Chapter Six

Results, Data analysis and Discussion

6.1 Change in Perimeter and surface area:

Analysis of Landsat images revealed the change in Perimeter of the River's course, also in surface area of the River's course and islands through the period 1985 to 2015.

Table (6.1): Change in Perimeter and surface area

year	Surface area of the River's course (Km^2)	Perimeter of the River's course (km)	Surface area of islands (Km^2)
1985	26.428	59.667	9.450
1995	24.699	60.149	9.425
2003	25.036	59.661	9.410
2009	23.394	60.071	9.421
2015	23.615	59.237	9.407

6.1.1 Change in surface area the river's course:

The surface area of the river's course showed continuous change over the period 1985 to 2015 with decreasing trend which may be due to increasing erosion processes and decreasing of deposition, therefore reduces the farmland adjacent to the banks of the Nile.

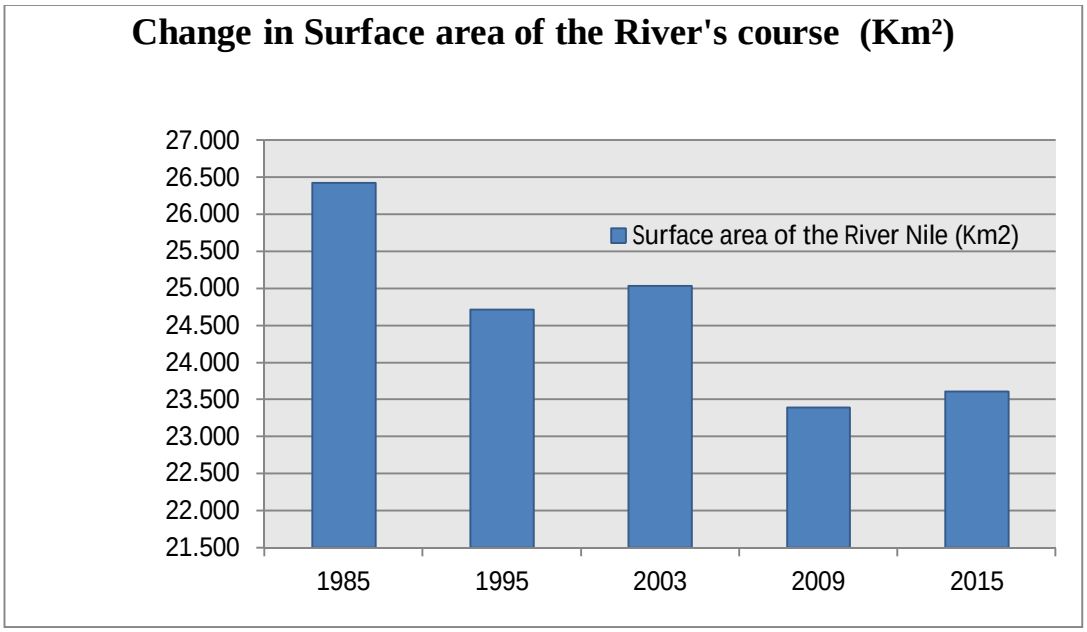

Figure (6.1): Change in Surface area of the River's course (Km²)

6.1.2 Change in surface area the islands:

The surface area of the islands showed continuous change over the period 1985 to 2015 with decreasing trend, which may be due to increasing erosion processes and decreasing of deposition, or may be due to disappearance of some islands, the Erosion rate in the islands, much higher than the deposition rate, And if the situation continues as its, it means that the Nile Basin will lose a lot of islands in the future.

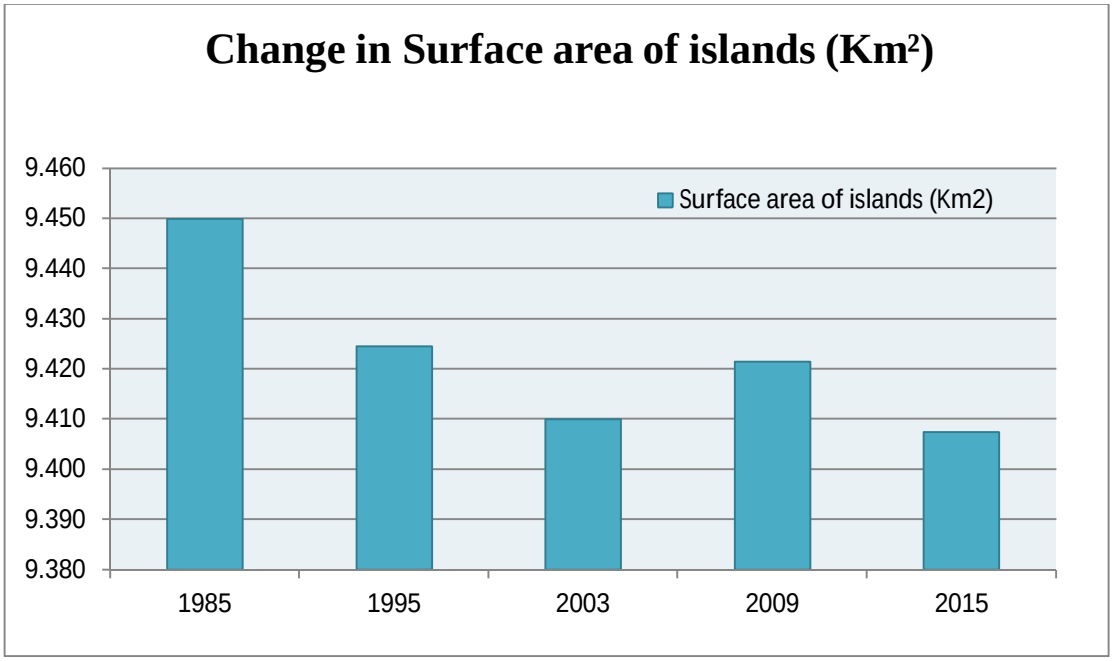

Figure (6.2): Change in Surface area of islands (Km²)

Change in the River's course Perimeter:

From the results, it's clear that the River's course perimeter showed little change over the period 1985 to 2015, sometimes increases and at other times decreases. The greatest change occurred at the period 2009 – 2015 which decrease about 834m, a rate of 139m per year.

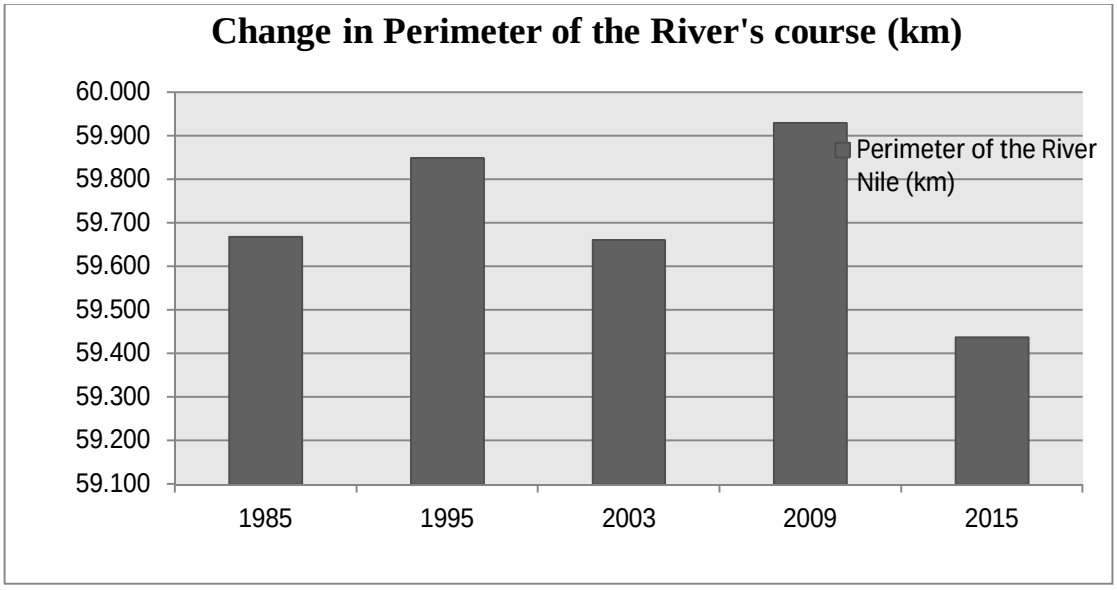

Figure (6.3): Change in Perimeter of the River's course (km)

Migration of Islands and the river's course with time

The analysis of Landsat images revealed the migration of River course with time and space. The studied Landsat images revealed that the river is changing its course with time due to meandering. Which change the Mirin position continuously.

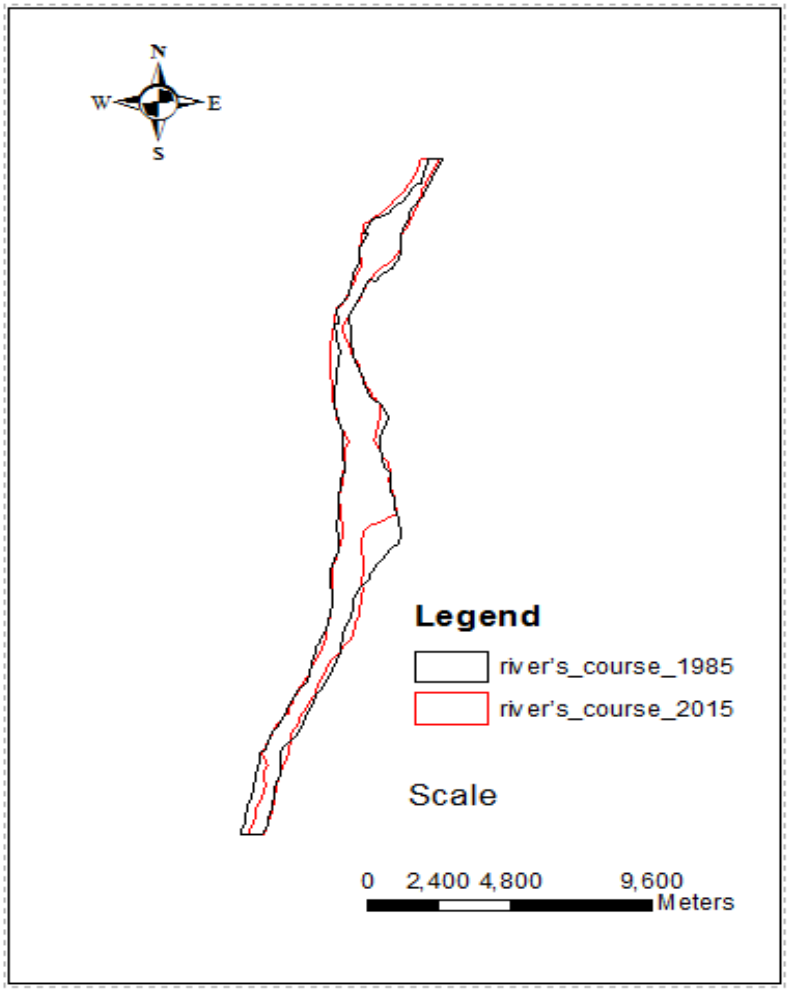

Fig (6.4) Change and migration of the river's course with time

- Migration of islands with time, therefore, changes of ownerships!! ↓↓

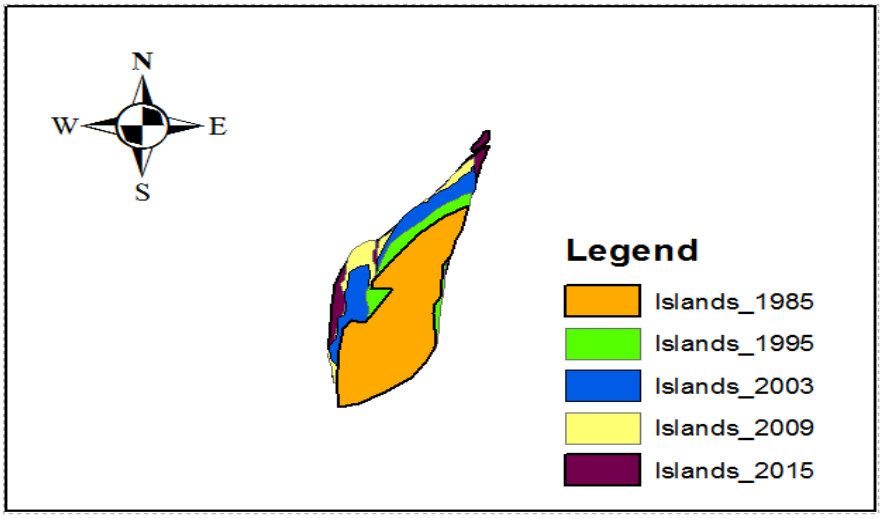

Fig (6.5): Migration of islands with time

Islands appear and disappear through time:

Seen from the results, some islands disappeared completely with time, and they appear again in different places, leading to gradual changing owners, and thus the occurrence of disputes and overlapping properties, especially those that show a new, fueling the dispute between the parties.

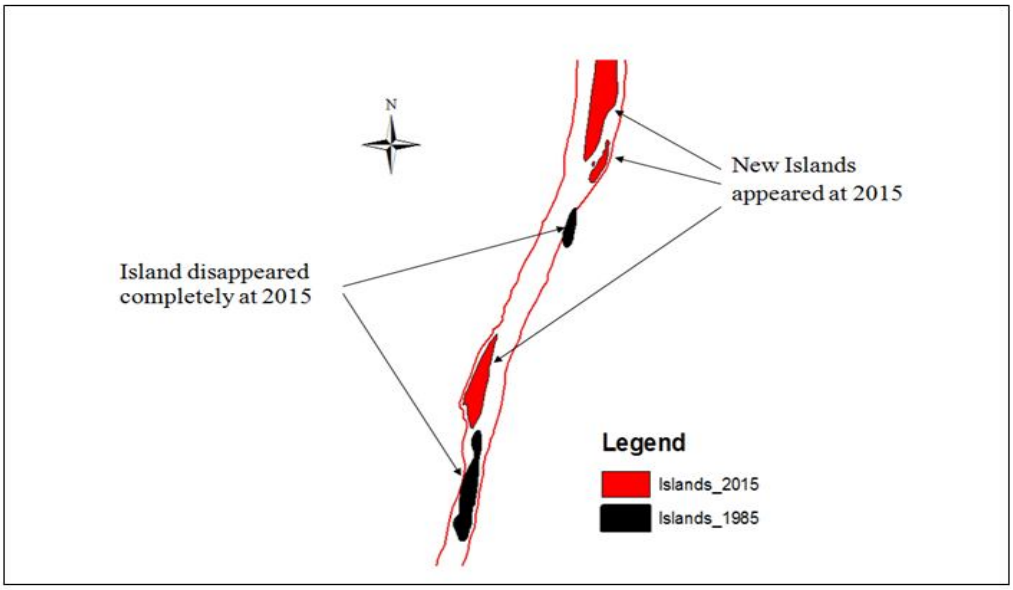

Fig (6.6): New Islands appears and Islands disappeared completely at 2015

- The results reflect also that the effects of erosion and sedimentation processes, occurrence of the division on the islands, especially the big ones, which happens loss of fertile agricultural land

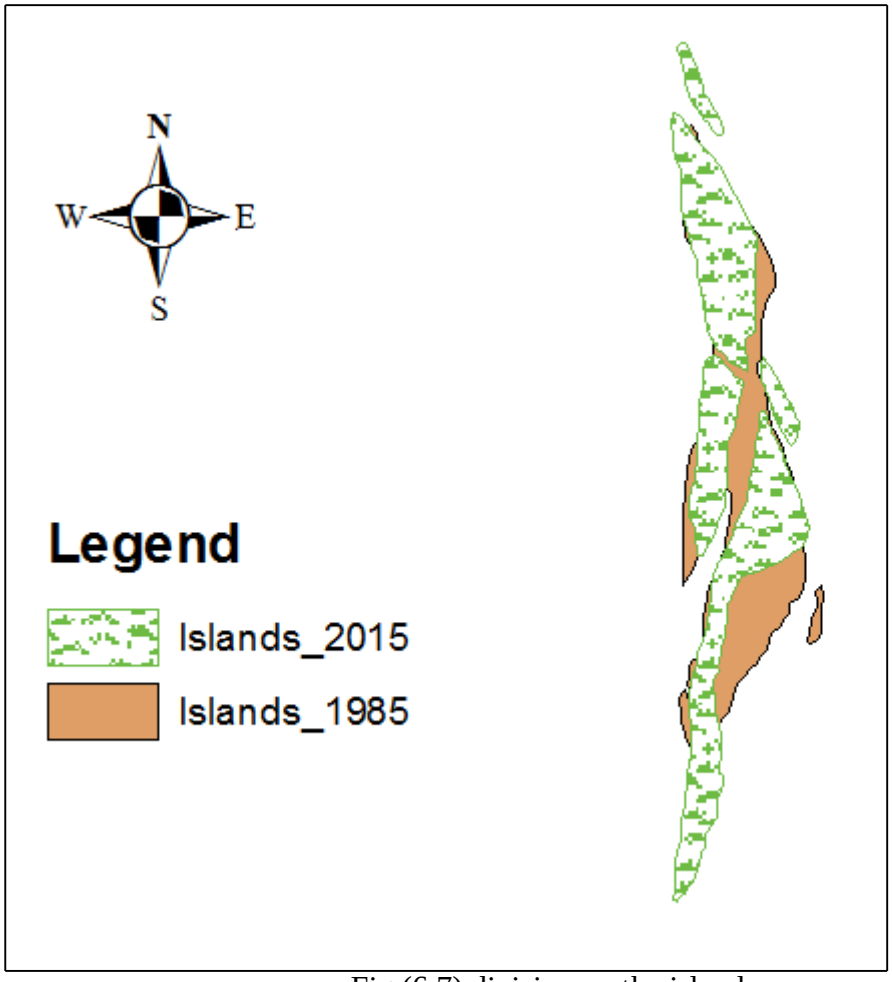

Fig (6.7) division on the islands

6.2 Erosion and deposition:

6.2.1 Erosion and deposition in river's course:

The Nile Basin faced by erosion and deposition processes continuously, the results indicate that the Erosion rate in the Nile Basin, higher than the deposition, also erosion and sedimentation processes in the study area with increasing trend, therefore, Shape of the land (edge of the Nile) is constantly changing.

Table (6.2) Erosion and deposition in river's course

year	Erosion	Meandering
1985 - 1995	0.915	2.620
1985 - 2003	1.885	3.263
1985 - 2009	2.173	5.191
1985 - 2015	2.537	5.416

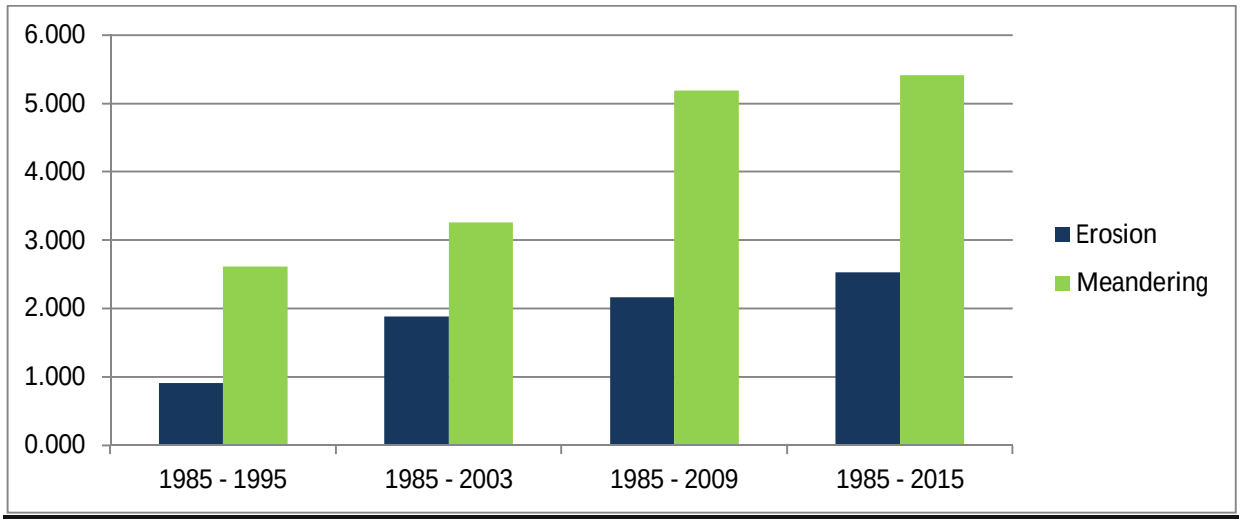

Fig (6.8) Erosion and deposition in river's course

6.2.1 Erosion and deposition in Islands:

The erosion and deposition processes also happens in islands continuously, the results indicate that the erosion and deposition processes occurs in the islands in equal amounts (approximately), In the study area some islands disappeared completely and new islands appears in the other locations, And therefore (in addition to the above), islands shape is changed its position And therefore change their owners.

Table (1.3): Erosion and deposition in Islands

year	Islands_ (Erosion)	Islands_ (Meandering)
1985 - 1995	1.705	1.679
1985 - 2003	2.463	2.423
1985 - 2009	3.111	3.094
1985 - 2015	3.824	3.780

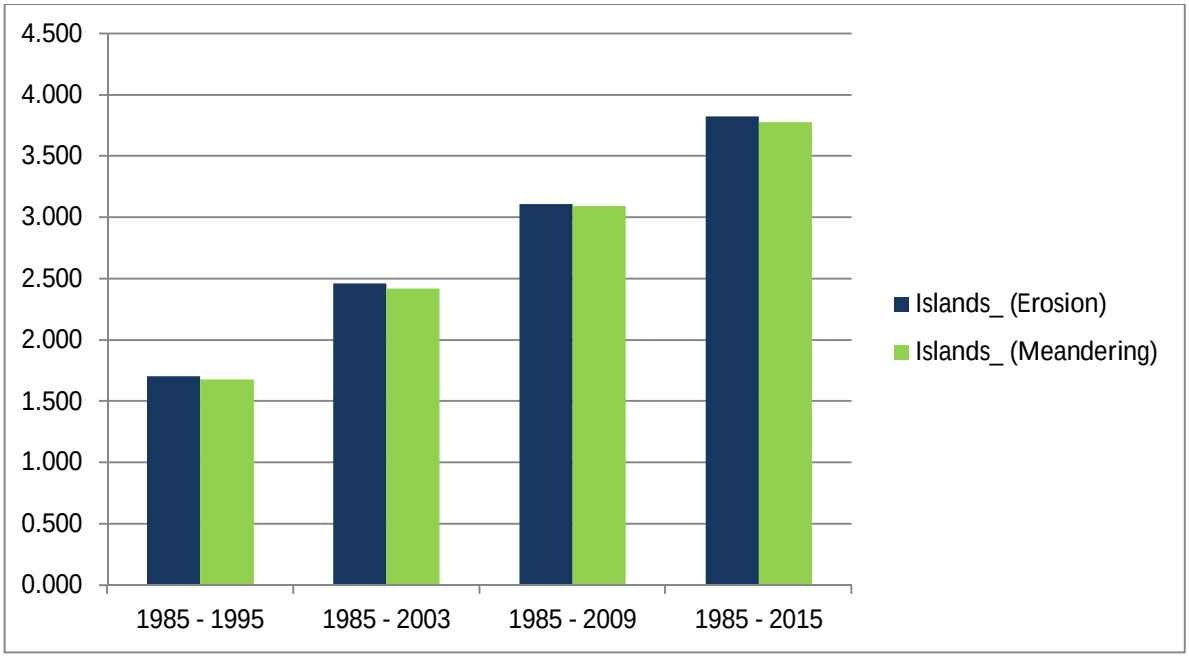

Fig (1.9): Erosion and deposition in Islands