Characteristics of Linkages between Kano State Agricultural and Rural Development Authority (KNARDA) and Technology Business Incubation Centre (TBIC) in Agricultural Mechanization in Kano State, Nigeria

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Abstract: *The characteristics of linkages between Kano State Agricultural and Rural Development Authority (KNARDA) and Technology Business Incubation Centre (TBIC), Kano in Agricultural Mechanization was studied. The study employed both purposive and random sampling Techniques in the selection of 100 respondents; 50 from each agency. Primary data were sourced directly from the respondents through the use of a well-structured questionnaire. Only descriptive statistics such as frequency distribution tables and mean scores generated from a 5-point likert scale were used. Result showed that organizing training (42%), linking with other organizations (24%), introduction of Animal bull and grain threshes (20%) among others were specific organizational strategies implemented by KNARDA. But, designing and fabrication of local equipment (38%), linking with other organization (32%) and organizing trainings (30%) were undertaken by TBIC. The information needed by the organizations to enter into inter-organizational programmes: was similar programme goals (98% KNARDA and 90% TBIC) among others. Further analysis revealed areas that both organizations were willing to enter into cooperative relations as well as their perceived need for cooperation. It was concluded that total commitment to institutional linkages is a sine quanone to development effort of the agricultural and rural development agencies studied. Necessary recommendations such as giving maximum support for local fabrication industries to ensure efficient service delivery and was made among others.*

Keywords: Characteristics, linkages, Agricultural mechanization, KNARDA, TBIC, Kano State, Nigeria

Introduction

In advanced countries, most of the farm operations have been mechanized. In this regard, bull dozers are used for clearing the farm and felling of trees, while tractor mounted instruments like ploughs and harrows are used in tiling the soil. In addition, there are planters, ridge making machines, cultivators, spraying machines and machines for applying fertilizers. Many types of harvesters are now available and there are machines used for processing agricultural produce for many purposes. Agricultural Mechanization indicates the use of Mechanical technologies to cause an increase in Agricultural production (Keswet and Haggai 2006). It is a process involving use of implements, machines with diverse power source and injection of extra capital into farming system with the aim of reducing drudgery, cost and increasing output (Morris, 1983).

According to Pawlack, Palletize and Fiala (2000), agricultural mechanization and mechanical power technology must be designed and developed towards solving emerging problems in a complex society such as Nigeria; which has been under soaring poverty, unemployment and poor education despite her rich and abundant natural resources. With the current low level farm power supply, withdrawal of labour from Agriculture, low labour productivity and ineffective farm operations in Nigeria, farm mechanization should assume very important role in increasing food output and ensuring food security (Ume, 1988).

Two governments owned institutions in charge of agricultural mechanization and rural development in Kano State were KNARDA and TBIC. There seem to exist a gap in knowledge of the characteristics of linkages between these two organizations. Till date, no empirical study has examined the characteristics of linkages between KNARDA and TBIC in the study area. This necessitated this study. In order to achieve the objectives of this study, answers to the following research questions were sought: What are the organizational features and operational strategies of the two agencies? What are the information needed for inter-organizational cooperation and areas of willingness for the cooperation? What are the perceived needs for cooperation among the two agencies?

1.1 Objectives of the Study

Specifically, the objectives seek to:
(i)   ascertain and describe the organizational features and operational strategies of the two agencies;
(ii) determine the information needed and areas of willingness for perfect inter-organizational relationship among the two agencies; and
(iii) identify areas of perceived needs for cooperation between KNARDA and TBIC.

1. Methodology

This study was conducted in Kano State of Nigeria. Purposive and random sampling techniques were used to select a total of 100 respondents; 50 from each organization. Primary data were collected through field survey by a well-structured questionnaire which was distributed to the respondents. The data collected were analyzed using descriptive statistics such as percentages and mean scores generated from a 5-point likert scale.

2.1 Model specification

2.2 Likert Scale Rating

The forms of inter-organizational relationships; levels and strengths of involvement/participation; and levels of agreement on the perceived factors that facilitate and/or impede the inter-organizational coordination by the staff of the two agencies were analyzed using a five (5) points Likert Type Scale responses. In using 5 points Likert type scales or rating, the response ranged between very great extent/very strongly agree with assigned value of 5 and very small extent/strongly disagree with assigned value 1 with decision rule of 3. The rating ranged from 5 – 1 as follows:

To a very great extent/very strongly agree 5
To great extent/strongly agree 4
To a moderate extent/agree 3
To a small extent/disagree 2
To no extent/strongly disagree 1

Likert formula $x = \frac{\sum fn}{Nr}$

Where:

$\overline{x}$ = Mean Score
$\sum$ = Summation
f = Frequency of each (5, 4, 3, 2, 1) option
n = Likert numerical values (responses of the respondents)
Nr = Number of respondents to each response category (total number of respondents)

2. Results and Discussion

The results and discussion were done according to the objectives of the study

3.1 Organizational Features and Operational Strategies of the two Agencies.

It was necessary to ascertain and describe the organizational structures and operational strategies of KNARDA and TBIC in the study area. The result obtained is shown in Table 1.

From the respondents (staff of KNARDA and TBIC) point of view in Table 1, majority (84.0% and 96.0%) of the KNARDA and TBIC staff asserted that their organization have implemented some operational strategies as a measure to enhance agricultural mechanization. The specific organizational strategies implemented by KNARDA were organizing training (42.0%) linking with other organization (24.0%) introduction of animal bull and grain threshers (20.0%) and granting of loan to farmers to buy or hire tractors (14.0%).

On the other hand, about 38.0% of the TBIC staff asserted that nature of their organization strategies implemented by TBIC were designing and fabrication of local equipment, linking with other organizations (32.0%) and organizing training (30.0%). As regards the funding of the organizational/agricultural mechanization activities, the KNARDA staff asserted that all (100.0%) were funded by the state government. On the other hand all (100.0%) of the TBIC staff asserted that both federal and state government of Nigeria funded their agricultural mechanization activities.

From the foregoing funding scenario, it could be deduced that both the federal and state government played a great role in funding the agricultural mechanization. However, in Kano State, the state government played a greater role in funding KNARDA activities, could be attributed to the fact that KNARDA belonged to state government. Data in Table 6 further showed that all (100%) respondents (both staff of KNARDA and TBIC) considered it normal to be reporting to the persons they were reporting. They reported to different persons based on their different units and the organizational structure. These include Director/Chief Executive Officer (CEO), Programme Controller, Manager, Area Programme Controller, Head of Department and individual's immediate supervisors.

Table 1: Organizational Features and Operational Strategies of TBIC and KNARDA (N=100).

Variables	KNARDA		TBIC	
	Frequency	%	Frequency	%
Have the organization implemented some operational strategies as measure to enhance Agricultural mechanization				
Yes	42	84.0	48	96.0
No	8	16.0	2	4.0
Nature of the organizational strategies				
Designing and fabrication of local equipment	-	-	19	38.0
Introduction of animal bulls and grain threshers	10	20.0	-	-
Linking with other organizations	12	24.0	16	32.0
Loan to farmers to buy tractors	7	14.0	-	-
Organizing training	21	42.0	15	30.0
Funding of organizational/agricultural mechanization activities				
Federal government	-	-	-	-
State government	50	100.0	-	-
Private organization and NGO	-	-	-	-
Individuals	-	-	-	-

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Federal and state government	-	-	50	100.0
Person whom workers report programme and problem to				
-Director/CEO	-	-	20	40.00
-Programme controller manager/APC	18	36.0	-	-
-Area directors	4	8.0	-	-
-Head of Department	12	24.0	11	22.0
Other (immediate supervisor)	16	32.0	19	38
Do you consider it normal to be reporting to person(s) you are reporting to				
Yes	50	100.0	50	100.0
No	-	-	-	-

Source: Field Survey, 2015.

3.2 Information needed and Areas of Willingness for Perfect Inter-Agency Coordination between the two Agencies

The result of data analysis shows that in any inter-agency programme relevant to Agricultural Mechanization created for organization to participate, both organization would need some information to participate meaningfully as indicated in Table 2. Ninety-Eight (98.0%) of KNARDA personnel and 96.0% of TBIC staff would want the programme goals to be similar to their respective organizations. Eighty percent (80.0%) and Eighty-Eight percent (88.0%) of staff and personnel of KNARDA and TBIC responded that they would want to know the detailed cost of the programme.
The result of data analysis in Table 3 shows that TBIC was willing to collaborate with KNARDA in all the areas identified except in determining the suitability of farmers holding for mechanization and personal integrity which scored less than the cut-off point (x = 2.6) and was rejected. Others were accepted because their mean scores were above the decision point of (3.0). The grand mean of all the responses given by the respondents was 3.9.

The result of field survey result analyzed in Table 4 shows that KNARDA was willing to enter into cooperative relationship with TBIC in all the areas mentioned. This is because the mean scores of the respondents were greater than the decision point of (3.0). The average mean score of the responses of the respondents was 3.9.

Table 2: Percentage Distribution According to Information Needed by Organisation to enter into inter-organisational Programmes

Information Needed	KNARDA		TBIC	
	Frequency	(%)	Frequency	(%)
That programme goals are similar to those of the organisation.	48	98.0	46	96.0
Detailed Cost of programme	40	80.0	44	88.0
That the organisation would have clearly designed objectives responsibilities for programmes should be clearly spelt out.	38	76.0	40	80.0
That public recognition will be distributed among the organisations.	9	18.0	11	22.0
That budgetary provision and funds allocation will be streamlined among the organisation.	4	8.0	0	0.0
That provision should be made for equal and commensurate career opportunities among beneficiaries.	2	4.0	4	8.0
That our organisations would have some Administrative Authority for the programme.	13	26.0	17	34.0

Source: Field Survey, 2015.

Table 3: Mean Score Analysis on Area of Farm mechanization Technology Development Incubation and Transfer that TBIC are willing to enter into Cooperative Relations with the KNARDA.

Area of Agricultural Mechanisation Activities	Mean score ($\bar{x}$)	Remarks
Inform farmers of sources, costs, objectives and scope of farm mechanisation	4.3	Accept
Assist farmers prepare farm and home plan.	3.7	Accept
Assist farmers procure farm mechanization technology implement and machines	3.3	Accept
Assist farmers to form cooperative societies.	3.7	Accept
Identity genuine farmers for the TBICS	4.5	Accept
Determine actual farm mechanisation needs of farmers	3.3	Accept
Determine suitability of farmers form holding for mechanization and personal integrity of farmers.	2.6	Reject
Educate farmers on the need for application of application of farm mechanisation and personal	4.0	Accept

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integrity of farmers		
Notify TBICS of farm mechanisation Technology packages needed by farmers.	3.8	Accept
Notify KNARDA on the cost of farm Mechanisation Technology Packages and	3.7	Accept
Advice TBIC on the mode of distribution of farm mechanisation Technology packages.	4.0	Accept
Ensure appropriateness of farm mechanisation Technology packages with respect to arranged procurement, and replacement, (quantity and quality place) time and place.	4.0	Accept
Ensure sufficient security against claim and impersonation in delivery of farm mechanisation input	4.2	Accept
Teach farmers better farm mechanisation practices/techniques	4.7	Accept
Educate farmers families improved living condition	4.3	Accept
Advice farmers on the use of farm labour in agricultural mechanisation process i.e. work schedule, chore routine, management of hired labour, and labour saving equipment).	4.1	Accept
Help farmers to keep farm account and production records.	4.5	Accept
Monitor the farmers' performance (close supervision).	4.6	Accept
Apply timely advice rectify faults	4.6	Accept
Promote attitude of saving among farmers	3.7	Accept
Predict farmers expectation to application of farm mechanisation technology packages	4.0	Accept
Advice farmers on profitable markets for their farm routes, marketing agencies, board's authorised agents) prices and other auxiliary services for their farm produce.	4.2	Accept
Planning for farm mechanisation technology packages procurement schedules to conform to their income.	3.6	Accept
Reminding farmers about farm mechanisation cost repayments instalment due or about to be due.	3.9	Accept
Grand mean		**3.9**

Source: Field Survey, 2015.

VEG = very great extent
GE = great extent
ME = moderate extent
SE = small extent
NE = no extent

Table 4: Mean scores Analysis on that Areas the KNARDA are willing to enter into cooperative Relationship with the TBIC

Areas of Agricultural Mechanisation Activities	Mean Score	Remarks
Inform farmers of sources, cost, objectives, and scope of farm mechanisation Technology.	4.2	Accept
Assist farmers to procure farm mechanisation technology Implements and machines.	3.1	Accept
Assist farmers prepare farm and home plans.	3.8	Accept
Assist farmers to form cooperatives.	3.6	Accept
Identify genuine famers for the TBICs.	4.4	Accept
Determine suitability of farmers' farm holding for farm mechanisation and personal integrity of farmers.	3.3	Accept
Determine Actual farm mechanisation need of farmers	3.6	Accept
Educate farmers on the need for Application of farm mechanisation technology packages.	4.0	Accept
Notify TBIC of farm mechanisation Technology Packages need by farmers.	4.0	Accept
Notify KNARDA on the costs of farm mechanisation Technology packages and services.	4.1	Accept
Notify TBICs on the most ideal appropriate time/period for farm mechanisation services.	4.4	Accept
Advise TBICs on the mode of disbursement of farm mechanisation Technology packages.	4.3	Accept
Ensure appropriateness of farm mechanization Technology packages with respect to arranged procurement and replacement (quantity and quality), time and place.	4.0	Accept
Ensure sufficient security against claim and impersonation in the delivery of farm mechanisation input.	3.6	Accept
Teach farmers better mechanisation practices/techniques.	4.7	Accept
Educate his entire family's improved living condition.	3.5	Accept
Help farmers keep farm account and production records.	4.0	Accept
Monitor farmers' performance (close supervision).	4.6	Accept
Apply timely advice to rectify faults.	3.6	Accept
Promote attitude of savings among farmers	3.2	Accept
Predict farmers' expectation to application of farm mechanisation Technology Packages.	3.8	Accept
Advise farmers on profitable markets (routes, marketing Agencies, boards, authorised agents) prices and other auxiliary services for farm produce.	3.8	Accept
Planning for farm mechanisation Technology packages, procurement schedules to conform to their income.	3.4	Accept
Reminding farmers about farm mechanisation cost repayments instalment due or about to be due.	3.8	Accept
Grand Means	**3.9**	

Source: Field Survey, 2015.

3.3 Areas of Preference/ Perceived Need for Inter-Agency Cooperation between the two Agencies

The result of data analysis in Table 5 shows the percentage distribution of perceived need for cooperative action among the two agencies. Result shows that in all the items identified, the two agencies are willing to come into cooperation in order to improve the effectiveness of agricultural mechanization, technology incubation, development and transfer to the farmers in the study area. This is true because linkages are designed to optimize distinctive goals of agencies. While Isife and Emah (2001) advanced that inter-agency linkages are the major avenue for exchange of technologies, materials and knowledge transfer needed for effective work of any extension organization.

Table 5: Percentage Distribution of Perceived Need for Cooperative Action among the two Agencies

Items	KNARDA		TBIC		Total 100
	Frequency	%	%	%	
Collaborative effort by TBIC and KNARDA staff will result in a measurable change in Agricultural Mechanisation, Technology, Development, Incubation and Transfer.	44	88.0	36	72.0	80.0
Collective action by TBIC and KNARDA staff will result in Agricultural Mechanisation Technology, Incubation and Transfer than will yield better the efforts of several groups which act independently of one another.	46	92.0	48	96.0	94.0
Agricultural Mechanisation Technology Development Incubation and Transfer will not be successful until TBIC and KNARDA learn to cooperate in pursuit of goals large than their own specific goals.					
Organisations which participate in activities related to agricultural Mechanisation Technology Development Incubation and Transfer may should cooperate in a unified effort.	45	90.0	47	94.0	92.0
Although participation in joint Agricultural Mechanisation Technology Development Incubation and Transfer never aid our organisation in achieving its specific objectives, we still have a responsibility to contribute to the larger effort.	50	100.0	50	100.0	100.0
Total	38	76.0	31	62.0	69.0

Source: Field Survey, 2015.

3. Conclusion/ Recommendations

This study had shown that strong linkages exist between KNARDA and TBIC in Agricultural Mechanization in the study area. There, commitment to institutional linkages is a sine quanone to development effort of the agricultural and rural development agencies. Based on the findings of this study, the following recommendations were made:

1) The government should encourage and as well give maximum support for local fabrication industries to ensure constant supply of spare parts of agricultural equipment.
2) Efforts should be geared by the NGOs and concerned institutions to strengthen the linkage system of the agencies to ensure efficient service delivery.
3) There should be review of land tenure system as well as land policies to ensure availability of large expanse of land to crop farmers who are limited by land as they strive to adopt agricultural mechanization technology packages in the study area.

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