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Land Fragmentation and Agricultural Development in Tivland of Benue State, Nigeria

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Abstract: This study examines the impact of land fragmentation on agricultural development in Tivland of Benue State, Nigeria. The study reveals that the land tenure system in Tivland encourages partitioning of land based on inheritance. A development which leads to excessive subdivision of land into plots of small sizes that are scattered over long walking distances. The study argues that due to small nature of farm sizes, farmers only engage in subsistence farming with barely surplus to generate income. Besides, the dispersal of land holdings and unstaggered planting does not allow the land to be put into effective productive use. The study recommends that policies and agricultural programmes in Nigeria should take into cognizance the existing land tenure systems and the problems that emanate from them. In addition, problems associated with small sized farms and dispersal of holdings can be resolved through the provision of infrastructural facilities. Finally, irrigation facilities should be introduced in Tivland to boost dry season farming.

Key words: Agriculture, irrigation farming, land fragmentation, land holding, Tivland

INTRODUCTION

In Nigeria, despite the dominance of the oil sector, agriculture still plays significant roles in economic development. It provides food for the growing population and raw materials for industries. It also serves as a source for foreign exchange and capital formation (Awotide and Agbola, 2010).

Nigeria is endowed with enormous arable land. Yet, agriculture is dominated by small holder farmers who operate several small and scattered farms. The small size and scattered nature of the farms is because of land fragmentation which is a logical consequence of inheritance practices. It is through inheritance procedures that land is fragmented in Nigeria.

There is controversy over the benefits and costs of land fragmentation. Some researchers have claimed that land fragmentation allows farmers with scattered plots to benefit from risk management through the use of multiple eco-zones and the practice of crop scheduling. It also enables farmers to disperse and reduce risk by a variety of soils and other micro-climatic and micro-environmental variations. Fragmentation also makes it possible for farmers to grow a variety of crops that mature and ripen at different times; so that they can concentrate their labour on different plots at different times thereby avoiding household labour bottlenecks (Bentley, 1987).

Despite this position by Bentley, the most popular and widely accepted position by scholars and land tenure researchers is that land fragmentation constrains agricultural development. The costs associated with fragmentation are seen principally in terms of inefficient resource allocation (labour and capital) and the resulting cost increase in agricultural production (Shuhao, 2005). According to Mcpherson (1983) and Simpson (1987), land fragmentation imposes detrimental effects on agriculture in three ways; (1) creating inefficiency (2) hindering agricultural modernization, and (3) making it costly to modify adverse effects by consolidation schemes. In addition, it causes physical problems, operational difficulties and foregone investment to individual farmer (Mcpherson, 1983; Simpson, 1987).

In Nigeria, small sized farms are characterized by low level of operation, low literacy of operators, and a labour intensive production technology with hired labour cost constituting about 60% of the total cash cost of production (Olayemi, 1980; Aromolaran, 1992). Agricultural development in Nigeria is therefore constrained by a myriad of factors especially land fragmentation. Land fragmentation has severe consequences for agricultural development; it leads to scattering of plots, little incentive for improvements, lack of security of tenure, restricted scale of operations etc., (Fabiyi, 1983; Famoriyo *et al*., 1977; Idowu *et al*., 1999). In spite of these associated costs, land fragmentation is still persistent and wide spread in Nigeria agriculture. This study thus attempts to analyze the impact of land fragmentation on agricultural development in Tivland

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Objective of the study: This study was carried out between November, 2009 and May 2010. The overall objective was to examine and create a heightened awareness on the impact of land fragmentation on agricultural development in Tivland in particular and Nigeria in general and to make recommendations on how land can be maximally utilized to boost food production.

METHODOLOGY

The study was conducted in eight (8) local government areas out of the fourteen local government areas that make up Tivland. The study was conducted between November, 2009 and May, 2010. The Tiv society is stratified into two based on the existing geo-political zoning system in Benue State - Nigeria. These zones are A and B. The population of Tiv in the last National Census is 2,945,994. While zone A has a population of 1,513,660, zone B has 1,432,334 (NPC, 2006).

Zones A and B have seven local government areas each with varying number of council wards. The local government areas under zone A are Katsina Ala, Konshisha, Kwande, Logo, Ukum, Ushongo and Vandeikya while those under Zone B are Buruku, Gboko, Guma, Gwer-East, Gwer-West, Makurdi and Tarka. Four local government areas were randomly selected from each of these zones for study.

In zone A, Konshisha, Logo, Ukum and Ushongo were selected while in Zone B, Buruku, Guma Gwer-West, Tarka were selected. The rationale for the selection of these local government areas was informed by their rural nature and geographical spread. An interview method was used for the collection of information from the respondents. Simple random sampling technique was used to select three council wards from each local government area. A total of 24 council wards were selected. In each council ward, 20 respondents were randomly selected and interviewed. Hence, a total of 480 farmers were interviewed. The personal interview method provided the opportunity to collect information on the modes of land acquisition, sizes of land holdings and the location of farms.

RESULTS AND DISCUSSION

The responses of the farmers are presented in analytical, descriptive and quantitative form below:

Land holding: In Tivland, most farmers own both upland and fadama fields. However, in Tivland, the major route of land acquisition is through inheritance. Other ways are rent and gift. While the upland fields are used for the cultivation of yams, groundnuts, soya beans, millet, corn, beniseed, etc, fadama fields are mostly used for the cultivation of rice.

Farmers in Tivland practice rain-fed agriculture. Thus both the upland and fadama fields are put to use during the rainy season. During the dry season however, the fadama fields in particular remain redundant. However, in areas such as Sokoto, Zaria, Kano, Katsina, etc where there are irrigation facilities, fadama holdings are economically beneficial because they are always put to use during the dry season and this makes farmers to be gainfully employed throughout the year. Besides, farmers generate income from fadama fields during the dry season (Ega, 1986). Regrettably however, in Tivland, fadama fields are only used during the rainy season. The implication of this is that farmers in Tivland hardly benefit from the possession of fadama fields in the dry season (Kakwagh, 2004).

Size distribution of holdings: A very striking feature of the selected local government areas was the general subdivision of holdings into several fields and the scattered nature of the fields. All the farmers had their holdings scattered in four or more non-consolidated fields. Table 1 presents the distribution of the size of fields by the sample of farmers. The average size of holding of the sample of farmers was 8.6 ha per farmer (Table 2).

A survey of the selected local government areas showed that fields were generally fragmented. Most of the farmers had more than four upland farms and between two to four fadama fields except in Ukum LGA where no farmer had any operational fadama field. Discussions with farmers revealed two reasons for the absence of any operational fadama farm in this area. Firstly, the flood plains are not rich enough for rice production and generally lack ample water supply. Secondly and the most important is that rice is planted between June and July, when yams which is a highly valued crop in the area needs weeding. During these times, labour requirement is usually at its peak and since farmers are not too sure of good harvest from rice because of poor fertility of the soil and the lack of adequate water supply, they prefer to concentrate on the production of yams whose productivity is more guaranteed.

Another consequence of land fragmentation was the high incidence of tiny fields. A survey of the selected local government areas revealed that both the upland and fadama fields were generally small. For instance, 78.25% of the fields were less than one hectare while 19.13% of the fields were between one and two hectares. On the whole, all the fields were between half a hectare and six hectares (Table 3). These figures support the contention that farmers in Nigeria operate small size farms.

As already stated, farmers' holdings were generally scattered. Discussions with farmers further revealed two reasons for the scattered nature of the fields. Firstly, the Tiv land tenure system allows individuals who have moved to new sites, to retain the rights over lands in their

Table 1: Average size of holding fields in the surveyed LGAs

Average size of fields	Size of holding (ha) Vandeikya	Konshisha	Gwer	Ushongo	Gboko	Logo	Ukum	Guma	Total
Upland	2.79	2.27	2.30	2.97	2.84	2.66	6.20	5.57	3.45
Fadama	0.78	1.92	0.78	1.12	0.51	0.85	-	1.33	0.91
Total	3.57	4.19	3.08	4.09	3.35	3.51	6.20	6.90	4.36

Field survey

Table 2: Average number of fields

Average No. of fields	Size of holding (ha) V.kya	Konshisha	Gwer	Ushongo	Gboko	Logo	Ukum	Guma	Total
Upland	5.00	4.98	7.15	4.83	6.40	8.73	11.08	11.60	7.47
Fadama	1.35	2.17	1.20	0.77	1.15	1.17	-	1.27	1.13
Total	6.35	7.15	8.35	5.60	7.55	9.90	11.08	12.87	8.60

Field survey

Table 3: Distribution of fields for the entire sample

	Upland		Fadama		Total	
Size (ha)	No. of ha	%	No. of ha	%	No. of ha	%
01 – 0.99	3210	82.46	223	45.14	3433	78.25
1 – 2.5	589	15.13	250	50.61	839	19.13
2.6 – 4.5	63	1.61	21	4.25	84	1.91
4.6 – 6.5	31	0.80	-	-	31	0.71
Total	3893	100	494	100	4387	100

Field survey

Table 4: Size distribution of land of the entire sample of farmer

	Vandeikya		Konshisha		Gwer		Ushongo		Gboko		Logo		Ukum		Guma		Total		
Size (ha)	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	No. of ha	No. of farmers	Average
1-5	69	27	84	24	102	27	66	15	93	30	66	18	24	6	-	-	504	147	3.34
6-10	174	24	147	21	111	15	131	24	45	6	119	18	102	18-	144	20	973	146	6.66
11-15	78	3	144	12	81	6	112	15	255	21	115	8	184	24	184	16	1153	105	10.98
16-20	60	6	54	3	207	12	27	6	60	3	234	14	79	6	352	20	1073	70	15.33
21-25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	4	92	4	23
26-30	-	-	-	-	-	-	-	-	-	-	60	2	-	-	-	-	60	2	30
31+	-	-	-	-	-	-	-	-	-	-	-	-	276	6	-	-	276	6	46
Total	381	60	429	60	501	60	336	60	453	60	594	60	665	60	772	60	4131	480	-
%		9.22	10.38		12.13		8.13		10.97		14.38		16.10		18.69				

Field survey

old sites. And since the Tiv people generally live in scattered settlements, even when an individual has abandoned his old homestead and built a new one, he still has claims of ownership over the old site of his homestead including the land he used for farming. Secondly, there is the existence of upland fields and fadama fields. The fadama fields are located on the plains of rivers and streams. The possession of both upland and fadama fields explains why fields are scattered.

A survey of the selected local government areas further revealed disparity in the size of farm holdings between individuals (Table 4). The average size of holding of the entire sample was 8.60ha per farmer. An examination of the table shows that more than half of the sampled farmers held land less than the average. For example 147 of the sampled farmers owned 504 ha (12.20%) out of the 4131 ha representing an average of 3.43 ha per farmer. One hundred and forty six farmers owned 973 ha (23.55%) representing an average of 6.66 ha. This means more than half of the farmers (293) held land below the average.

The inequality in sizes of land holding was explained on the basis of history and attitude to work. In Tivland, the amount of land owned is a consequence of initial occupation and hard work on the part of the original occupier of the land (Utov, 2000). If a person had a grand father or great grand father who occupied a large tract of uninhabited land and worked hard on the land, he maintained absolute ownership rights to the land. Thus, at death even if such a person had many inheriting children, such heirs would come to inherit and own larger parcels of land than the person whose father did not control large amount of land through hard work.

In spite of the small size of holdings, no farmer was found to be landless. This notwithstanding, population growth has greatly influenced migration in Tivland. Many farmers have realized that their specific holdings are too small to provide them means beyond subsistence level. This has propelled many to migrate to under-populated areas such as Ukum,and Logo local government areas in Benue state and the neighbouring Nassarawa and Taraba States where land is surplus.

CONCLUSION

The study has shown that farmers' land holdings in Tivland are fragmented, small in size, non-contiguous and interspersed over long walking distances. Fragmentation of holdings has negative impact on agricultural development. First, it has encouraged the excessive subdivision of land into plots of small sizes belonging to separate individuals. Since the sizes of farms are not large enough, they neither provide farmers with enough sustenance nor do they enable farmers to achieve a surplus. In fact, the small size of farms does not provide farmers with enough income to satisfy their basic needs. Also the small sized holdings do not permit farmers to be engaged in farming activity throughout the year since they (farmers) always abandon farming activity for leisure once their small plots of land are cultivated.

Secondly, fragmentation of land has encouraged the scattering of holdings into different locations. Though the fragmentation of land is seen by farmers as essential for meeting their land needs, the study observes that it is inhibiting the optimal use of land resources. For instance, the dispersal of holdings which fragmentation entails makes many farmers to plant different crops on several distant plots. And since planting is not staggered, it is preventing land from being productively used as it creates bottlenecks such as non flexibility in the use of labour time. Moreover, efficient use of the land is compounded, as the shifting system of cultivation encourages extensive use of land which is abandoned only after few cropping. Particularly, the scattered nature of the plots makes farmers to waste precious hours that would have been otherwise put to agricultural activity traveling between distant plots. Moreover, the scattered nature of the plots equally makes the transportation of inputs and crops to and from the farm a serious problem to the farmers.

The study has established that there is an emerging inequality in landholding, which has the potential of making some people landless especially those with initial disadvantage in land. Though it was observed that the inequality is not yet in favour of any class of people, the fear is that if it is allowed to acquire a higher dimension, it may subject upcoming generations to perpetual tenancy. At the moment, it was observed that the inequality has caused many enterprising farmers to operate small farms while the less enterprising farmers own land larger than they can effectively utilize.

RECOMMENDATION

Agricultural development in Nigeria is a complex process because of the interacting variables. However, for Nigeria's agriculture in general and the Tiv society in particular to develop with the prevailing primitive technology, the organization of the producing unit is very essential. The present system of agricultural organization where farmers operate small farms, make use of crude technology such as hoes and cutlasses is not satisfactory. Besides, small sized farms can no longer provide sustenance to the family due to economic crisis confronting the nation.

In Nigeria, the most single aspect of the agrarian structure is the land tenure. Therefore, for the agricultural production and income of small holders to improve, there is need for the modification of the existing land tenure systems so as to address the series of problems emanating from them. Policies and agricultural programmes that would pay particular attention to land holding patterns should be put in place.

Furthermore, practical steps should be taken by government at both federal and state levels to address the problem of land fragmentation. In addition, farmers' small-sized farms should be made more productive by providing them with agricultural support services and technical advice. Productivity enhancing support services such as fertilizers, herbicides and chemicals should be made readily available and at affordable prices to farmers. In addition, an effective and efficient agricultural extension service scheme should be put in place to avail farmers with the opportunity of managing their small farms more effectively for optimum productivity.

The provision of support services can also help to alleviate the problem of dispersal of holdings. Rural infrastructures such as feeder roads, bridges/culverts should be constructed. Availability of these infrastructures will facilitate the transportation of farm produce and inputs to and from farms and to the markets Besides, the problem of labour, occasioned by the dispersed nature of holdings, can be addressed if the cropping pattern adopted by the farmers is changed. Farmers generally plant several crops at the same time at several distant plots; this creates labour bottlenecks and results to inefficient use of land resources. It is therefore, recommended that planting should be staggered so as to ensure flexibility in the use of labour time. However, this should be based on the recommendation of an effective extension service. The conviction is that it will allow labour to be spread throughout the year and reduce the risk of total crop failure in case of shortage of rainfall or disease.

Finally, government should provide irrigation facilities to farmers in Tivland so that they can engage in fadama farming during the dry season like their counterparts in Kano, Zaria, Sokoto and Katsina. This will go along way to increase food production as well enhance farmers' income.

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