بسم الله الرحمن الرحيم

Sudan University of Science and Technology

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Description and Analysis of Farming Systems in South Kordofan: A Case Study of Rashad Locality

وصف وتحليل النظم المزرعية فى جنوب كردفان: دراسة حالة محلية رشاد

Thesis Submitted In Fulfillment For The Requirements Of The Degree Of M.Sc. In Agricultural Economics

By

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Dedication

**To my father, mother, sisters, brothers and my
small family who gave a meaning to my life**

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Abbreviations

ABS :Agricultural Bank of Sudan

CPA :Comprehensive Peace Agreement

EEC :European Economic Community

FAO :Food and Agriculture Organization

GDP :Gross Domestic Production

GOS :Government of Sudan

IFAD :International Fund for Agricultural Development

IPM :Integrated Pest Management

LSU :Livestock Unit

MFC :Mechanized Farming Corporation

NMAC :Nuba Mountains Agricultural Corporation

NMRDP :Nuba Mountains Rural Development Project

PCAP :Public Corporation for Agricultural Production

RAU :Rural Administrative Unit

SDG :Sudanese Guinea

SKADP :South Kordofan Agricultural Development Project

SKRDP :South Kordofan Rural Development Programme

SPLM :Sudan People's Liberation Movement

UNDP :United Nations Development Program

Definition of Local Terms

Assida :A porridge-like preparation, made from fermented or fresh batters of sorghum or millet flour.

Baleela :Traditional food consists of sorghum, sesame, groundnuts, beans and leaves of some plants.

Gardud :Non-cracking clay of pediments around the base of hills

Goz :Sand dune, applied commonly to the fixed sand dunes occurring in the Darfur, Kordofan and northern regions

Jebel :Hill or mountain; rocky hill outcrop.

Jubraka :Home garden, or backyard garden

Kantar :A yield of crop equal to 141.523 kg

Karkade :Rossel (Hibiscus sabdariffa)

Khor :A seasonal watercourse, usually smaller than a wadi, but both words are synonymously used in Sudan.

Kisra :An unleavened, fermented batter made from sorghum flour and water, cooked into thin sheets.

Merissa :A weak alcoholic drink made of fermented sorghum or millet flour.

Molokhiya :Leaves and tender shoots of young jute (Corchorus olitorius) plants

Mulah :Traditional sauce eaten with kisra or assida.

Nafier :Work party.

Remail :Dry sowing/planting

Sheikh :Village chief

Sheil :Credit, a system of money lending repaid at harvest with a specific quantity of crop yield equivalent to the loan.

Shermute :Sun dried strips of meat.

Wadi :Seasonal watercourse, usually wider than a khor, but both words are used almost synonymously in the Sudan

Weika :Okra (Hibiscus esculentus)

Zakat : Islamic relegious tax

ABSTRACT

The main objective of the study was to describe and analyze the farming systems in Rashad Locality. The specific objectives were to describe and analyze the farming systems in the area, to study the socio-economic characteristics of the farmers in the different farming systems as well as conducting crop budget analysis for the farming systems to come up with recommendations for the development of these farming systems. The study also

covered the problems and constraints of agricultural production in the study area.

Primary and secondary data were obtained from different sources, books, reports and other published articles in websites. A multi-stage stratified random technique was used to select a sample size of 160 households, which represents 8% of the total population. Descriptive statistics e.g. means, frequencies, cross tabulations, percentages and t-tests were used to describe and analyze the socio-economic characteristics of households in the study area, and conduct enterprise and farm budget models for the farming systems in the study area.

The results of the study indicated that, average household size is 9 members for traditional system and 10 members for the semi-mechanized. For rainfed mechanized farming system, 40% or 4 household members were in age group less than 15 years, 20% in age group 16-25 years, 30% in age group 26-45 years. Then the last two age groups 46-55 years and 56 years and above are represented by 10% and zero of household members, respectively. Those engaged in farm labour represent 30% of total household size, out of this percentage, females represent 33%. For the rainfed traditional farming system, 55% of household members are in age group less than 15 years old, 23% in both age group 16-25 years old, and age group 26-45 years old.

Fifty six percent of total household members are engaged in farming activities with females representing 40%.

The study indicated that, average harvested area under the rainfed traditional farming system accounted for 18 feddans bringing crop intensity index to 33%. Household cultivated area decreases to 66% at harvest time, while it is 90% of the cultivated area under the rainfed semi-mechanized farming system, cropping intensity accounted for 68%.

The cropping pattern in the study area is dominated by four main crops, these are; sorghum, millet, sesame and groundnuts. Minor crops that could be consumed in the home or sold in the market are; cowpea, karkadeh, maize, okra and pumpkin. All sample households are cultivating sorghum and virtually 57% and 67% of the cultivated land was under sorghum for the rainfed traditional and semi-mechanized farming systems, respectively.

Off-farm income from categories listed under others (Gum Arabic tapping and petty trading) and income from semi-skilled labour are the major sources of income for the rainfed traditional farming system accounting for 31.9% and 28.9%, respectively. For the rainfed semi-mechanized farming system, income from skilled labour scored the highest percentage of 75.6% followed by cash sent from household members.

The results indicated that, all households for the rainfed traditional and semi-mechanized farming system

are involved in livestock raising. For the traditional system, 33%, 65%, 14% are reported owning cattle, goats and sheep, respectively. Camels and donkeys are kept as animals for burden and transportation; the well-off households tend to have camels 6%, while the majority is using donkeys 42%. Forty percent of households within the rainfed semi-mechanized farming system own cattle, 13% goats, 27% sheep and only 13% owning donkeys.

The comparison between the two main systems as reflected by gross margin and net income proved that, rainfed traditional farming system is far better than the rainfed semi-mechanized farming system e.g. gross output per feddan for the traditional system is almost three times that of the semi-mechanized system, while gross margin per feddan and net income are also nine times those calculated for the semi-mechanized farming system.

The study provided some recommendations, but the most important is that; focus should be on vertical production expansion through provision of improved agricultural inputs. Agricultural extension and agricultural research should play a key role to provide responsive farmers with quality information to increase their production.

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الملخص

الهـدف مــن الدراســة وصــف وتحليــل النظــم المزرعيــة المختلفة بمحلية رشاد بولاية جنوب كردفان بالتركيز على وصــف وتحليل النظم المزرعية بالمنطقة ودراسة الخصـائص الإقتصـادية والإجتماعية وفقاً للنظم المزرعية المختلفة، بالإضافة إلـى إجـراء

تحليل للميزانية للمحاصيل بهذه النظم المزرعية بغية الوصول إلى التوصيات التى تساعد على تطوير وتحسين هذه النظم المزرعية. كما شملت الدراسة أيضاً المشاكل والمعوقات التى تواجه الإنتاج الزراعى عموماً بالمنطقة.

تم جمع البيانات الأولية والثانوية من المصادر المختلفة والتى شملت الكتب والتقارير والمراجع والمطبوعات المنشورة وقد تم إستخدام ،(Websites) فى مواقع الشبكة العنكبوتية الأسلوب الطبقى العشوائي متعدد المراحل لإختيار 160 أسرة عشوائياً كعينة طبقية والتى تمثل 8% من جملة السكان. تم إستخدام منهج الإحصاء الوصفى لتحليل البيانات وشمل ذلك وصف وتحليل الخصائص الإجتماعية والإقتصادية للأسر بالمنطقة بالإضافة إلى تطبيق نموذج ميزانية المزرعة للنظم المزرعية بمنطقة الدراسة.

أشارت نتائج الدراسة إلى أن متوسط حجم الأسرة 9 فرد للنظام المطرى التقليدى و10فرد للنظام المطرى شبه الآلى. فيما يتعلق بنظام الزراعة الآلية المطرية التقليدى فقد تبين أن 40% من أفراد الأسرة ضمن الفئة العمرية أقل من 15 عام و 20% منهم من الفئة العمرية بين 16-25، بينما 30% منهم يقعون فى الفئة العمرية 26-45 عام. أما بالنسبة للفئات العمرية 46-55 عام وأكثر من 56 عام فقد بلغت نسبتهما 10% و صفر على التوالى. إتضح أن العاملون بالزراعة يمثلون حوالى 30% من النسبة الكلية لعدد أفراد الأسرة وأن النساء يمثلن 33% من هذه النسبة. وبالنسبة للنظام المطرى التقليدى فنجد أن 55% من أفراد الأسرة يقعون ضمن الفئة العمرية أقل من 15 عام و 22% منهم يقعون فى كلاً من الفئة العمرية 16-25 سنة و الفئة العمرية 26-45. أشارت النتائج أيضاً إلى أن 56% من حجم الأسر الكلى يعملون فى الأنشطة المزرعية والنساء يمثلن 40% منهم.

أوضحت النتائج كذلك أن متوسط المساحة المحصودة فى النظام التقليدى المطرى بلغت حوالى 18 فدان مع ملاحظة أن متوسط المساحة المزروعة للأسرة تنخفض بنسبة 66% عند وقت الحصاد. المحاصيل الرئيسية بمنطقة الدراسة هى الذرة، الدخن، السمسم والفول السودانى، حيث تزرع الأسر الذرة بنسبة بلغت سبعاً وخمسين وسبعاً وستين بالمائة من جملة الأراضى المزروعة فى النظامين التقليدى المطرى والنظام شبه الآلى على التوالى. وهنالك محاصيل ثانوية للإستهلاك العائلى

ويتم فى بعض الأحيان بيع الفائض منها فى الأسواق المحلية مثل اللوبيا والكركدى والذرة الشامية والبامية والقرع.

الـدخل مـن خـارج المزرعـة مثـل (طـق الصـمغ العربـى والتجارة الصغيرة) والـدخل مـن العمـل شـبه المـاهر يعتـبر مـن المصـادر الرئيسـية للـدخل فـى النظـام التقليـدى حيـث بلغـت نسبتهما 32 و29% على التوالى. بالنسبة للنظام المزرعى شـبه الآلى نجد أن الدخل من الأيدى العاملة الماهرة أحرز نسبةً عاليـةً بلغت 76%.

أشـارت نتائـج الدراسـة إلـى أن كـل الأسـر فـى النظـامين التقليـدى وشـبه الآلـى يقومـون بتربيـة الحيوانـات، أمـا بالنسـبة للنظام المزرعى التقليدى فإن نسب الحيوانات بلغـت 33% 65 و14% تمثل الماشية، الماعز والضـأن علـى التـوالى، أمـا الإبـل والحمير فتستخدم للنقـل والترحيـل حيـث نجـد أن الأسـر الغنيـة تمتلك الإبل بنسبة 6%؛ بينما غالبية الأسر تستخدم الحمير بنسبة بلغت 42%؛ حيث نجد أن 40% مـن الأسـر فـى نظـام الزراعـة المطـرى شـبه الآلـى يمتلكـون الماشـية و13% المـاعز و27% الضأن و13% الحمير.

إن المقارنة بيـن النظـامين الرئيسـيين تنعكـس فـى الربـح الإجمالى وصافى الدخل ويثبت هذا أن النظام المزرعى المطرى التقليدى أفضـل بكـثير مـن نظـام الزراعـة المطـرى شـبه الآلـى ومثـال ذلـك أن إجمـالى الـدخل الناتـج مـن الفـدان فـى النظـام المطرى التقليدى يعادل ثلاث مرات النظام المطرى شبه الآلـى، بينما إجمالى الربح للفدان وصافى الدخل يساوى ضـعف النظـام شبه الآلى.

خلصت الدراسة إلى بعض التوصيات تتمثل ضرورة الـتركيز علـى التوسـع الرأسـى للإنتـاج عـن طريـق المـدخلات الزراعيـة الحديثة.