

Factors Influencing Farmers Diversification of Their Cropping Enterprises: A Case Study of Sabon Gari Local Government Area of Kaduna State, Nigeria.

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Abstract: An examination of small holders' fields in almost any part of Nigeria will reveal that production is based on crop associations of varying complexity rather than on the mono cropping characteristic of mechanized production in more developed agricultural economics. The study was therefore conducted to determine the factors responsible for farmers' diversification of their cropping enterprises in Sabon Gari Local Government Area of Kaduna State. Data for the study were obtained from 45 randomly selected farmers in three villages in the study area between March and April, 1998 using pre-tested structured questionnaires. The collected data were then analyzed using simple descriptive and inferential statistical analysis. The study revealed that, all the respondents cultivated more than one crop in the same field. Price instability, unpredictable weather, fear of crop failure, lack of sufficient inputs, lack of enough supply of different crop types all year round/food insecurity inputs, lack of special skills on any specific crop, among others were identified as reasons for farmers diversification of their cropping enterprises. It is therefore suggested that while emphasis should be placed on the provision of credit and/or farm inputs to farmers at the right time and quantity, effort should also be made to develop and promote improved agronomic packages given the farmers' total resources.

Key Words: Cropping enterprise, farmers diversification

I. Introduction

Agricultural structure in Nigeria has been characterized historically by the large number of relatively small family operated farm who account for about 90% of the total food production (Awoyemi, 1981; Ajakaiye, 1984; Mendelsohn, 2010). This is due to the low farm income; low level of capacity to satisfy the food and fibre needs of the country and primitive techniques of production (Oyatoye, 1981; Shawki *et al.*, 2004). This is the picture of so many developing countries where about 70-80% of the total population not only live in the rural areas but also derive their livelihood from agriculture. In spite of their peasantry nature of the sector, however, agriculture continues to play its traditional roles of not only providing food for both human and livestock consumption, raw materials for industries, employment and revenue generation and a sector that still contribute significantly to both the total export, earning and Gross Domestic Product (GDP) of the country. It is widely recognized that the development of agriculture is one of the crucial requirements for overall economic growth, there is very little consensus with respect to the most appropriate strategy for securing increased farm output and productivity per unit area of land in an under-developed agriculture. Recent food shortages and prospect of inadequate supplies in the future have prompted accelerated interest for increasing food production per unit area of land. The need to take into consideration their specific bottlenecks and possibilities as defined by the physical and human environment, most small-scale farmers in Nigeria have taken to crop enterprise diversification (in the form of multiple cropping) in order to ensure continuous maximum returns to the resources they allocate to agriculture.

Gains in the production per unit area with monoculture cropping with single harvester per season have not been impressive in recent years, and the potential for improvement through new technology remains uncertain (Ezeh and Olukosi, 1990; Papendick, *et al.*, 1991; Asif, 2012) concluded that the most promising means for many areas to increase food output is through the development and application of new technology for multiple cropping systems.

Multiple cropping described forms of cropping practices where total production from a unit area of land in a farming year is achieved through growing crops simultaneously, sole crops in sequence, or combination of mixed and sole crops in sequence (Andrew and Kassam, 1981; Saleth, 1995; Shawki *et al.*, 2004). Under conditions of subsistence farming as exist in much of the developing world, farmers operate with difficulties arising from low capital, unfavorable price relations, unsophisticated markets and rudimentary

infrastructure. Multiple cropping involving the growing of rain-fed crops in mixtures matches well the total resources available to these farmers in maintaining low but often adequate and relatively steady production.

However, the form of multiple cropping practiced varies from area to area depending on the farmers' total resources as well as on their socio-economic and cultural background.

II. Material And Methods

The study area:

This study was conducted in Sabon Gari Local Government Area of Kaduna State. The area lies within the Northern Guinea Savanna Zone of Nigeria where weather conditions within the same year are characterized by seasonal variations with a distinct raining season, commencing around May and ending around sometimes in October, and dry season, commencing around November and ending around April. The annual rainfall in the study area ranges from around 600 to about 1600mm. The Local Government Area has a typical conditional type of climate, with a wide temperature range, sometimes up to 12°C.

Farming is the main occupation of the people in the study area. The traditional economy is characterized by low level of production and low farm incomes. This is a consequence of their small size holdings and use of primitive techniques of production. The farming systems practised are similar throughout the area because of cultural similarities among the people with multiple cropping and/or mixed farming commonly practised. The major food crops grown in the study area include sorghum, maize, millet, yam, cocoyam, sweet potatoes, cassava and vegetables such as tomatoes, pepper, onions and amaranths, among others, and most of these crops are grown for daily subsistence.

Sampling procedures:

The selection of responding villages was purposive. Three villages were selected out of the existing villages in the LGA based on their accessibility. The selected villages include Hanwa, Koraye Jama'a and Dan-Birni. Farming units in all the three villages were first identified with the help of their respective village leaders after which 15 farmers were then selected at random from the various farming unit already identified in each of the three villages. In all 45 respondents were selected to represent the total number of farmers in the study area. The simple random sampling technique was employed in selecting the respondents for the study to ensure that each member of the population has an equal chance of being included in the sample.

III. Results And Discussion

The general information obtained was analyzed into frequency tables including the distributions according to farm size, sources of income, multiple cropping combination, and reasons for multiple cropping systems. Studies have shown that it is often necessary to ascertain information about the farmers and their families, for such information has often been indispensable to good understanding of their farming systems, practices problem.

Table 1. Shows that a good half of the farmers are over 50 years old. And over 69 percent of them have very low educational standard (Table 2).

Table 1: Age Distribution of Respondents

Age Class	Frequency	Percentage	Cum. Percentage
≤30	2	4.44	4.44
31 – 50	18	40.00	44.44
51 -70	23	51.12	95.56
>70	2	4.44	100.00

Distribution of Respondents according to Literacy Level

Literacy Level	Frequency	Percentage	Cum. Percentage
No Schooling	1	2.2	2.2
Koranic Education	29	64.5	66.7
Adult Education	1	2.2	68.9
Primary School	2	4.4	73.3
Secondary School	6	13.3	86.7
Tertiary School	6	13.3	100.00

Respondents Farm Size

Farm Size(ha)	Frequency	Percentage	Cum. Percentage
<5	28	62.2	62.2
5 - 10	11	24.5	86.7
<10	6	13.3	100.0

Respondents Source of Income

Income Source	Frequency	Percentage
Personal Savings	38	84.4
Relations/Friends	16	35.6
Commercial Banks	-	-
NACB Limited	1	2.2
Co-operatives	-	-
Money Lenders	-	-

Source: Field Survey, 1998

Multiple Cropping Combinations

Type of Combination	Frequency	Percentage
Sorghum + Maize	10	22.2
Maize + Pepper + Sweet Potatoes	3	6.7
Maize + Cowpea + Sorghum	16	35.6
Yam + Sorghum + Rice	12	26.7
Millet + Cowpea + Groundnut	4	8.9

Reason for Multiple Cropping Systems

Reason	Frequency	Percentage
Price not stable	20	44.4
Unpredictability of Weather	40	88.9
To enhance production of others	30	66.7
Family Size	11	24.4
Fear of Failure	40	88.9
No Sufficient Inputs	2	4.4
Lack of Special Skill	3	6.7
To ensure supply of different species	40	88.9

Source: Field Survey, 1998

These two characteristics will definitely militate against fast adoption rate. It is thus responsible to infer that their readiness to accept and adopt new innovations will be limited by old age and low educational standards. However, a similar study from Teweldemedhin and Kapimbi (2009) in the commercial area indicated that younger farmers or those with less experience were less likely to diversify. The middle age were much more likely to be involved in a variety of farming activities and that farmers were and more energetic their operations were more likely to more commercially oriented than activities of older people. Thus, age implied that experience was related to decisions to diversity their enterprises. Tabgay (2005) also reported similar result that majority of farmers are illiterate and own small land holding.

More than half of the respondents Suggests inadequacies in land availability, as shown in Table 3 further reinforce this claim with 62% of them having less than 5ha of cultivated land. These views agree with the information on Table 4 which indicates that only one farmer claimed to have enjoyed any formal credit assistance for his farming activities.

In view of the fact that most technological packages involves suitable capital requirement to employed the services of sophisticated farming machinery, fertilizers, improved seeds and a host other inputs which the present capital position of the farmers cannot sustain, the supportive roles of various credit programmes need to be specially refashioned is relation to the farming activities of farmers. This contrasts the findings of Utpal and Manabendu (2010).

Enterprise Diversification

Multiple Cropping Combinations, it was observed that all the respondents interviewed cultivated more than one cropping enterprise. Most mixtures were made up of two or three crop species (Table 5) 20 and 80 percent of the mixtures respectively. The five most frequent mixtures were: Sorghum + Maize; Maize + Pepper + Sweet Potatoes; Maize + Cowpea + Sorghum; Yam + Sorghum + Rice; and Millet + Cowpea + Groundnut. Among the crop mixtures, Maize + Cowpea+ Sorghum combination was the common (Table 5). This contrasts

the findings of Norman (1974). Who reported that Millet + Sorghum Combination was the most common, though he noted that the composition of mixtures depends largely on rainfall. (Tabgay, 2005; De and Menabendu, 2010) also reported similar results that farmers would also try to cultivate as many crops as possible on the given piece of land and choose crops which offer meeting their consumption needs, and to also meet their minimum cash requirements for the maintenance of their daily life; even the medium and large farmers approach diversification for improvement of their living standard. The study of Brajesh *et al.*, (2009) further confirmed that agricultural diversification at the farm level is supposed to increase the farm income; the utility of diversification as risk management practices however remains.

On the other hand, infrastructural development, penetration of rural markets, development and spread of short duration and drought resistant crop technologies have all contributed to minimizing the role of non-economic factors in crop choice of even small farmers; crop diversification was needed from low value to high value crops, from single to multiple crops Asif, (2012).

Saleth (1995), in a separate study reported that crop diversification is certainly an important component of the overall strategy for small farm development performance of the crop sector which is linked to the underlying cropping pattern. One notable aspect of the cropping pattern is the uniform and dominance of seasonal crops over trans-seasonal or annual crops irrespective of the farm size being considered.

Reason for Multiple Cropping Diversifications

The main reason given by family heads for growing many crops simultaneously were empirically verified by the study and the result is shown in Table 6. From the table the most important reasons advanced by the farmers include the need to guide and guard against the unpredictability of weather and/or the fear of crops failure and also to ensure the supply of different species of crops in the family menu as well as to enhance the production of other crops. Security motivation and the beneficial efforts of interplanted legumes have obvious rational basis that some farmers articulated in their responses. Multiple cropping leads to security through diversification of crops. (Saleth, 1995) study revealed that, the economic considerations such as the income, cost and net return as well as food/fodder self-sufficiency requirements that assume significance crop choice at a given endowment and socio-economic context.

Rechard and Mahen (2005) in their study revealed that, the type of uncertainty most fear are climate factors, pests and diseases, price uncertainty and policies related to agricultural production, marketing and trade; in this respect, farm diversification may be considered as a spontaneous response to avoid many of the uncertainty.

There are several reasons why diversification is an option for managing these uncertainties. First, the relationship between diversification and farm size is an indication of trade-off between risk reduction and return in farming activity; a farmer may give up a large expected return by specialization in order to ensure against risk through diversification Rechard and Mahen (2005).

Tabgay (2005) strongly argue that, growing alternative food crops to diversify traditional farm practices increases profit. Most farmers depend on just one or two field crops as their main source of food. He emphasizes that diversification can spread economic risk and offer profitable niches markets, lessen impact on environmental resources strained by monoculture and some times, offer new opportunities to strengthen communities.

Successful diversification often resulted into a mere varied mix of activities at the level of farm enterprises and the economic sectors, including new input markets and emerging processing industries; this will reduce community dependency on a narrow range of outputs and, as a result, will reduce vulnerability top shocks from climatic variability and volatility of commodity prices Shawki et al. 2004.

According to Asif (2012), household food and income security were the basis objective of agricultural diversification, diversification at the farm level is supposed to increase the farm income, the utility of diversification as a risk management practices however remains; diversification of agricultural is advocated as one of the important strategies to stabilize and enhance farm income, increase employment opportunities and conserve natural resources. Agricultural diversification encompasses change in production portfolio from low value to mere remunerative and high value commodities.

Constraints Associated with Multiple Cropping System

All the farmers interviewed identified difficulty in the application of improved inputs notably fertilizers and herbicides and difficulty in mechanized planting and harvesting as the principal constraints associated with multiple cropping systems. Studies that collaborated this finding include those of Okigbo and Greenland (1981) and Milton (1997).

IV. Conclusion

Based on the major findings the following conclusion could be derived:

- (i) A good number of the farmers are over 50 years old and majority of them have very low educational standard.
- (ii) The vast majority of the farmers have large family sizes and that they still cultivate less than 5 hectares of land.
- (iii) Majority of the respondents do not have any access to formal credit institution such as the commercial and merchant banks, and the Nigerian Agricultural and Cooperative Bank.
- (iv) All the respondents interviewed cultivated more than one crop enterprise, with most mixtures being made up of two or three crop species. The most common crop mixture identified in the study is that of Maize + Cowpea + sorghum Combination.
- (v) The main reason given by family heads for growing many crops simultaneously were many and varied, ranging from unstable prices to unpredictability of weather to enhance production of other crops, big family size, fear of failure, lack of sufficient inputs, lack of special skills and to ensure supply of different crop species. Among these, the need to guide and guard against unpredictable weather, the fear of crop failure and to ensure all year round supply of different crop species in the family menu were deemed the most important.
- (vi) Difficulty in the application of improved inputs notably fertilizers and herbicides and difficulty in mechanized planting and harvesting were identified by all the respondents as constraints associated with the practiced of crop enterprise diversification in the form of multiple cropping.

V. Recommendation

The study provided ample evidence for the fact that crop composition does play a dominant role in determining the overall performance of crop enterprise. This justifies the rationale for crop diversification as a strategy for improving crop cultivation. However, it has been shown that, since the crop composition is determined by resource endowments and household economic requirement, crop diversification scheme faces constraints especially in the context of small farm holders.

The government should assist the small scale farmers becomes imperative in reducing their production cost by regularizing subsidies on agricultural inputs and by operating tractor-hiring units, and by implementing a scheme that would protect the farmers from earning very low income particularly during harvest time. Farmers are encouraged to form co-operative associations so as to capture the opportunity for loan distributions by government agencies and financial institutions.

High yielding varieties of seeds for mixture should be developed and made available to farmers at affordable prices. This need to be supported by effective extension services to create awareness and ensure adoption by farmers.

In order to attract and retain labour, particularly during peak period of farming activities, it will be necessary to provide social amenities in these villages which are comparable to those available in the urban centers. There should also be a systematic collection and dissemination of information by the government on the demand and the supply of labour.

Urban and rural community awareness programmes through radio, television, films and posters should be vigorously pursued to promote the adoption by farmers of various risks management strategies such as crop and livestock insurance, contracting and hedging, and flexibility, among others to guard against complete crop failure.

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