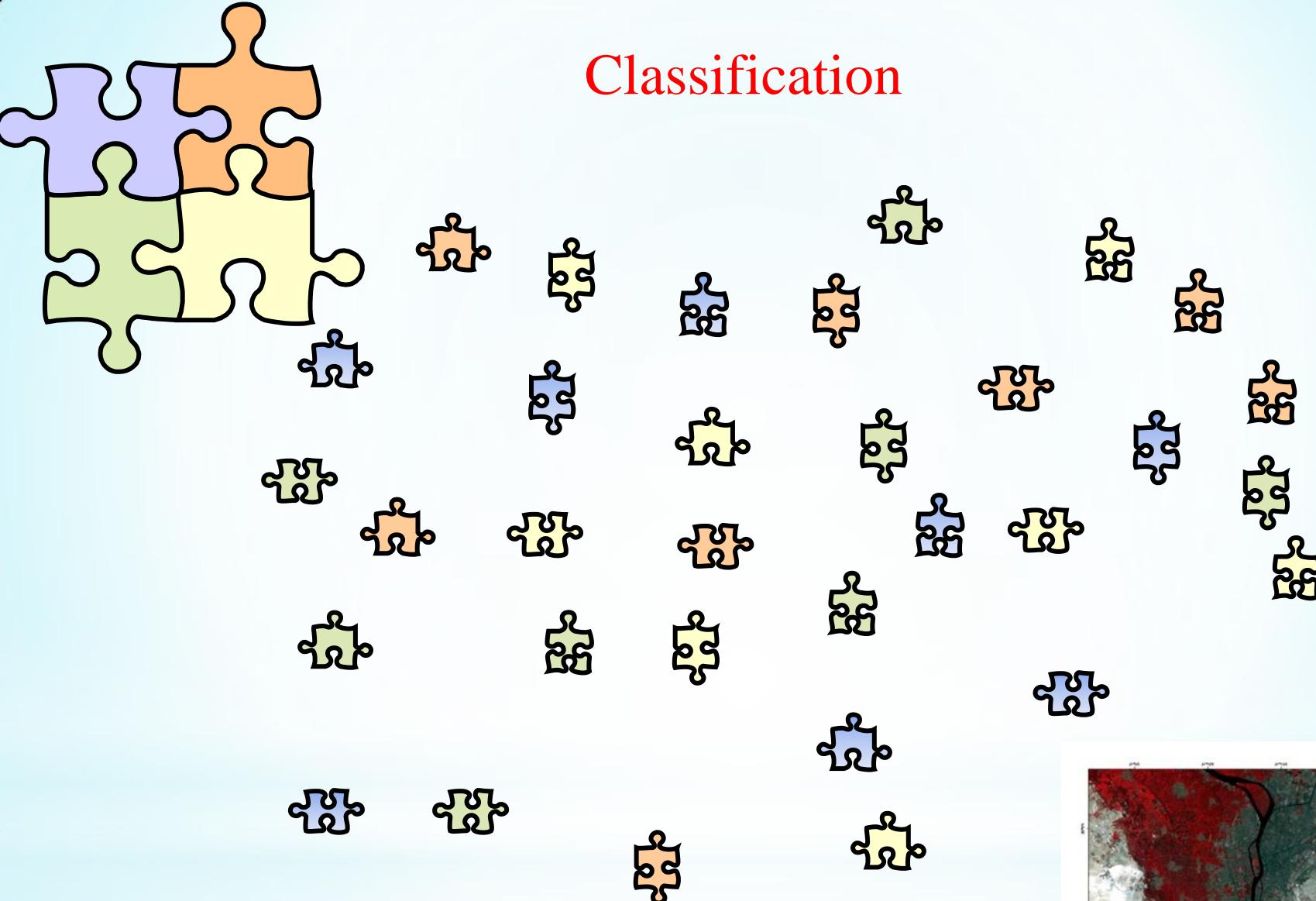
# Monitoring and dynamic change detection



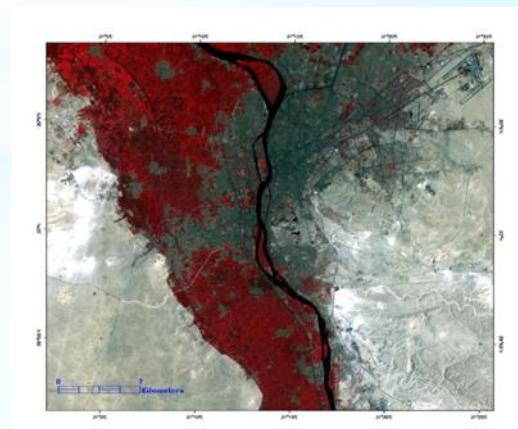
*Time Series  
Satellite Images*

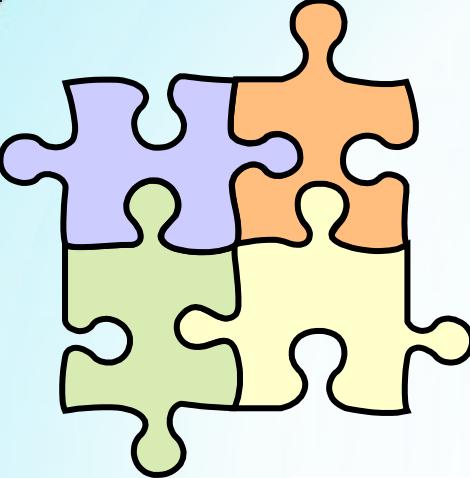


# Classification

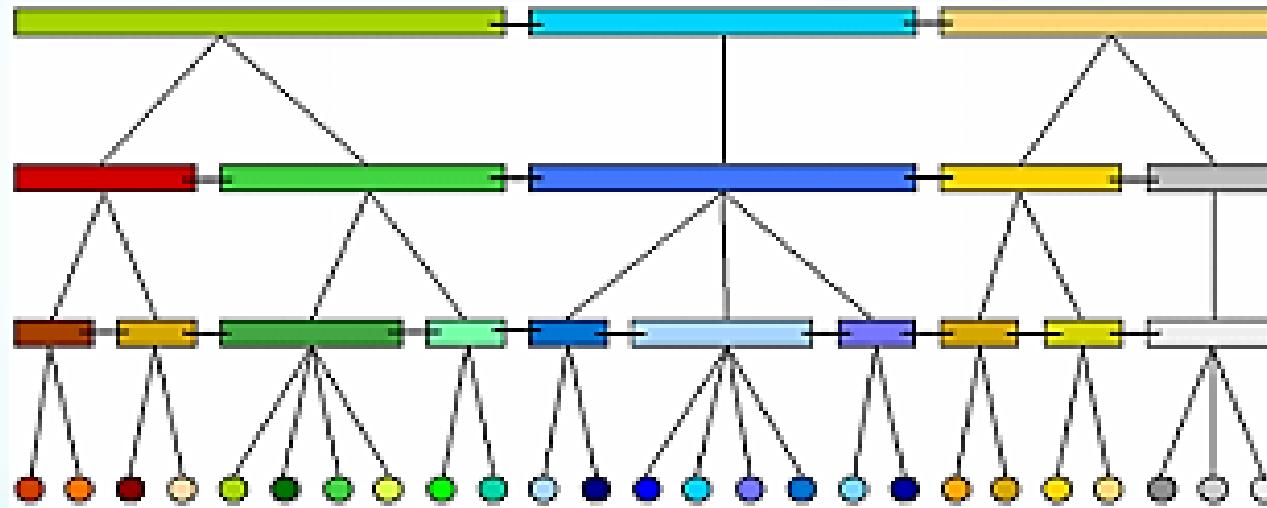


*Pixel-based classification*

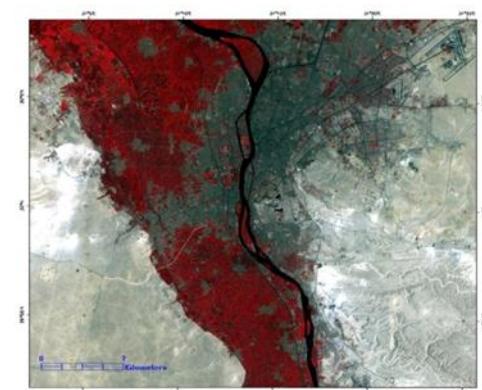




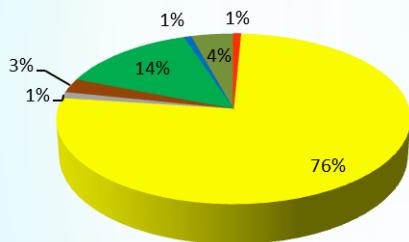
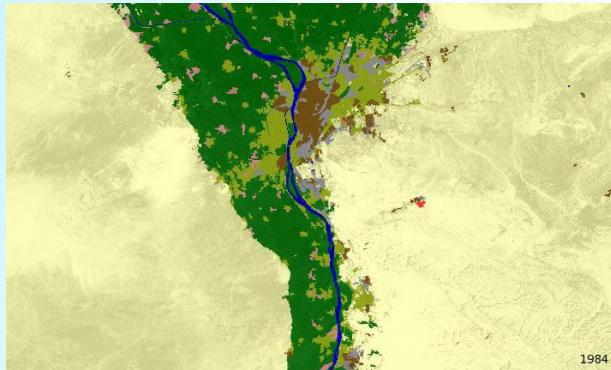
- Hierarchical network of segments in different scale levels.
- Choice of proper thresholds for homogeneity and heterogeneity criteria.



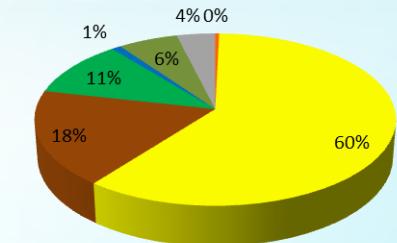
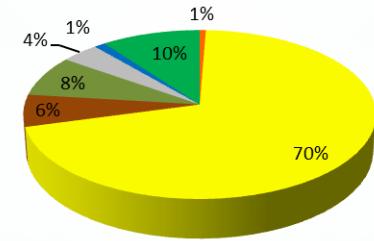
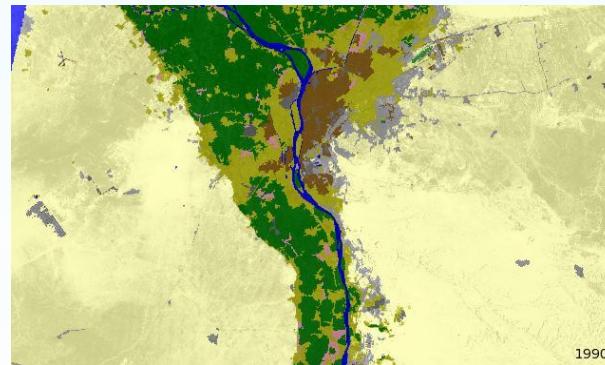
## *Object-based classification*



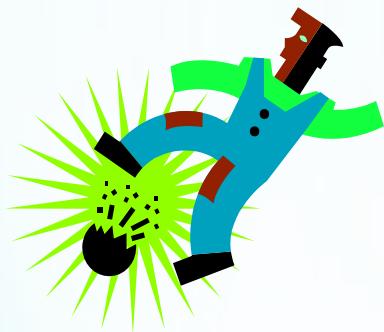
## *Land cover-use changes in Greater Cairo*



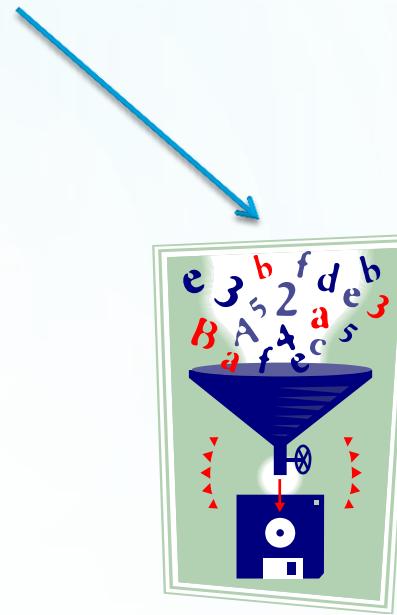
- Bare Soil2006
- Desert2006
- Urban-Areas2006
- Vegetation Cover2006
- Water2006
- Urban-Cultivated2006
- Very lose urbanization06



# Rapid growth and expansion



Explosion



Management

Or

**THANK YOU**

A photograph of a bridge spanning a wide river at sunset. The sky is a gradient of orange and yellow. On the far bank, a dense city skyline is visible, featuring several tall, modern buildings. The bridge has multiple lanes of traffic and streetlights. The water in the foreground is calm with some ripples. The overall atmosphere is peaceful and suggests a developing urban landscape.

**Change Today Shape Tomorrow**