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Capabilities of Universities in Achieving the Agricultural Transformation Agenda in Nigeria: Evidence from Climate Change Study in Southeast, Nigeria.

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Abstract
The study examined the capabilities of universities in combating the problems of climate change towards increased food production. A total sample size of 79 respondents selected from universities in Southeast, Nigeria was used. Data were collected with the use of questionnaire and analyzed using descriptive and inferential statistics including percentage and factor analysis. All (100%) the respondents had no capability in acquiring machines and equipment needed for teaching and conducting researches on climate change. Majority (85%) of the respondents had no capability in terms of human resource development with regards to climate change. Funding/manpower (0.657), organizational (0.575) and weak policy (0.565) related factors influenced the development of the capabilities of the respondents. For a successful agricultural transformation that will not be marred by the negative impact of climate change, the study recommends that the Federal Government of Nigeria should provide adequate funding to the universities in order to enhance the development of their capabilities in acquiring machines and other things needed for the teaching and research in climate change related issues. Also, bodies concerned should provide regular in-service training for respondents in other to promote human resource needed for tackling climate change issues.
Keywords: capabilities, agricultural transformation agenda, climate change, universities

Introduction

The vision of the present Agricultural Transformation Agenda (ATA) is to achieve a hunger-free Nigeria through an agricultural sector that drives income growth, accelerates achievement of food and nutritional security, generates employment and transforms Nigeria into a leading player in global food markets to grow wealth for millions of farmers. This vision if not tread with caution could be marred by the negative impacts of climate change. This is because agricultural production in many African countries including Nigeria is projected to be severely compromised by climate variability and change (Ajetomobi and Abiodun 2010; Harris, 2009; Cribb, 2008; Glantz and Cullen 2003). To achieve ATA that will not be marred by climate change, researches, training and innovation in the area of climate change is needed. University education provides leadership in research, training/innovation and development of human resource often responsible for sustainable development of which climate change is a component. This implies that universities have responsibility for generating knowledge, advancing teaching and learning in climate

change issues and injecting same into the economy to create opportunity for innovation to thrive. Such innovations could include those that will help to combat the challenges posed by climate change, especially through the promotion of adaptation strategies; and the production of crop/animals that can withstand changes in the climate and invariably helping to achieve food security. If universities will achieve this feat, they must have the necessary human resource in the field of climate change and also possess relevant equipment needed for teaching/learning and research in climate change issues.

In Nigeria, especially in the Southeast, climate change is occurring and is already affecting lives. It therefore becomes pertinent to determine the capabilities of the universities in Southeast, Nigeria in tackling climate change towards increased food production which will invariably help in achieving the proposed ATA in Nigeria. Hence, the following questions become imperative: In terms of human resource development, what capabilities do the universities in the southeast have and which is lacking? What capacities do they have with regards to acquisition of equipment/machineries needed for the teaching and conducting researches in climate change related issues? What factors impede the capabilities of the respondents? The paper therefore aims at:

1) determine the capabilities (in terms of machine/equipment acquisition and human resource development) of universities in tackling climate change;
2) identify factors that impede the capabilities of the respondents.

Methodology

Area of study
The study was carried out in Southeast Nigeria. The Zone is located between Latitudes 04° 30′ N and 07°30′ N and Longitudes 06° 45′ E and 08°45′ E. It covers an area of 29,908 square kilometres with a population of about 16,381,729 (Federal Republic of Nigeria, 2007). The area comprises the geographical location of the following states: Abia, Anambra, Ebonyi, Enugu, and Imo.

Economically, it is primarily an agricultural zone. The soils of the region are largely sandy, mostly loose and porous. The commonest crops grown in the zone include cassava, yam, cocoyam, maize, Fluted Pumpkin "*ugu"* (*Telferia occidentalis)*, plantain/banana, oil palm and coconut while major animals reared include goat, sheep, poultry etc. The region is experiencing devastating impact of climate change which is well represented in the frequent cases of flooding and increased number of gully erosion sites on farmlands.

All academic staff in the universities in the Southeast formed the population. Three states (Abia, Anambra and Enugu) were purposively selected based on the high incidences of climate change related disaster. Both state and federal universities/faculties of Agriculture in the three States, namely: Abia State University, Uturu and Micheal Okpara University of Agriculture, Umudike for Abia State; Anambra State University, Uli and Nnamdi Azikiwe University Awka for Anambra State; Enugu State University of Science and Technology and University of Nigeria, Nsukka for Enugu State. Simple random sampling was used to select three (3) academic staff on the rank of senior lecturer and above across the departments in the faculty/college of agriculture of each university with the exception of UNIZIK

where four (4) old staff of the University who are the pioneer staff of the new faculty of Agriculture were purposively selected. A grand total sample size of 79 was used for the study.

Structured questionnaire was used for data collection. The questionnaire was divided into two sections. Section 1 was devoted to information on capabilities of the respondents while section 2 investigated factors that impeded the capabilities of the respondents.

Objective 1: sought information on the capabilities of the respondents. Capabilities were accessed based on acquisition of machines and other equipment needed for teaching/researching on climate change issues. It was also based on human resource development of the respondents. Respondents were asked to indicate if as a faculty/college they have capability in terms of acquisition of necessary equipment needed for teaching and conducting researches on climate change issues. If they do, they should itemise the equipment, state the function of the equipment, when was it purchased, who purchased them and what the cost was. For human resource development, the respondent specified the number of staff with their qualifications, the type of training on climate change the staff have embarked on, the duration of such training and amount invested into such trainings, new lessons learnt etc.

Objective 2: factors that impede the capabilities of the respondents. The respondents were asked to respond to possible factors using a four-point Likert-type scale of “to a great extent (4)”, “to some extent (3)”, “to a little extent (2)” and “to no extent (1)”. The mean value of 2.5 was used to determine the factors. Variables that have a mean value of 2.5 and above were considered as factors that impede the capability development and those below 2.5 were not. Data were further subjected to exploratory factor analysis procedure using the principal factor model with varimax in grouping the impeding factors. Only variables with loadings of 0.4 and above (10% overlapping variance) were used in naming the factors while variables that loaded high in more than one factor were discarded (Comrey, 1962).

Information on the capabilities of the respondents (objectives 1) was analysed using percentage. Information on factors that impede the capabilities of the respondents (objective 2) was analysed with exploratory factor analysis. Version 16.0 of the Statistical Package for the Social Science (SPSS) software was used for the analysis.

Results and Discussion

The capabilities of respondents

Figure 1 shows that all (100%) the respondents had no capability in terms of acquiring equipment/machines needed for teaching and conducting researches on climate change issues. The Figure also shows that 85.0% have no capability in human resource development. This result shows that the respondents lack the needed equipment needed for teaching and conducting researches anchoring on climate change. It also shows that human resource development with regards to climate change issues is poor.

University education usually provides leadership in research, training and innovation, often responsible for sustainable development of which climate change adaptation is a component (Committee on Building Trans-disciplinary Capability at the University of Nigeria, UNN_ATPS, OSF Project, 2011). Yanda (2010) also noted that one of the goals of university education globally is to provide solutions to the development challenges such as climate change. With the increase in the challenges that climate change pose on agricultural production, it is expected that universities/faculties of agriculture should massively embark on researches that will help provide scientific adaptive strategies that would be taught/impacted on students and other stakeholders; unfortunately, this result implies that with regards to climate change issues, the university which is supposed to be the place where solutions about climate change should emanate are lacking the needed equipment and human resource capacity. Lack of expertise/human resource capability among university teaching staff has being attributed to the fact that most of this category of staff were trained before climate change became a recognised problem (Achike and Okpara, 2011); consequently, there is need for regular in-service training for these staff.

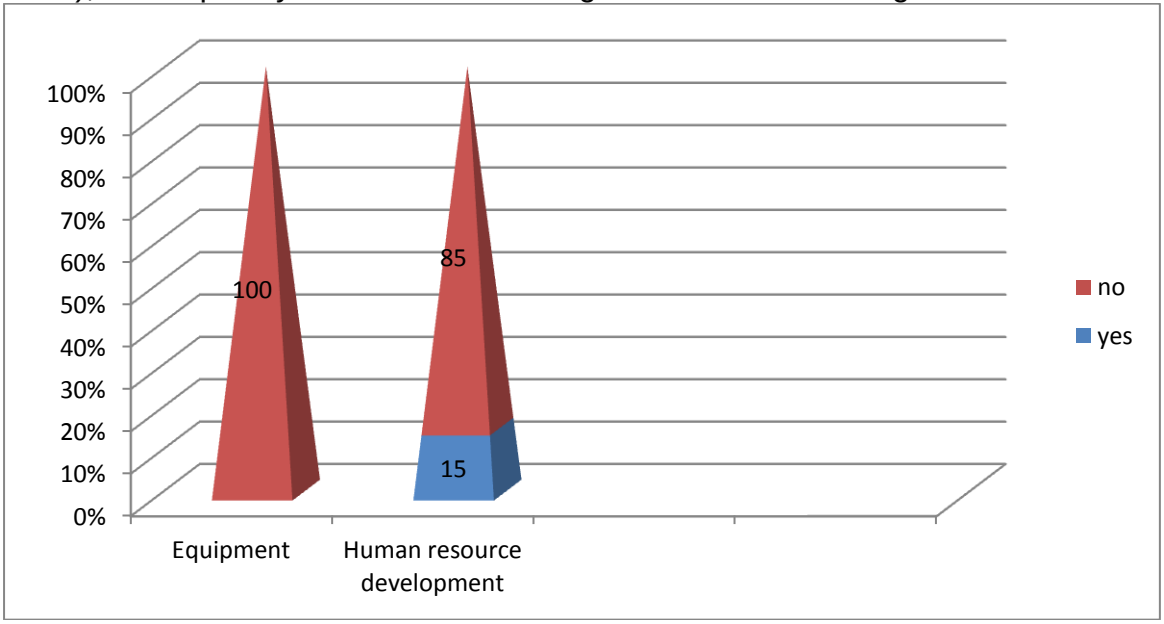

Fig 1: Chart showing percentage distribution of respondents based on their capabilities

Factors that impede the capabilities of the respondents

Table 1 shows varimax rotated factor on factors that impede the capabilities of the respondents. Based on variable loading, three factors were identified and named. Factor one was named funding/manpower related factors, factor two was named organizational related factors while factor three was named weak policy related factors.

Entries in the Table show that factors that loaded high under funding/manpower related factors (factor 1) were poor funding to research (0.657), poor funding to teaching (0.651), lack of manpower (0.471), unavailability of technology (0.495), unavailability of equipment (0.650), lack of training opportunity, (-0.650), lack of competent staff i.e. climate change experts (0.650). Poor funding will not allow the

respondents to invest in training, research and development, or state-of-the-art technology acquisition. Also, unavailability of equipment needed for teaching and research among the respondents imply that they are incapable of transferring needed climate change adaptation skills to their students and other stakeholder. With adequate funding into teaching/research, teachers/researchers will have enough equipment and other technology needed for their researches and this will bring technological change. Technological change itself stimulates capability accumulation and will directly and indirectly enhance teachers/researchers capabilities.

Poor motivation (0.575), culture of firm (0.482), bureaucracy (0.550), poor remuneration (-0.541),) and lack of interaction between actors i.e. poor linkage (0.565) loaded high under organizational related factors (factor 2) (Table 2). Interaction among the respondents will allow them swap information and enhance learning (Dominguez and Brown, 2004). Such learning will permit the respondents to accumulate capabilities in adapting to the challenges of climate change. Lack of interaction hence implies there will be no opportunity of learning and development of climate change capabilities. This inability to learn or link could retard efforts towards addressing the problems of climate change.

Table 1 equally shows the factors that loaded high under weak policy related factors (factor 3) as poor fiscal government policies (0.565), policy dynamics (0.521), poor access to knowledge and information on new technologies (0.475), poor government commitment to climate change issues (0.545) and lack/weak legal framework (-0.470). Government can be instrumental in stimulating capability enhancement through a number of fiscal incentives (Porter, 1980). Aderemi, Oyebisi and Adeniyi (2009), maintained that government has the roles of setting priorities, participating and enacting laws that could enhance capabilities' development and accumulation. Capabilities of the respondents could be enhanced if government makes and enacts polices that allow funds to be adequately provided to the universities and also monitor the utilization of such funds.

Table 1
Factors that impede the capabilities of the respondents

Impeding factors	**Funding/manpower**	**Organizational**	**weak policy**
Poor funding to research	**0.657**	0.367	0.359
Poor funding to teaching	**0.651**	0.280	-0.250
Lack of manpower	**0.471**	-0.344	0.209
Unavailability of technology	**0.495**	0.319	0.301
Unavailability of equipment	**0.650**	0.123	0.279
Size of firm	-0.329	0.026	0.319
Culture of firm	0.390	**0.482**	0.254
Firm organisation strategy	0.215	-0.191	0.375
Lack of training opportunity	**-0.650**	0.254	0.354
Lack of competent staff(climate change experts)	**0.650**	0.297	0.191
Bureaucracy/organisational bottleneck	0.351	**0.550**	0.250
Poor fiscal government policies	0.252	0.362	**0.565**
Policy dynamics	0.344	0.289	**0.521**
Farmer's conservatism	0.301	0.233	0.280
Market forces	0.312	0.375	0.148
Poor access to knowledge and information on new technologies	0.008	0.321	**0.475**
Poor remuneration	0.371	**0.541**	0.362
Influence of donor agencies	0.364	0.254	0.301
Poor government commitment to climate change issues	0.258	-0.098	**0.545**
Poor motivation/poor working environment	0.208	**0.575**	0.206
Lack of interactions among actors/poor linkage with other actors	0.287	**0.565**	0.328
Inadequate finance/credit	0.521	0.470	0.365
Lack /weak legal framework	0.367	0.319	**-0.470**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization (loading at .4 and above)
Bold type is used to highlight high factor loads.
Source: Field survey, 2012.

Conclusion and Recommendation

Agricultural transformation agenda among other things aims at making Nigeria food secured. This mission stands to be threatened by the negative impact of climate change, hence, innovations that will help overcome the threats is paramount. Such innovations could be developed in the universities if the needed enabling environment is provided. The study showed that the respondents lacked both machines and human resource needed for teaching and conducting climate change researches. This unfortunate situation implies that the universities are not capable in combating the problems of climate change which will negatively affect food production and invariably threatening the transformation agenda.

It is recommended that bodies responsible for the funding of the universities should financially support them so that they can acquire equipment needed for teaching/researching with regards to climate change. The bodies should also provide in-service training to the universities so that they can build human capacity needed for teaching/researching on climate and climate change related issues.

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