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Changes Detection and identification of erosion risk areas of Aji Chay River between Khaje to Vanyar

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Extended abstract

1- Introduction

Changes in the human environment in different periods and in different areas it is reasonable by the satellite images, aerial photographs and maps in certain forms are easily done. This is particularly important when the data becomes more critical in areas such as environment, agriculture; Natural resource management and river engineering are used (Pris and etal, 1997, 23). Therefore, in order to discover and detect changes that occur in different regions of the Earth Can ensure that remote sensing technology and satellite images in a sequence-specific forms used (Atood and al. 2005, 8)

And their results in the prediction, risk maps, choosing the right strategies to deal with behaviors sudden, More Accurate and more economical operation than to past and successfully implemented projects and structures of organizations and agencies On the rivers for future use. Thus, the geometry changes, the process of depositing and important morphological changes in the organization of the river, flood control, design of linear structures (roads, ...) Hydraulic (bridges, dams, ...) settlements and destruction of agricultural lands on the river and its margins are evaluation of morphological changes part of river Ajy Chay between Khaje to Vanyar, north east of Tabriz 46° 23' 55" to 46° 34' 55" along the eastern and 38° 07' 1" to 38° 08' 40" north latitude Length of approximately 22 km with

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the aim of identifying risk areas to the lateral erosion investigated.

Of studies on the following can be noted:

Table 1. Studies on the topic of domestic and foreign

Names of authors	year	Topic	Result
Javaheri et al	2005	Morphological changes of Karun River	Development process is reversed Meander rings.
Karami	2007	Effective factors in the erosion of river Saidabad Chay	Identify areas with low risk, moderate to severe.
Dadrasi sabzevar	2007	Study privacy and deformation of river use Rs &GIS	GIS & Rs powerful techniques to study changes.
Aswathy et al	2007	Factors Influencing the Sinuosity of Pannagon River India	Vegetation and tectonics play a major role.
Lofthouse & Rabert	2008	Riffle-Pool Sequences and Meander Morphology	Both factors are influential in forming Meander.
Matti kummu et al	2008	"Riverbank Change Along The Mekong River.	Estimated average lateral erosion.

2- Methodology

How it works for this research have been carried out, the first report-required information and report about the range of research and library-based methods and field studies were collected. In the second stage, maps and aerial photos have been scanned, georefrenced, mosaic. In the third stage of the coastline extraction the River For a the time period three (years 1956, 1995 and 2008) Land and water border with digitization in eara gis To calculate the amount of surface erosion and sediment riverbank was done for three periods. To calculate the erosion and sediment to the coasts, along the river intervals of 250 meters, divided in three periods and than linear displacement due to sediment and erosion per meter on year for each period was obtained. At this stage the layer requirements such as erosion, land use, lithology, slope, floodingbed, and road digital and descriptive data were applied to each. Then all the layers due to the influence and reception of each factor over time and toward River erosion rate, converted to raster and weighting was ready. In the final stage of the layers and changes coastal The softwares environment Arc GIS 9.3 ,Excel were processed and charts, tables and maps were extracted needed to determine the risk areas.

3- Discussion

Displacement of the river using three different data in software Arc GIS by comparing the coasts the river in both periods 1956-1995 (39 years) and 1995- 2008 (13 years) was carried out . This study intended to measure changes in linear sides through time and identifies areas where it has been the erosion and sedimentation. Results of the linear by specifying Areas of erosion and sediment delivery and to chart the lateral rate the changes as a function of distance along the coasts (every 250 m) were mapped in the software Excel.

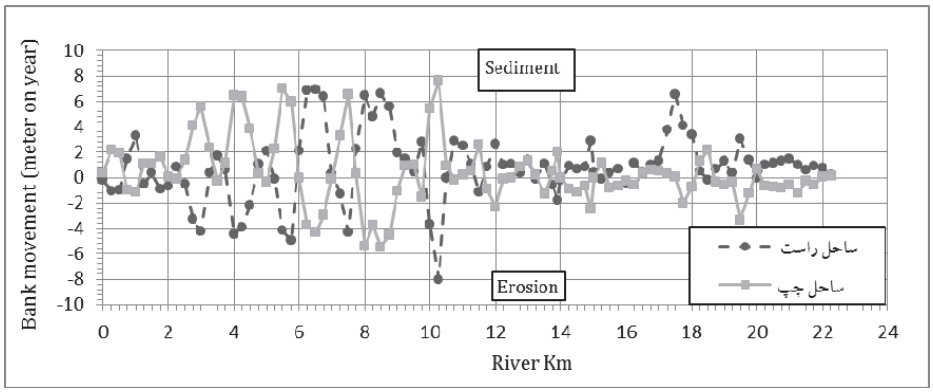

Figure. 1. The rates of bank movement (meter on year) as a function of distance along each of the left and right banks between the years 1956 to 1995.

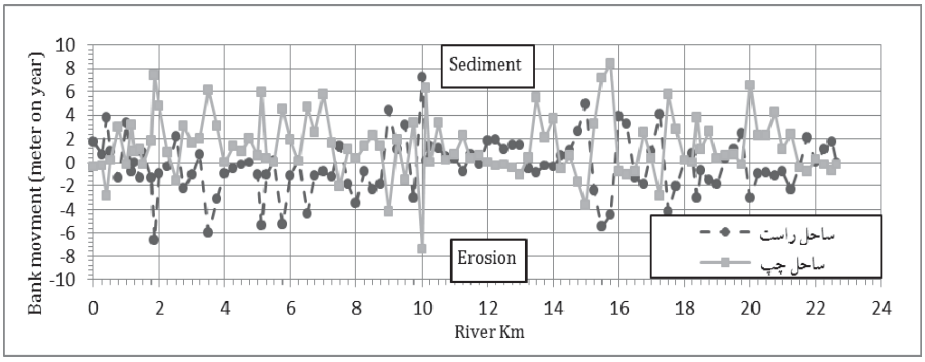

Figure. 2.The rates of bank movement (meter on year) as a function of distance along each of the left and right banks between the years 1995 to 2008.

Overall the amount deposited in the first period toward erosion in left bank 24 percent has increased and in right bank is approximately equal. Also in the second period, the amount of sediment toward erosion in left bank 43 percent has increased but in right bank 13% decrease show.

- Identification of risk areas

Lateral changes in connection with other factors in region such as litho logy, land use, flooding bed, slop, linear structures (road) and residential over the steps to prepare the vector layers, table of data formation, Off-line buffer layers, Values, Raster to vector conversion and weighting of the layers in the software Arc GIS was evaluated and ultimately led to the identification of vulnerable areas, critical and very critical on the riverbank. It should be noted that the Values factors in the region due to the impact and reception of each factors towards time and toward Erosion River.

Table 2.Values layers in the region due to the impact and reception of each factors towards time and toward erosion river In the study area

weighting	Values	Distance from linear structures	Distance from residential structures	Distance from flooding bed	slop (Percent)	Lateral erosion in year	lithology	Land use
Very critical	4	5-10 meter	50 meter	100 meter	0-9	6 meter high	sediments present	Agricultural
critical	3	10-40 meter	100 meter	75 meter	9-18	4-6 meter	Marl and gypsum salt	Sparse pasture
vulnerable	2	40-80 meter	150 meter	50 meter	18-27	2-4 meter	Marl	pasture
	1	80 meter high	200 meter	25 meter	27 high	0-2 meter	Marl&conglomerate	Woodlands

Table 3. Percentage changes in risk zones along the riverbank between the years 1956 - 1995 and 1995-2008.

Very critical	critical	vulnerable	
0	14	9	right banks between the years 1956 to 1995
0	33	15	right banks between the years 1995 to 2008
0	+135	+66	Percentage changes
3	21	19	left banks between the years 1956 to 1995
2	15	9	left banks between the years 1995 to 2008
-3	-29	-53	Percentage changes

towards the first period shows the 53, 29 and 33 percentage decrease. Finally the combination of maps of risk areas in left to right on the bank For both periods 1956-1995 , 1995-2008 was prepared and areas where of vulnerabilities, critical and very critical repeats were identified (Figure. 3 &4).

According to Table number 3 Vulnerable areas and critical right bank In the second period towards the first period shows the 66 and 135 percentage increase and in none of the courses There are no very critical areas . While the vulnerable areas, critical and very critical in the second period

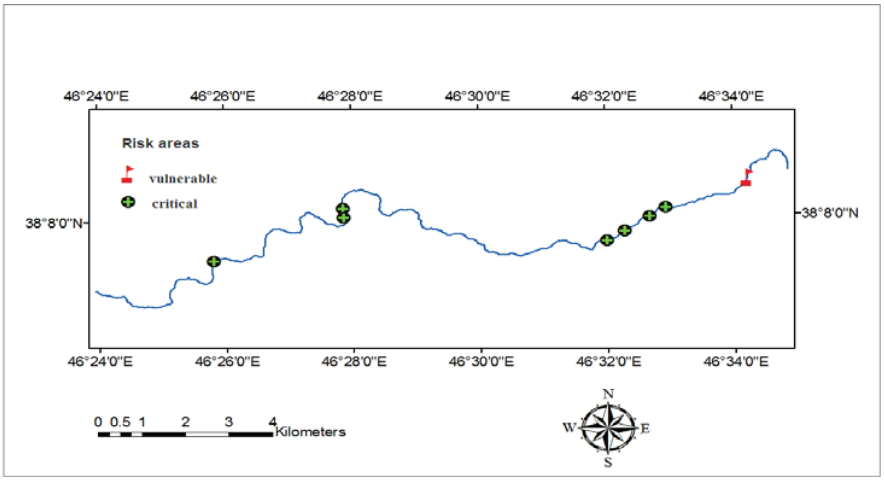

Figure 3. Risk areas map of the right bank during the both period 1956-1995, 1995-2008.

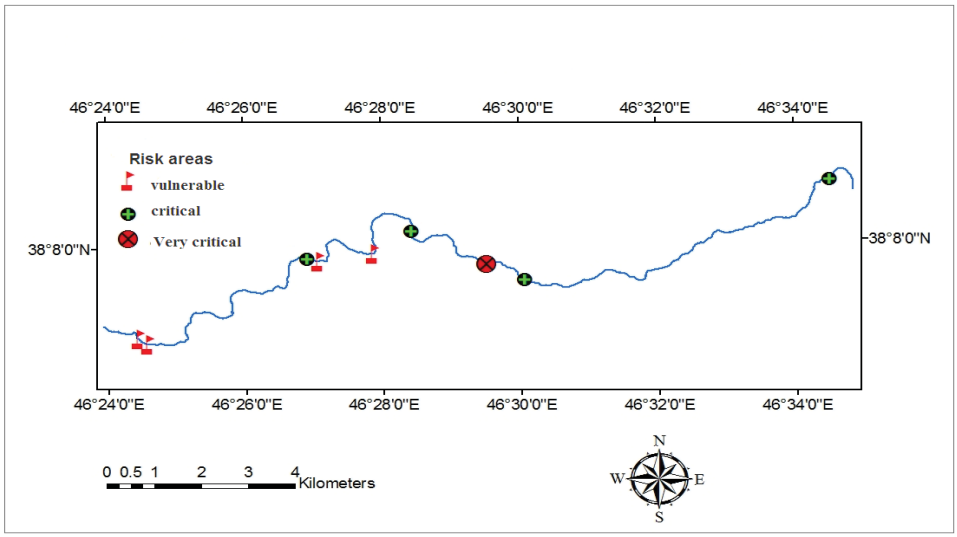

Figure 4. Risk areas map of the left bank during the both period 1956-1995, 1995-2008.

4- Conclusion

The results of maps and charts show that in both periods right bank of erosion more than left bank and the second term right down the bank deposit and left the bank deposit has increased. Considering that the second term on the right bank more erosion than deposition but also increase the deposition in left bank the erosion can be seen that this phenomenon is due to the high sensitivity right bank to erosion, less shrub cover, accumulation of sediment erosion in the left bank and the relative resistance to against erosion is on the left bank. Cause an increase in vulnerable areas and right bank of the critical in the second period than in the first period and less vulnerable areas, the critical and very the critical left bank in the second period than in the first period can be understood that it was already too much discharge and erosion on the left bank to slip and fall are also effective but with a little discharge due to the uneven impact of the lower left of the bank and the right bank, mostly in left bank sediments have accumulated. But the right bank due to flow in alluvial deposits still contain high erosion potential. Obviously, the results of this research by other professionals can be effective in preventing disaster. In this study, merely the river Lateral changes over time has been and comment on its applications to professional experts in various fields of environmental and engineering.

Keywords: Detect changes, Side erosion, Risk areas, GIS & RS, AjiChay River.

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