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Abstract

The aims of this thesis are to identify the available water resources in arid regions in third world countries . Most of the dry areas of the world, defined as including arid , semi – arid and dry sub humid regions, fall in the developing world. These developing countries often do not possess the technical know-how , financial capacity, efficient management or social structure to undertake modern water control schemes management. Sudan, like other developing countries, experiences water management problems. The management aspect is always neglected and attention is mostly concentrated in the engineering aspect rather than management aspect. This led to failure of most of the water resources schemes in general, and in the study area particularly. The absence of efficient water resources management in the Sudan, and in the study area in particular, is considered as core element behind this study.

The study investigates the pattern of water harvesting and small scale water control Schemes in Northern Darfur (Shingle Tobbya) Study area of Abu Hamra Wadi. Also this study focuses on the impact of management in Water Resources in the Area and assesses the significant impacts of water harvesting techniques on the environment and socio – economic life. It suggests how to mitigate water resources management problems in the area. Therefore, there is an urgent need to develop and

manage scientific methods of small scale water harvesting system for crops in order to increase agricultural production and income of the farmers.

The thesis includes the theoretical framework of previous studies in third world countries, and in Sudan in addition to local studies in water resources management in the study area ..

To collect data in the area the researcher adopted a number of Social, methods such as Statistical Packages for Social Sciences (SPSS). In this method the researcher used the questionnaires, interviews and observations in the study area .The Remote Sensing (land – sat) images are used to detect target areas for water exploitation projects.

The study revealed that, the new change is to provide and develop policy, management skills and involvement of stakeholders in decisions making.

The study revealed that, lack of appropriate management of water resources in the study area resulted in continuous loss of run off water , which led to negative impact on socio – economic life and on the environment. In response to this deficiency farmers in the study area have to adopt the modern techniques of water harvesting in order to cope with this deficiency.

Small scale water control schemes in rainfed sector in the study area has suffered from low productivity and hence , profitability as a result of mismanagement of this sector

The study revealed that the level of education of most of target group in the study area is above basic education which helps in understanding the management operation.

The results give good indication of the merit of using the water harvesting technique in order to gain high crop production.

On the other hand, most people in the study area are now found to believe in the important role of local people's participation, in planning and management of water.

Farmers in the study area began to believe that high agricultural productivity depends on water availability.

المستخلص :-

تهدف هذه الأطروحة إلى التعرف على الموارد المائية المتاحة في الأقاليم الجافة في العالم الثالث .
معظم المناطق الجافة في العالم والتي تعرف بأنها أقاليم جافة او شبه جافة, تقع في العالم الثالث . هذه الدول غالبا ما تفتقر إلى التقنية المعرفية و الموارد المالية و الإدارة الفاعلة بالإضافة إلى تركيبة اجتماعية غير قادرة على القيام بدور تحديث إدارة مياه فعالة .

السودان واحدة من دول العالم الثالث التي تمر بمشكلة إدارة المياه .
الناحية الإدارية غالباً هي الأخرى مفقودة بل ظل التركيز على الناحية التصميمية لمشروعات إدارة المياه وخاصة في منطقة البحث .
لمعالجة مشكلة المياة وادارتها - تبنت عدد من الدول في العالم الثالث تقنية حصاد المياة وادارتها كحل لمعالجة القصور الناجم عن سوء ادارة المياه وندرتها وزيادة الانتاج والدخل للفرد
غياب إدارة فعالة لإدارة المياه في منطقة البحث تعتبر عنصراً أساسياً لقيام هذه الدراسة

هذه الدراسة قامت بتقصي أنماط حصاد المياه ومشروعات المياه في المنطقة أي شمال دارفور - شنقل طوباية - وادي أبو حمرة - هذا البحث أيضاً وقف على أثر الإدارة في عملية حصاد المياه مع الأثر الجاد لهذه التقنية على البيئة والحياة الاجتماعية والاقتصادية

الدراسة أيضاً تقترح بعض الحلول الاداريه لمشاكل الموارد المائية في المنطقة . عليه هنالك حاجة ملحة لأساليب تطوير إدارة علمية لحصاد المياه للعملية المحصولية من أجل زيادة الإنتاج الزراعي والدخل للمزارعين .

هذه الأطروحة تحتوي على دراسات نظرية سابقة لبعض دول العالم الثالث - السودان بالإضافة إلى دراسات محلية . لجمع المعلومات من منطقة البحث قام الباحث بتبني عدة مناهج علمية - فنية - اجتماعية منها الحزم الإحصائية للعلوم الاجتماعية (SPSS) . استخدم الباحث في هذا المنهج الاستبيان - المعاينة -

المشاهدة . أيضاً استخدم الباحث عملية الاستشعار عن بعد (LAND - SAT) (صور الأقمار الاصطناعية) لتحديد موقع البحث , بالإضافة للظواهر المصاحبة لمشروعات استغلال المياه .كانت نتيجة البحث متطابقة لحد كبير مع الفرضيات - بضرورة تبني تقنيات حصاد المباح وادارتها من اجل زيادة الانتاج وتقليل المخاطر وزيادة الدخل

الدراسة خرجت بعدة نتائج وأوضحت أثر الإدارة في عملية إدارة الموارد المائية.

ونتيجة للدراسات السابقة في العالم الثالث - السودان وموقع البحث - أوضح البحث أن هنالك رؤى وتحديات جديدة لا بد من الاهتمام بها , كتطوير السياسات والتخطيط والقوانين والنظم والمقدرات الإدارية واشراك المستفيدين أو المشتركين في العملية الإدارية التي تبدأ القرار من الأسفل إلى أعلى من أجل النجاح .

الدراسة أيضاً أوضحت عدم وجود إدارة فعالة في إدارة المياه بالمنطقة ونتج عن ذلك فقدان كميات كبيرة من المياه الجارية - مما أدى إلى آثار سلبية للحياة الاجتماعية والاقتصادية والبيئية . وكننتيجة لهذا النقص في الماء قام المزارعون بتبني تقنيات حديثة في عملية حصاد المياه من اجل التعامل مع تلك النتيجة السالبة.

الدراسة أوضحت ان المشروعات الإنتاجية الصغيرة لادارة المياه فى القطاع المبرى عانت من تدنى فى الانتاج والربحية نتيجة لغياب الادارة الفعالة
الدراسة أوضحت أن المستوى التعليمي لبعض العينات المستهدفة فوق مرحلة الأساس مما يساعد كثيراً في إنجاح عملية التوعية بدور وأهمية الإدارة في العملية الزراعية .النتائج أظهرت فوائد جيدة ومفيدة في عملية حصاد المياه في زيادة إنتاج المحصول من ناحية أخرى معظم المزارعين في منطقة الدراسة بدأوا بقتنعون بأهمية دور المشاركة وإعادة التخطيط والإدارة بالنسبة للمياه . أيضاً ادرك المزارعون أن الإنتاج الزراعي يعتمد على وفرة وإتاحة المياه .

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Abbreviations:

| | |
|--------|---|
| ABS | Agricultural Bank of Sudan |
| CTA | Chief Technical Advisor |
| CDC | Community Development Committee |
| EIA | Environmental Impact Assessment |
| FAO | Food and Agricultural Organization |
| GPC | Government Project Coordinator |
| GDP | Gross Domestic Product |
| IWRM | Integrated Water Resources Management |
| ITCZ | Inter Tropical Convergence Zone |
| IWSC | International Water and Sanitation Center |
| ITFP | Italian Trust Fund project |
| LRWDD | Land use and Rural Water development department |
| LDCs | Less Developed Countries |
| MOIWR | Ministry of Irrigation and Water Resources |
| EDRP | Emergency Drought Recovery project |
| NDIC | National drilling and investment company |
| NRWC | National Rural Water Corporation |
| NWC | National Water Corporation |
| RWH | Rain Water Harvesting |
| RCS | Rural Councils |
| UNESCO | United Nations Education and Science Organization |
| UNEP | United Nations Environmental Programme |
| WM | Water Management |
| TA | Technical Assistance |
| WRM | Water Resources Management |
| WFO | World Food Organization |