Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles

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Tracer Study of Agricultural Graduates in West Africa demand, quality and job performance

A Synthesis Report on The Gambia, Mali and Ghana

CORAF/WECARD

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On behalf of CORAF/WECARD

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Table of Contents

Executive Summary 3

The Study 7

1. Introduction 7

2. Methodology 8

3. Findings 10

3.1 Training institutions 10

3.2 Perception of graduates' performance by employers 11

3.3 Graduates' Perception of training curricula 12

4. Recommendations 12

Executive Summary

The main objective of this study is to evaluate the qualitative demand for agricultural graduates at all levels of training in four countries of the CORAF/WECARD region, namely Congo (Brazzaville) The Gambia, Ghana and Mali. The output of the study is expected to contribute to the improvement of agricultural education and training institutions for a better development of human capacities.

The most important development challenge today, mostly for developing countries, is the creation, dissemination and use of relevant knowledge.The economic liberalization policies which are widely adopted throughout Africa aim to improve efficiency throughout the economy. Agricultural graduates have to become more efficient in the way they relate to farmers, especially small farmers[1], and to all employers including the private employers and civil society. Agriculture, like all economic sectors, has to become more demand- and knowledge- driven.The World Bank (2007) notes that "agriculture has been neglected by both governments and donor community, including the World Bank." To address this neglect, the *"new look"* agricultural graduates need to be able to work with markets and interact with a wide range of private and public sector stakeholders.

Discussions with public and private employers, including farmers' organizations and NGOs on the one hand and with the graduates on the other hand, led to a general conclusion that future agricultural graduates need new skills to cope with the new market demand characterized by competitiveness through higher efficiency. These new skills cannot be acquired without what Blackie et al. (2009) appropriately calls a "mindset change" andthat is termed in this report a mindset revolution.

The *necessary condition* for this revolution to really take placeis an effective change in the key importance given to agriculture by politicians and policy makers, which is the recognition of the contribution of this sector to the overall development process, recognition to be translated into concrete facts and not in empty political discourse. The *sufficient condition* lies in the capacities of training institutions that should be aware that the employers of their future products will come more from the private sector than from the public and consequently rethink their curriculum as well as their teaching approaches. Training institutions have to identify and partner with the new stakeholders of all agricultural value chains. The revolution is the transformation of African agriculture from*a way of life* for smallholders into*commercial enterprises*, even with their small sizes. The move towards agribusiness development well established in the developed world, will become apparent. Value chains addition and the nonfarm activities related to the agro-food sector (processing,product and input distribution, storage, etc.) will progressively represent a much larger share of agricultural sector earnings.This inevitable move towardscommercial agriculture and agribusiness activities will, by necessity, require new skills. Agricultural training institutions, responding to this evident demand, will have to shape their curricula so as to be capable to provide their graduates with these skills.

The specific findings below are of particular importance:

[1] There iswidespread consensus the Green Revolution in Africa requires the active participation of smallfarmers.

1 In all three countries, especially in The Gambia, information obtained from training institutions indicate that there is shortage of adequate infrastructures, scientific equipment and services and qualified human resources, confirming the findings of SCARDA (2007).Over the years, curricula have remained nearly the same with no real input from the private sector. The time allocation between theoretical teachings and laboratory/field practices and internships is largely in favor of the former. The institutions know very little about their graduates once they leave the establishment.

2 With respect to employment, the public sector employs by far the largest proportion of agricultural graduates, from 55% in Ghana to 74% in the Gambia and 94% in Mali.In all these three countries, the second largest employer is the NGOs who have recruited about 4% in Mali, 14% in Ghana and 28% in The Gambia. The private sector recruited only 1.2 (% in Mali, 7% in The Gambia and 12% in Ghana.

3 Despite the fact that the large percentage of food producers are made up of women in all the Sub Sahara region, the findings indicate that the proportion of women graduates range from a low of less than 10% (The Gambia) to a high of 14% (Mali). The above statistics confirm the widely established fact that women are by far underrepresented among agricultural graduates. This calls forconcrete action in the recruitment of female students through some positive discrimination or affirmative action measures. This low representation of women more than justifies SCARDA's commitment to redress gender inequalities in capacity building. These inequalities in agricultural training have to be vigorously fought against if the battle against food insecurity has to be won.

4 Public employers maintain that agricultural graduates are weak in applying their knowledge to solve practical problems and to respond to the changing environment, though they are well trained in theoretical and fundamental subjects. Their knowledge of administrative procedures and writing is limited.

5 Their private counterparts stressed the graduates' lack of skills to solve practical problems faced by farmers. These graduates were not well prepared for production, processing, management, storage/conservation, and marketing activities. Their writing skills and knowledge of ICTs were also below expectation.

6 Concerning criteria for recruitment, both public and private employers identified academic qualifications (in terms of level of training) and the areas of specialisation as major criteria. For the public sector in particular, the first and necessary criterion was (understandably) nationality while the private sector, including NGOs, emphasized prior working experience.

7. The private employers expressed a preference for degree holders but some expressed the need for non degree or in-service training. None of the institutions interviewed had a formal in-service training program.

8. All the countries under study do have separate research institutes. The Gambia (NARI) with less than 23 researchers suffers from a very serious shortage in human resources, both quantitatively and qualitatively. Mali (IER) with 235 researchers and Ghana (CSIR.CRI) with 83 researchers are better off.

9. Graduates identified the strengths of the training they received as good theoretical contents and breadth of disciplinary cover - this allows them to take employment in different sectors of the economy.

10. There was a general consensus among graduates, particularly the first degree holders, that the practical training received was poor. This was attributed especially to overcrowding of laboratories, libraries, and classrooms due to the large number of students admitted for degree programs without the corresponding expansion of facilities. As a consequence, most graduates were more shaped in their thinking and orientation towards office work as technocrats and less as field or real extension officers.

The consensus from both employers and graduates is thatagricultural training programs in the study countries are largely inadequate in terms of products they deliver. This is attributed to several reasons, including (a) insufficient and/or obsolete physical infrastructures, (b) poorly trained lecturers and technicians, as well as insufficient numbers of teachers, (c) outdated curricula and teaching methods which are not well adapted to the current needs of different employers. As a consequence, graduates' performance is below expectation and they face difficulties in finding and securing employment. The study therefore formulates the following general recommendations.

1. Adequate and sufficient infrastructures and equipmentare a fundamental essential to ensure quality of training and by extension, play a key role in the future job performance of graduates. Commercial agriculture and agribusiness are necessarily the way to achieve food security. The future demand for agricultural graduates is more a qualitative demand (graduates with specific skills) than a quantitative one.The study therefore suggests a deep reform of curricula and teaching methods with the view to give more weight to practical sessions through field practices and internships. The policy for development/revision/reforms of agricultural curricula should be based on employerdemand -driven principles.

2. The skills required by employers keep changing with the rapidly changing physical, technological, financial and economic environment. In order for the training institutions to deliver the desired products, employers and trainers should develop partnerships where the former participate actively not only in the development of curricula, but also in effective teaching.
3. No agricultural training institute is capable of providing (or should reasonably to expected to provide) the entire universe of knowledge and skills areas of interest to various employers to its curricula. Employers will need to continuouslyorganize in-service training for the graduates they recruit or contribute key elements their training at universities and colleges.

4. Adequate infrastructures/equipments and more practical curricula are not by themselves enough to deliver better products to the agricultural sector. In addition, they require qualified, experienced, "retrained" and dedicated human resources.

5. The majority of agro food activities, be it in production, processing or distribution, are handled by women. The findings showed that over 90% of agricultural graduates are males. It is suggested that concrete and significant measures be taken to substantially increase the percentage of females in student enrollment.

6. Agriculture being a strategic but very risky sector, there is a real need for a political will and commitment which go beyond lip service to rethink the public financing of this key sector of the economy. This may include better work conditions and remuneration for lecturers, subsidies for inputs for producers, facilitating settlements of young graduates willing to go into business, subsidies for employers willing and ready to effectively participate in training, etc.

Final Note: While there are evident weaknesses in the curricula and teaching methods objectively identified in the training institutions by this study, it is important to note tertiary training should produce not only professionals capable of joining the job market right after their graduation, but also that the first degree holders should also be prepared for further training (Masters and Ph Ds), teaching, research and consulting either in their countries or abroad. As a consequence, the formula to produce "*work ready* and confidentfirst degreegraduates with management, administrative and leadership skills alongside some work experience at graduation, is a balance between theory and field practices in training programs.

It therefore impliesthat the training of students with sufficient work experience who will join the job market and be immediately productive either as employees or self-employed, needs to be carried out largely, though not exclusively, in agricultural colleges.

The Study

1. Introduction

The Sub Saharan African region has been left far behind in the fight against poverty. It is an established fact that this region of the world is the only one where food productivity per person has declined between the 1960s and today. Sub Saharan Africa (SSA) will definitely not be able to meet the first objective of the MDGs, namely,*reduce hunger by half by 2015*.

The sub-Saharan population remains largely agricultural with about 70% still living in rural areas. Most of these dwellers are smallfarmholders and should be considered as the*innovators* of the missing/delayed or lost *African Green Revolution*. In order to meet the first objective of the MDGs as indicated above, a dynamic agricultural sector must be taken as a necessary condition.Further,this condition needs to be met in a relatively short term because of the urgency to free the African population from famine and hunger. After decades of fruitless debates and the neglect of agriculture following the writings of Lewis (1954), Hirshman (1958) and Prebish (1959), there is a near consensus today about the need of an efficient, dynamic and strong agricultural sector as the *engine* and even a *pre requisite* for agricultural and by extension, for overall economic development (World Bank, 2007).

As far back as 1988, Eicher stated that *"Africa's food and poverty problems require a redirection of thinking about agriculture's role in development….and about the need for a reliable food surplus as a precondition for national development"*

The poor performance of African agriculture has always been attributed to several factors, including specifically: (a) lack or shortage of adequate investments in physical (roads, markets, electricity) and social (education and health) infrastructural in rural areas, (b) relatively negligible and inappropriate direct investments in agriculture, (c) an unfavorable macroeconomic environment to agriculture, (d) agricultural policies not conducive to increased incomes and improved livelihood for farmers and rural dwellers, etc. The impact of all these factors has been more than disappointing, especially on small farmers who still represent, by far, the largest proportion of agricultural producers.

In addition to the constraints identified above, and given the documented evidence of the strong connection between the quality of agricultural training and research on the one side, ,and economic growth and development on the other, more and more people are questioning the relevance, adequacy and effectiveness of traditional agricultural training curricula and teaching methods adopted in most African countries. Several scientists hold the view that capacity building and strengthening in the area of agricultural development require a new look, not to say a revamp of agricultural training in order to develop and implement "tailor-made" agricultural development packages. This new look is precisely what is meant by Eicher as the "redirection of thinking".

It is mindful of this disappointing performance of the agricultural sector and the necessity of an in depth and critical analysis of agricultural training and research that SCARDA has defined as one of its main objectives, *"to strengthen the institutional and human capacity of African agricultural research and development systems, to identify, generate and deliver research outputs that meet the needs of poor people"*.

The present tracer study is the third out of four outputs that SCARDA has decided to produce in order to contribute to SCARDA's Program initiated by FARA/AU. The study falls in line with the objectives of the Comprehensive Africa Agriculture Development Program (CAADP) developed by the New Partnership for Africa's Development (NEPAD) on behalf of the African Union. Specifically, it addresses CAADP's fourth pillar, namely, "*Agricultural research, technology dissemination and adoption*". This study in particular and the SCARDA objective in general, will, hopefully, help in the construction of this long-term pillar by contributing through its findings to better research through improved training of researchers and better widespread adoption of successful production and marketing technologies and programmes to allow the rural poor to break out of poverty.

The main objective of the study, following the terms of reference (see Annex 1), is to improve the capacity of agricultural education and training institutions to better develop human capacities. The study is expected "*to identify key skill gaps in graduates of agricultural faculties who are employed in a range of public and private organizations. This will be done through the use of questionnaires and structured and unstructured interviews*".Three countries were selected within the CORAF/WECARD region on the basis of reports from a team of consultants. The selection was made such as to include: a country with a relatively young (and undergoing reform) agricultural training and research base (Gambia), a country with stable and experienced agricultural research and training institutions (Mali), and a country stable, experienced though under reform research and training infrastructures (Ghana). In each of these countries, a focal institution was identified to facilitate the logistics for the study. These institutions were the:The National Agricultural Research Institute (NARI) in The Gambia, l'Institutd'EconomieRurale (IER) in Maliand the Council for Scientific and Industrial Research-Crop Research Institute (CSIR-CRI) in Ghana.

This synthesis report is organized in two major parts. The first part which is the synthesis per se, comprises the following sections: After the preceding sections on the executive summary and the study context, the next sections present the methodology, followed by the findings and the recommendations. The second part is the presentation of the countries' profiles which is the summary of each of the 3 national reports. The final and complete national reports are not included in this present document but can be consulted separately.

2. Methodology

Before the study effectively started, a methodological workshop was organized in Dakar with the project coordinator, the international consultant, the four national consultants and CORAF/WECARD staff members including the SCARDA project coordinator. The objective of the workshop was to discuss the study methodological framework to ensure that each national consultant will follow the same methodological approach. This common approach will allow some comparisons among institutions/countries.

In each of the countries, the consultant selected a small number of agricultural education and training institutions, a sample of employers of agricultural graduates (public, private, farmers' organizations and NGOs) and a sample of graduates. Training institutions and the different employers were analyzed through the information obtained from unstructured interviews. A structured questionnaire was developed for the graduates. These interview guides and the structured questionnaires for graduates are presented as an annex. The number of institutions and employers to include in the study in each country was dependent on the size of the country, the diversity of institutions and of employers.

The sample size for the graduates was dependent on their population. Those sizes and samples were as follows:

- Training institutions (faculty and college of agriculture and other professional agricultural training institutions):

  - The Gambia (1 university/college, 1 professional institution);
  - Ghana (2 universities/colleges, 2 professional institutions);
  - Mali (3 universities/colleges, 3 professional institutions)

- Employers:

  - Public: All sector ministries: agriculture, livestock/fisheries, and environment/forestry; government research institutes; about 10 international organizations involved in training and capacity strengthening, processing, inputs dealers, production, livestock, fisheries, etc.
  - Private: A minimum of 10 enterprises comprising at least 2 from production, processing and/or inputs dealers, etc.
  - Farmer Organizations: 5-10 farmer organizations comprising at least 2 organizations focusing on production or processing, and/or inputs dealers, etc.
  - NGOs: A minimum of 10 NGOs (local and international) comprising at least 2 from NGOs involved in training and capacity strengthening, processing, inputs dealers, production, livestock, fisheries, etc.

- Graduates (which are defined as holders of certificates in agriculture to those with PhDs):

  The interview sample comprised two groups - 150 – 170 employed graduates depending on the size of the population, and 20 – 30 unemployed graduates. Particular care was taken to ensure that gender was properly representative in each sample and that the proportion of females in each subsample (certificate holder, BSc etc) was similar to the overall sample.

The findings have been summarized using descriptive statistics (tables, graphs, histograms, pie charts, etc.)

In nearly all tracer studies, the three approaches suggested by Norman (1985) were used, (a) the follow up approach, (b) the employer's approach and (c) the retrospective approach.

The *follow-up approach* is an assessment of the training program by the students themselves. It is an evaluation of courses delivered prior to the final examinations. The same assessment is conducted some time after graduation, especially with working graduates. The *employer's approach* is an attempt to apprehend the degree of employers' satisfaction about the work performanceof graduates. The *retrospective approach* investigates the impact of the graduates' working experiences on the reform and/or development of new training programs. The methodology adopted in this study was based on the *follow-up approach* and the *employer's approach.*

3. Findings

3.1 Training institutions

The number of institutions visited during the study was two (the only institutions that exist) in The Gambia, ten in Ghana (6 colleges and 4 universities, and twenty six in Mali (12 public and 14 private training institutes). In The Gambia, one of the two institutions was an agricultural college. In Mali, twenty two were agricultural colleges and the balance weretertiary or institutions of higher learning. Mali is the only country with a sizeable number of private secondary agricultural colleges.

In the Gambia and Mali, it was noted that both at the secondary and tertiary levels, the majority of these institutions have enough class rooms. On average, each had only about 30 students while the capacity is about 50 students. Even in most scientific laboratories, the ratio of students per bench was about 1:1. The onlycrowded facilities were the computer labs and the rooms for internet where less than 10 per cent were functioning. The Gambia College has large demonstration and research farms. The University of Gambia at the time of the study had not secured this important training facility. All agricultural colleges in Mali had relatively big research farms (8 to 70 hectares).

In Ghana, the agricultural colleges have sufficient class rooms while most universities, because of their increasing intake, have very crowded class rooms. This last resulted in poor supervision of students and insufficient exposure to practicals and field experience. Overall, in the agricultural colleges, students spend more time in class lectures than in practicals. The exception is Mali, where in a 3-year course, students have to spend a whole year in the field.

Almost all institutions lack sufficient training infrastructure such lecturers' offices, demonstration fields, computer facilities, supplies for practical laboratory exercises, etc. Most of the computers, including those that were functioning, were obsolete. Libraries were under equipped; under staffed and very few were computerized. The institutionsalso lacked well trained and experienced teaching and technical staff (including both technicians for laboratories and field demonstrators). The shortage of qualified lecturers is partially explained by poor salaries.

The Gambia was training up to the Masters level (though the supervision capacity is weak) while Ghana and Mali were training up to the PhD level. The areas of training at both secondary and tertiary levels included crop and animal science, agricultural engineering, veterinary science, forestry and economics. The analysis of the areas of specialization or option in the three countries showed that, in Mali, a large majority of students enroll in crops and agricultural engineering about (55%) followed by forestry (20%). In Ghana, about 50% of employed graduates specialized in the areas of agricultural economics and crops (with about 25% in each area) while graduates from the area of animal science represented 17%.

Concerning the curricula per se, it was noted that very few changes have been introduced since the creation of these institutions. The subjects taught remain almost the same with the same contents and the same number of hours. One may explain this static situation partially by the fact that in the first years of the creation of these institutions, nearly all graduates were recruited by the Government and one knows the resistance and the delay

of government institutions to accept changes. Later on, and more precisely with the adoption of the structural adjustment programs (SAPs) around the 1980s, governments were told not to recruit and most graduates had to look for jobs in the private sector, in the NGOs, in the farmers' organizations and/or in international organizations. Some graduates by necessity had to become self employed.

3.2 Perception of graduates' performance by employers

*The public sector employers*in all countries ironically (they are the ones who develop and/ revise curricula) maintain that agricultural graduates, though they are theoretically well trained,are rather weak in applying their knowledge to solve practical problems with the changing environment. The teaching methods in general have remained too academic. Further discussions led to the conclusion that graduates lack skills in project elaboration and management. Report writing and overall capacity to implement administrative procedures were weak.

The private sector, including agribusinesses, NGOs, farmers' organizations, employs a very small percentage of agricultural graduates ranging from 06% (Mali)to 20% (The Gambia).The study revealed that female agricultural graduates in the threecountries represent only between 4% and14%.

There was a consensus among private employers that graduates were lacking in several areas important to these employers, such asproduction, marketing and farm management. Graduates typically did not effectivelyinterface with private employers. Priority areas identified especially by private employers in all three countries include:

1. Agricultural engineering and machineries;
2. Agricultural economics with emphasis on farm management;
3. Communication, particularly report writing skills;
4. ICT skills

Concerning criteria for recruitment/employment, public employers(understandably) identifiednationality as the first and necessary criterion followed by academic qualifications (in terms of level of training) and the areas of specialisation.The private sector, including NGOs, emphasized prior working experience. This last is consistent with a 1989 study on demand for graduates conducted at the University Center of Dschang (Cameroon).

Private-sector employment criteria in order of importance were: (1) experience, (2) personal characteristics and attitude, (3) subject matter of education and (4) level of education. The private employers in addition, expressed a preference for degree holders but some expressed the need for non degree or in-service training.

All the countries under study do have separate research institutes. The Gambia (NARI) with less than 23 researchers suffers from a very serious shortage in human resources, both quantitatively and qualitatively. Mali (IER) with 235 researchers and Ghana(CSIR-CRI) with 83 researchers are better off. As already mentioned above in the recruitment of graduates, women are highly underrepresented in these research institutes, with 7 women only (30%) amongst the 23 Gambian researchers.

3.3 Graduates' Perception of training curricula

The strengths of the training programs as identified by graduates were essentially their theoretical contents. Specifically, they felt that they were very well trained in basic and applied sciences such as mathematics, biology, physics, botany,etc. They also felt comfortable in areas like crops, soil science, plant/animal diseases and protection, water management and food science. As already indicated above, this solid theoretical training prepared them for taking employment in any of the various areas of the agro food chain. Several weaknesses were identified by the graduates themselves.There was a general consensus among graduates, particularly the first degree holders, that the practical training received was poor. In Ghana, a significant factor was the large number of students admitted for degree programs without the corresponding expansion of facilities like in Ghana. Graduates in The Gambia noted weaknesses originating from the lack of facilities and materials, insufficient time, and inadequate teaching in management and attitudinal change skills. In Mali additional specific weaknesses were identified as (a) insufficient training in computer science, (b) lack of training in economics and agricultural economics, especially in farm management, project preparation and management and entrepreneurship, (c) inadequate bilingual training and (d) absence of course evaluation by students.An important weakness was poor linkage of training to demand. In The Gambia for instance, the study found only one graduate (degree holder) in agricultural engineering yet employers identified that area of specialization priority number one.

4. Recommendations

On the basis of the information gathered from (1) different countries and from the different training institutions, (2) the observations made by several employers and (3) the graduates' assessment of the training received and (4) the discussions during the validation workshops, the following is recommended:

- *At the level of training institutions:*

1) A substantial increase in the number and quality of laboratories, computer rooms, libraries, as well as their updating equipment. Good and regular access to internet by students and lecturers should be a must.

2) The acquisition and/or extension of land not only for practicals, but also for commercial production units to allow students to become fully familiar with in real production conditions.

3) The introduction of new areas of teaching such as project design and management, economics, leadership, management of financial and human resources, climate change and the encouragement of students to engage morein their learning process through participatory teaching methods and course evaluation by students.

4) The establishment of formal and stronger linkages with industry and other stakeholders. The views of these stakeholders should be sought actively through the periodic review of curricula for agricultural training to make agricultural training more responsive to market demands. Those links would allow students to have extended practical attachments to various industrial establishments.

5) The development of a program for training trainers through seminars, short courses, sabbaticals, higher qualifications. The utilization of ICT techniques should become a must for all lecturers in most courses.

- At the level of employers

1) An effective and better involvement of different employers in the development and/ or revision of curricula. Their involvement will facilitate the adaptation of course contents to their needs.

2) The widespread and continuous organization of in-service training sessions and internships (with or without remuneration) for their own trainees and for students (probably towards the end of their training) so as to have a pool of graduates from which to recruit who have the specific knowledge and skills required in their jobs.

3) The provision of financial support of training institutions for specific training through scholarships and other forms of remuneration to students. This can include training equipment and other materials to the institutions.

- At the level of governments

National policy should explicitly include concrete and significant support to the whole agro food chain because of its recognized indispensable role in reducing poverty among the poorest, namely farmers, by increasing their real income, a necessary condition for the overall process of sustainableeconomic growth and development.

Specifically, governments are calledupon to:

1) Allocate more funds to agricultural training and research institutions at all levels to allow them to satisfactorily accomplish their core business of teaching, research and extension.

2) Attract students to agricultural training institutions through loans and scholarships, with particular attention to ensuring the needy and disadvantage groups (especially women) are actively included.

3) Facilitate the entry of graduates into small business enterprises by providing them with (preferably group) loans for the acquisition of land and equipment.
4) Revise land policy to facilitate land acquisition and use for agriculture by young graduates.

5) Elaborate a general agricultural policy which will bring about a strong and dynamic agricultural sector capable of generating agribusiness activities, thus creating wealth and employment. This will include such interventions as the improvement andmaintenance of “feeder roads” and incentives (tax rebates or subsidies) for activities such as storage and processing.

WHERE DO WE GO FROM HERE: THE ROAD MAP?

Any good road map assumes that one knows the answers to four core questions (a) Where am I? (b) How did I get there? (c) Where am I going?and (d) What is the road map?

Where are we?

The present tracer study has shed some more light on where agriculture is in the three countries. The situation is not significantly different on other countries of the SSA region. The performance of the agricultural sector in nearly all these countries is far below expectation, given the available natural and human resources. This poor performance is highlighted by widespread food insecurity, recurrent food riots, and the costs imposed on national budgets by food imports. In 2009 for instance, Cameroon spent close to 20% of the national budget on food imports. These food crises impact negatively on the whole economy.

> *"Agriculture-led development is fundamental to cutting hunger, reducing poverty, generating economic growth, reducing the burden of food imports and opening the way to an expansion of exports"(NEPAD, 2003).*

How did we get there?

It is now a widely established fact that agriculture has been seriously neglected in much of SSA.The post independence years up to the present have been characterized by a long period of economic policy misled by the writings of some theorists of development economics, alluding to the neglect of agriculture. Today, there is a growing consensus about the indispensable and vibrant role of the agricultural sector in SSA (World Bank2008).

Among the factors responsible for the poor performance of the agricultural sector, training has not been sufficiently and adequately addressed. There is a consensus that the impact of trained agriculturalists has been more than disappointing and one cannot escape from asking: *Was this training adequate in terms of its contents and its teaching methods? Did it equip the trainees with the mindset and skills needed to increase agricultural/food production by small farmers and especially women farmers?*

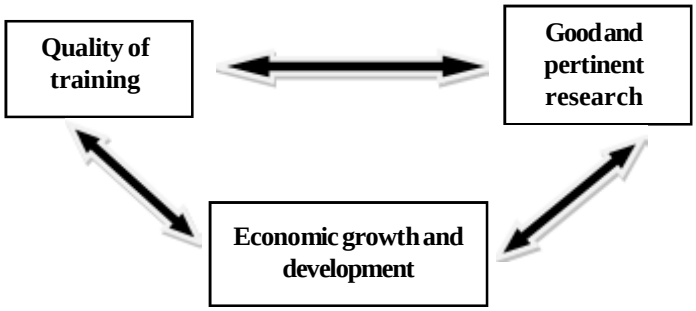
Ngugi et al. (2002) emphasize the necessity and urgency of change in agricultural education and *the "new universities"* to be willing and capable of buying and induce this change. The 2007 World Bank report on *"Cultivating Knowledge and Skills to Grow African Agriculture"* is a strong argument in favor of the positive impact of pertinent knowledge systems on the expansion and development of the agricultural sector. The success of Green Revolution in India and South East Asia is, with no doubt, the result of sound agricultural training and research. We got where we are because of inadequate policies and an agricultural training not relevant and/or adapted to the needs of producers who are small farmers and mostly women.

*Where are we going?*The final destination is the *lost African Green Revolution*. It is the realization of food security as understood by the 1996 FAO definition which states that a country is food secure "when all people at all times have physical and economic access to sufficient, safe and nutritious food for a healthy and active life". Since food security is a human right, this FAO definition has been extended by others to include the dimension of

sovereignty implying *the right of each country tofavor local production and marketing ofbasic foods by shortening the channels between producers and consumers and the right to protect its agriculture against dumping from developed countries.*

What is the road map? In order to remain within the terms of reference,the present report study will address only issues related to quality of agricultural training. No particular emphasis is on research since all researchers are products of training.

The well known performance of the US agricultural sector and that of European, Indian and some South Asian countries is the result of the success of their Green Revolution. This success came from an adequate training. The literature provides evidence of a strong connection between the quality of higher education and scientific research on the one side and economic development and growth on the other. This connection is probably another rather obvious paradigm which has been often forgotten;



Adequate and sufficient infrastructure and equipment constitute a must in the quality of training and by extension, play a key role in the future job performance of graduates. Commercial agriculture and agribusiness are necessarily the way to achieve food security. The future demand for agricultural graduates is more a qualitative demand (graduates with specific skills) than a quantitative one. The study therefore suggests a deep reform of curricula and teaching methods with the view to give more weight to practical sessions through field practices and internships. The policy for development/revision/reforms of agricultural curricula should be based on employer demand -driven principles.

There is a link between the quality of training and corresponding investments in physical and human resources. Donors' financial support have been directed more to research (NARS) than to institutions of higher training. The study has brought out clearly that most institutions which were visited in the three countries suffer from an acute shortage (in different degrees) of training infrastructure, equipment and materials, both quantitatively and qualitatively. There will be no improvement in the quality of agricultural training without a new vision of training comprising:

(1) A mindset revolution by the policy makers, the university lecturers, the students and employers.

(2) A real and effective emphasis on practical skills required by employers in the whole agro food chain.

The importance of practical training is given by David Bragg as quoted by Blackie et al.

"If I hear, I forget;
If I see, I remember;
If I do, I understand".

In short, this new agriculture will require:

- A significant increase of financial support to these institutions in order to acquire more and up to date training infrastructure, equipment and materials. This increase financial support is a pre condition for curriculum reform.

- Better working physical and financial conditions for lecturers in order both to retain the competent lecturers and to bring in new blood. Attention needs to be paid also to the career paths and attractiveness of conditions of service for non- teaching staff.

- The creation of a new image for agriculture by attracting and encouraging the youth (better secondary school graduates) to register in agricultural training. This attractiveness also requires, and this is not the least, increased and sustained real income for farmers. Maduke (2002) reported opinions such as "the clever do not into agriculture as they can make more money elsewhere".

- Adequately address the gender issues. One recalls the key role of women in food production and marketing and the extremely low enrollment of girls in agricultural training institutions and subsequently in the work force. Effective incentives should be defined and implemented to attract young girls into the profession with due regard to customs and other considerations.

- A strong and working partnership between the training institutions, the local community and employers, especially private employers at all levels of training as they are the ones to best express the needs of the community and/or of the professions. Only such a partnership will allow training institutions to produce and deliver the "work ready" or "pre cooked" graduates with sufficient work experience at graduation to take up jobs with confidence and immediate productivity. The partnership may take the form of the U.S.*" land Grant Colleges"*or any other form.