

# Employment and Performance of Agricultural Graduates: Who Are We Training for?

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## Abstract

The fit-for purpose of agricultural graduates in the job market remains a challenge to agricultural training and education despite the active involvement of farmer organizations, non-governmental organizations (NGOs), and agribusiness in the agriculture job market. This paper traces: (1) the employment of agricultural graduates in the last 10 years in Mali, Republic of Congo, Ghana, and the Gambia; and (2) through a case study, assesses the attitudinal and mindset change in the way research for development is conducted by research staff of the National Agricultural Research Institute (NARI) of the Gambia. Not surprisingly, the public sector consistently employed more agricultural graduates in all four countries. The next highest employer of agricultural graduates was the NGOs, followed by agribusiness. Positive attitudinal and mindset change among research staff and their collaborators in the Gambia was enhanced when collaborative learning and coaching and mentoring in managerial and financial skills enhancement complemented technical skills improvements. Employers indicated strong preference for graduates in agricultural engineering and farm machinery; agricultural economics with emphasis on farm management; innovation systems and value chains; and information communication technology including report writing. Farmers' organizations showed particular interest in interpersonal skills; participatory technology development and dissemination; and appreciation of socio-cultural contexts including farmer innovations. In Mali, Ghana and the Gambia, employers reported that 4%-14% of the agricultural graduates they hired were women.

## Keywords

Agricultural graduates, farmers' organizations, non-government organizations (NGOs), agribusiness, attitudinal and mindset change

A number of factors have been associated with the disappointing performance of the agricultural sector in many African countries. These include inadequate investment in roads, markets, and energy; weak social capital including education and health infrastructure especially in rural areas; limited or inappropriate direct investments in agriculture; and an unfavorable policy environment.

If the recent 6.0% average growth in gross domestic product (GDP) in 2002-2007 over the poor annual average rate of 2% in the 1990s in

Sub-Saharan Africa (SSA) is to be maintained, significant investment in physical and human capital

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would be required over an extended period. Adequate and quality human capital development is therefore a key stepping-stone to viable entrepreneurships and the transformation of African agriculture.

Physical investment and a variety of market and non-market institutions cannot be efficiently utilized or maintained where technical, leadership, and managerial competencies and skills are in short supply. Efficient human capital development is necessary for moving up the technological, organizational, and institutional ladder in order to break into higher value, knowledge and research intensive activities with promising long-term demand prospects (World Bank 2007). Africa's human capital at secondary and tertiary levels is comparatively small and its quality highly variable. By raising the rate of investment in human capital, the region can reach and sustain the level of economic performance it needs. Recently however, the performance of the agricultural sector has started to show positive trends in a number of African countries (Wiggins and Slater 2011).

The CORAF/WECARD (*Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles*/West and Central African Council for Agricultural Research and Development) and hereafter, CORAF that facilitated institutional analysis and scoping studies among others have highlighted that strengthening agricultural research management in tandem with technical competence strengthening is crucial in enhancing the competence and skills of agricultural research and development actors to conduct and manage quality research for the benefit of the poor. As a contribution to address this challenge, a project on Strengthening Capacity for Agricultural Research and Development in Africa (SCARDA) was supported by the Department for International Development (DFID) of the Government of the United Kingdom through FARA (Forum for Agricultural Research in Africa) and the SROs (sub-regional research organizations) including CORAF. The purpose of SCARDA was to strengthen

the institutional and human capacity of African agricultural research and development systems in order to generate and deliver research outputs that meet the needs of the poor. The SCARDA mainly focused on enhancing technical and managerial competencies and skills of the National Agricultural Research Institutes (NARIs). However, during the process, some extension, and training and education organizations benefited.

While the World Bank (2007) argued that context specific knowledge systems were needed to boost the productivity of African agriculture, Ngugi et al. (2002) emphasized the necessity and urgency of change in agricultural education and for the "new universities" to demonstrate willingness and capability to induce change. The number of higher education institutions and the students enrolled in them has grown rapidly throughout Africa since the early 1960s. Funding for higher education in Africa kept pace with the expanding institutional base during the 1960s and 1970s, but has fallen well behind the growth in student numbers since 1980 (Beintema, Pardey, and Roseboom 1998). It is therefore not surprising that the impact of trained agriculturalists on the performance of African agriculture continues to be questioned.

Africa's food and poverty challenges require a redirection of thinking about agriculture's role in the development process, and the need for a reliable food supply as a precondition for national development (Eicher and Staatz 1988). While technological solutions to many of Africa's food and nutrition security exists, African agriculture is still constrained by institutional and organizational innovations and that remains a major challenge to academic and research institutions among others. Agricultural education and training therefore need to rethink how to critically engage with society and rural development in general. The vast investments in knowledge creation and "innovation" is highly skewed toward research that does not sufficiently respond to society's benefit in the short to medium

term.

Woodhill (2010) suggested that the incentive regimes were largely oriented toward publishing in academic journals with little academic merit for researchers who helped society to engage in collaborative processes of learning and change. Institutional innovation requires investments in the capacities needed for multi-stakeholder engagement in collaborative learning. This involves developing the qualities of leaders so that they are able to recognize the value of, and support, such processes. It also means developing a depth of facilitation capability and making process facilitation a core part of the professional competence and skills taught in educational establishments. It requires reconfiguring the capacities of knowledge institutions to complement their research and academic pursuits, and taking an active role in supporting innovation processes in society. Institutional innovation is not a neutral process. Whether in small groups such as innovation platforms (IPs) that comprise diverse social and economic actors or whole societies, the kind of change that is possible is highly determined by the collective influence of individuals, mindsets, values and beliefs among others. Navigating complexity, learning collaboratively, engaging politically, and being self-reflective are four necessary capabilities that are critical for institutional innovation (Woodhill 2010).

North (2005) however contended that institutional innovations involved challenging, disturbing and sometimes overthrowing existing dynamics of authority and power. Being naive or ignoring the dynamics of power and authority is a common criticism directed at processes of collaborative learning and stakeholder engagement. The overall implication for capacity development is that institutional innovation requires investing in the capacities of actors to be self-reflective. This means looking at and understanding one's own emotional drives and responses and looking at where they come

from (Scharmer 2007). It means questioning one's own assumptions and beliefs. It means looking inward when problems with others emerge rather than, from the security of one's own prejudices, judging and blaming others. However, this is not easy (Rosenberg 2005).

Western inspired education and training systems have largely excluded such core capacities for self-reflection and introspection from curricula. In practical terms, there are some simple implications for capacity development. One involves investing in activities and processes that give people the time and space to develop themselves and their self-understanding. Another is including feelings and emotions as a normal part of discussion and exploration in collaborative processes of change. A third is recognizing that the emotional and self-reflective aspects of development demand "safe" environments for people. This means working to create trusting environments in which people can give and receive open and honest feedback to each other. Institutional innovation ultimately depends on human relations, and the quality of leadership and facilitation processes that mediate such relations. In turn, these depend on individual capacities for self-understanding, critical reflection, and genuineness (Gorzynski 2009; Scharmer 2007).

It is also clear that innovations, and in particular institutional innovations, do not arise from academic research and "experts" alone, but from the interactions between the many different actors involved in a particular problematic situation (Röling and Jiggins 2001). Essentially, the more effective collaborative learning is institutionalized, the greater the capacity for institutional innovation.

While academic training for graduates in agriculture and related services in rural development remains critical to the well-being of society, academy is yet to sufficiently respond to the complexity of skills needs in a dynamic job market. Consequently, the expected performance of agricultural employees

continues to be debated and many are of the opinion that investments in the sector do not match benefits accruing to society. Frequently some questions are asked such as: is the agricultural training on offer adequate in terms of curricula and teaching methods and does it equip the trainees with the requisite mindset and attitudinal change including competencies and skills to improve smallholder agricultural productivity? This paper attempts to show that the CORAF facilitated SCARDA model piloted in Mali, Republic of Congo, Ghana, and the Gambia, does not only improve competencies and skills of agricultural graduates and trainees, but also can bring about attitudinal and mindset change when collaborative learning is mainstreamed in the way that research for development is approached and embedded in change processes.

## **METHODOLOGY**

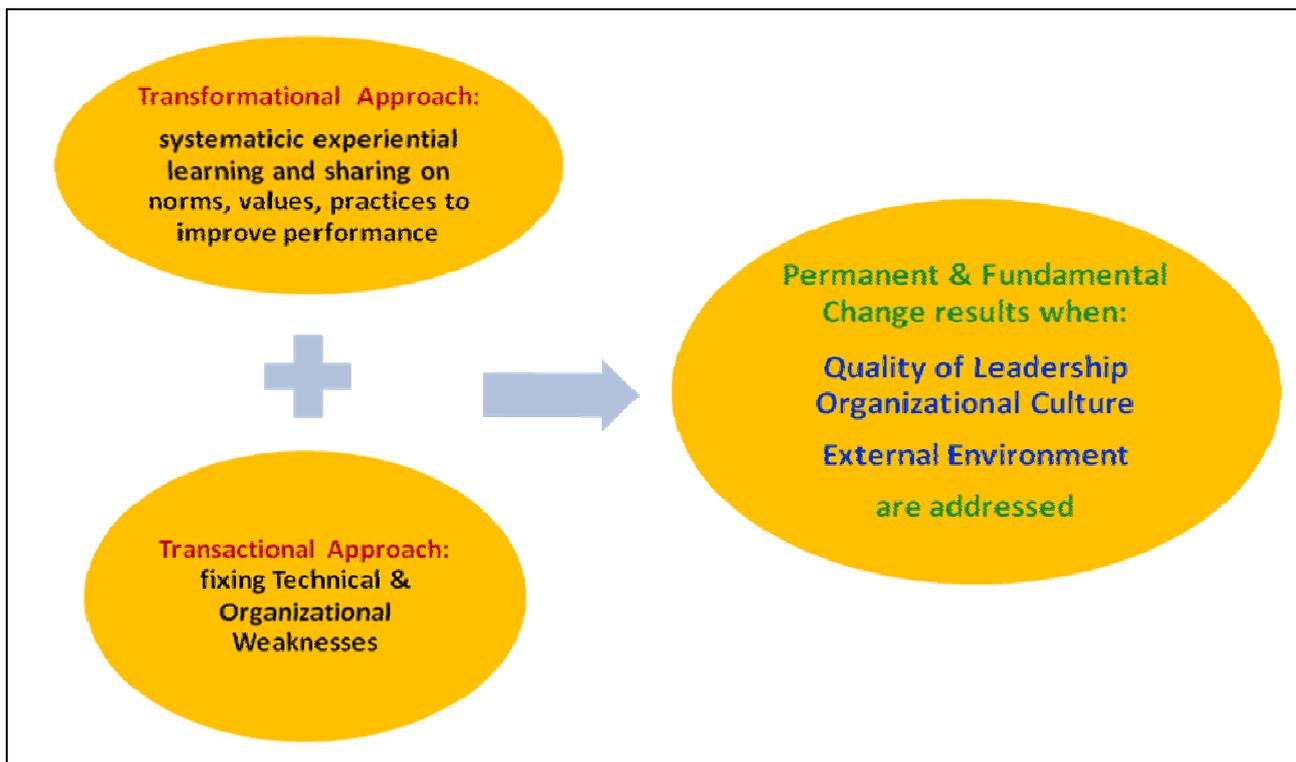
The Capacity Strengthening Program of CORAF adapted two alternative approaches of change: the transformational and transactional approaches from Burke and Litwin (1992) to facilitate improvements in competencies and skills of research staff and practitioners (see Figure 1). The transformational approach targets the leadership, institutional culture, norms and value systems, and the external environment. These are facilitated through systematic experiential learning and sharing of best practice in enhancing competencies and skills of managers and staff to better perform their job. These involve targeted short-term practical hands-on skills enhancement training for leaders and managers in the governance and management of agricultural research and development; peer review and experiential learning and sharing of best institutional practice to positively influence institutional culture, norms and values systems; facilitating an enabling external environment for collaborative learning to take place, for example, through IPs; and policy dialogue and

learning workshops in the generation, dissemination and adoption of technologies and best institutional practice.

The transactional approach to change focuses on “fixing” technical and organizational weaknesses by addressing short- and long-term training and skills needs of managers and staff to deliver quality agricultural research services and products for the benefit of poor smallholders (CORAF/WECARD 2011). In that regard, a two-stage complementary change management process which largely targets institutional and human capacity for innovation in agriculture was pursued. The first stage includes: (1) participatory consultation between CORAF and consultants in Dakar, Senegal to identify a common methodology for assessing the employment opportunities for agricultural graduates in Mali, Republic of Congo, Ghana and the Gambia; and (2) a case study involving the Ghana Institute of Management and Public Administration (GIMPA) and research staff of the NARI of the Gambia.

The participatory consultation on employment of agricultural graduates used three approaches: (1) the follow-up approach; (2) the employer’s approach; and (3) the retrospective approach (Närman 1988). The follow-up approach involved assessment of the training received by students. It was based on an evaluation of courses delivered prior to examinations, and the same assessment is then conducted some time after graduation, especially with working graduates. The employer’s approach is an attempt to understand the degree of employers’ satisfaction with the work performance of graduate student employees. The retrospective approach investigated the impact of the graduates’ working experiences on the reform and or development of new training programs.

In each country, the study focused on agricultural training and education institutions and employers of agricultural graduates in the public sector, agribusiness, farmers’ organizations, NGOs active in agriculture, and to a limited extent, regional and



**Figure 1.** Transformational and Transactional Approach to Institutional Change in Enhancing the Capability of Research Staff and Practitioners. Source: Adapted from Burke and Litwin (1992).

international organizations. Open-ended interviews were used to gather information from training institutions while a structured questionnaire was used for agricultural graduates and employers including some of the 26 of the 27 M.Sc. graduates who successfully completed agriculture, food technology, food safety, and library service courses through the SCARDA project in West African Universities (Kwame Nkrumah University of Science and Technology [KNUST] in Ghana, Université d'Abomey-Calavi in The Republic of Benin, Université D'schang in Cameroun), and to a limited extent, University of Greenwich in the United Kingdom.

Training institutions including faculties and colleges of agriculture were interviewed in Mali, Republic of Congo, Ghana and the Gambia (see Table 1) and the number of samples depended on the

number of training institutions in each country. The sample size for employers of agricultural graduates in the public sector and agribusiness (including farmer organizations) was 5-10 per country. Over 150-170 employed and only 20-30 unemployed agricultural graduates were interviewed in each country. An attempt was made to interview both men and women employees. The interviews sought information covering the previous 10 years and included training and employment opportunities relating to crops and livestock production, fisheries, food processing, agricultural inputs, environment and forestry.

Furthermore, a case study on change management process at the NARI of the Gambia involving a mixture of documentary reviews, organizational audit, focus group discussion, and participatory workshops was used with the active participation of research staff to obtain information and data. Institutional analyses,

**Table 1.** Agricultural Training Institutions Interviewed

Mali	Republic of Congo	Ghana	The Gambia
Centre d'Apprentissage Agricole (CAA) de Samanko			
Centre d'Apprentissage Agricole (CAA) de Samé	Lycée Technique Agricole Amilcar Cabral (LAAC)	University of Ghana, Legon, Accra	
Centre de Formation Pratique en Elevage (CFPE) de Sotuba	Institut Sylvo Agro Pastoral-Centre d'Education Professionnelle Agricole (ISAP-CEPA)	Kwame Nkrumah University of Science and Technology (KNUST), Kumasi	Gambia College
Centre de Formation Pratique Forestier (CFPF) de Tabacoro	Lycée Technique Agricole d'Ouessou (LTAO)	Kwadaso Agriculture College in Ashanti Region	University of the Gambia
Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR/IFRA) de Katibougou	Institut de Développement Rural (IDR)	Animal Health and Production Collège in Pong Tamale	
Faculté des Sciences et Techniques (FAST), Université de Bamako			
Université Mandé Bukari			

management and technical training workshops for staff, and a CORAF scoping study in 2007 were also used to analyze the capacity needs and in developing action plans for strengthening agricultural research for development in the Gambia.

Key tools used in the institutional analysis were stakeholder mapping, forced-field analysis and learning workshops. These tools were very effective in determining the weak linkages and collaborations among the key stakeholders as well as the “undesired” state of the agricultural research in the Gambia; and in facilitating the envisioning of a future desired state. The tools also brought to the fore, the compelling forces toward the desired state as well as the restraining forces in maintaining the status quo. The GIMPA was contracted by CORAF to facilitate the change management process at NARI. The purpose was to change the way NARI staff approach research for development through the active participation of relevant stakeholders in agriculture including rural development, and training and education.

The change trajectory of NARI started with the development of the Participatory Action Plan (PAP) during the first and second agricultural research management (ARM) workshops involving the other SCARDA focal institutions (FIs): *Institut d'Economie Rurale* (IER) in Mali, *Centre de Recherches Agronomiques de Loudima of the Délégué Général à la Recherche Scientifique et Technologique* (DGRST/CRAL) in the Republic of Congo, and the Crops Research Institute of the Council for Scientific and Industrial Research (CSIR-CRI) in Ghana. Prior to the implementation of the PAP, a change management reflection workshop was organized for a cross section of NARI staff to fine-tune the PAP. The revised PAP included critical “soft skills” such as marketing and public relation skills, and coaching and mentoring support for the change management process. To drive the change process, various capacity strengthening interventions outlined in the revised PAP were provided to a cross-section of staff, including the leadership of NARI and a few

representatives from other National Agricultural Research Systems (NARS) organizations in the Gambia such as the University of the Gambia, Ministry of Agriculture, Women Farmers Association, and the International Trypanotolerance Center (ITC).

The main capacity strengthening interventions in the PAP was to establish change champions to drive the change process from within NARI; marketing and public relations skills development; financial resource management skills enhancement; facilitating gender mainstreaming skills in agricultural organizations and programs; proposal writing skills; and long-term M.Sc. training to enhance technical and managerial capability in agricultural research for development. These interventions were facilitated through appropriate coaching and mentoring on the one hand, and learning workshops on the other hand and higher degree academic training. The combination of managerial and technical interventions was to significantly reduce the risk of NARI staff falling back to the old undesirable ways of managing and conducting effective and efficient agricultural research for the benefit of poor resource households.

The methodology used to deliver the capacity building interventions sought to blend the enhancement of requisite knowledge, skills and positive attitudinal change. This was accomplished through the engagement of staff in critical reflection processes toward self-discovery as well as the use of various analytical tools such as the problem tree analysis, SWOT (Strengths, Weaknesses, Opportunities and Threats) and stakeholder analysis, syndicate group work, plenary session, and case studies.

## RESULTS

### *Job Opportunities for Agricultural Graduates*

Over the 10 years of the study period, it was not surprising that the public sector employed the majority of agricultural graduates: 94% in Mali, 84% in the

Gambia, and 55% in Ghana. The second largest employer was the NGOs, accounting for 4% in Mali, 7% in the Gambia and 14% in Ghana. The agribusiness sector employed 1.2% in Mali, 7% in the Gambia, and 12% in Ghana. It was only in Ghana that farmer organizations reported employing agricultural graduates, and that accounted for 4% of the total. Data collection in Congo was incomplete and comparable statistics are not available. Nevertheless, 984 agricultural graduate employees were reported in the public sector and only 16 within agribusinesses.

About 55% of employed graduates in Mali were employed in crops and agricultural engineering with another 20% in forestry. In Ghana, about 50% of the employed graduates were in economics and crops with graduates in animal science representing 17%.

This study targeted employers of various levels of agricultural graduates and could not systematically trace unemployed agricultural graduates in all countries. However, in Ghana the highest numbers of unemployed graduates were found in crops and livestock while agricultural engineering and forestry have the lowest numbers of unemployed.

Although the Republic of Congo reported 40% female agricultural graduates, the Gambia on the other hand indicated at most 5%. While Mali reported 13.7% female agricultural graduate in the public service, Ghana indicated about 5% female unemployment rate compared to their male unemployment rate of 11%. In Mali, Ghana and the Gambia, employers reported 4%-14% of the graduates they hired were women. In general, there were fewer female graduates employed in agriculture compared to their male counterparts and consequently, fewer females in this study sample.

The public service sector employers in all countries maintained that agricultural graduates were well trained in theoretically aspects and that teaching methods and curricula in general have remained largely academic and unchanged. The graduates remain weak in applying their knowledge to provide

practical hands-on solutions in a dynamic system. They also reported that graduates lacked skills in preparing and managing projects, and administrative procedures including financial and human resource management as well as writing good reports. Despite all this, public sector employers continue to demand high academic qualifications and nationality in employment opportunities. Ironically, public institutions are heavily involved in the development and revision of curricula and yet, they cannot proactively respond to the dynamic skills needs of employers of agricultural graduates.

It was observed that in all countries with the exception of Mali and the Republic of Congo, students spent significantly more time in lectures than engaged in practical hands-on skills development. In Mali, students spent one year of the three-year program in the field. In general, training institutions reported that they suffered from a lack of basic infrastructure such as good library facility, computer facilities, functional laboratories, and good experimental and demonstration farms.

They also reported lacking requisite human resources, namely well trained and experienced teaching staff and technicians. The shortage of qualified lecturers is partially explained by the generally unattractive salaries despite the fact that generally, salaries in academia are higher than most public institutions. It was noted that very few changes have been introduced into the curricula since the creation of the training institutions. The subjects, content, and number of hours taught remain largely unchanged. The quality of students' supervision by teaching and support staff was not adequate. Furthermore, collaborative supervision of student thesis by teaching and research staff remains poor and where it exists is poorly coordinated. It is not uncommon for research students to conduct their thesis at research stations but only to find out that their methodology and hence findings, do not fully respond to the degree requirement of the University.

This is often an outcome of poor coordination between research and academy.

Ghana reported a general growing disinterest in agricultural training through the decreasing number of students applying for admission. Evidence from the University of Ghana showed that the number of applicants dropped sharply from 1,000 in 2003 to 370 in 2004. Similar trends were also observed for the KNUST in Kumasi, Ghana. The disinterest in agricultural training can be partially explained by the declining job opportunities offered by the major public sector employer since 2003 as well as the lack of appropriate skills needed by graduates to engage in self-entrepreneurship and business generation.

While public sector employers focused largely on academic qualification of agricultural graduate employees, NGOs and agribusiness in all four countries preferred graduates with analytical and practical hands-on skills in innovation systems and value chains among others. Farmer organizations shared nearly the same views as agribusiness and NGOs but further emphasized interpersonal relationships, participatory technology development and dissemination, rural sociology, and appreciation of socio-cultural context and specificity of farmers. Both employers and graduates call for a review of agricultural curricular to take into consideration practical hands-on skills that will enable them become attractive to non-public sector job market and self-entrepreneurship.

#### *Attitudinal Change Among Research Staff*

A GIMPA facilitated organizational audit indicated significant improvements in human resource management systems, procedures and practices at NARI in the Gambia. The NARI management style has changed from that of weak engagement of staff in decision-making to one that is more participatory, evidenced by the increase in staff involvement in management decision-making processes as well as more devolution of power to the programmes and

units. A cadre of research scientists and potential leaders for the institution have emerged with four of the 10 M.Sc. graduates from the SCARDA supported training programme that has already been appointed heads of programmes in NARI. Furthermore, NARI has put in place enhanced accounting practices with adequate internal controls in handling cash and deposits; and approval of spending and disbursements that conform to acceptable international standards. Different accounts have now been opened for the various programmes and regular financial statements and balance sheets are provided in a timely manner to board of directors, management and heads of programmes and units as well as investors and partners.

The efficient financial practices have resulted in NARI moving from deficit financing to a positive balance in their account system as well as being able to pay staff social security contributions. Despite the challenges, the financial situation continues to improve as the newly formed business winning teams facilitated by the SCARDA began to win research grants through competitive grants (succeeding in two out of five proposals written in 2011).

At the individual level in NARI, there has been some change in attitude from that of “indifference” and “inertia” to a more business-oriented approach to work. Research staff have been facilitated to undertake various research and income-generating activities for NARI. Commercial vegetable production, cultivation of medicinal plants, and manufacture of a seed planter for commercial use were some of the income-generating activities undertaken by NARI. Staff are also now more willing to promote the common good of NARI and there is increased realization of the need for collaborative learning and team work across the different categories of staff of NARI.

Research and consultancy proposal writing are now being undertaken by interdisciplinary scientific staff and to some extent, participation of other

relevant stakeholders. The M.Sc. graduates have also initiated improved maize varietal selection, and pond aquaculture activities; design and manufacture of equipment to press weeds into charcoal for household use; and the manufacture of a rice seeder to reduce the drudgery for women, just to name a few, with the active involvement of producers. Self-confidence has been observed among the various beneficiaries of the change management process. The observed shifts in mindsets, attitudes, and practices at both the individual and organizational levels are largely attributed to the change management process, which integrated acquisition of new knowledge, skills and positive attitudinal orientation.

At the wider and more inclusive NARS level, there is a strengthening of relationships and collaboration among key NARI stakeholders and partners (e.g., Department of Agriculture [extension], University of the Gambia, International Trypanosomiasis Centre [ITC]) through interactions in field trials and supervision of students’ research thesis, as well as sharing of library facilities. There is also increased joint research between NARI and agribusiness enterprise in the manufacture of a rice seeder and thresher for commercial use as well as farmer groups in producing medicinal plants for commercial purpose.

The collaboration between NARI and the Department of Agriculture (extension) is also deepening despite the challenges of perception, as the latter regularly consults the top management of NARI on agricultural policy-related issues. A significant consultancy service provided by NARI to the Ministry of Agriculture was led by a SCARDA-sponsored M.Sc. graduate to assess the efficacy of the imported fertilizers. This detected that some of the fertilizers imported into the country were not of the quality required, and the order was subsequently cancelled, thus saving the government from huge financial loss and potential litigation.

The NARI do not however have a well-defined

internal monitoring tool for tracking progress being made which tended to undermine the adequate measurement of the effects of the change management process on the NARI and the Gambia NARS in general. The limited impact at the NARS level was partly attributed to the limited involvement of the relevant NARS institutions in the SCARDA change management process. As a result, staff from the wider NARS did not demonstrate ownership and commitment to the SCARDA change management process. Because the change management process was not for extended periods beyond project cycle, there remains the risk of NARI staff returning back to the old way of “indifference” and “inertia” or once again, content with the depth of change induced by SCARDA change process and not therefore building and improving on achievements.

## **DISCUSSION**

Organizational change can be chaotic (Gleick 1987). The number of variables is changing simultaneously; the magnitude of environmental change and the frequent resistance of human systems create a confluence of processes that are extremely difficult to predict and almost impossible to control. The enormous and pervasive impact of culture, norms, beliefs and value systems can cause organizations to do fundamentally unsound things. Therefore, two complementary theories of change are necessary to influence positive change in the organizations and the institutions that govern over behaviour: (1) implementation theory; and (2) change process theory described by Porras and Robertson (1987) and Woodman (1989).

Woodhill (2010) suggested that implementation theory involved activities that must be undertaken to affect planned change while change theory implied changes that needed to occur as a consequence of embracing a particular value system or culture. For example, emphasizing service to customers more than

adhering rigidly to procedures regarding how to deal with customers would be the critical change factor. Putting this in the context, grant making to the NARS, for example, should take into account not only the quality of the science but also the institutional culture and value systems of both the grantees and the organizations that host the projects. Sanyang et al. (2012) indicated that where decision-making in grants to the NARS involve local decision-making, often a time, both the quality of science and process itself results in positive change. This often results in greater achievements and in the long run, impact. Local decision-making processes enable key players in research and development to not only allocate grants to the quality of science but also take into consideration institutional culture that enable organizations and individuals to perform. It is therefore important to understand how organizations function and how they might be deliberately changed (Burke and Litwin 1992).

The African landscape is complex and diverse and this is even more complicated in formal organizations. While the “transformational approach” to institutional change is desirable and a matter of urgency to improve performance in agricultural service delivery, it also presents risks to both staff and the institutions that govern their behaviour. In that regard therefore, systematic facilitation and brokerage by professional resource persons and/or role models would be critical to success.

Facilitation and brokerage of sound institutional culture, values, norms and practices in order to efficiently manage interactions that leads to fruitful relationships, as well as sufficient incentive and reward regimes for staff and clients, will invariably touch on sensitive cultural norms and value systems. It will not therefore be uncommon, for such change processes to be seen as taboo by many. This often brings about a culture of indifference or silence on the part of the majority of staff in an organization because of the potential harmful consequences especially for

staff in organizations where redress systems are weak or absent. In such cases, change activities become very difficult to implement and therefore least productive.

Because the curricula and teaching methods in general have remained academic and technical, agricultural graduates were observed to lack basic managerial and financial skills. The training and education institutes continue to train for public sector employment, and there is little emphasis, for example, on understanding agricultural value chains or practical hands-on skills to increase smallholder productivity and entrepreneurship. The agribusiness employers and NGOs preferred to hire people with prior work experience, positive personnel attitudes and values.

There was a general consensus among graduates that the practical training received was inadequate because of the large number of students admitted for degree programs relative to the available facilities. As a consequence, most graduates were more shaped in their thinking and orientation toward office work. The graduates in the Gambia and to some extent in Mali further explained these weaknesses as inadequate research facilities and materials. The public sector continues to be the main employer of agricultural graduates despite civil society organizations such as agribusiness and farmers' organizations are becoming more prominent in the employment market.

The introduction of new areas in agricultural curricula such as leadership and management; norms and value systems, practices including trust and confidence building; policy dialogue and formulation; learning processes and innovation, participatory curricular and teaching methods; financial and human resources management; project design; and climate change among others, would help enhance the competence and skills of future agricultural graduates and better prepare them for the dynamic job market including self-employment and entrepreneurship. These should be the hallmark of catalyzing attitudinal and mindset change to capacity strengthening of

diverse social and economic actors in agriculture.

In agriculture and rural development in general, institutional change management processes should be firmly anchored in organizational innovations, value chains, food systems as well as the management of natural resources to avoid disconnection with real life situation of the key stakeholders. If institutional change management processes are to enhance agricultural productivity and raise incomes of the poor and the vulnerable including women and youth, it should be built around physical and virtual innovation platforms in value chains, food systems, and the management of natural resources, as well as the organizations themselves.

To bring about institutional change through change in attitudes, behaviour and mindset, however; leadership, culture, norms and value systems on the one hand, and individual needs, reward and incentive systems including motivation and performance on the other hand, must be addressed. These can best be achieved through systematic facilitation of interactions in collaborative learning, sharing of experience and best practice to improve relationships among stakeholders. In African agriculture and rural development in general, both the purpose of the organizations in terms of its mission and strategy, structure, task requirements and individual skills and abilities including performance, must be addressed if organizations are to be positively changed. While the public sector continues to be the main employer of agricultural graduates, civil society organizations, agribusiness and farmers' organizations are becoming more active in the employment market.

## CONCLUSIONS

This study clearly demonstrates something of a mis-match between the agricultural training and education that is on offer and what potential employers are seeking. The establishment of formal and strong linkage in innovation and entrepreneurship

with not only research institutes but also civil society employers such as farmers' organizations, NGOs active in agriculture and agribusiness, should make agricultural training and education more responsive to the dynamic job market. Such linkages should enable students' access to practical attachments and internships at various enterprises. To achieve this however, radical change is required in the mindsets of policy makers and those managing agricultural training and education.

Attitudinal and mindset change to improve performance can be better achieved through coaching and mentoring of peers in best institutional practice, policy dialogue, and collaborative and experiential learning and sharing of information and knowledge. To influence fundamental institutional change therefore, the holistic development and functioning of the NARS should address improvements in the quality of leadership for organisations to perform better; favourable institutional culture to enhance individual and collective performance; productive relationships through interactions among stakeholders in the external environment where agriculture is key to livelihoods; and rewards and incentive regimes that support and encourage performance of individuals and peers.

## Acknowledgements

The authors are grateful to the Department for International Development (DFID) of the Government of the United Kingdom for their support to CORAF/WECARD. The authors are equally thankful to National Agricultural Research Systems (NARS) of Mali, Republic of Congo, Ghana, and the Gambia for their contributions and commitment to SCARDA. Any and all errors are the sole responsibility of the authors.

## Funding

The study was funded by the Department for International Development (DFID) of the United Kingdom aid (UKaid).

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