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Role performance of extension agents in post harvest activities of rice in southwestern Nigeria

Desempeño de la función de los agentes de extensión en las actividades posteriores a la cosecha de arroz en el suroeste de Nigeria

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ABSTRACT

The paper assessed role performance of Extension agents (EAs) in Post-Harvest Activities (PHAs) of rice in Southwestern Nigeria. It specifically described the socio-economic characteristics of the respondents; identified the roles performed by respondents in PHAs of rice; determined the level of roles performance in PHAs of rice and identified constraints associated with their role performance in rice PHAs. A two-stage sampling procedure was used to select all (124) EAs across the selected States in the study areas. Primary data were collected through questionnaire. Frequency counts, percentages and means were used summarised the data collected while Pearson Product Moment Correlation and Chi-square analyses were employed to draw inferences on the hypothesis. The result showed that majority (84.7 % and 96%) of the respondents were males and married respectively, with a mean age of 49.1± 7.3years. Formation of rice farmers' into cooperative groups (mean = 4.49) and provision of information on best time to harvest rice (mean = 4.48) were the foremost roles performed by respondents, while inadequate staffing (mean=2.64) and poor funding of extension (mean = 2.46) were the majority constraints to the extension agents' role performance. Sex (χ^2 = 11.115) and secondary occupation (χ^2 = 24.83) had significant association with role performance while significant relationship existed between years of working experience (r = 0.661), years of residence (r = 0.503 and role performance of

extension agents. The study concluded that majority of EAs had average level performance in PHAs of rice.

Keywords: Constraints, extension agents, post-harvest activities. socio-economics, performance

RESUMEN

En el documento se evaluó el desempeño del rol de los agentes de extensión (EA) en las actividades posteriores a la cosecha (PHA) de arroz en el suroeste de Nigeria. Se describe específicamente las características socioeconómicas de los encuestados; identificaron las funciones realizadas por los encuestados en PHAs de arroz; determina el nivel de rendimiento de los papeles de PHAs de arroz y limitaciones identificados en relación con su actuación en el papel de arroz PHAs. Un procedimiento de muestreo de dos etapas se utilizó para seleccionar todas las EA (124) a través de los Estados seleccionados en las áreas de estudio. Los datos primarios se recogieron a través de cuestionario. Se utilizaron los recuentos de frecuencias, porcentajes y medios resume los datos recogidos mientras que los análisis de correlación de Pearson producto momento y Chi-cuadrado se emplean para sacar conclusiones sobre la hipótesis. El resultado mostró que la mayoría (84,7% y 96%) de los encuestados eran varones y se casó, respectivamente, con una edad media de 49,1 ± 7,3 años. La formación de los productores de arroz en grupos cooperativos (media = 4,49) y el suministro de información sobre mejor momento para cosechar el arroz (media = 4,48) fueron los papeles más importantes realizada por los encuestados, mientras que la falta de personal (media = 2,64) y la mala financiación de extensión (media = 2,46) fueron las limitaciones de la mayoría para el desempeño del rol de los agentes de extensión. El sexo ($\chi 2$ = 11.115) y la ocupación secundaria ($\chi 2$ = 24,83) tuvieron asociación significativa con el desempeño del rol, mientras que existía una relación significativa entre los años de experiencia de trabajo (r = 0,661), años de residencia (r = 0,503 y el papel actuación de los agentes de extensión. La del estudio se desprende que la mayoría de las EA tuvo un rendimiento promedio de nivel de PHAs de arroz.

Palabras clave: Limitaciones, agentes de extensión, actividades poscosecha, socioeconomía, desempeño

INTRODUCTION

Role is a comprehensive pattern of behaviour that is socially recognized, providing a means of identifying and placing an individual in a society (Encyclopaedia Britannica, 2015). Role is a set of expected behavioural patterns, obligations, and privileges attached to a

particular social status. Going by this definition, it is clear that every occupant of a position is not just recruited but to perform some tasks in form of activities to achieve the purpose for which their service are engaged. This implies that agricultural extension agents are employed to carry out specific functions to facilitate positive changes in agricultural sector. Role playing of agricultural extension agents in the development of rice sector therefore has inherent importance in the adoption of post-harvest technologies of rice and thus, in improving farmers economy as well as poverty reduction in developing countries.

However, observations showed that in developing countries, there is a gap between agricultural performance and available research information (FAO, 2017). This is an indication that a lot of research results from research stations where new technologies are generated do not get to farmers for which such information are meant. To bridge such gap, an agricultural extension arm of the ministry of agriculture was created to perform the task of taking information from research breakthroughs to farmers for adoption. Such step must have been taken with strong realization that sustainability and productivity of agricultural sector worldwide depend on farmer's access to relevant information on their farming enterprises. Quality and effectiveness of extension services among other factors therefore, becomes an important key to bring about changes on how farmers' are doing things on any commodity of interest.

Presently, rice is a commodity of interest in the country and in fact has become a political crop as various interventions by the government are put in place to control its importation. Rice is highly consumed by both old and young as it is popularly used during ceremonial events and as raw materials by industries. Akinwumi (2013) noted that Nigeria is the 6th highest consumer of rice in the world with over 6 million metric tons of milled rice consumed annually at the rate of 40kg per Nigerian/annum and the 2nd largest importer of rice in the world. Also, the country ranks 16th position in the world rice production and the commodity can be cultivated in all 36 States of the federation including the Federal Capital Territory (FCT). Implicitly, Nigeria does not supposed to depend on foreign countries for rice as its production is well favoured in all the ecological zones of the country. However, the demand for rice in Nigeria is growing faster than its production, thus making the country to depend on importation to meet its high demand (FAO, 2003)

The demand for rice in Nigeria has been on the increase partly as a result of increasing population growth, increased income levels, rapid urbanization and associated changes in family occupational structures. The short-fall in domestic rice production that necessitated its importation in large volume constitutes an enormous drain on the country's foreign exchange

reserve. Several factors had been attributed to the short-fall in the demand and supply gap of rice which include; lack of high yielding varieties with good grain qualities, competition with imported rice and inadequate post-harvest activities (Apata *et al*., 2016). The situation could have been attributed to poor extension services delivery as well as limited interaction between technology developers (researchers) and extension workers. Poor communication between actors in extension services delivery particularly the Government, Non-Governmental Organizations (NGOs), private sector (agribusiness) and farmers also hindered flow of developed technologies to farming communities (Kimaro *et al.*, 2010).

Extension agents have been known for ages in creating awareness about innovations, mobilizing farm households for training programmes, organizing programmes for and sensitizing the target audience to enable them adopt the messages or new ideas that is passed to them. The overall goal of playing such roles is to improve the lots of the farmers from the social and economic perspective. In the context of this study, the target audience is the rice farmers' that produce rice for both consumption and commercial purposes. Rice production in the country has become an important sector that could be said to encompass three phases which are pre planting, planting and post-harvest phases.

In the past more attention was given to the first and the second phases than the post-harvest phase of rice production, however the sustainability of rice production depends on how well the farmers and processors are able to handle the post-harvest phase successfully. Implicitly, extension of modern post-harvest activities of rice is paramount to making local rice compete favourably with imported rice. Adisa *et al.* (2020) reported that in a bid to curb the importation of rice in Nigeria, relevant research institutes such like International Institute of Tropical Agriculture (IITA) and National Cereals Research Institute (NCRI) have developed different quality-enhancing post-harvest technologies on rice and have been disseminated to rice farmers through extension agents. However, the extent at which extension agents are performing these roles in PHAs has not been adequately documented in the literature, hence, this study is aimed at assessing the role performance of extension agents in PHAs of rice in in Southwestern Nigeria. Specifically, the study described the personal and socio-economic characteristics of extension agents in the study area; identified the roles performed by extension agents in PHAs of rice; determined their level of role performance; and identified constraints associated with their role performance in post-harvest activities of rice farmers in the study area. One hypothesis was set in the null form for this study namely: There is no significant relationship between respondents' socio-economic characteristics and their role performance in PHAs of rice.

MATERIALS AND METHODS

The study was carried out in Southwestern Nigeria which is one of the six geo-political zones of Nigeria. It has six states which include Osun, Ondo, Lagos, Oyo, Ekiti and Ogun States. A two- stage sampling procedure was used to select respondents for this study. At the first stage. Osun, Ekiti and Ogun States were purposively due to their involvement in high production rice over the years. The second stage involves purposive selection of all serving government extension agents in Agricultural Development Programmes (ADPs) across the three states, which translated to 63, 33 and 28 numbers of EAs from Ogun, Ekiti and Osun States respectively, making a total of !24 EAs. Duly pretested and validated questionnaire was used to collect quantitative data from the respondents. Simple descriptive statistical techniques such frequency counts, percentages, means and standard deviation were used to summarize the data collected while Pearson Product moment correlation and Chi-square analyses were used to draw inferences on the hypothesis.

The dependent variable of the study was conceptualized as role performance of extension agents in PHAs of rice. Role performance was measured by asking the EAs to indicate the extent to which they perform their 22 expected roles in PHAs of rice. Their responses were rated on a 4-point scale ranging from never performed (0 point), rarely performed (1point), occasionally performed (2 points) and always performed (3 points) as used by Famakinwa *et al.* (2019). The total scores of each respondent were calculated as role performance score. These scores were added to obtain a value of 6 which was divided by 4 to get a benchmark of 1.5. Any role with a mean score ≥ 1.5 was regarded as regularly performed role by the respondents while any role with a mean score < 1.5 was regarded as not regularly performed. To determine the level of role performance, equal interval approach was used to divide the respondents into three high, moderate and low level. Constraint was measured by asking the respondent to indicate the level of severity of constraints hindering to perform their roles in relation to PHAs of rice using four point scales ranging from Not severe (0), Less severe (1), Severe (2) and Very severe (3). A cut-off point of 1.5 was obtained. Any role with mean score ≥ 1.5 was regarded as major constraints while any role with mean score < 1.5 was regarded as minor constraints

RESULTS AND DISCUSSION

Results in Table 1 showed that the mean age of extension agents as at the time the survey was conducted was 49.1 ± 7.3 years, while more than half (56.5%) of the respondents

were between the ages of 51 – 60 years. This is contrary to the findings of Adeola and Ayoade (2011) and Ajala *et al*, (2014) who reported that extension agents in their study areas were still young and active. Age is an important factor which could influence job performance of field extension workers, based on the results, most of the respondents are getting to retirement age from the service of their respective States. Hence the need to employ new hands into the service of agricultural extension to avoid extinction of extension personnel which may jeopardize farmers' education that can results into low productivity and food insecurity. Majority (84.7%) of the respondents were males while the remaining (15.3%) were female, suggesting males dominate agricultural extension service in the area of study. This finding corroborate with the reports of Olorunfemi *et al*, (2019), Ajayi and Alabi (2013) and Alabi (2014) that established male dominated public extension service in Southwestern Nigeria.. This implies that there is gender imbalance among extension agents in the area of study and could have a serious implication on the extension service as many of the female farmers may be neglected in their outreach. The observed defect might have occurred right from the point of recruitments of the agricultural extension agents; hence gender issue must be taken into cognisance in future recruitment of extension agents.

Also, majority (96%) of the respondents were married with mean household size of 5 members. This implies that majority of the extension agents had family responsibilities ties to can compete with their attention if not properly managed. This is similar to submission of Olorunfemi *et al*, (2019) and Adesope *et al*. (2007) who stated that majority of EAs were married. This result also indicates a moderate household size which might be attributed to their high level of education and were well informed about huge economic commitment that is needed to support large family. Implicitly, moderate responsibility that is associated to small household number will not be too much to cope with by extension agent, thereby having enough time to perform their job effectively and efficiently in PHAs of rice. This gives credence to the submission of Olorunfemi *et al*, (2019) who reported that EAs in Southwestern Nigeria had a mean household size of 5 persons. Almost half (46.8%) of the respondents were holders of Higher National Diplomas while 41.1 percent possessed Bachelor of Science degree. This implies that extension agents in the study area were highly educated and possessed requisite academic qualification to perform their roles effectively in PHAs of rice since high level of education enhance the role performance of the extension agents. This agrees with the similar findings of Fabusoro *et al*. (2008) and Ajala *et al*. (2014). The mean of work experience of extension agents was 19.6 ± 6.7 years. This is an indication majority of extension agents had enough experience in the job as they had spent greater part of their active years in service. This means that they were aware of those roles expected of them in PHAs of rice and this

might have positive influence on their role performance in PHAs of rice. This result supports the finding of Okwuokenye and Okoedo-Okojie (2014) who reported similar findings among EAs in Delta State, Nigeria. Further result revealed that 82.3 per cent of the extension agents in Southwestern Nigeria were member of one professional association or the other while only 17.7 percent did not participated in any professional organization. This is in contrary with the report of Ajayi.*et al.,* (2013) that only 31.5% of agents in Osun State participated in professional associations. This is an indication that majority of the extension agents belonged to one professional association or the other which might likely have positively influence on their knowledge horizons through increased access to relevant information and cross fertilization of ideas, and invariably influences their role performance in PHAs of rice.

Role performance of EAs in PHAs: Results in Table 2 show rank mean in descending order of roles performed by extension agents in PHAs of rice and reveal that formation of rice farmers' into cooperative groups (mean = 2.49), provision of information on best time to harvest rice (mean = 2.48), linking farmers to new technologies (mean =2.35), linkage with rice farmers on area of needs (mean = 4.26), training on drying to safe moisture content (mean = 2.19), good hygiene practices during storage (mean =2.13) and linkage with other stakeholders (mean = 2.68) had mean scores above the cut-off point 1.5 implying they were they roles regularly performed by extension agents in PHAs of rice. Other roles performed regularly by extension agents in PHAs of rice include provision of information on threshing of paddy rice (mean = 2.58), dissemination of information on improved parboiling (mean =1.57), feedback role on PHAs (mean = 1.54) and advocacy campaign for adoption of new post-harvest technologies (mean = 1.52). On the other hand, provision of training for farmers on storage of rice (mean = 1.43), linking rice farmers to market (mean = 0.82), sourcing for new technologies (mean = 0.73), conduct workshop and seminars on PHAs of Rice (mean = 0.65), introduction of harvesting machines to rice farmers (mean = 0.59), facilitates farmers access to loan (mean = 0.32) and among others were roles not regularly performed by extension agents with mean score below 1.5. It is evident from this result that extension agent were more involved in the performance of post-harvest activities that were manually or traditionally operated but less involved in performing rice postharvest activities that required use of modern machines and techniques which would have impacted positively on rice productivity and minimize stress. This observation is in line with Osabuohien *et al.,* (2018). Based on this finding, it is necessary to equip extension agents with latest advances in technical knowledge on the use of modern machines and techniques in handling post-harvest activities of rice through regular trainings, and organising seminars and workshops for them.

Table 1: Selected Personal and Socio-Economic Characteristics of Respondents

Variables	Frequency	Percentage	Central Tendency
Age			
21 – 30	3	2.4	
31 – 40	20	16.1	49 ±7.3
41 – 50	31	25	
51 – 60	70	56.5	
Sex			
Male	105	84.7	
Female	19	15.3	
Marital Status			
Married	119	96	
Single	1	0.8	
Widow/widower	4	3.2	
Level of Education			
OND	8	6.5	
HND	58	46.8	
B.Sc	51	41.1	
M.Sc	6	4.8	
Ph,D	1	0.8	
Household Size			
1-2	3	2.4	
3-4	40	32.3	5 ± 2
5-6	65	52.4	
7-8	16	12.9	
Years of work experience			
1-10	27	21.8	
11-20	26	20.9	19.6 ± 6.17
21-30	64	51.6	
31and above	7	5.6	
Membership of Profess Assoc.			
Yes	102	82.3	
No	22	17.7	

Source: Field survey, 2018

Table 2: Role performance of EAs in PHAs

Role Performance	Mean	Std. Deviation
Formation of rice farmers' into cooperative groups	2.49*	0.924
Provide information on best time to harvest rice	2.48*	0.869
Linking farmers to new technologies	2.35*	0.865
Linkage with rice farmers on areas of needs	2.26*	0.882
Training on drying paddy to acceptable moisture content	2.19*	0.991
Maintaining good hygiene practices during storage	2.13*	0.979
Linkage with other stake-holders	1.68*	1.041
Provide information on threshing of Paddy rice	1.58*	1.100
Disseminate information on modern parboiling techniques	1.57*	1.154
Feedback role on PHAs	1.54*	1.086
Advocacy campaign for adoption of new PH Technologies	1.52*	1.129
Provide training for farmers on storage techniques	1.43	0.926
Linking farmers to market	0.82	1.052
Sourcing for new technologies on PHA of rice	0.73	1.143
Conduct workshop and seminar on PHAs of rice	0.65	1.068
Introduce to them simple harvesting machine for adoption	0.59	1.133
Facilitates farmers' access to loan	0.32	1.130
Organize excursion for farmers on PHAs	0.20	1.107
Facilitate construction of storage facilities	0.15	1.202
Facilitates erection of milling machine	0.13	1.276
Facilitates training of local fabricators	0.10	1.192
Liaison with policy makers	0.08	0.982

Cut-off point = 1.5, * regularly perform

Source: Field survey, 2018

Level of role performance

Results in Table 3 reveals that 60 per cent of extension agents had moderate level of role performance in post- harvest activities of rice, while 37. 1 per cent had low and only 2.4 per cent had high level of role performance respectively. Average level of performance of extension agent in PHAs of rice is not good enough at this period that the country is trying to cut down export bill from rice importation, be self-sufficient in the production of good quality rice and ensure food security. Since adoption of modern techniques of PHAs of rice by farmers is depend on the level at which EAs advocate campaign, demonstrate and persuade their clientele to take up new techniques for use. Extension agents therefore, must be seriously inspired, directed, motivated and monitored to perform their roles in PHAs of rice at high level. This will eventually increase the demand for local rice, reduce importation of foreign rice and ensure food security.

Table 3: Distribution of EAs by level of role performance in PHAs of Farmers

Level	Performance score	Frequency	Percentages
Low	< 29.30	75	60.7
Average	29.30 – 58.60	46	46
High	>58.60	3	2.4

Source: Field survey, 2018

Constraints to role performance

Table 4 shows the ranked mean scores of constraints militating against role performance of extension agents in descending order of severity and based on the cut-off point of 1.5, inadequate staffing (mean=2.64), poor funding of extension (mean = 2.46), delay in promotion (mean = 2.32), poor remuneration (mean = 2.31), inconsistent government policy on rice importation (mean = 2.21), bad attitude to work (mean = 2.10), poor capacity building of extension on rice PHAs (mean = 2.09), poor coordination of extension system (mean =2.08), poor logistics to move and organize programmes (mean = 3.06) and among others were the major constraints confronting extension agents in PHAs of rice. While conservatism of farmers to innovations on PHAs of rice (mean = 1.35) was the least constraints. Inadequate staffing, poor funding, delay in promotion and poor remuneration took the lead among the constraints because many of the field extension agents are retiring from the service without recruiting young ones to replace them; and since the withdrawal of world bank Agricultural Development Programme, State governments in Nigeria have not been showing financial commitment to extension service which also has affected promotion and salaries of EAs. This similar to the finding of Wiggins (1986) and Belay (2008) who established that agricultural extension work in many developing countries is characterized by conditions that foster low morale, lack of logistics, virtually no equipment and extremely low salaries. All these major constraints put together bring about poor extension service delivery on PHAs to rice farmers and this will hinder the adoption quality enhancing technologies of rice processing by farmer. Donye and Ani (2014) and Aremu *et al*., (2015) also observed that Nigerian Government has not given agricultural extension the desired attention as there is no policy yet to pave way and support large financial intervention for agricultural extension and farmer-education.

Hypothesis testing Socio-economic characteristics and role performance

Results in Table 5 show that sex of respondents (χ^2 = 11.115; p ≤ 0.01) and secondary occupation of the respondents (χ^2 = 24.83) had significant association with role performance of extension agent in post-harvest activities of rice. This implies these variables could determine role performance of extension agents in PHAs of rice. Further analysis in Table

6 shows that years of working experience ($r = 0.661$, $p \leq 0.000$) and years of residence ($r = 0.503$, $p \leq 0.000$) were positively and significantly correlated with role performance of extension agents in PHAs of rice. The positive correlation of years of working experience of extension agents means that the higher the number of years spent on the job, the higher their role performance of extension agents. This is because respondents tend to acquire more knowledge, skill and confidence that it takes to do the job better. This is conforms to the findings of Olorunfemi *et al*, (2019) and Bahua *et al*. (2013) who stated that increase in years of experience of extension agents improves their job performance in diffusing innovations to farmers. Also, positive correlation of years of residence of the extension agents in the current locations implies that the higher the number of years extension agents spend/stay in location where they were working, the more stronger the relationship that exist between them and the farmers which eventually lead to higher performance and greater productivity.

Table 4: Constraints militating against role performance of extension agents' in PHAs (n=124)

Post-harvest Activities	Ranked mean	Standard deviation
Inadequate staffing	2.64*	0.679
Poor funding of extension programs	2.46*	0.667
Delay in promotion	2.32*	0.705
Poor remuneration	2.31*	0.679
Inconsistent government policy on rice importation.	2.21*	0.913
Poor attitude to work	3.10*	0.892
Poor capacity building of extension on rice PHAs	2.09*	0.920
Poor coordination of extension system	2.08*	0.820
Poor Logistics to move and organize program	2.06*	1.184
Poor monitoring and evaluation	2.05*	1.007
Lack of cooperation from farmers	1.70*	0.892
Non Extension work	1.60*	0.854
Lack of freedom to operate (bureaucracy)	1.59*	1.203
Conservatism of farmers to innovations on PHAs	1.35	1.112

Cut-off point = 1.5, * major constraints

Source: Field survey, 2018

Table 5: Results of Chi-square analysis between selected personal and socio-economic characteristics and role performance in PHAs (n=124)

Personal and socio-economic variables	χ^2	D.f	p-value
Sex	11.115*	2	0.022
Marital status	0.219	4	0.994
Indigenous status	0.598	2	0.742
Secondary Occupation	24.83**	4	0.001

**Significant at $p \leq 0.01$; * Significant at $p \leq 0.05$

Source: Field survey, 2018

Table 6: Relationship between personal and socio-economic characteristics and role performance in PHAs (n=124)

Personal and socio-economic variables	Correlation co-efficient (r)	p-value
Age	0.117	0.875
Years of working experience	0.661**	0.000
Years of residence	0.503**	0.000
Membership of professional association	0.193	0.035
Household size	0.212	0.375

** Significant at $p \leq 0.01$; * Significant at $p \leq 0.05$

Source: Field survey, 2018

As conclusions and recommendations, the foremost roles performed by extension agents in post-harvest activities of rice were formation of rice farmers' into cooperative groups, provision of information on best time to harvest rice and linking rice farmers to new technologies. Major constraints identified militating against their role performance were inadequate staffing, poor funding of extension and delay in promotion. Also, years of working experience and years of residence were found to be significantly related to role performance of extension agents' performance in PHAs of rice. The study concluded that majority of the extension agents performed their roles in post-harvest activities of rice at average level. It is therefore recommended that government should employ more qualify extension agents into the respective state extension services (Agricultural Development Programmes) and taking into consideration the issue of gender inclusiveness. Federal government should make policy that would favour funding of extension in the country and State government should create enabling environment for the extension agents by giving them incentives and motivation

through better remuneration. Finally, there should be capacity building for extension agents through regular trainings on latest postharvest technologies developed by research institutes to keep extension agents abreast of the latest technologies that will enhance high quality rice production and processing for sustainable food security.

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