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*Impact of Sudan national development planning
on sustaining natural resources :A case study
of Rahad Agricultural Scheme*

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*A thesis summited for the requirements
of a degree of Ph.D in environmental science.*

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Dedication

To the soul of my dear father who I
direly missed,

To my beloved mother the remaining
hope,

To my dear sisters and their kids the
expected hope,

To my supervisor the unfinished
fountain,

To my friends the ongoing support,

Without their support this work could
have never seen the light,

To all of them, I dedicate this work.

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Researcher

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ABSTRACT

Development in the Sudan depends mostly on the agricultural sector, also agricultural production is found to be mainly concentrated in rural areas and partially in Khartoum state, the federal capital of the country. In this regard Rahad agricultural scheme represents one of the most important schemes that mainly produce cotton in addition to other different crops (field crops, horticultural crops and roughage crops).

The main objective of this study is to investigate to which extend the establishing of the scheme affected (positively or/and negatively), in the scheme area, plus some socioeconomic characteristic and factors which share in production of some field crops such as cotton, sorghum and groundnuts.

A field survey was conducted in Rahad scheme area, during the period July 2005. Primary data was collected from selected sample of some 405 respondents and due to some purposes of the study, sample size has been decreased to 286 respondents, using stratified random sampling technique with aid of formal questionnaire. Also secondary data was collected from relevant sources.

Data were subjected to descriptive statistical and regression analysis to determine the different factors affecting field crops production in the scheme.

The main positive impacts which are caused by establishing the scheme are the improvements in social, economic and cultural aspects of the people in the scheme area, in addition to improving of some important social services such as, education, health, water, and veterinary services....etc.

Meanwhile the establishing of the scheme has affected negatively some natural resources which were originally found in the scheme area such as,

natural forests, natural pastures and wildlife; also it caused some environmental complications like, water and air pollution which ultimately led to degrading human health. Establishing the scheme led to the appearance of some new human diseases such as Malaria, Typhoid, and Cancer.....etc.

The result of regression analysis of cotton production indicated that, cotton, sorghum and groundnuts returns, production cost of cotton, land cultivation of cotton and labour cost of cotton have a significant effect on cotton production, and they have negative signs on their coefficient except production cost of cotton and sorghum return which they have positive signs. Also regression analysis of sorghum production revealed that, production cost of sorghum and cotton, in addition to labour cost of sorghum have a significant effect on sorghum production, and all of them have negative signs on their coefficient. Moreover, regression analysis of groundnuts production showed that, production cost of groundnuts and cotton, groundnuts return and labour cost of groundnuts have a significant effect on groundnuts production, and they have positive signs on their coefficient except production cost of groundnuts which has negative sign.

In order to achieve sustainable development, the study has reached some recommendations to be applied in each developmental project in general and agricultural ones in particular, most important of which are:

- Putting great consideration for feasibility of environmental studies before establishing any developmental project.
- Supporting and encouraging scientific research on various types of sustainable development and environment reservation particularly in agricultural schemes.

الخلاصة

تعتمد التنمية في السودان على القطاع الزراعي، ويتركز الإنتاج الزراعي بصورة رئيسة في المناطق الريفية بالإضافة إلى ولاية الخرطوم التي تمثل العاصمة القومية للسودان. ويمثل مشروع الرهد الزراعي أيضا احد المشاريع الهامة التي تنتج القطن بصورة رئيسية إضافة إلى بعض المحصولات الأخرى (حقلية، بستانية، ومحاصيل اعلاف...الخ).

الهدف الرئيس من هذه الدراسة هو معرفة إلى أي مدى اثر المشروع (ايجابيا أو/ وسلبيا) على المنطقة. إضافة إلى دراسة بعض الاوضاع الاقتصادية الاجتماعية، وبعض العوامل التي تؤثر على انتاج بعض المحاصيل الحقلية كالقطن والذرة والفول السوداني.

اعتمدت الدراسة على مسح ميداني تم اجراؤه بمنطقة مشروع الرهد الزراعي (الفاو) في يوليو ٢٠٠٥م، وتم تصميم استبانة لجمع المعلومات من عينة مختارة من المزارعين في منطقة الدراسة باستعمال وسيلة العينة الطبقيّة العشوائية، ودعمت بمعلومات ثانوية من مصادر ذات صلة، وأخضعت المعلومات لتحليل احصائي وصفي وتحليل ارتدادي للتعرف على العوامل التي تؤثر على انتاج تلك المحاصيل الحقلية سابقة الذكر.

اظهرت نتائج التحليل الوصفي نوعين من التأثيرات:

١. تأثيرات ايجابية مثل تحسين الاوضاع الاقتصادية والخدمات الاجتماعية كالتعليم، الصحة، مياه الشرب، الخدمات البيطرية وصحة الحيوان...الخ.
٢. تأثيرات سلبية كتدهور كثير من الموارد الطبيعية الموجودة اصلا في المنطقة مثل الغابات الطبيعية والمراعي الطبيعية والحياة البرية. إضافة إلى تدهور البيئة الطبيعية مما أدى إلى تلوث الهواء الجوي والمياه واضر بصحة الإنسان والحيوان في المنطقة. تدهورت أيضا البيئة الصحية وظهرت الكثير من

الأمراض التي لم تكن معروفة في المنطقة قبل قيام المشروع كالملاريا
الخبثية، التيفويد، الحساسيات المختلفة، البلهارسيا، ومرض السرطان.....الخ.
كما اظهرت نتائج التحليل الارتدادي أن عائدات القطن والذرة والبقول السوداني،
إضافة إلى تكاليف إنتاج القطن، المساحة المزروعة من القطن، وتكاليف عمالة
القطن هي أهم العوامل المؤثرة على إنتاج القطن، أظهر التحليل الارتدادي أيضا
لإنتاج محصول الذرة أن تكاليف إنتاج القطن والذرة وتكاليف عمالة الذرة هي
أهم العوامل المؤثرة على إنتاج الذرة في المشروع، في حين أن أهم العوامل
المؤثرة على إنتاج البقول السوداني في المشروع هي تكاليف إنتاج القطن والبقول
السوداني، عائدات البقول السوداني وتكاليف عمالته.

- وللحصول على التنمية المستدامة في المشروعات التنموية بصورة عامة
والزراعية بصورة خاصة فقد توصلت الدراسة إلى عدة توصيات من أهمها:
- الاهتمام بدراسات الجدوى البيئية قبل البدء في إقامة أي مشروع تنموي.
 - دعم وتشجيع البحوث العلمية في المجالات المختلفة للتنمية المستدامة
والمحافظة على البيئة لا سيما في المشاريع الزراعية.