Innovation Transfer Practice Among Universities and Research Institutes. A Panacea for Entrepreneur Development.

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ABSTRACT

The study examine the innovation transfer practice among universities and research institutes in north central zone of Nigeria, examined socioeconomic characteristics of the respondents in the study area, identify specific areas of innovation transfer practice, compare innovation transfer practices among ARI's and Universities and identify constraining factors hindering innovation transfer practices. One hundred and sixty academic staff and research scientists were randomly selected from Universities and research institutes respectively giving a total of three hundred and twenty (320) respondents. Validated questionnaires with reliability coefficient of r=0.92 was used to elicit data. Data collected were analysed using descriptive statistics, likert-scale, T-test and Factor analysis. Major areas where the Universities and research institutes form strong linkages for innovation transfer were categorizing farmers according to needs ($\bar{x} = 3.57$) and disseminating innovation through farmers' existing communication channels ($\bar{x} = 3.56$). Universities differed from research institute in areas of conducting short in-house staff training t=6.11;P<0.05) and Knowledge of rural dynamics t=10.78;P<0.05). Factors constraining transfer of innovation by respondents for entrepreneur development are top down decision making procedure (agein value= 0.801) and Limited ICT facilities (agein value=0.796). It was recommended that decision making process should be demand driven so that the interest of young entrepreneur would be taken in to cognizant for innovative stride.
Key words: Innovation, Constraining Factor, Innovation transfer, and innovative stride.

INTRODUCTION

Background of the Study

Globally, Universities are recognized as the center for production of knowledge accumulation and knowledge transfer through research and scholarship. Universities all over the world are mandated to perform three functions, namely teaching, research and community service with the overall aim to produce trained manpower for essential areas of social and entrepreneur development (Okiki 2013). Nirman (2007), assert that the mission of higher education is to advance knowledge, create knowledge, disseminate knowledge through research and provide services to the rural farm families and entrepreneur development.

In African, agricultural innovation is complex set of functions and linkages. In order to increase agricultural productivity, farm house-hold income and entrepreneur development, innovation has to be interactive, whereby farmers, farm organizations, research, extension, input suppliers, non-governmental organizations, young entrepreneur and other agencies work together in a coordinated manner (Swanson and Claar, 2004).

Nigeria agricultural innovation transfer policy emphasized transfer of technical information on specific cash crop using regional Ministry of Agriculture (MOA) in the North, West and East. The establishment of agro-research institute, namely: Institute of Agriculture Research (IAR) in the north; Moor plantation in the West; and National Root Crop Research Institute (NRCRI), Umudike in the east, is to link research and extension services. After independence the main focus of agro-innovation transfer policy was food production through the Federal and states ministry of agriculture. However, it was the sole agency responsible for agro-innovation transfer until the 1976 local government reform (LGR; Mijindadi, 1983).

In Nigeria, the aim of establishing the research institutes and universities are imperative, but the issues of establishing a cordial relationship between institutional technology design among actors such as young entrepreneurs constitute critical issues in innovation transfer in Nigeria Universities and Research Institutes. More so, there are obvious challenges in instituting efficient collaboration and linkages among various agencies for greater innovative stride. The findings will inform the policy makers the opportunity of designing and implementing holistic and regional approach and appropriate strategies for tackling the problems associated with innovation transfer to meet need of farm families in rural communities and young entrepreneurs for social and economic development.

1.3 Objectives of the Study

The main objective of the study is **to examine the innovation transfer practices among research institutes and universities for entrepreneur development.**

The Specific Objectives are to:

1. describe the socio-economic characteristics of the respondents in the study area.
2. rating specific areas of innovation transfer practice for entrepreneur development
3. **compare innovation transfer practices among Agricultural Research Institutes and Universities for entrepreneur development**
4. **identify constraining factors hindering innovation transfer practices.**

Methodology

The study was conducted in North Central Agro-Ecological Zone of Nigeria. The region occupies a total land of 296,898km^2 representing about 32% of the land area of the country. It is located between latitude 6^O 30^1 N to 11^O 20^1 N and Longitude 2^O 30^1 E to 10^O 30^1 E . The region has two main season; namely dry and wet season, with the wet season beginning toward

the end of the March and ends at the October, While the average of 187 to 220 rainy days with average monthly temperature ranging from 21^{o} C to 37^{o} C. The vegetation of the zone consists of the forest Savanna Mosaic, Southern Guinea Savanna and the Northern Guinea Savanna. Geographically, the zone is characterized by varying landforms such as extensive and swampy features which are common in the lowland areas which occurs in the areas along the valleys of Niger and Benue rivers, alongside deep valleys, large hills, mountains and plateaus,. The vegetation, soil and weather pattern are favourable for production of wide spectrum of agricultural food, industrial and cash crop of various types. The study was conducted in North Central agro-ecological Zone of Nigeria. Niger and Kwara was purposively selected for the study. Their selection was based on the existence of University with agro transfer outreach programme and functional research institutes. A total of 320 respondents were sampled representing 58% of the established sampling frame of 550. A validated questionnaire which was subjected to Cronbach's Alpha reliability test (r= 0.85) was used for data collection. Data were collected on the respondent's socio-economic characteristics, specific areas of innovation transfer practice, linkage types used for innovation transfer, **innovation transfer practices among ARI's and Universities, constraining factors hindering innovation transfer practices.** Age, research experience were measured in years; while house hold size was measured in number. specific areas of innovation transfer practice were measured by asking the respondents to indicate their specific area of interest. **Innovation transfer practice were measured by asking the respondents to rate nine possible transfer practice on four point** four point Likert scale of non-existed (4) weak (3) somewhat strong (2) quite strong (1). The mean value obtain were use to carry out t-test for **innovation transfer practices among ARI's and Universities. Constraining factor to innovation transfer practice were measures by identifying Twenty-eight possible constraining variables on f**our possible factors. Factor one (1) was political and/or policy related constraints which includes pressure from policy and

its effect on value, reward and sanctions; factor two (2) was organizational/ institutional constraints; factor three (3) attitude related factors and factor four (4) was poor motivational factors. **Data collected were analyses using descriptive statistics, likert-scale, T-test and Factor analysis.** Field survey for data collection was conducted between January and March, 2017. Data were analyzed using descriptive statistics (frequency, Percentage and mean), T-test and factor analysis.

RESULTS AND DISCUSSION

SOCIO ECONOMIC DISTRIBUTION OF THE RESPONDENTS

Table 1 reveals that majority of university staff about 46.9% were between 41 and 50 years old while majority (59.4%) of research institute respondents were between 31 and 40 years old. This means that universities had relatively older staff than research institute. The implication of this is that large proportion of respondents were young and in active age to face challenges associated with the research activities. The findings reveals that only 12.5% of the respondents from the university system had research experience of less than five years while 56.3% of the research institutes fell in the same categories. This corroborate with findings of Ogungbaigbe (2004) who reported that a relatively inexperienced institution is one with researchers having less than five years of work experience. Also the brain drain and the retirement from service scourge in the past decade must have left behind in the systems, staff with relatively few years of research experience in the research institute. The data in Table 1 shows that about 8.1% of research institutes staff held HND certificates, while none of the university staff was in this category. The study shows that, about 62.5 % of the university respondents had Ph.D, while only 4.4% of the research institutes staff had same qualification. This agreed with the findings of Oyedokun (2000) who reported that universities in Nigeria have higher number of qualified researchers than the agricultural research institutes. More so the table revealed that, majority

(59.4%) of University respondents had house hold size ranging from 6-10. while 90.6% of research Institutes staff had house hold size from 1-5 persons. Universities respondents had more children than their counterpart in research institutes. This may probably be as results of number of dependents and/or probably number of respondents who are Muslim that practice polygamy. Majority (97.5%) of universities respondents were membership of professional bodies while only 2.5% percent of them were non-member. While for research institutes 65.6% were Member of professional while 34.5% were non-member. This means that majority of respondents from both system were membership of professional bodies. The higher percentage of membership for both systems is because belonging to membership of professional bodies of your discipline is compulsory and needed for assessment in promoting academic staff.

Table 1. Socio economic distribution of respondents

Age (years)	Universities n=160	Research Institutes n=160
21-30	18 (11.3)	15 (9.4)

31-40	55 (34.4)	95 (59.4)
41-50	75 (46.9.4)	42 (26.3)
>50	12 (7.5)	8 (5.0)
Mean	*43*	*39*
Research Experience (years)		
1-5	20 (12.5)	90 (56.3)
6-10	85 (53.1)	40 (25.0)
11-15	44 (27.5)	20 (12.5)
>15	11 (6.9)	10 (6.3)
Mean	*15*	*10*
Educational Qualification		
HND	-	13 (8.1)
BSc/ Btech	10 (6.3)	55 (34.4)
MSc/M.Tech	50 (31.3)	85 (53.1)
PhD	100 (62.5)	7 (4.4)
Marital Status		
Single	5 (3.13)	28 (17.5)
Married	155 (96.9)	132 (82.5)
House Hold Size		
1-5	56 (35.0)	145 (90.6)
6-10	95 (59.4)	15 (9.4)
11-15	9 (5.6)	-
Mean	*6*	*4*
Membership of Association		
Member	156 (97.5)	105 (65.6)
Non-Member	4 (2.5)	55 (34.4)

Source; Field Survey, 2017

Rating of Specific Area of Innovation Transfer Practice: Table 2 reveals major area where the Universities and research institutes form greater linkages for transfer of innovation was categorizing farmers according to needs ($\bar{x} = 3.57$). This is in-line with findings of Obibuaku, (1983), who reveals that agro-innovation transfer programmes are directed toward farmers with diverse social, educational, political and economic needs. This mean that categorizing farmers according to their needs will enhance quick response to the innovation been transfer to the farmers. More so, disseminating innovation through farmers' existing communication channels ($\bar{x} = 3.56$)was found to strong channel of innovation transfer.

Table 2: Rating of Innovation Transfer Practice for entrepreneur development (≥2.5)

Innovation Transfer Practice	Universities (n=136)	Research Institutes (n=152)	Pooled	Ranks	Decision
Disseminating innovation through farmers organization	390 (2.86)	250 (1.64)	640 (2.22)	4th	Weak
Categorizing farmers according to needs	478 (3.51)	549 (3.61)	1027 (3.57)	1st	Strong
Orienting existing services to suit client interests	333 (2.44)	267 (1.76)	600 (2.08)	5th	Weak
Disseminating innovation through farmers' existing communication channels	451 (3.32)	573 (3.77)	1024 (3.56)	2nd	Strong
Conducting short in-house staff training	166 (1.26)	284 (1.87)	450 (1.56)	7th	Weak
Provision of training incentives to staff	191 (1.40)	229 (2.16)	420 (1.45)	9th	Weak
Use of demonstration methods	224 (1.64)	326 (2.14)	550 (1.90)	6th	Weak
Use of print and electronic media	321 (2.36)	439 (2.88)	760 (2.63)	3rd	Strong
Knowledge of rural dynamics.	180 (1.32)	260 (1.71)	440 (1.53)	8th	Weak
Overall mean score			$(\bar{x} = \mathbf{2.28})$		Weak

Values in the parentheses are the weighted mean
Field Survey, 2017

Comparison of Innovation Transfer Practice among Universities and Research Institutes for Entrepreneur Developments

The Data in Table 3 shows that research institutes differed from Universities in the areas of Disseminating innovation through farmers organization ($t=1.96;P<0.05$) and disseminating innovation through farmers' existing communication channels $t=2.32;P<0.05$). Entrepreneur were called in later in the research process, usually after the innovation was developed in the process of field testing,. This may be the principal reason why research institute differs from Universities in that aspect. Universities differed from research institute in terms of conducting short in-house staff training $t=6.11;P<0.05$). The reason been that academic staff need updated knowledge to face challenges of the world and more so because Universities were the apex of learning. Other area of differences were; use of print and electronic media $t=2.25;P<0.05$),

Knowledge of rural dynamics t=10.78;P<0.05) and Orienting existing services to suit client interests (t=11.38;P<0.05);

Table 3: T-test results showing differences in agricultural innovation transfer practice between University and research institutes for entrepreneur development

Innovation transfer practice	Universities (max.=4)	Research Institutes (max.=4)	t-cal
Disseminating innovation through farmers organization.	3.36 (.652)+	3.51 (.655)+	1.96*
Categorizing farmers according to needs	3.58 (.509)	3.59 (.613)	0.218
Orienting existing services to suit client interests	3.21 (.999)	1.79 (1.012)	11.38*
Disseminating innovation through farmers' existing communication channels	3.32 (.850)	3.54 (.719)	2.32*
Conducting short in-house staff training	2.86 (.075)	2.18 (.879)	6.11*
Provision of training incentives to staff	1.86 (.986)	1.88 (.943)	0.18
Use of demonstration methods	3.43 (.841)	3.51 (.719)	0.85
Use of print and electronic media	3.38 (.910)	3.59 (.683)	2.25*
Knowledge of rural dynamics.	2.01 (.911)	3.27 (1.028)	10.78*

+ Data in parenthesis are standard deviation
*P<0.05
Field Survey, 2017

Factors Constraining the innovation transfer for entrepreneur developments

Table 4. Showed factor matrix on linkage constraints. Factors base on variable loading were used; four factors were identified and named. Factor one (1) were political and/or policy related constraints which includes pressure from policy and its effect on value, reward and sanctions; factor two (2) were organizational/ institutional constraints; factor three (3) attitude related factors and factor four (4) were poor motivational factors. Items that loaded high in factor 1, (

political/ or policy related constraints), included lack of adequate sources of finance (.327), top down decision making procedure (.801), unclear delineation of function (.689), multiplicity of organization with varying ideologies (.707), management policy (.794 and bureaucratic bottle neck (.770), this agreed with the findings of Farinde (1996), who added that the bureaucratic domination in the Ministry of Agriculture and Natural Resources, under which research institute operates in Nigeria contributes to the in ability of research into meeting technology need of the farmers. Items that loaded high in factor 2, (organizational/institutional constraints) included long administrative procedure/administrative bottleneck associated with public agencies (.667). Inappropriate government policy on agriculture (.665) and influence of international/ donor mandates (.499). Items that loaded high in factor 3, (attitude related factors), included poor differences in orientation of personnel of agencies (.615), lack of farmers interest in extension (.690), general poor attitudes and low morale of extension workers (.789), poor training opportunities for professionals (.488) and wrong view of farmers incapable of taking rational decision (.652). Items that loaded high in factor 4, (poor motivational factor), included: limited physical resources (ICT, telephone) (796) poor access to knowledge and information on new innovation (.783), poor logistics support and incentives for linkage (.431) and traditional public characteristics of most extension information (.346).

Table 4: Factors constraining transfer of innovation by the respondents (0.30)

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Rank
Overlapping mandate/objectives	**.351**	**.398**	-.032	.025	-
Limited qualified human resources in the agencies for linkage leadership	**.373**	.134	.242	**.466**	-
Lack of adequate sources of finance	.327*	.109	.282	.204	19th
Limited physical resources (ICT, Telephone)	.149	.035	.065	.796*	2nd
Poor access to knowledge and information on new innovation	.161	.027	.039	.783*	5th
Low mobility of expert/professionals	-.005	.041	.192	.431*	16th
Poor logistics support and incentives for linkage	-.020	**.354**	.204	**.452**	-
Organizational rigidities	-.079	**.504**	**.452**	.046	-
Long administrative procedure/administrative bottleneck associated with public agencies	.164	.667*	.139	.158	11th
Weak legal frame work/lack of rule for interaction/linkage	-.066	**.715**	-.126	**.320**	-
Poor macro system linkages	.014	**.622**	.163	**.343**	-
Excessive organizational fragmentation	.175	**.470**	.168	**.408**	-
Inappropriate government policy on agriculture	.290	.665*	.107	-.145	12th
Poor/differences in orientation of personnel of agencies	.061	.261	.615*	-.032	13th
Influence of international/donor mandates	.080	.497*	.159	.007	14th
Lack of farmer's interest in extension	.025	.103	.690*	.298	10th
In equality in qualification and salary scale of staff of the agencies	.103	**.553**	**.335**	-.137	-
General poor attitude and low morale of extension workers	.022	.079	.786*	.058	4th
Poor training opportunities for professionals	.163	.276	.488*	.007	15th
Traditional public characteristics of most extension information.	.154	.032	.717	.346*	17th
Poor government commitment to extension	**.326**	.297	**.473**	.014	-
Wrong view of famers incapable of taking rational decision	.080	-.013	.652*	.239	9th
Un equal status among agencies	**.486**	**.400**	.163	.107	-
Top down decision making procedure	.801*	.132	.056	-.052	1st
Unclear delineation of Function	.689*	.071	.129	.006	8th
Multiplicity of organization with varying ideologies	.707*	.112	-.007	.293	7th
Management policy	.794*	-.090	.128	.039	3rd
Bureaucratic bottleneck	.770*	.160	.021	.197	6th

Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
*Sig Extraction
- overlap
Field Survey, 2017

Conclusion and Recommendations

It was concluded that decision making process were top-down which make it very difficult to catch the interest of young entrepreneur for innovative stride. More, so, categorizing young entrepreneur (farmers) according to needs and dissemination of innovation through entrepreneur's (farmer's) organization were the major areas where the universities and research institutes form strong bond for innovation transfer for entrepreneur development. It was recommended that decision making process should be demand driven so that the interest of young entrepreneur would be taken in to cognizant for innovative stride.

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