

الآية

(وَلِيَعْلَمَ الَّذِينَ أُوتُوا الْعِلْمَ أَنَّهُ الْحَقُّ مِنْ رَبِّكَ فَيُؤْمِنُوا بِهِ فَتُخْبِتَ لَهُ قُلُوبُهُمْ وَإِنَّ اللَّهَ لَهَادٍ الَّذِينَ آمَنُوا إِلَى صِرَاطٍ مُسْتَقِيمٍ)

صدق الله العظيم

الحج - الآية 54

DEDICATION

At the beginning I thank Allah for giving me the strength and patience to complete this research and to my father **Abdelmutaal Hassan Elawad** and my mother **Sumia Babiker Musa** who helped me to reach success and to all who helped me to complete the search all, thank you.

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ABSTRACT

Floods are one of the most dangerous natural phenomena that negatively affect human life. In Alsalha-algeea region, Omdurman locality, Sudan, annually exposed to floods due to the low level of the region and inability to identify the areas effected accurately and prediction of damages there are no researches going on to solve this problem.

This study developed a GIS approach for management the flood disasters in terms of using spatial data, processing and applying appropriate spatial, statistical and network analysis techniques to generate flood hazard thematic maps and reports.

Spatial analysis was used to determine the level of the Study Area, then the affected area were calculated and a gathering point for the affected area was determined. Network analysis was used to determine the shortest path from the civil defense to the gathering point. In addition to the closest path from the gathering point to the nearest hospital was determined.

The main recommendation of this study is to develop new methods of mapping and monitoring of flooded areas and predicting possible extensions of the flood. Moreover an employment of geographic information systems is proposed to find solutions to mitigate flood risks.

المستخلص

الفيضانات هي واحدة من أخطر الظواهر الطبيعية التي تؤثر سلباً على حياة الإنسان . في منطقة الصالحة القiecie ، أمدردان السودان، تتعرض المنطقة سنوياً للفيضانات بسبب إنخفاض مستوى المنطقة وعدم القدرة على تحديد المناطق المتأثرة بدقة والتنبؤ بالأضرار، ولا توجد أبحاث تجرى لحل هذه المشكلة.

طورت هذه الدراسة منهجاً لنظام المعلومات الجغرافية لإدارة كوارث الفيضانات من حيث إستخدام البيانات المكانية و معالجتها و تطبيق تقنيات التحليل المكاني والإحصائي والشبكي المناسبة لتوليد خرائط وتقارير موضوعية عن مخاطر الفيضانات. تم إستخدام التحليل المكاني لتحديد مستوى منطقة الدراسة، ومن ثم تم تحديد حساب المنطقة المتأثرة و تحديد نقطة التجمع للمنطقة المتأثرة ، تم إستخدام التحليل الشبكي لتحديد أقصر مسار من الدفاع المدني إلى نقطة التجمع ، بالإضافة إلى تحديد أقرب طريق من نقطة التجمع إلى أقرب مستشفى.

تتمثل التوصية الرئيسية لهذه الدراسة في تطوير طرق جديدة لرسم الخرائط ورصد المناطق التي غمرتها الفيضانات والتنبؤ بالتمديدات المحتملة للفيضان وعلاوة على ذلك ، يُقترح إستخدام نظم المعلومات الجغرافية لإيجاد حلول للتخفيف من مخاطر الفيضانات

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List of Terms

OCHA	UN Office for the Coordination of Humanitarian Affairs
SRCS	Sudanese Red Crescent Society (SRCS)
GIS	Geographic Information System
2 D	Two Dimensional
3 D	Three Dimensional
CC	Computer Cartography
RS	Remote Sensing
GPS	Global Positioning System
DEM	Digital Elevation Model
GCS	Geographic Coordinate System
KSSC	Khartoum State Survey Corporation
TR	Trace
UTM	Universe Transverse Mercator
PCS	Projected Coordinate System
SRTM	Space Shuttle Radar Topography Mission