

**ASSESSMENT OF RAIN-FED AND IRRIGATED FARMING SYSTEMS OF
SUGARCANE PRODUCTION IN BAUCHI STATE, NIGERIA**

BY

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MTech/SAAT/2017/6821**

**A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL,
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RURAL SOCIOLOGY**

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DECLARATION

I hereby declare that this Thesis titled “Assessment of Rain-fed and Irrigated Farming Systems of Sugarcane Production in Bauchi State, Nigeria” is a collection of my original work and it has not been presented for other qualification anywhere. Information from other sources (published and unpublished) has been duly acknowledged.

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CERTIFICATION

The thesis titled “Assessment of Rain-fed and Irrigated Farming Systems of Sugarcane Production in Bauchi State, Nigeria” by ADEMOLA, Thompson Oluwole (MTECH/SAAT/2017/6821) meets the regulations governing the award of the Degree of Master of Technology (M.Tech) of the Federal University of Technology, Minna and it is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This research work is dedicated to Almighty, the miraculous and omnipotent God for his sustenance and to my beloved parents late Mr. Amos Ajamu Fagbemi (R I P) and Mrs. Oladunni Ajamu and to my late Uncle late Abraham Ademola Oyesina, who cultured and nurtured me to whom I am today.

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ABSTRACT

The study assessed rain-fed and irrigated farming systems of sugarcane production in Bauchi State, Nigeria. The specific objectives were to describe the socio-economic characteristics; determine the productivity, determine the costs and returns, determine the level of improved technologies utilized and to examine constraints of sugarcane. A three – stage purposive sampling procedure was used to select 123 and 108 sugarcane farmers under rain-fed and irrigated farming systems respectively. This gave a total of 231 respondents. Structured questionnaire was employed to collect primary data which were analysed using descriptive statistics (means, percentages counts and frequency distribution), productivity index, farm budgetary techniques and Kendall's coefficient of concordance as well as attitudinal measuring scale such as Likert type scale. The result of analysis revealed that the farmers were within the age group of 26 – 55 years with mean age of 44 and 42 years, respectively, while 96.7% and 97.2% under rain-fed and irrigated farming system respectively were married. The mean years spent in formal education by the respondents under rain-fed and irrigated farming system was 6 and 8 years, respectively, while mean farming experience was 10 and 12 years, respectively. Few respondents under rain-fed (17.1%) and irrigated (12.0%) farming system had access to credit facilities, while 48.8% and 21.3% of the farmers had contact with extension agents, respectively. The result of sugarcane productivity revealed that 60.2% of the respondents under rain-fed farming system had sugarcane productivity ranges of 261 – 1000 kg/ha with an average productivity of 382 kg/ha, while 58.3% of the respondents under irrigated farming system had sugarcane productivity greater than 1000 kg/ha with an average productivity of 1824 kg/ha. The costs and returns analysis result revealed that the gross margin realized from sugarcane production under rain-fed and irrigated farming systems was ₦430,038.82 and ₦947,697.23, respectively, while the net farm income was ₦414,342.25 and ₦926,638.339, respectively. Thus, profitability ratio of 1.14 and 1.85 implies that for every ₦1 invested in sugarcane production under rain-fed and irrigated farming system, ₦1.14 kobo and ₦1.85 kobo were realized, respectively. The results on improved technologies utilized by the respondents under rain-fed farming system revealed that 56.1% of the respondents utilized light texture soil with good drainage, 69.9% raised sugarcane nursery during land preparation, 71.5% utilized Autumn planting of sugarcane (i.e. September to October), 76.4% utilized weeding by hoe; 31.7% applied NPK fertilizer at 112kg(N), 25kg(P), 48kg(K) rate/acre; and 64.2% utilized manual harvesting; while improved technologies utilized by the respondents under irrigated farming system revealed 62.0% of the respondents utilized ploughing depth of 30cm during land preparation, 65.7% utilized sowing depth of 30cm, 59.3% utilized combination of cultural and chemical methods during weeding, 74.8% utilized application of water once at every 7 days during growing phase of sugarcane, 31.7% applies inorganic fertilizer and 54.6% utilized early harvesting (10 – 11 months) of sugarcane plantation. The major constraints associated with sugarcane production under rain-fed farming system was inadequate capital and access to credit facilities (\bar{X} = 2.74) ranked 1st for rain—fed, irrigated and pooled. Kendall W value of 0.201 for rain-fed, 0.166 for irrigated and 0.155 for pooled revealed consensus agreement on the constraints to sugarcane production. Meanwhile, the t-test value of 9.579 at 1% level of probability implied significant difference in sugarcane productivity. The study concluded that sugarcane production is profitable, however, irrigated farming system gave higher profitability ratio when compare to rain-fed farming system. It was, therefore, recommended that agricultural extension agencies should intensify efforts in educating and sensitizing sugarcane farmers on how to appropriately and optimally utilise available resources to maximise sugarcane productivity in the study area.

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