


Introduction and objectives
Study Area and Data Set
Used methodology
Results and conclusions

Land Use Change Detection Using Satellite Images for Najran City, Kingdom of Saudi Arabia (KSA)

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Introduction and objectives

Land cover is the physical material at the surface of the earth, include grass, asphalt, trees, bare ground, water, etc.
Land use is a description of how people utilize the land
Remote sensing is the acquisition of information about an object or phenomenon without making physical contact with the object


Importance of Change detection

- to determine better land use policy.
- to project transportation and utility demand.
- to identify future development pressure points and areas to implement effective plans.
- to manage regional development.

Study objective

The objective of this research is to identify the land use/land cover analysis and change detection techniques using temporal multi-spectral data (2009 and 2014) of the Landsat TM image.

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Once the phenomenon for change detection has been selected, the following steps should be employed:

- 1 Image acquisition
- 2 Image preparation
- 3 Selection of a change detection algorithm
- 4 Production of change detection results

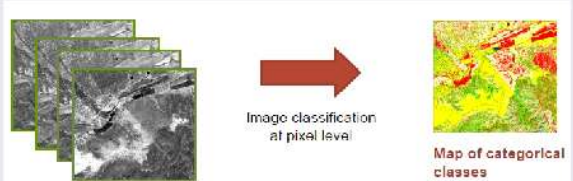



Figure : The traditional approach for land cover mapping

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Used change detection techniques

Four of the most commonly used change detection techniques were discussed to detect the nature and extent of the land-cover changes in Najran area using Landsat images. These techniques are;

- post-classification,
- image differencing,
- image rationing, and
- principal component analysis.


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Study Area and Data Set


The study area is an area of approximately 800 square kilometers. It includes various land use activities: urban, desert and road networks.

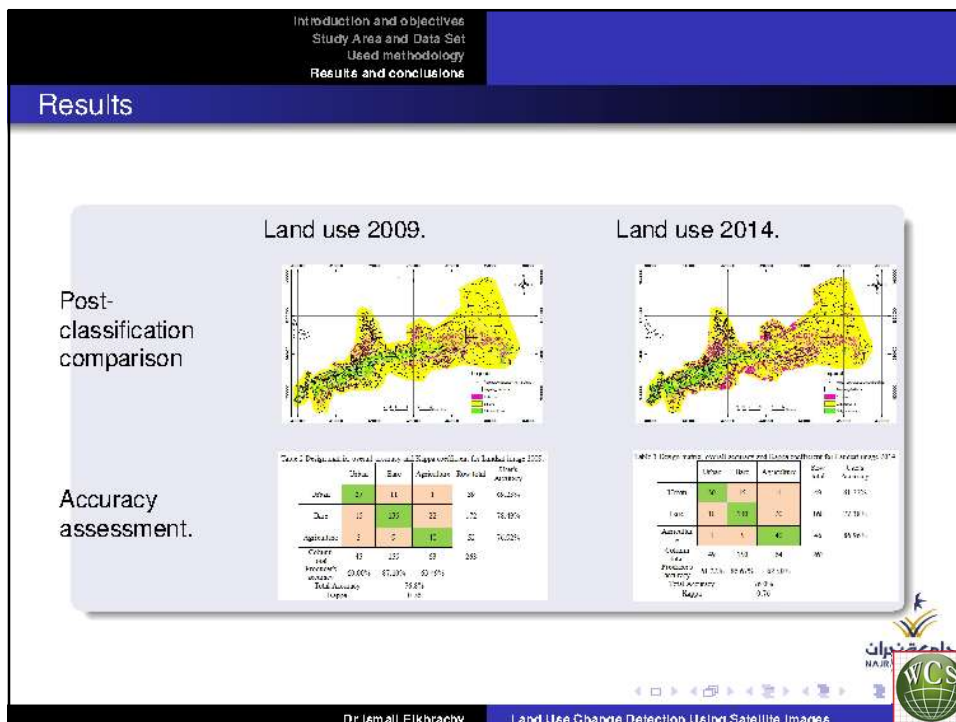
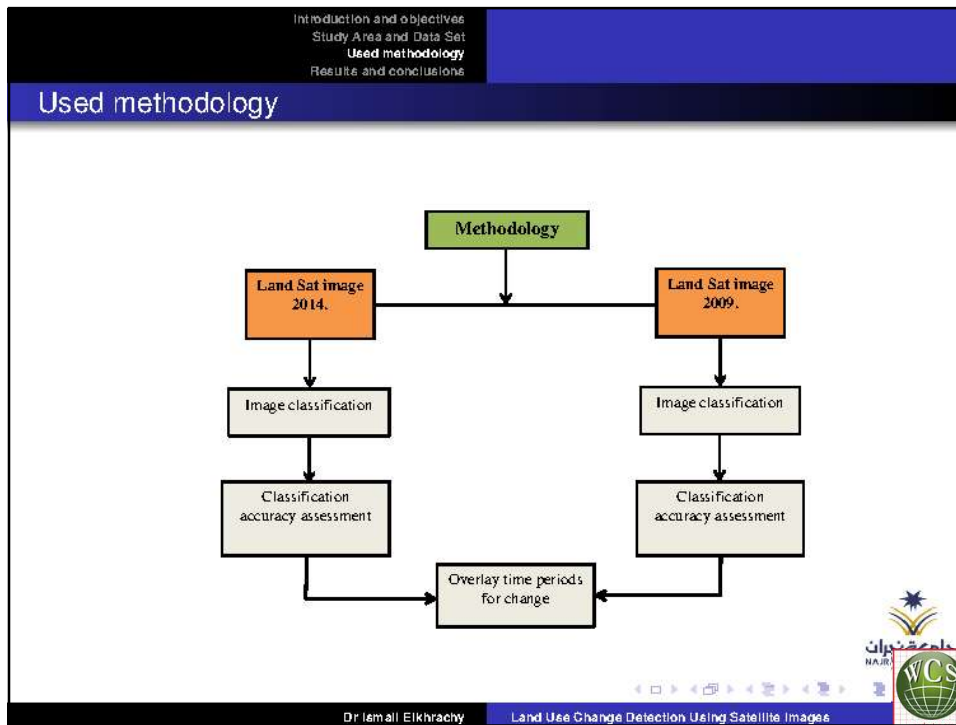


The used Landsat satellite imagery is downloaded from the USGS Earth Explorer (<http://earthexplorer.usgs.gov>).

Image	Image Type	Image Source
Landsat 7 ETM+ 2004	Orbita Product level 1-G	USGS website
Landsat 7 ETM+ 2004	Orbita Product level 1-G	USGS website
Distric's boundary map	sharc file	Najran municipality
Google Earth images	Satellite images	Google Earth website

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Results cont.

Change from 2009 to 2014

As value

From to value

Table 4 The lands cover changes in (km^2) in 2009 and 2014.

Class name	2009 km^2	2014 km^2	Total km^2	change
Urban	74.2	128.5	54.3	73.2%
Bare	687.8	639.6	-48.2	-7%
Agriculture	57.4	51.4	-6	-10.5%
Total km^2	819.4	819.4		

Table 5 Changes of land cover classes from 2009 to 2014

	Urban		Bare		Agriculture	
	km^2	%	km^2	%	km^2	%
2009	74.2	9.1	687.8	83.9	57.4	7
2014	128.5	15.7	639.6	78.1	51.4	6.2
Unchanged	58.2	78.4	586.4	85.3	20.2	25.2
Gained	70.3	91.7	53.2	7.7	31.2	24.1
Lost	16	21.6	101.5	14.8	37.2	24.8

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Conclusions

In this work, land use change detection is we are mainly highlighted by using Landsat image 30 m spatial resolutio for Najran city. The following are conclusions were obtained:


- ① Unsupervised image classification has been performed to classify the images into different land use categories.
- ② Three land use classes have been identified as urban, barren land and agricultural. Classification accuracy is also estimated using the field knowledge obtained from Google earth images.
- ③ The obtained accuracy was between 61% to 87% percent for all the classes. Change detection analysis showed that Built-up area has been increased by 73.2%, agricultural area has been decreased by 10.5 % and barren area reduced by 7% during time from 2009 to 2014.
- ④ The quantitative study indicated that the area of urban class has unchanged by $58.2km^2$, gained $70.3 km^2$ and lost $16 km^2$.
- ⑤ For bare land class $586.4km^2$ has unchanged, $53.2km^2$ has gained and $101.5km^2$ has lost.
- ⑥ While agriculture area class, $20.2km^2$ has unchanged, $31.2km^2$ has gained and $37.2km^2$ has lost.

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Thank you for your attention.

Questions?



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