International Journal of Agriculture Innovations and Research
Volume 4, Issue 3, ISSN (Online) 2319-1473
Manuscript Processing Details (dd/mm/yyyy) :
Received : 02/09/2015 | Accepted on : 22/09/2015 | Published : 18/11/2015

Analysis of Linkages among Organizations Involved in Agricultural Mechanisation and Rural Development in Kano State, Nigeria

Chukwu, Uchenna Patricia
Centre Manager/Director, Technology Business Incubation Centre
P.M.B. 5081, Nnewi, Anambra State, Nigeria.
Email: victory2010@yahoo.com/upcpatricia@yahoo.com; Phone: +23408038248935

Abstract **– This study analysed linkages among organizations involved in Agricultural Mechanization and Rural Development in Kano State, Nigeria. These are; Kano State Agricultural and Rural Development Authority (KNARDA) and Technology Business Incubation Centre (TBIC). Purposive and random sampling techniques were used to select a total of 100 respondents; 50 from each organisation. Primary data used were collected through field survey, with a well-structured questionnaire. Appropriate statistical tools were employed in data analysis, according to the specific objectives of the study. Both descriptive and inferential statistics were used. Descriptive statistics such as frequency distribution tables and percentages were used in the analysis of objectives I and II while factor analysis was used to analyse objective III. Result showed that incubation, research, training, personal contacts by field staff/extension among others were forms of inter-agency coordination between the two agencies. However, providing agricultural mechanization facilities to farmers (80% KNARDA & 100% TBIC), supervising farmers to ensure proper utilization of farm mechanization packages, technologies and equipment (80% KNARDA and 90% TBIC) and teaching farmers improved farm mechanization practices (98% KNARDA and 80% TBIC) among others were the roles of the agencies towards agricultural mechanization in the study area. The result of factor analysis identified: administrative, financial, institutional, technical and social constraint as major impediments to effective linkages among the development agencies. The study concludes that linkages mechanizations exist among the agencies through showing of ideas, knowledge and material resources which can enhance their activities. Necessary recommendations such as an unalloyed commitment to improve linkage facilities through adequate funding strengthening of existing linkage system to ensure efficient service delivery were made among others.**

Keywords **– Analysis, linkages, organisations, Agricultural Mechanization, Rural Development, Kano State, Nigeria.**

I. INTRODUCTION

The unfolding scenarios of rural urban drift of youths and able bodied men as well as increase in the population growth has resulted to significant margin between food demand and supply in Nigeria. While food supply is growing in arithmetic progression, food demand is growing in geometrical progression. This situation no doubt resulted to high costs of farm labour and has necessitated Agricultural Mechanization in Nigeria Chinwe and Madukwe (2013). Equally, this situation of low profitable margin in Agricultural production occasioned by persistent employment of traditional technologies in food production and processing occasioned by persistent employment of traditional technologies that encourages drudgery, intensive use of labour and unprofitable capital investment have given need for agricultural mechanization (Alimba and Akubuilo, 2002).

Mechanization as a process involves all types of tools, implements, power machines and other agricultural equipment in the form that can boost Agricultural production and development. Earlier research report by Mithal *et al*., (1988) has viewed Agricultural Mechanization as instrument for higher farm production, a saving device, operationally effective, specific and cost-effective. Keswet (2006) added that effective agricultural mechanization the world over, requires appropriate awareness through realistic grassroot orientation and enduring extension system necessary in stimulating appropriate use of agricultural technology among farmers.

Kano State Agricultural and Rural Development Authority and Technology Business Incubation Centre are two basic government owned institutions with mandate to achieve agricultural and rural development in the State. Till date, there is paucity of information on the linkages between these two organisation as they work together to achieve set objective. This study investigated these linkages so as to obtain first-hand information on the inter-organisational relationships. In order to achieve this goal and bridge the widening gap in knowledge, the following research questions were asked: What are the nature and extend of inter-agency coordination between the two agencies; what are the roles of the agencies towards agricultural mechanization in the study area and what are the impediments to effective linkages among the two development agencies.

1.1 Objectives of the Study

Specifically, the objectives seek to:

(i) Determine the nature and forms of inter-agency coordination between the two agencies;
(ii) Ascertain the roles of the agencies towards agricultural mechanization in Kano State; and
(iii) Identify constraints to effective linkages among the development agencies.

II. METHODOLOGY

The study was conduct in Kano State of Nigeria; which lies within latitudes and longitudes. There are 3 agricultural zones and 44 local government areas; with

International Journal of Agriculture Innovations and Research
Volume 4, Issue 3, ISSN (Online) 2319-1473

total population of 9,383,682 people (NPC, 2006). A combination of purposive and random sampling techniques was used to select 100 respondents; 50 from each organisation. Primary data sourced through field survey with the use of questionnaire were analysed; using descriptive and inferential statistics. Objectives I and II were analysed using descriptive statistics such as frequency distribution tables and percentages, while factor analysis was used in the analysis of objective III.

III. Results and Discussion

The results and discussion were discussed according to the objectives of the study.

3.1 Nature and Forms of Inter-Agency coordination between the two agencies.

The result of the data analysis on the nature and forms of inter-agency coordination between the two agencies is shown in Table I.

Table 1: Percentage Distribution of the Nature and Forms of Inter-Agency Coordination between KNARDA and TBIC in the Study Area

Nature and Forms of Mechanization	Nature and forms of coordination observed							
	KNARDA				TBIC			
	Formal		Informal		Formal		Informal	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Incubation	0	0	0	0	0	100.0	0	0.0
Research	20	40.0	30	60.0	40	80.0	10	20.0
Training	45	90.0	5	10.0	25	50.0	25	50.0
Personal Contact by Field staff/extension	35	70.0	15	30.0	10	20.0	40	80.0
Provision of information on availability and prices of farm tools	40	80.0	10	20.0	5	10.0	45	90.0
Group Demonstration method	30	60.0	20	40.0	25	50.0	25	50.0
Agricultural shows of farm machinery	25	50.0	25	50.0	20	40.0	30	60.0
Field day/Technical exhibitions	27	54.0	23	46.0	15	30.0	35	70.0
Use of posters/users manuals	36	72.0	14	28.0	20	40.0	30	60.0
Exploration/exchange visits to market output services	12	24.0	38	76.0	0	0	10	20.0
Use of radio and Television programme on farm mechanization.	30	60.0	20	40.0	40	80.0	10	20.0

Source: Field Survey, 2015.

The table showed that formal inter-organizational coordination or linkages existed between KNARDA and TBIC with areas of research, training, use of radio and television programme on farm mechanization while in some case, there exist informal relationship in the area of incubation of farm mechanization packages. The result of Isife and Onyeocha (2014) on areas of inter-organisational relationship among the organisations they studies is closely related to the findings of this study. But, Onyeocha (2014) observed that the major focus of the relationship of the development agencies is to help raise the standard of living of farmers by their own efforts using their own resources and teaching the farmers improved practices to aid processing of agricultural produce. However, Isife (2000) advanced that inter-agency linkages are the major avenue for exchange of technologies, materials and knowledge needed for effective work of any extension organisation. Thus, the need for effective inter-agency relationship cannot be overemphasized. According to Tugru and Ajit (2002), linkages are designed to optimize distinctive goal of the agencies under agency's specific constraints and component constraint. Invariably, interaction among agencies could lead to solution of the problems faced by individual agency and subsequently enhance improved performance of the system.

3.2 Roles of the Agencies (KNARDA and TBIC) towards Agricultural Mechanization.

The roles of the agencies towards agricultural mechanization were ascertained and presented in Table 2.

Table 2: Respondents view on Activities in which their organization were involved in Agricultural Mechanization Activities

Activities	KNARDA		TBIC	
	Frequency	(%)	Frequency	(%)
Providing Agricultural Mechanization to farmers (Equipment, tools, and implements).	40	80.0	50	100.0
Supervising farmers to ensure utilization of farm mechanization packages, Technology Equipment, etc	43	86.0	45	90.0
Teaching farmers improved farm mechanization practices.	49	98.0	40	80.0
Monitoring the progress of farmers' implementation of recommend improved farm mechanization packages.	44	88.0	39	78.0
Promoting the development of cooperative society/associations.	25	50.00	11	22.0
Assisting farmers in obtaining farm mechanization equipments/input	42	84.00	10	20.0
Ensuring proper loan repayment by farmers	39	78.00	10	20.0
Determine the worthiness of Agricultural mechanization	36	72.0	35	70
Providing of enabling environment for incubation of farm mechanization Technologies	0	0	50	100.0

Source: Field Survey, 2015.

The result of data analysis in Table 2 showed that both organisations were involved in providing agricultural mechanization facilities to farmers; supervising farmers to ensure proper utilization of farm mechanization packages, technologies and equipment as well as teaching farmers effective and improved farm mechanization practices among others.

3.3 Constraints to Effective Linkages among the Development Agencies

Factor analysis was used to identify and isolate specific constraints limiting coordination of the two agencies. The result obtained is presented in Table 3. From the data obtained through field survey, five (5) major constraints were extracted based on the responses of the respondents. Only variables with constraint loading of 0.40 and above at 10 % overlapping variance (Ashley *et al*., 2006, Madukwe, 2004) were used in naming the factors. Variables that loaded in more than one constraint or those which did not load high in any of the factors such as poor organizational understanding on the importance of inter-agency coordination, inadequate work environment, cultural barrier among farmers and lack of group participation were discarded. The next thing to do as reported by Kessler (2006) was given each constraint a denomination that best describes or characterizes the set of variables contained in it. In this regards, the variables were grouped into five (5) major constraints as Constraint 1 (Administrative constraint), Constraint II (Financial constraint), Constraint III (Institutional constraint), Constraint IV (Technical constraint) and Constraint V (Social constraint).

Table 3: Varimax Rotated Component Matrix on Constraints Limiting Coordination Activities of the two Agencies in Agricultural Mechanization Technology Transfer

	Constraints				
	1	2	3	4	5
Absence of formal coordinating body	.716	-.041	-.152	-.303	-.043
Lack of budgetary provision and financial support	.231	.905	.028	-.090	.077
Poor government policy on Inter-agency relation	-.117	-.027	.597	-.054	.003
Poor organizational understanding on importance of inter-agency coordination	.015	.227	.267	.042	-.134
Lack of staff training on relevant equipment/Operational and mechanization, technology development package	.119	.242	.724	-.108	-.073
Farm mechanization budget implementation deficit	.629	.278	.034	.029	.077

Procedural delay in farm mechanization policy formulation and implementation	.688	-.064	.014	-.100	.238
Streamlined condition for inter-organizational relationship	.770	.267	.265	.126	-.712
Inadequate work environment	-.498	.042	-.292	.004	-.180
Cultural barrier among farmers	.145	.016	.157	-.638	.024
Poor socio-economic conditions of farmers	.017	.287	.292	.070	.403
Inadequate land space for agricultural mechanization	.032	.251	.212	-.047	.923
Inadequate field staff	.281	.234	.651	.112	.160
Inadequate Professional staff for machinery fabrication and operation	.145	-.040	.120	.820	-.038
Inadequate technical skill of available staff	.071	.263	.057	.703	-.102
Frequent breakdown of farm and agro machinery	-.250	-.053	-.028	.602	.147
Inadequate supporting rural infrastructure	.064	-.249	.555	.123	.274
Lack of appropriate market	.119	.242	.724	-.108	-.073
Lack of credit facilities	.016	.785	.034	.029	.077
Inadequate extension staff training on agricultural mechanization	-.688	-.064	.814	-.100	.238
Inadequate extension contacts with farmers on agricultural mechanization	.770	.267	.265	.126	-.712
Uncooperative attitude of farmers	-.498	.204	-.292	.004	.809
Poor rural leadership	.145	.016	.157	-.638	.524
Poor maintenance schedule in the use of farm mechanization	.021	.391	.291	.810	.110
Lack of feedback	.632	.251	.012	-.047	-.023
Poor means of communication	.281	.734	-.351	.112	.160
Bureacracy/Red Tapism	.453	-.040	.120	.220	-.038

Source: Data Analysis, 2015.

After careful examination, the variables that loaded high in factor one were grouped and named administrative constraints. These were: absence of formal coordinating body; farm mechanization budget implementation policy formulation and implementation; unstraeamlined conditions for inter-organizational relationship, inadequate extension contacts with farmers, lack of feedback and bureaucracy/red tapism.

Similarly, factor two was considered and named financial constraint because the variables that loaded high under it related to financial issues. These were: lack of budgetary provision and financial support; lack of credit facilities and poor means of communication.

Factor three was considered and named institutional constraint due to high loading variables under it which were induced by institutional weaknesses. These were: poor government policy on inter-agency relation, lack of staff training on relevant equipment/operational and mechanization technology developmental packages, inadequate field staff, inadequate supporting rural infrastructure, lack of appropriate market and inadequate extension staff training on agricultural mechanization.

In the same vein, factor IV was considered and named technical constraint because most of the variables that loaded high under this factor were closely related to technical issues. These were: inadequate professional staff for machinery fabrication and operation, inadequate technical skill of available staff, frequent breakdown of farm and agro machinery and poor maintenance schedule in the use of farm mechanization.

Finally, factor V was considered and named social constraint due to the variables that loaded high under it. These were: poor socio-economic conditions of farmers, inadequate land space for agricultural mechanization, uncooperative attitude of farmers and poor rural leadership.

The findings of this study is consistent with the result of other researchers such as Rasouli et al ., (2009) who observed that small farming and scattered agricultural holdings present itself as a major inhibiting factor affecting agricultural mechanization. While Blachandra (2003) noted that the main constraint on farm mechanization was small farm size and fragmentation of holdings. IFPRI (2010) also identified small farm holdings due to land tenure and poor capital base as a serious bottleneck to agricultural mechanization in developing countries.

Generally, the institutional constraints identified by this study have been identified by other researchers as key factors limiting government and private sectors' efforts in implementing agricultural development programmes in Nigeria (Isife and Igbokwe, 1998; Isife and Emah, 2000; Abali, 2000).

IV. Conclusion

The study established that the agricultural and rural development agencies studied (KNARDA and TBIC) operating in the study area had similar objectives and targets. In their development programmes and projects, linkage mechanization existed among them through

sharing of ideas, knowledge and material resources to enhance their activities. This needs to be strengthened to enhance overall performance of the agencies.

RECOMMENDATIONS

Based on the findings of this study, it was recommended that:

(i) There should be serious commitments to improve linkage facilities, adequate funding, update of professional knowledge of extension personnel by the government.

(ii) Efforts should be geared by the NGOs and concerned institutions to strengthen the linkage system of the agencies to ensure efficient service delivery.

(iii) Sufficient funds should be made available for research purpose to the concerned agencies to facilitate the process of development, incubation and transfer of improved technology on agricultural mechanization package.

(iv) Land should be made available to farmers while equipment should be subsidized.

REFERENCES

[1] Abali (2000).An Appraisal of the Rural Development Projects of Nigerian Agipoil Company in Orashi Region, Rivers State.An Unpublished Msc Thesis Department of Agricultural Economics and Extension, Rivers State University of Science and Technology Port Harcourt. P50.

[2] Alimba, J.O and C.J.C Akubuilo (2002). Assessing the consequences of technological change on enterprises in Southeastern Nigeria by the use of factor analysis. *Agricultural Systems* 74 (2002): 257-270.

[3] Ashley C. Maxwell S (2001). Rethinking Rural Development. *Journal of Development Policy Review,* 19(4): 395-425.

[4] Blachandran, P.G. (2003). Constraints on diffusion and Adoption of Agro-mechanical Technology in Rice cultivation in Kerala: available online at: http:llkkrpeds.org.publication/downloads/ 59.pdf

[5] Chinwe, J.O and Madukwe, M.C (2013). Linkage Level among climate change actors in agricultural innovation system in Southeast Nigeria. *Journal of Sustainable Development in Africa* 15 (5): 1520-5509

[6] Isife, B. I and Onyeocha, V. C. (2014). Analysis of linkages among organisations involved in Agricultural and Rural Development of Ogba Area in Rivers State, Nigeria. *Arabian Journal of Business and Management Review* 2 (9): 36-42.

[7] Isife, B. I, (2000).An analysis of Non-government Agricultural Extension system in south Eastern Nigeria. A Ph.D Thesis, Department of Agricultural Extension, University of Nigeria Nsukka. 233p

[8] Isife, B. I. and Emah J.O. (2001). Linkages between Non-governmental Agricultural Extension system and Technology Generation and utilization sub-systems in South Eastern Nigeria. The *Nigerian Agricultural Journal,* 32: 174-187.

[9] Keswet, A D. (2006). A Review of Small Farms Mechanical Power Development in Developing Countries; proceeding of the 20th Annual National Conference of Farm Management Association of Nigeria; pp. 42-46.

[10] Mittal, V.K. Mittal, J.P; and Hauvan, K. C. (1988) Research Digest on Energy Requirement in Agricultural Development; Digest published by Coordinating Research cell; All Indian Coordinated Research Project on Energy Requirement in Agricultural Sector; C. College of Agric Eng. B. Agric University Ludhiana