Dedication

To my father (AHMED)

Mother (AMNA)

Sisters (MONA.AMANY.HOWIDA)

Brothers (ALSADIG.ANAS. EMAD.HASHIM)

Friends (AFRAA & REHAB)

To all I love

Walla
Acknowledgement

Praise be to Allah who gave me health, strength and patience to conduct this work. I would like to express my gratitude and appreciation to my main supervisor Dr. Maysara Ahmed Mohammed for his consistent supervision and patience, invaluable advice, and guidance throughout the course of study.

I'm indebted to Dr. Hitham Ragab Elrmlawy for his invaluable help in the computer model design. I also find myself indebted to Dr. Hassan Ibrahim and Dr. Omran Musa and Dr Alsadig Almahadi and Dr Alsadig Almahadi and all Department of Agricultural Engineering Sudan university for their invaluable help through the study period.

Finally, I shall be failing in duty if I don’t say a word to Eng. Izzeldin Ahmed for his invaluable help and continuous encouragement and support all through the study period. and my brothers Waly Aldeen Alnaeam, and Abdelgadir Idriss although their names didn’t appear here simply because they are innumerable.
بسم الله الرحمن الرحيم

سورة

صدق الله العظيم

الخلاصه

القائم علي بيئة (APAMM) تم إعداد برنامج حاسوبي لإدارة الآليات الزراعية أو (7) أو الأنظمة الحديثة أو برنامج سهل الاستخدام كتب علي برنامج (X) ويدوز visual basic. لإدارة الآليات يتيح للمستخدم إدخال البيانات المطلوبة لمعالجتها حسابيا كما يمكن المستخدم من استخراج المخرجات التي تظهر علي الشاشة مباشرة.
يتبنا بالسعة الحقلية لمختلف الآلات الزراعية (هكتار/ساعة)، يحدد قدرة الجر المطلوبة لكل آلة (كيلو واط)، كما يتبنا البرنامج بعدد الجرارات والآلات المطلوبة لكل عملية زراعية، يحسب التكلفة الكلية للعمليات (هكتار/ساعة) وأيضاً يحسب التكلفة الكلية والثابتة لمختلف الدورات الزراعية، يمنح المستخدم خيار شراء أو إيجار الآلة الزراعية.

تم التحقق من صحة البرنامج بالتحليل الإحصائي بالمقارنة مع مشروع الرهد موسم (2006-2007)، وواضحت المقارنة أنه لا يوجد فروق معنوية. أشارت النتائج أن APAMM يمكن تنفيذها على أرض الواقع بكل نجاح وثقة.
ABSTRACT:

The program APAMM, is a Windows based program that can be run on a Windows xp or higher system on computers. It is a user-friendly interactive program written in a Visual Basic (VB) programming environment for machinery management. It allows the user to interact with it by entering the required inputs and it will carry out the interactive calculations. The program enables the user to print out the output which is displayed on the screen. The APAMM can predict the effective field capacity for different implements (ha/hr), determines the drawbar power needed for each implement (kw), calculates the power take-off power for each implement (kw). Predicts the number of tractors and implements required for each agricultural operation. Calculates the total operation cost per ha, and per hour and finally estimates total costs of owning and operating machinery for various crop rotations, giving the user an option to hire or purchase the machine. APAMM was successfully validated statistically (chi-square) in comparison to Rahad scheme machinery system season 2006-2007. The comparisons indicated that there were no significant differences. In general, the results indicated that the APAMM could be applied to any real-life case successfully and with confidence.
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**LIST OF ABBREVIATIONS**

List of Abbreviations and Notations.

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<td>ASAE</td>
<td>American Society of Agricultural Engineering.</td>
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TFC  Theoretical field capacity.
EFC  Effective field capacity.
FE   Field Efficiency.
A    Area to be processed.
D    Implement draft.
F    Dimensionless texture adjustment factor.
d   Tillage depth.
P_{db} Drawbar or Propulsion Power
S    Forward or travel speed.
PTO or TOP Take-off shaft power.
Prot Rotary power.
pp   Purchase Price.
l    Life on farm.
S_v  Salvage value.
tis  Taxes, insurance and shelter costs.
el  Economic life.
f    Fuel cost.
fp   Fuel price.
0 Oil costs.
Mtc Machinery total cost.
op Operation cost
R &m Repair & Maintenance.
I Interest rate.
D Depreciation
SDG Sudanese giniah