DEDICATION

To my parents whom always encourage me, to my teachers whom taught me throughout my life from the beginning till today. To all those whom have given assistance to make this work possible.

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Abstract

Due to the great change of Global weather, rain falls and floods have caused real disasters in many of the world countries.Sudan was one of the countries that had been affected by excessive rain fall and flooding. In the year 2007, heavy rains had fallen in different parts of our country. Khartoum State had the lion share of rain water and flood. Which had brought real harm to the population of Khartoum State.

To participate in solving the rainy season problem ,this research have been accomplished to concentrate on the development of a GIS-based software system to obtain the information required for helping the planners in the Ministry of Physical Planning and Public Utilities (MPPPU) for drainage of rain and flood waters management in Khartoum State .

Omdurman City (Elthawrt) was undertaken as a case study to meet the requirement of this research. This Geographic Information System (GIS)-based system consists of two types of data non-spatial data was collected either via interviews with some employees in different departments or by using the existing documents and spatial data was collected using the information existing in the manual maps .

Four softwares have been used to fulfill the analysis, design and implementation of the Geodatabase system these tools are Unified Modeling Language (UML) tool which is used for the analysis and design of the database, MicroSoft (MS) Access is used in the project as backend database , Visual Basic is used as a front-end or interface for creating forms so as to save the data in the backend database (MS Access) and ArcGIS9.0 is used for representing spatial information .

This Geodatabase system has to be capable of meeting the requirements of the manual maps and solving its disadvantages such as search and update problems.

ملخص الأطروحة

نظرا للتغير الكبير الذي طرأ علي المناخ العالمي نتجت أمطار وفيضانات مما تسبب في كوارث حقيقية في العديد من دول العالم وكان السودان من بين هذه الدول التي تأثرت بهطول الأمطار والفيضانات.في العام ٢٠٠٧ هطلت أمطار غزيرة في مناطق مختلفة من بلادنا وكان لولاية الخرطوم نصيب وافر من الأمطار والفيضانات التي جلبت أضرارا بالغة لسكان الولاية.

أعد هذا البحث للمشاركة في حل مشاكل فصل الخريف. يركز البحث علي تطوير نظام يرتكز علي نظم المعلومات الجغرافية للحصول علي المعلومات المطلوبة التي تساعد المخططين بوزارةالتخطيط العمراني والمرافق العامة علي إدارة تصريف مياه الأمطار والفيضانات الناجمة عنها في ولاية الخرطوم .

أتخذت مدينة أمدرمان (الثورات) مصدرا للبحث .إن هذا النظام الذي يعتبر من إحدي تطبيقات نظم المعلومات الجغرافية يعتمد علي نوعين من البيانات :

١.البيانات غير المكانية تم الحصول عليها من خلال المقابلات مع بعض الموظفين من ذوي الإختصاص وبإستخدام المستندات الموجودة.

٢.البيانات المكانية تم الحصول عليها من خلال الخرائط اليدوية.

تم إستخدام أربعة أنواع من البرمجيات للإيفاء بتحليل وتصميم وتطبيق النظام.الأدوات المستخدمة هي:

(Unified Modeling Language tool) استخدمت لتحليل وتصميم قاعدة البيانات.

(Microsoft Access') تم إستخدامه كقاعدة بيانات.

(Visual Basic) تم إستخدامه كواجهة للمستخدمين لحفظ البيانات في قاعدة البيانات بسهولة.

(ArcGIS9.0) تم إستخدامه لتمثيل المعلومات المكانية.

لقد أثبت النظام الإمكانية لتحقيق المطلوبات من الخرائط المتوفرة وإستبعاد سلبيات الخرائط اليدوية مثل البحث والتعديل.

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LIST OF ACRONYMS AND ABBRIVIATIONS

MPPPU :Ministry of Physical Planning and Public Utilities

MS-MicroSoft.

GIS :Geography Information Systems.

NPDES -National Pollutant Discharge Elimination System.

GPS -Global Positioning System.

UML :Unified Modeling Language.

DDL:Data Definition Language.

RTF:Ritch Text Format.

HTML:Hyper Text Marckup Language.

SQL-Structured Query Language.

DBMS:DataBase Management System.

TIN -Triangulated Irregular Networks.

AI -Artificial Intelligence.

ES -Expert Systems.

DSS- Decision Support Systems

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