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المصدر:	باستخدام تقنية الاستشعار عن بعد و نظم المعلومات الجغرافية
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مواضيع:	الإستشعار عن بعد ، نظم المعلومات الجغرافية ، الغابات ، التغيرات البيئية، وادي كفرنجة (الأردن)
رابط:	<a href="http://search.mandumah.com/Record/655742">http://search.mandumah.com/Record/655742</a>

**2010- 1978**

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2010- 1978

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**Forest Land Cover Change in Wadi Kufrange Basin/Jordan During the Period 1978-2010: Using Remote sensing(RS) and Geographic Information System (GIS) Techniques**

**Dalal ali zreqat  
Yousra alhusban  
Khaled alzamatt**

**Abstract**

The purpose of this study is to detect, analyze and explain the change in the forest land cover in Wadi Kufrange Basin/Jordan during the Period 1978-2010.

To achieve these goals, Geographic Information system (GIS) and Remote Sensing (RS) techniques were used by analyzing aerial photographs cover of 1978, and satellite image from web-link of Google earth 2010.

It was apparent from the study that:

- The forested area in the basin increased from 16.9km<sup>2</sup> in 1978 to 23.4 km<sup>2</sup> in 2010 (its proportion increased from 13.38% to 18.53 % from the total area of the basin).The increases in forest area through afforestation between 1978 and 2010 was 6.5 K.m<sup>2</sup> or 5.15% of the total area of the watershed.
- 0.5 km<sup>2</sup>of the land across the watershed has been converted from forest cover to build up area, 6.2 km<sup>2</sup> to agricultural land, 0.15 km<sup>2</sup> to rangelands. 3.45 km<sup>2</sup> of barren land and 9.4 km<sup>2</sup> of rangelands converted to forest land through afforestation.
- There is always high probability of conversion of forest land to another type of land cover and land use. Barren lands suitable for afforestation is about 6.6 km<sup>2</sup>, where slope ranges between 13°-20°, 20°-55°, and rainfall ranges also from 300 to 400 mm.

**Keywords:** Forest cover, Land cover/land use changes Conversion Probability, Wadi Kufrange Basin, Geographic Information System, Remote Sensing.

2010- 1978

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191

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.(Bhattarai K, et al, 2008)

.(Falcvcci, A, et al, 2007)

1990- 1970

.(Brown, D, 2003))

Himalalyan

.(Schreier.H, et al, 1994)

(Dhinwa P., et al., 1992)

Bharatpur

(Shalaby.A.,et al, 2007)

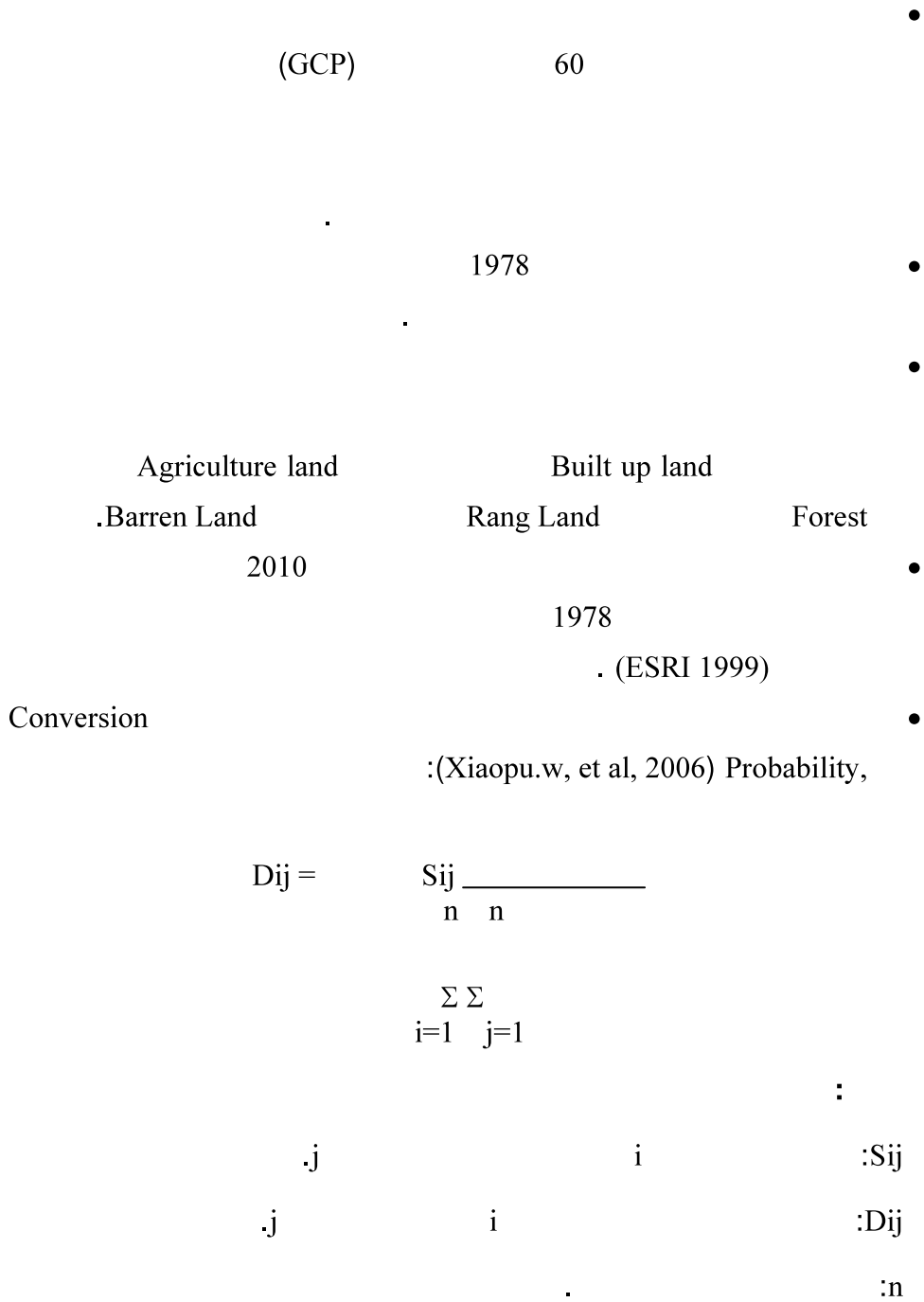
2001- 1987

2010- 1978



Analytical Approach

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... 2010-1978

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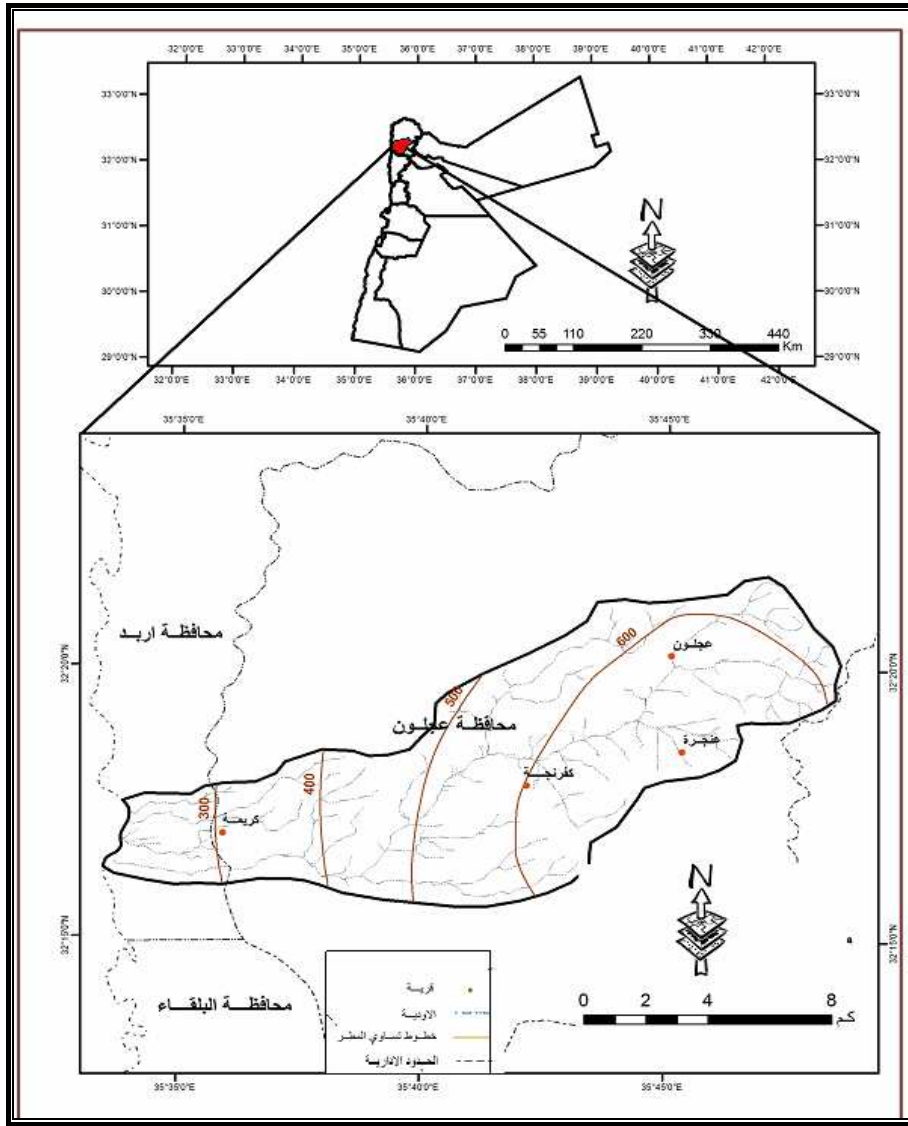
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Conversion Matrix

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	.(3)				
.				. <sup>2</sup> 126.3	
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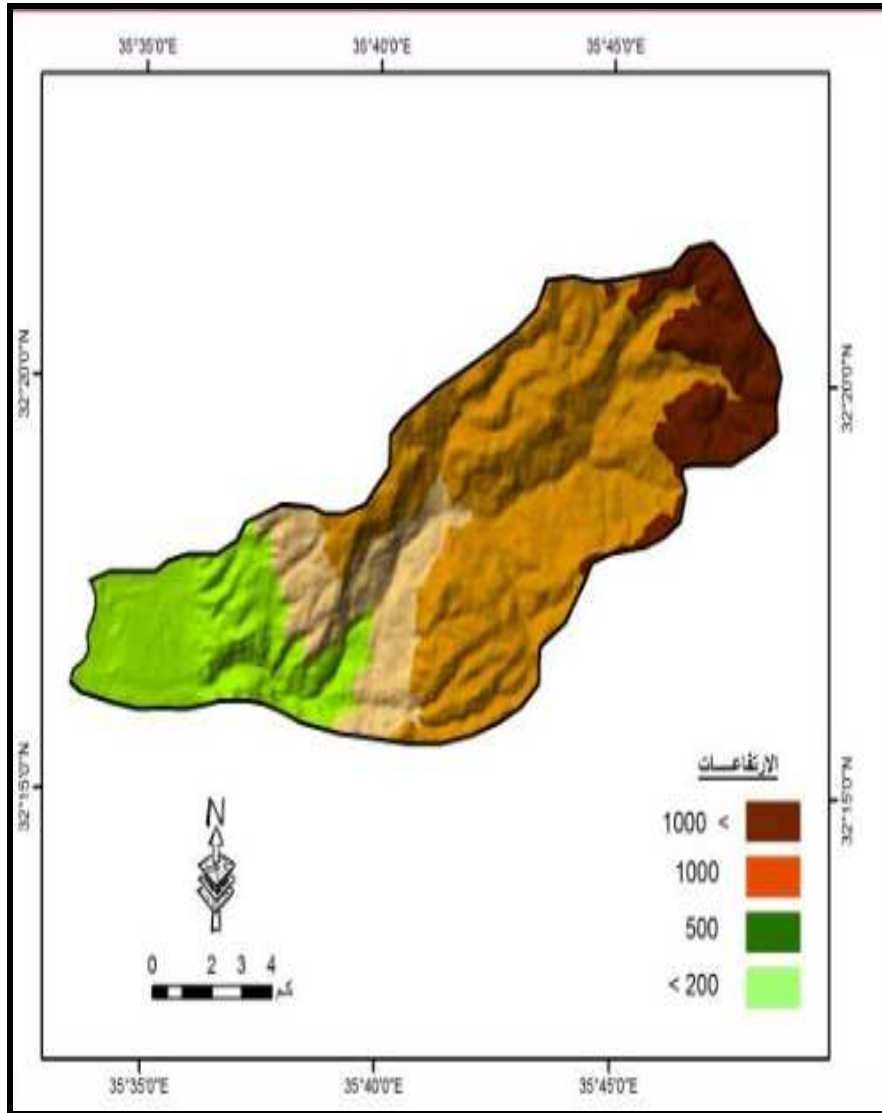
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.(1)



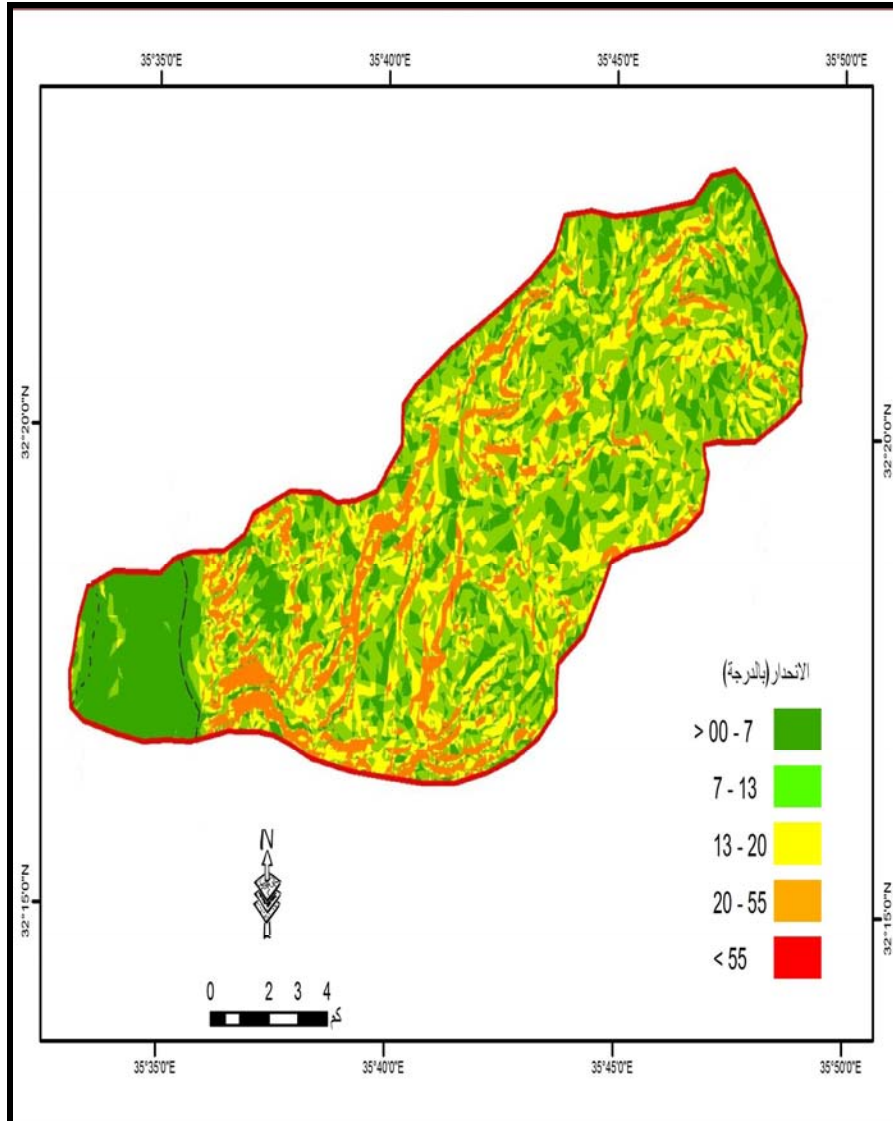
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(1)



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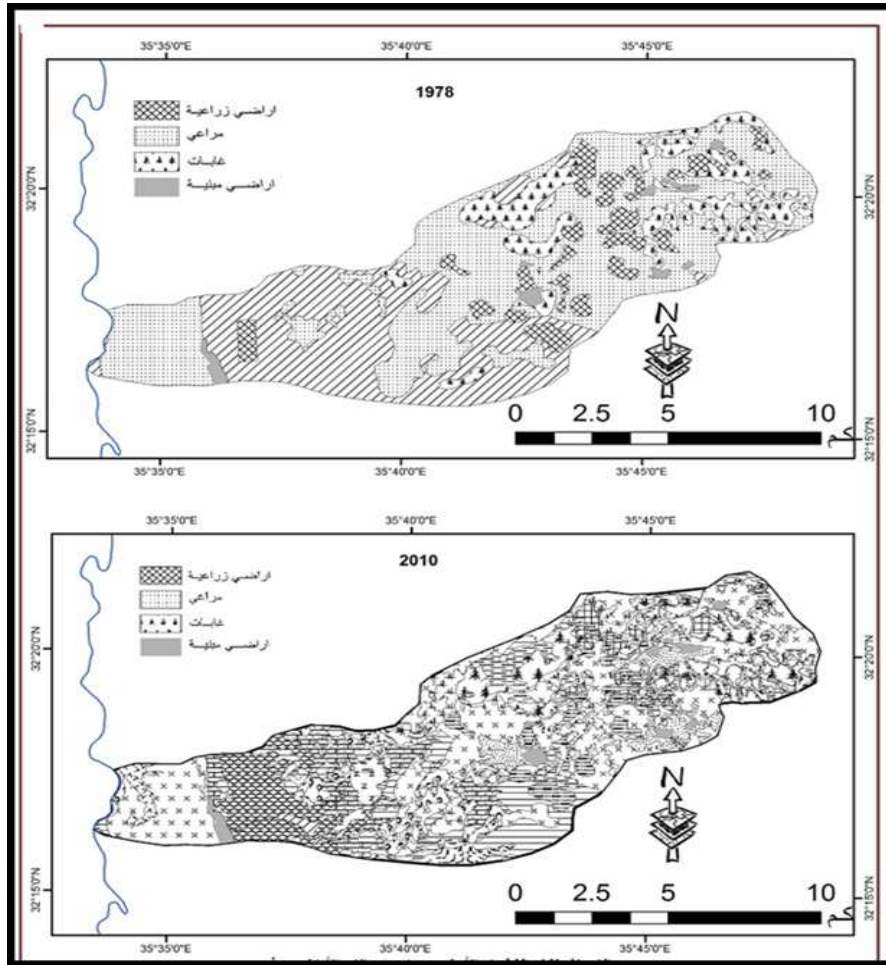
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6.02	7.6	1.50	1.9	7.52	9.5	
5.15	6.5	13.38	16.9	18.53	23.4	
41.25	52.1	9.98	12.6	51.23	64.7	
-35	-44.2	48.30	61	13.30	16.8	
-17.42	-22	26.84	33.9	9.42	11.9	
		100%	126.3	100%	126.3	

(2) (7 5•6)

<sup>2</sup> (10.05) 2010- 1978

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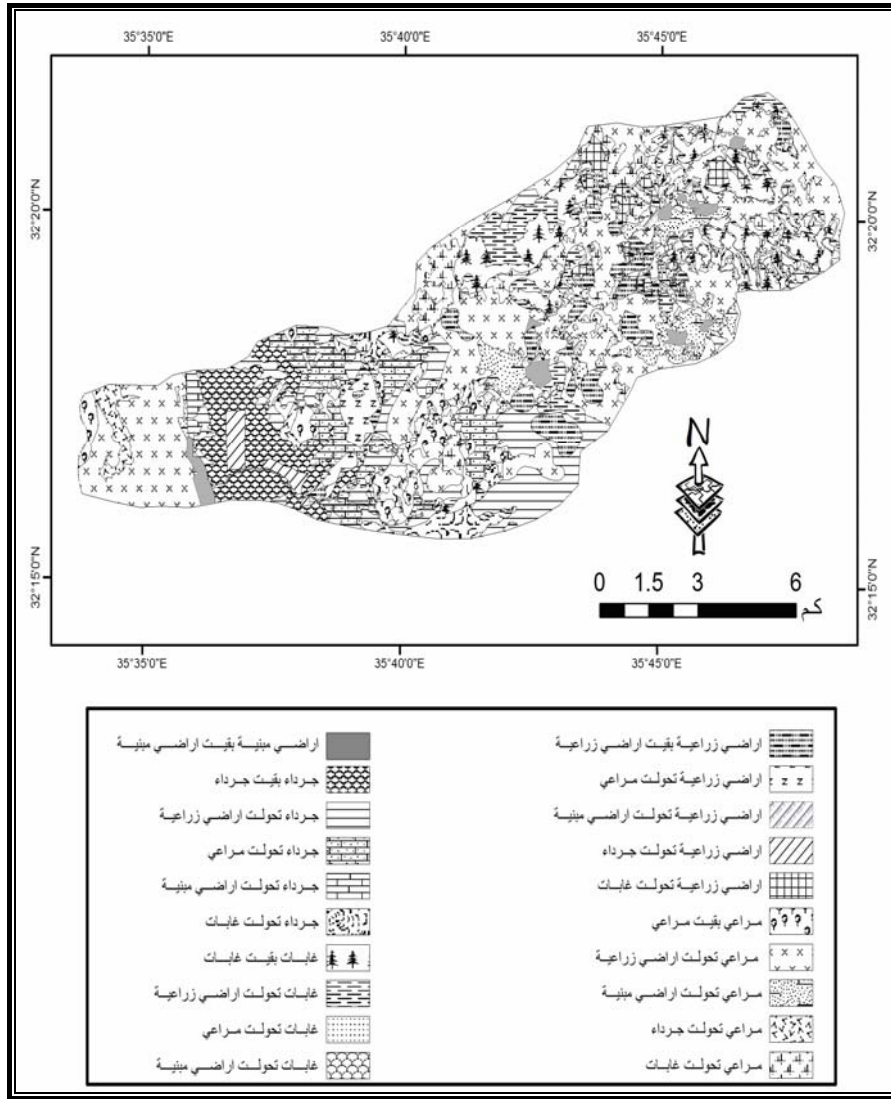
( 6) 400  
.( 6) <sup>2</sup> (0. 15)  
(1960 )

**2010- 1978**

**(2)**

$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	
16.9	0.15	0	6.2	0.5	10.05	
1.9	0	0	0	1.9	0	
12.6	2	0.8	7.5	1.8	0.8	
33.9	8.45	9.5	11.7	0.8	3.45	
61	6.2	1.6	39.3	4.3	9.45	
126.3	16.8	11.9	64.7	9.3	23.4	

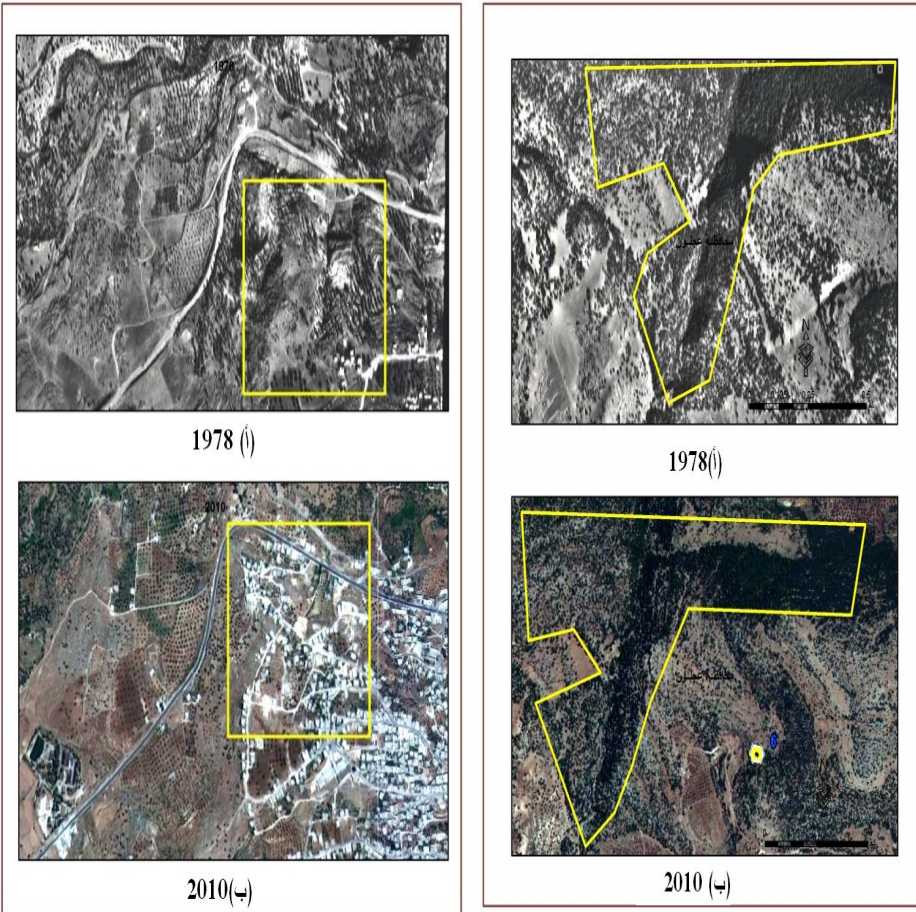
<sup>2</sup> 3.45 ( 7) <sup>2</sup> 0.5  
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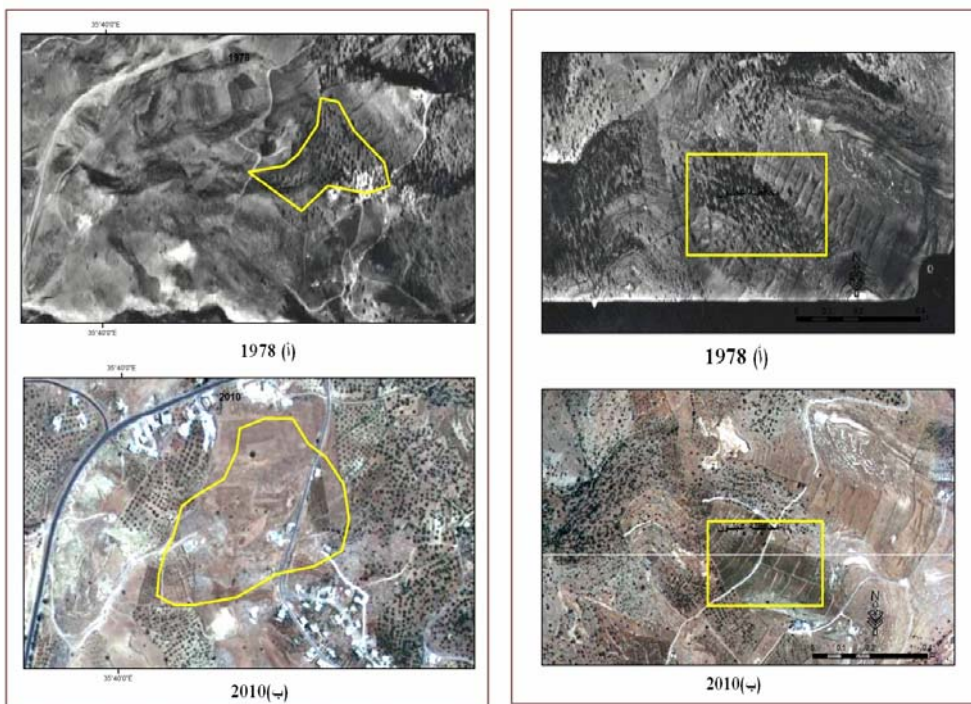
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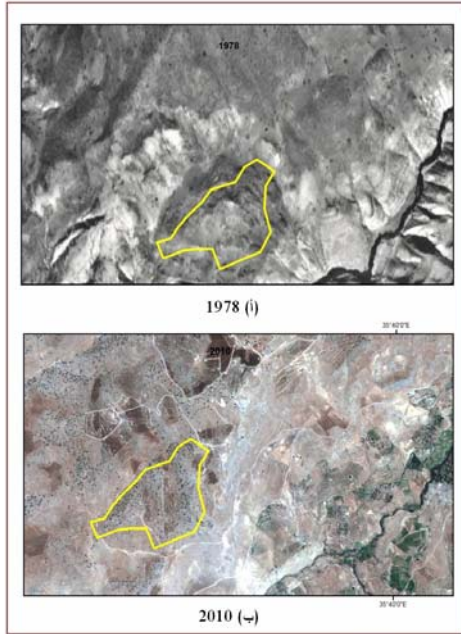
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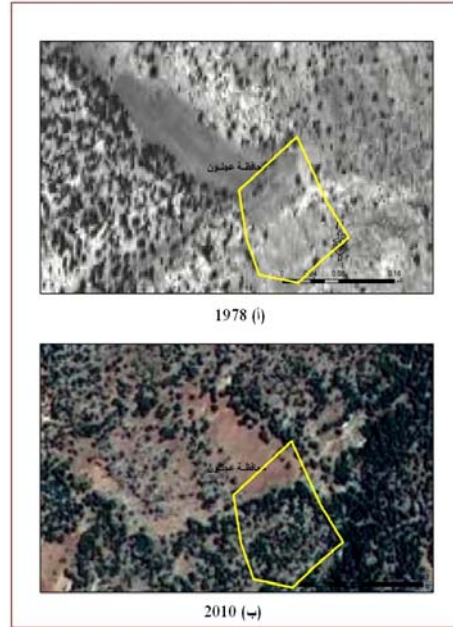
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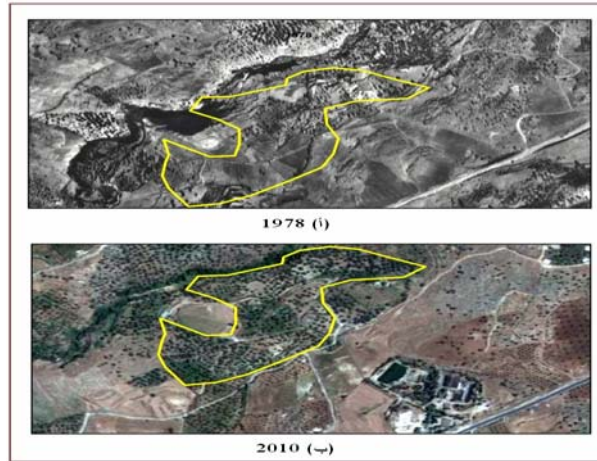
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**2010- 1978**

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0.015044	0	0	0	0.015044	0	
0.099762	0.015835	0.006334	0.059382	0.014252	0.003959	
0.268409	0.068884	0.075218	0.092637	0.006334	0.025337	
0.482977	0.049089	0.012668	0.315914	0.038005	0.0673	
1	0.134996	0.09422	0.517023	0.077593	0.176168	

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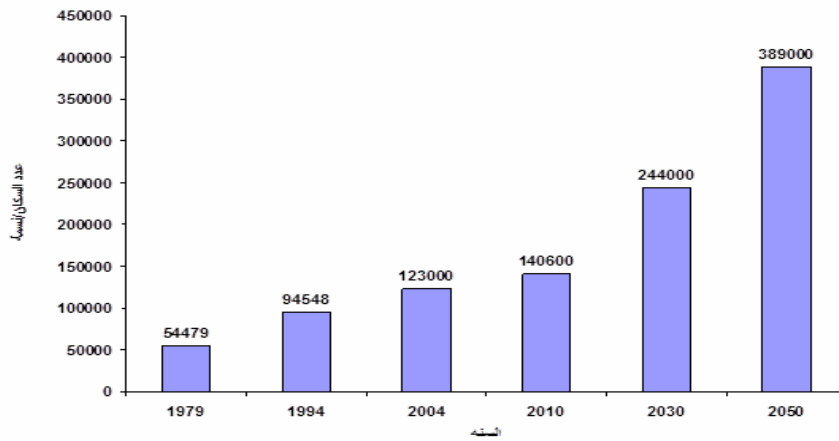
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شكل (٨): عدد السكان في محافظة عجلون ما بين 1979-2010 والإسقاطات السكانية للعام 2020-2050



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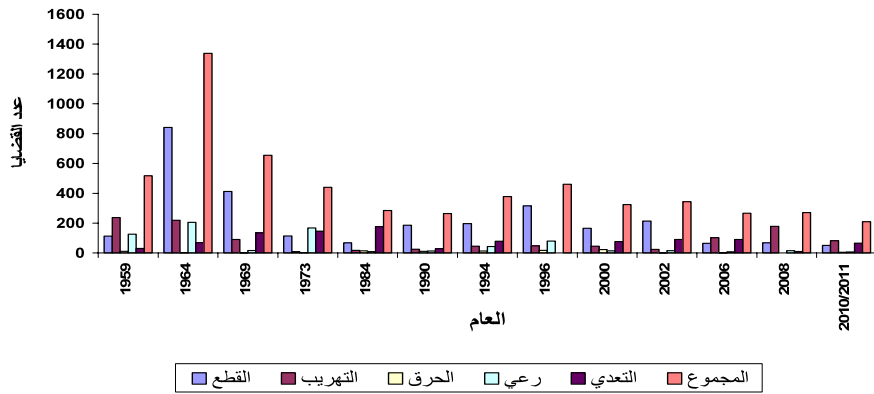
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(9)

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الشكل(9): عدد القضايا المقدمة للمحاكم النظامية نتيجة الاعتداءات على الحجاج في محافظة عجلون خلال الفترة 1959-2011

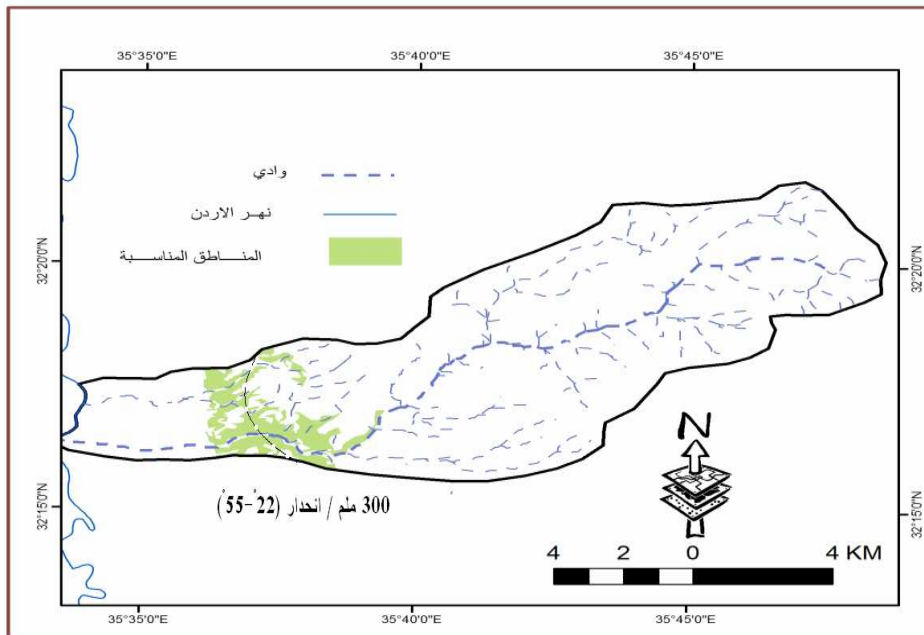
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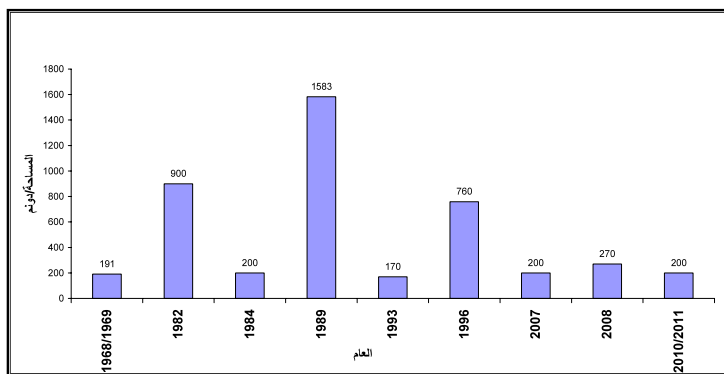
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<sup>2</sup> 6.85

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.1927 102  
.1951 81  
.1952 18  
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.1972 23  
.1972 14  
.1973 20  
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. (2002 44

.(11)

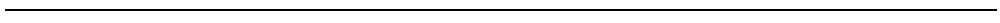


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.1951/7/1	1073	81
.1952/4/1	1104	18
.1958/11/16	1404	35
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.1971/11/25	2333	71
.1972/5/6	2357	23
.1972/5/6	2357	14
.1973/5/16	2419	20

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.2002/8/1 2419 44  
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Behrens,T, T, the contour map for terrain-based DEM mapping, European Journal of Soil Science, vol 61,issue 1.2010, pp133-140.

- Bhattarai K, Conway D. Evaluating Land Use Dynamics and Forest Cover Change in Nepal's Bara District (1973-2003), *Hum Ecol* 36. , 2008, pp 81-95.
- Brown .D, Land Use and Forest Cover on Private in Upper Midwest in USA, *Landscape Ecology* 18, 2003 pp 777-790.
- Celikayan,Murat, Accuracy Assessment of Land Use Mapping By Manual Digitizing, *Environmental Engineering science*, vol 2,No 3,2007, p p301-314
- Chaplot.V, accuracy of interpolation techniques for derivation of DEM relation to land form types & data density, *Geomorphology*, vol,77, issue1-2, 2006,p126-141.
- Dhinwa .P .S ., Pathan, S. K.,. land use changing analysis of Bharatpur District using GIS, *Journal of Indian Society of Remote Sensing*, Vol 20 .No. 4,1992,p p 238-248 .
- Drummond A. Thomas R. L, Land-use Pressure and Transition to Forest-cover Loss in the Easterk, *BioScience* , Vol. 60 No. 4, 2010,p p286-298.
- ESRI, Arc GIS, Using Arc GIS Desktop, USA, 2006,P P 398- 419.
- ESRI, Getting to Know Arc GIS, USA,2006, p p115-168.
- Eklondh, L , Rapid generation of DEM from Topographic Map, 1995,p 329.
- Falcucci A, Maiorano L, Boitani Changes in Land use- Land cover Patterns in Italy and their Implications For Biodiversity Conservations , *Land Scape Ecol*, Vol 22, 2007, pp 617-631
- Gautam A P, Webb E L, Eiumnoh A, GIS assessment of land use /land cover changes associated with community forestry implementation in the Middle Hills of Nepal, *Mountain and Development*, vol 22, no 1, 2002,pp 63-69.
- Hietel E, analyzing Land – cover changes in relation to environmental variables in Hess Germany, *Land Scape Ecology*, volume 19, No 5, 2004,p. p 473-489.



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- Khresat S, AL-Bakri J, AL-Tahhan R, Impacts of Land use/cover Change on Soil Properties in the Mediterranean Region of Northwestern Jordan, *Land Degrad, Develop.* 18, 2007, pp 1-11.
- Knuwar.P, Use of high –resolution IKONOS data and GIS technique for transformation of land use/cover for sustainable development, *Current Science* ,Vol 98,NO 225, 2010,p p204-213.
- Reddy,B,T, Topographic normalization of satellite imagery for image classification northeast India, *Progressing Physical Geography*,33(6), 2009,p p 815-839.
- Reis.S, Analyzing land use /land cover changing using remote sensing and GIS in RIZE North-East Turkey, *Sensors* ,2008, 8 p p 76188-76202,DOI:10.3390/5/1076188.
- Schreier.H, Sandra B, Margaret S, Pravakar Sh, Bubhan Sh, Gopal N, Khagendra S, and Susanne W, (1994), Gaining forests but losing ground: A GIS evaluation in a Himalayan watershed, *Environmental Management*,1994, Vol 18, No 1, pp 139-150.t
- Seto ,K, C.; Woodcock, C.E.; Song C.; Huang X.; Lu ,J.; Kaufmann, R.K , Monitoring Land –Use Change In The Pearl River Delta Using Landsat TM .*International Journal Of Remote Sensing*,23,(10), 2002, pp 1985-2004.
- Shalaby A, Tateishi R, Remote sensing and GIS for mapping and monitoring landcover and land use changes in northwestern Coastal Zone of Egypt, *Applied Geography* , vol 27, 2007,pp 28-41
- Tekle K, Hedlund L, Land cover changes between 1958 and 1986 in Kalu District, southern Wello, Ethiopia, *Mountain Research and Development*, vol 20, no 1, 2000, pp 42-51.
- Xiaopu W, Zhiyao T, Haiting C, Jingyun F, Land cover dynamic topographic conditions in Beijig, China, *journal of plant ecology*, vol 30, (2), 200 p p 239-251.
- Yang,X, Using satellite image and GIS for land use and land cover change mapping in an Estuarine watershed, *International Journal of Remote Sensing* ,Vol.26,No 23. 2005,p p5275-5296

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(2)



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