



Activity Report 2007 - 2015

ECOWAS Actions Plan for the Development of Biotechnology and Biosafety in West Africa



November 2015

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Abbreviations

AATF	Africa Agricultural Technology Foundation
ABS	African Bio-fortified Sorghum project
ACMV	African Cassava Mosaic Virus
ARCN	Agricultural Research Council of Nigeria
AHBF	Africa Harvest Biotech Foundation International
ARC	Africa Rice Centre
AUSAID	Australian Agency for International Development
BBP	Biotechnology and Biosafety Program of CORAF/WECARD
BECA	Biosciences Eastern and Central Africa
CIRAD	Centre International de Recherche Agricole en Développement
CIRDES	Centre International de Recherche - Développement sur l'Élevage en zone Subhumide
CNRA	Centre National de Recherche Agronomique (Côte d'Ivoire)
CORAF/WECARD	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/ West and Central African Council for Agricultural Research and Development
CRI/CSIR	Crop Research Institute/Council for Scientific and Industrial Research of Ghana
ECOWAS /CEDEAO	Economic Community of West African States
ECOBIO/PA	ECOWAS Action Plan for the Development of Biotechnology and Biosafety in West Africa (ECOBIO/PA)
ECOWAP	ECOWAS Agricultural Policy
FARA	Forum pour la Recherche Agricole en Afrique
FSP	Fonds de Solidarité Prioritaire (Ministère des Affaires Européennes et Etrangère Français)
GBP	Global Biotechnology Platform of CORAF/WECARD
GFSR	Global Food Security Response
GMO/GM	Genetically Modified Organisms
GMC	GM-Cotton
IER	Institut d'Économie Rurale (Mali)
INERA	Institut National de l'Environnement et des Recherches Agricoles
INSAH/CILSS	Institut du Sahel/Comité Inter-états de Lutte contre la Sécheresse au Sahel
IITA	International Institute for Tropical Agriculture
IRD	Institut de Recherche en Développement
MAS	Marker Assisted Selection
MOU	Memorandum of Understanding
NARS	National Agricultural Research System
NEPAD	New Partnership for Africa's Development
NGO	Non-government Organisation
USAID	United States Agency for International Development
RYMV	Rice Yellow Mottle Virus
SABIMA	Strengthening capacity for safe biotechnology management in Sub-

	Sahara Africa
SFSR	SYNGENTA Foundation for Sustainable Agriculture
SRO	Sub Regional Organisation
STC	Scientific and Technical Committee of CORAF/WECARD
SWG	Specialised Working Group
WA	West Africa
WABNET	West AfriCan Biosciences Network
WAEMU	West Africa Economic and Monetary Union

Executive summary

Since the Sacramento (USA) Summit in June 2003, West Africa is exploring ways of using appropriately biotechnology to improve agricultural productivity and reduce nutritional and food insecurity as well as poverty. In this perspective, the second ECOWAS Ministerial Conference on Biotechnology and Biosafety, held in Bamako in June 2005, has defined the global orientations on an Action Plan and decided to institutionalize a regular ministerial conference on Biotechnology. The conference also commissioned the ECOWAS commission, in relation with CORAF/WECARD and INSAH/CILSS, to finalize and circulate a detailed Action Plan for the implementation of its recommendations. The ECOWAS Biotechnology and Biosafety Plan of Actions (ECOBIO/PA) was elaborated through a participatory approach involving a large range of stakeholders as well as WAEMU and Biotechnology and Biosafety networks/initiatives already operating in the region. Its Global cost was evaluated at 26 215 000 US \$ for 5 years divided into: i) 17 005 000 US \$ for the development of Biotechnology product in the ECOWAS region to improve agricultural productivity/competitiveness and sustainably manage the genetic resources; ii) 6 250 000 US \$ for the development and the implementation of a regional approach to Biosafety, and; iii) 2 960 000 US \$ for putting in place at the regional level an efficient mechanism for Coordination, Monitoring, Evaluation, Outreach and Funding of Biotechnology and Biosafety activities. It was validated by the regional and national experts and adopted thereafter by the Ministers during the 3rd Ministerial Conference held in May 2007, in Accra (Ghana).

In the view of its specific mandate in the region and in application of the Agricultural Research Cooperation Agreement signed between the two institutions in the 22nd December 2005, CORAF/WECARD was commissioned by ECOWAS to coordinate the implementation of the Plan through its Biotechnology and Biosafety Program (BBP).

This document gives a brief report on the state of implementation of the ECOBIO/PA since its approval by ECOWAS Ministers in charge of Agriculture, Environment and Scientific Research in May 2007.

Since the adoption of the Plan, CORAF/WECARD has worked toward putting in place the enabling environment conducive to its implementation. At the institutional level, a Biotechnology and Biosafety Program Manager was officially hired for the Plan's implementation and a Coordination Unit was set at the CORAF/WECARD Executive Secretariat in 2007. In addition, a Global Platform for Biotechnology (GPB) composed with representatives of the 22 CORAF/WECARD Member countries (including all the ECOWAS states) and officially appointed focal persons of International Agricultural Research Centers (IARCs), Agricultural Research Institutions (ARIs) and major development partners, was established. Four Specialized Working Group (Plant Biotechnology, Animal Biotechnology, Biosafety and Communication) were constituted out of the GPB to work on the specific regional biotechnology issues. These instruments have functioned during the 2007-2009 period to define the priority projects portfolio of the Plan, develop detailed specific projects and participate in their implementation. With the support of various donors, twelve (12) regional projects, involving at least 3 countries each and covering all the 15 ECOWAS Member States, were developed and are currently being implemented for a total budget exceeding 16 million \$ US (including USAID funded Staple Crop and Seed Programs). Strategic partnerships were developed with development partners, research institutions and other stakeholders in order to ensure the full participation of all in the Plan implementation. More than 50 sub contracts were signed with national institutions for the Plan's implementation.

In terms of technology deployment, the Biotechnology and Biosafety program have implemented several projects and conducted field testes on various crops (Cassava, Cotton, Cowpea, Rice, Maize, Millet, Sorghum, Yam) and technologies (Molecular breeding, Tissue culture, Genetic Transformation, Post-

harvest technologies). All these projects have significantly impacted the livelihood of the targeted populations.

A regional Biosafety Regulation which involved the 3 sub-regional institutions (ECOWAS, WAEMU and CILSS) was also developed within the framework of the Action Plan. CORAF/WECARD back-stopped the development process of the Regional Biosafety Regulation and also contributed in strengthening the capacities of countries in internalizing it through specific Biosafety projects. In addition to that, CORAF/WECARD has developed a Regional Biosafety Manual and produced countries and regional reports on the state of implementation of the Cartagena Protocol.

Overall, the Action Plan's implementation can be considered as Satisfactory even though many challenges were encountered and many other are still to overcome in order to fully benefit from the impact of agricultural biotechnology on the regional agricultural productivity and competitiveness. That includes a further re-appropriation of the Action Plan by the ECOWAS Commission and its commitment to support the Plan's implementation. At the technical level, efforts must continue in coordinating the regional interventions in biotechnology, deploy more relevant biotechnology processes and products and to support the implementation at the country level, of the Regional Biosafety Regulation.

ECOWAS Plan of Actions for the Development of Biotechnology and Biosafety in West Africa (ECOBIO/PA) 2007- 2015 Activity Report

1. Background

During the last twenty years, the development of biotechnology has significantly improved the understanding of living species. The knowledge generated have contributed to the development of more efficient technologies for better characterization and conservation of species and also allowed the development of new methods for the control of diseases and biotic constraints affecting cultivated plant species and animals breeds. Nowadays, most of the common biotechnologies used to improve agricultural productivity are well mastered and are widespread. Unfortunately, they are still not currently applied in agricultural research and development programs in West Africa, even though most experts agree that modern biotechnology can significantly contribute to the achievement of the development goals defined within the national agricultural productivity frameworks as well as regional policies such as the ECOWAS Agricultural Policy (ECOWAP). Since the Sacramento (USA) Summit in June 2003¹, West Africa is exploring ways of using appropriately biotechnology to improve agricultural productivity and reduce nutritional and food insecurity as well as poverty. During this summit, strong recommendations were formulated in order to facilitate access of the Developing Countries to new agricultural and alimentary technologies with the goal of realizing the World Food summit's objective as well as one of the Millennium Development Goals which is to reduce by half, hunger in the world by 2015. To follow up on these recommendations, the Ouagadougou² ministerial meeting highlighted, among other issues, the necessity to establish: 1) a Public Information Service on Biotechnology in West Africa, 2) a partnership between the West African Research Institutions and their counterparts from the northern countries, particularly with those from the USA, 3) a West African Centre of Biotechnology. The conference also decided to organize a Ministerial Conference on Biotechnology under the auspice of ECOWAS in order to adopt the framework on an Action Plan to promote biotechnology and harmonize regulations on biosafety, and institutionalize a West African Ministerial Conference on Biotechnology, as a first step toward the creation of an African Ministerial Conference. In this perspective, the second ECOWAS Ministerial Conference on Biotechnology and Biosafety, held in Bamako in June 2005, has defined the global orientations on an Action Plan and decided to institutionalize a regular ministerial conference on Biotechnology. The conference also commissioned the ECOWAS commission, in relation with CORAF/WECARD and INSAH/CILSS, to finalize and circulate a detailed Action Plan for the implementation of its recommendations. The ECOWAS Biotechnology and Biosafety Plan of Actions (ECOBIO/PA) was elaborated through a participatory approach involving a large range of stakeholders as well as WAEMU and Biotechnology and Biosafety networks/initiatives already operating in the region. It was validated by the regional and national experts and adopted thereafter by the Ministers during the 3rd Ministerial Conference held in May 2007, in Accra (Ghana).

In the view of its specific mandate in the region and in application of the Agricultural Research Cooperation Agreement signed between the two institutions in the 22nd December 2005, CORAF/WECARD was commissioned by ECOWAS to coordinate the implementation of the Plan through its Biotechnology and Biosafety Programme (BBP). This document reports on the state of

¹ Ministerial Summit on Sciences and Technology, Sacramento, USA June 2003.

² West African Regional conference on "Mastering Science and Technology to increase agricultural productivity in

² West African Regional conference on "Mastering Science and Technology to increase agricultural productivity in Africa: perspectives for West Africa", Ouagadougou, June 2004.

implementation of the ECOBIO/PA since its approval by ECOWAS Ministers in charge of Agriculture, Environment and Scientific Research in May 2007.

2. Overview of the Action Plan

2.1 General Objective

The key objective of the Action plan is to promote Biotechnology within the ECOWAS area in order to contribute to achieving the ECOWAS agricultural policy (ECOWAP) goals: pursuit of sustainable food security, economic and social development and reduction of poverty in the Member States.

2.2 Operational Objectives

The Action plan has been assigned three operational objectives:

- Setting up the Coordination, M&E and Steering mechanisms, for the Action Plan
- Development of biotechnological products to enhance agricultural productivity and competitiveness and to manage genetic resources on a sustainable basis
- Development of a regional approach to biosafety

2.3 Expected Results

The following results are expected from the implementation of the Actions Plan:

- A Coordination and Steering Unit (CSU) is set up and strengthened
- Capacities for communication and sensitization in biotechnology and biosafety in the ECOWAS member countries are enhanced
- Effective co-operation in the field of agricultural biotechnology in the ECOWAS sub-region is implemented
- The financial capacity is strengthened for the creation of a Regional funds to support Biotechnology and Biosafety
- Biotechnology application is promoted across the ECOWAS sub-region
- A regional biosafety framework is established in the ECOWAS member countries
- The national capacities for the implementation of the regional biosafety regulatory framework are strengthened

2.4 Beneficiaries

The promotion of biotechnology in the ECOWAS member countries will undoubtedly provide additional solutions to cope with the many constraints, which affect crop and animal productions in the sub-region. As a matter of fact, the following is expected: i) a framework for the identification of priority constraints is established; ii) fruitful partnerships between the main stakeholders of the public and private sectors are established; iii) legislations related to intellectual property and seed systems are strengthened in the member countries; iv) operators are trained in the various aspects of biotechnology applications; v) endogenous research is encouraged to create a dynamic allowing capturing the regional and international market; vi) relevant socio-economic studies are conducted to prove the positive effects of the development of the biotechnology sector.

2.5 Global Budget

The Global cost of the Actions Plan was evaluated at 26 215 000 US \$ for 5 years including: i) 17 005 000 US \$ for the development of Biotechnology product in the ECOWAS region to improve agricultural productivity/competitiveness and sustainably manage the genetic resources; ii) 6 250 000 US \$ for the development and the implementation of a regional approach in Biosafety, and iii) 2 960 000 US \$ for putting in place at the regional level an efficient mechanism for Coordination, Monitoring, Evaluation, Outreach and Funding of Biotechnology and Biosafety activities.

3. Achievements

3.1 A Coordination, M&E and Steering mechanisms developed

3.1.1 Finalizing the ECOBIO/PA's implementation strategy

Following the formal adoption of the Actions Plan by ECOWAS Ministers in May 2007, a tripartite (ECOWAS, INSAH/CILSS and CORAF/WE CARD) meeting was held at ECOWAS headquarter in Abuja (Nigeria) the 21st and 22nd August 2007, to finalize operational plans developed by CORAF/WE CARD and INSAH/CILSS for the year 2008. The meeting recommended the urgent mobilization of a total of \$ 7 817 000 including an ECOWAS contribution estimated at US \$ 2 102 000 (27% of the total budget) for the immediate launching of the program activities. ECOWAS contribution were planned to take into account, aspects of the Actions Plan dealing with capacity strengthening. The priority activities were: i) Institutional support to CORAF/WE CARD for the implementation of the Plan; ii) Training of scientific and technical personnel in Biotechnology, iii) Biotechnology research Capacity Strengthening of National and Regional Institutions; iv) Putting in place competitive funds to conduct basic and applied biotechnology research in laboratories and Centres of Excellences of the region and; v) Evaluating socio- economic impacts of GM products in the region. A memorandum outlining the activities and budgets for the priority activities was elaborated by CORAF/ WE CARD and presented at the ECOWAS Technical Committee Meeting on Food and Agriculture, in Ouagadougou (5- 8 November 2007) with a revised budget of US \$ 2 700 000. The proposed activities and budget were adopted later on, by the ECOWAS Ministers of Agriculture. During the 4th trimester of 2008, the CORAF Executive Secretariat followed up on the advances made at ECOWAS level for the disbursement of the project funds. Fine-tuned Work Plan budgets were subsequently submitted to ECOWAS and accepted (Abuja, 16-18 mars 2009). However, a first disbursement of 909,964 UC (US \$ 1,390,000) could be effective, only in December 2009 (see details in chapter 3.1).

3.1.2 Establishment of a Coordination unit at CORAF/WE CARD

Immediately after the Ministerial conference in May 2007, CORAF/WE CARD hired a Manager for its Biotechnology and Biosafety Programme who was thereafter formally appointed to coordinate the ECOBIO/PA. A Coordination Unit (CU) for the Plan was then put in Place at CORAF/WE CARD within the framework of the CORAF/WE CARD Biotechnology and Biosafety Program (CW/BBP). The BBP benefited from a USAID support in 2008 to allow the setting up of the ECOBIO/PA Coordination Unit at CORAF/WE CARD Executive Secretariat in Dakar. The outcomes of this USAID support which global budget was \$ 180 000 include: 1) The Biotechnology and Biosafety Program Coordination Unit is established and functional at CORAF/WE CARD Secretariat; 2) A regional workshop to validate the CORAF/WE CARD Biotechnology and Biosafety communication strategy was held; 3) A national sensitization workshop on biotechnology and biosafety was held in Ouagadougou; 4) Three (3) Concept notes for identified priority research areas were developed and submitted to USAID for additional funding. Africa Rice Center was also supported for the dissemination of virus-resistant rice varieties developed through MAS in 4 WA countries (Burkina Faso, the Gambia, Guinea and Mali).

The first priority of the CU was to develop the environment conducive for the implementation of the Plan. Thus, appropriate institutional instruments were put in place, the Plan's priority project portfolio was defined and funds were raised for the implementation of some of these projects.

3.1.3 Putting in place the technical Partnership

During a Program launching workshop funded with the support of USAID and held in Senegal (Saly-Portudal, February 27-29, 2009), a Global Biotechnology Platform (GBP) and Specialized Working Groups (SWG) were put in place to support the coordination activities of the BBP Manager. Each of those

working instruments comprises formally nominated representatives of the National Agricultural Research Systems (NARS) of ECOWAS, International Agricultural Research Institutions (IARC) and Advanced Research Institutes (ARI) involved in Biotechnology and Biosafety research in the sub region.

3.1.3.1 The Global Biotechnology Platform (GBP)

The GBP is a panel of experts and a very broad consultative instrument of the CORAF/WECARD- BBP, which ensures that all stakeholders are involved in the discussions, priority settings, the formulation of concept notes, the development of priority projects, their evaluation, etc. and guarantee the full participation of their institutions in the whole process of promoting biotechnology and biosafety research in the sub region. Based on their area of specialisation, GBP members can constitute specific Task Forces to face particular demands (develop research projects, conduct studies, etc.).

3.1.3.2 The Specialized Working Groups (SWG)

The SWGs are technical groups that back up the activities of the BBP Manager particularly in: i) coordinating the competitive grant research proposal submission, selection and monitoring processes, ii) identifying priority themes and institutions for commissioned research activities to be proposed to CORAF/WECARD Scientific and Technical Committee (STC); iii) coordinating and monitoring the activities of the BBP national focal points, NARS components, Base centres, Centres of excellence and scientific partners involved in the implementation of the BBP activities and; iv) proposing to CORAF/WECARD - STC, terms of references and criteria that will be used in identifying the BBP Base Centres and Centres of Excellences on a competitive basis. The SWGs are composed mostly with members selected within the GBP but also comprise other stakeholders such as representatives of Regional Economic and/or Political Organisations and Development Partners. Four (4) SWGs are currently functional: 1) The Biosafety WG animated by INSAH/CILSS; 2) The Animal Biotechnology WG led by CIRDES; 3) The Plant Biotechnology WG co-directed by CNRA (Côte d'Ivoire and ARCN (Nigeria) and; 4) Biotechnology and Biosafety Communication WG animated by the WABNET. Table 1 below shows the institutions represented in each working group as it was decided during Saly-Portudal meeting. The activities of all these SWG are coordinated and supervised by CW/BBP.

Table 1: Composition of the Specialized Working Groups

Member Institutions	Specialized Working Groups			
	Biosafety	Info. and Com.	Animal Biotechnology	Plant Biotechnology
CERAAS/ Senegal				x
Bioversity Int. / Benin				x
ADRAO-WARDA/ Benin	x	x		x
INRAB/ Benin				x
INERA/ Burkina Faso	x		x	x
CNRADA/ Mauritania	x			x
CNERV/ Mauritania			x	
CIRDES/ Burkina Faso	x		x	
ISRA/ Senegal	x		x	x
IER/Mali	x		x	x
IRAG/Guinea	x	x	x	x
INRAN/Niger				x
ITC/Gambia			x	
INSAH-CILSS/Mali	x	x		
NRI/ UK		x		x
CIRAD/ France	x		x	x
IRD/ France	x	x		x
NARI/Gambia				x
ARC/Nigeria	x	x	x	x
ITRA/Togo	x	x	x	x
CARI/Liberia				x
WABNET	x	x		
INIDA/Cap Verde				x
UCAD-BV/ Senegal	x	x		x
SLARI/ Sierra Leone	x	x		x
CSIR/Ghana	x		x	x
CNRA/Côte d'Ivoire	x			x

3.1.4 Putting in place the Steering Committee

A Steering Committee for the Plan's implementation was put in place by the Agriculture, Environment and Water Department of ECOWAS Commission in May 2013. The membership of the SC is as follows:

- The Commissioner for Agriculture, Environment and Water Resources, ECOWAS Commission; Chairman
- Director of Agriculture, ECOWAS Commission
- Director of Environment, ECOWAS Commission
- Director of Education, Culture, Science and Technology, ECOWAS Commission
- Director of Research and Statistics, ECOWAS Commission
- Programme Manager, Biotechnology/Biosafety Program, CORAF/WECARD
- Coordinator of Biosafety Programme, CILSS
- Representative of NEPAD African Initiative on Biosciences
- Representative of IITA
- Representative of CIRDES
- Representative of African Development Bank
- Representative of USAID
- Representative of
- Director General, CNRA, Côte d'Ivoire (representing NARS)
- President of ROPPA
- Representative of Federation of West African Chambers of Commerce

3.1.5 Defining the Project Portfolio of the BBP and ECOBIO/PA

In addition to the working instruments, the Saly-Portudal (Senegal) workshop also allowed to: 1) officially launch the activities of the GPB and SWGs, 2) review the on-going initiatives in Biotechnology and Biosafety in the region, 3) identify priority projects and define the PBB portfolio of projects for the 5 upcoming years, 4) determine the funding mechanisms for the identified priority projects, 5) define the road maps of the SWGs in terms of project development and fund raising. Each of these SWGs is currently very active.

3.1.6 Developing projects and fund raising

Based on the priority projects portfolio developed by all the stakeholders as well as the major actions contained in the ECOBIO/PA, several project proposals were elaborated and submitted for funding to various donors. We report here in chapter 3.2, on the projects that were formally accepted for funding by several donors and for which, the implementations have already started on the ground or have been completed. A total of 16 Million \$ US were mobilized for the Actions Plan implementation.

3.1.7 Developing strategic partnerships

As indicated above, several development partners have contributed in financing regional biotechnology and biosafety research projects within the frame of the ECOBIO/PA. In general, CORAF/WECARD has signed Cooperative agreements with major donors such as the USAID, the DFID, the EU, the AUSAID, WAEMU and ECOWAS which includes some support for the Biotechnology activities. Similarly, conventions were signed with classical European research institutions partners such as CIRAD, IRD, and AGROPOLIS for the development of regional research projects in basic and applied biotechnology as well as human capacity strengthening programs. Conventions with technical partners based in Africa, such as the IITA, Africa Rice Centre, AATF and BECA were revisited and aligned with the new context. For the implementation of regional projects, agreements were also signed with coordinator countries as well as implementing institutions for the implementation of research projects. More than 50 sub-agreements were signed with national partners for the implementations of the projects.

3.2 Development of biotechnological products to enhance agricultural productivity and competitiveness and to manage genetic resources on a sustainable basis

Several Biotechnology products or processes were developed, adopted, adapted and/or promoted within the framework of the ECOBIO/PA through the implementation of various projects:

3.2.1 The Africa Harvest "African Bio-fortified Sorghum" project

A Memorandum of Understanding (MOU) was signed between CORAF/WECARD and Africa Harvest Biotech Foundation International, Inc. (AHBFI) which designate CORAF/WECARD as a sub- contracting



regional agency for the implementation of the activities of the ABS project in Burkina Faso. This was a 3 years project with a total budget evaluated at \$ 155 250 (\$ 51 750/ year). Activities conducted within the framework of the ABS project include: 1) the preparation and presentation of regular briefings to policy makers and government officials on the need to apply biotechnology, particularly genetic modification technologies to improve African indigenous crops like sorghum, cow pea, millets, yams, etc.; 2) the preparation and presentation of regular briefings to policy makers and government agencies in Burkina Faso on biosafety. Spin-offs

(press packs and media briefings, to support the ABS); 3) the development and presentation of communication materials on biosafety for government agencies, policy makers, the scientific community and the public in Burkina Faso; 4) holding a biotechnology and biosafety awareness workshop (common format, materials, presentations and presenters) for the broad public in Burkina Faso, with emphasis on engaging farmers through their professional organizations and; the development of a standard workshop content and format on biotechnology and biosafety for training purposes in Burkina Faso.

3.2.2 The FSP- Cotton Project



The FSP (Fonds de Solidarité Prioritaire) project on Cotton was funded by the French Ministry of Foreign and European Affairs within the framework of a global initiative aimed at re-boosting cotton production after the crisis that shook the cotton sector in West and Central Africa during the 1995- 2005 period. It was coordinated by CORAF/WECARD with CIRAD (France) as the technical backstopping partner. The objectives of the project are to:

1) Create a Technical platform on cotton Biotechnology and Biosafety; 2) Support a regional phytosanitary coordination mechanism for cotton. The overall budget for the implementation of these activities was 530,000 Euros. The project was officially launched in June 2009 and activities are being implemented on ground in 4 countries (Burkina Faso, Benin, Mali and Togo). The project resulted in the constitution of a formal regional network for the evaluation of the impact and the sustainable management of Genetically Modified Cotton (GMC). This started with the training of both trainers and researchers specialised in risk assessment and management who also developed and applied experimental methods for the evaluation of



GMC for studies on Gene flow, the efficiency of GMC in the West African parasitic environment, Impact on entomofauna, Evaluation of the initial frequency of the resistance genes to Bt in the populations of carpophagous (fruit-eating) nymphs, Evaluation of the performance and socioeconomic impacts of GMC. This allowed the production of knowledge and training support for actors in the field of GMC cultivation. The project activities contributed in training of actors in the application of national or regional regulations, in the acquisition of knowledge on production systems and in the implementation of a management strategy of innovation and particularly for the prevention of the development of insect resistance.

3.2.3 The SFSA project on “Strengthening capacity for safe biotechnology management in Sub-Sahara Africa (SABIMA)”.

The purpose of the SABIMA Project was to strengthen Africa’s capacity in sound biotechnology management for enhanced food security. It was a 3 years project coordinated at the continental level by FARA with a total budget of US \$1,265,596 and for 6 countries (Burkina Faso, Ghana, Nigeria, Kenya, Uganda, Malawi), among which, 3 belong to the ECOWAS region. At the West African Regional level, CORAF/WECARD coordinated the project with a total budget of approx. US \$ 295 250. The project resulted in:



- Reviewing the current status of agricultural biotechnology and bio-safety in the key countries that are either commercializing or field testing genetically modified organisms in 2010: Burkina Faso, Ghana and Nigeria;
- Identifying the capacity building gaps in these countries and the modalities for intervention and implement improvements;
- Developing stewardship policies, procedures and staff capability to provide leadership in stewardship for the safe and effective use of agricultural biotechnology at CORAF/WECARD level and in Burkina Faso, ;
- Identifying, training (3 modules: Biotechnology Stewardship Introduction, Biotechnology Stewardship Communication and Policy Development, Biotechnology Stewardship Audit and Verification) and mentoring 15 stewardship leaders in CORAF/WECARD and stewardship champions in each of the 3 countries and 70 national researchers trained in Biotechnology Stewardship (at least 1 module).
- Creating, through countries stewardship champions, an effective, informed network of experts with access to quality information and communication channels for advocacy and promotion of safe practices and agricultural biotechnology utility.
- Sensitizing more than 200 policy makers, media workers, and the general public on biosafety issues through 3 workshops

3.2.4 Projects funded under the USAID Global Food Security Response (GFSR) initiative

Within the framework of the USAID-funded GFSR initiative, the Biotechnology and Biosafety Program implemented three commissioned projects. All the 3 projects participated in solving the food crisis in West Africa and were also meant to build intrinsic scientific and technical capacities in the involved countries, to sustain the biotechnology methods and products that will be developed and/or transferred during the projects implementation. These projects are also models for solving global issues through regional cooperation in the area of biotechnology where the need for a collective effort to reinforce capacities, share experiences and adopt regional approach for important issues like Biosafety, is still

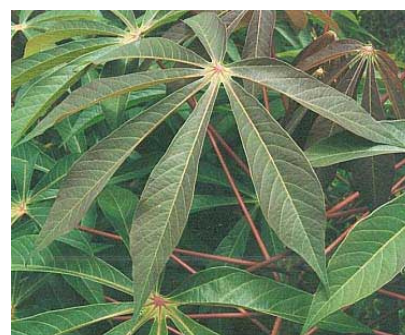
high. A total of 10 countries benefited from the USAID projects outcomes. The global budget for the two years of the projects implementation is estimated at 2 million US \$.

3.2.4.1 Deployment of RYMV resistant rice varieties through Marker Assisted Selection

In order to contribute in mitigating the food crisis in West Africa, the “Deployment of RYMV resistant rice varieties through Marker Assisted Selection” project, proposed to expand to more³ countries, the use of the Rice Yellow Mottle Virus (RYMV) resistant rice lines bearing the dominant *rymv1* allele, that were previously identified by the Africa Rice Center (ARC, Cotonou, Benin) and IRD through Molecular Marker Assisted Selection (MAS). For its implementation, The Centre National de Recherche Agronomique de Côte d’Ivoire (CNRA) an institution of one of the Seven (7) countries involved was selected for the



coordination of the project and was technically backed up by ARC. The approach of the project was the following: the RYMV resistant lines pre-selected at ARC were tested within each country in order to identify the best adapted lines for each agro ecological zone. Breeder seeds from 6 elite lines were produced at the research station level and distributed to Extension Services of the 7 countries and to at least 2 Farmer Associations for the production of certified seeds. More than 100 farmers received the appropriate training for the production of seeds that were subsequently distributed widely in the countries. Researchers involved in the project were trained at ARC in the MMAS techniques and used these skills to check for the presence of the *rymv1* allele and the purity of the certified



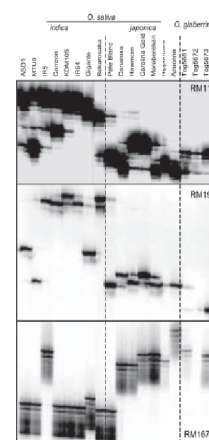
seeds produced by farmers and extension services.

3.2.4.2 Using *in vitro* tissue culture methods to preserve, multiply and distribute cassava cuttings free of ACMV to farmers in West and Central Africa

The objective of this project was to improve the cassava productivity in cassava producing countries through the use of quality planting material sanitized and multiplied by *in vitro* tissue culture methods. For its implementation, The Crop Research



Institute of the Council for Scientific and Industrial Research of Ghana (CRI/CSIR), an institution from one of the Seven (7) countries involved was coordinating of the project and was technically backed up by the International Institute for Tropical Agriculture (IITA, Ibadan, Nigeria). The project was based on the following principle: cuttings from the two (2) most preferred Cassava varieties from each country and two of the varieties



³ USAID has supported the deployment of some of these varieties in Burkina Faso, the Gambia, Guinea and Mali in 2007-2008 through a grant awarded to ARC and supervised by CORAF/WECARD

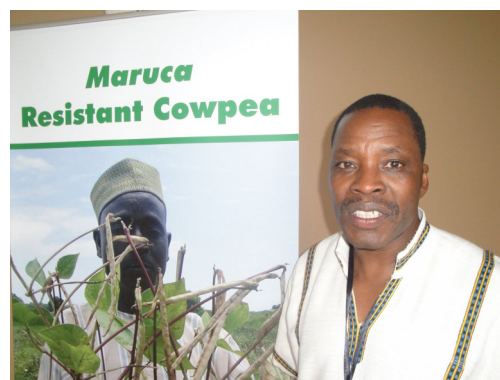
deployed by IITA in these countries, were selected and sent to IITA for sanitization. 20 Technicians from the seven (7) countries were trained at IITA or in the relevant countries in the sanitization and *in vitro* micro-propagation methods. The technical capacities (equipment and infrastructure) of each participating institution were reinforced in order to multiply through a combination of *in vitro* and *in vivo* methods, cassava cuttings that were distributed to Farmers Associations and Extension Services for additional multiplication. The cleaned cuttings produced were widely distributed to farmers in regions where ACMV is a serious constraint for Cassava production. A total of 50 ha of cleaned parkland are currently being used to provide cuttings to farmers in Benin, Togo and Côte d'Ivoire.

3.2.4.3 Facilitating the adoption of Bt- cowpea in selected West African countries



The main objective of this project was to contribute in addressing the current food crisis facing west and central African region by improving the cowpea productivity in through the use of Bt- cowpea varieties. Specifically the project's objective was to evaluate the socio-economic and environmental impact of Bt- cowpea in at least 2 countries in preparation of the dissemination of local Bt-cowpea varieties in West and Central Africa. The project was coordinated by the "Institut National de l'Environnement et de Recherche Agronomique" (INERA) of Burkina Faso, an institution from

one of the three (3) countries involved. The authorization to use Bt-cowpea seeds were negotiated by CORAF/WE CARD with African Agricultural Technology Foundation (AATF). A first round of testes of various Bt-cowpea lines were conducted in Burkina Faso and 2 most adapted lines were selected. The socio-economic as well as environmental impacts of one or two best lines were evaluated in the 3 countries. The project also reinforced human and technical capacities for the management of GM crops, of 4 technicians from IER Mali and ITRAD trained at INERA, Burkina Faso. The Authorization for conducting Confined Field trial on Bt-cowpea was obtained in Burkina Faso (INERA) and Mali (IER) even though, the trial could take place only in Burkina Faso. The project intervention resulted in the publication of 3 decrees for the application of the Biosafety law in Mali, and the initiation of the process of revising the Biosafety bill in Togo.



3.2.5 Projects funded under ECOWAS grants

One of the reasons for the weak adoption of biotechnologies in the region lies, among others, in the insufficiency of funding, qualified human resources and well equipped laboratories of excellence as well as lack of an institutional framework for capacity strengthening in Biotechnology. In order to specifically address in priority, these insufficiencies, an Implementation Agreement was signed in November 2nd 2009 between ECOWAS and CORAF/WE CARD, in application of the global Convention established in December 22nd 2005 between the two institutions, designating CORAF/WE CARD as a technical arm of ECOWAS for the implementation of ECOWAS agricultural policy (ECOWAP). Human capacity strengthening was clearly identified as one of the priority actions to undertake in the logic of progressively developing local competencies and putting in place an effective biotechnology research teams in West Africa. That is the reason why, the first intervention of ECOWAS in the implementation of ECOBIO/PA focuses on:

- **Strengthening the Biotechnology and Biosafety Research Capacities** of West African Scientific and Technical Personnel: this was done by supporting i) regional training activities aimed at enhancing the operational capacities of technicians and researchers, ii) the construction of a Regional Master program in Biotechnology and Biosafety and iii) reinforcing the technical capacities of selected Centers of Excellence.
- **Supporting the coordination and fund raising capacities of the CORAF/WECARD Biotechnology and Biosafety Program** to ensure the implementation of the ECOBIO/PA through: i) support the BBP in conducting scoping studies to identify Center of excellences that will serve for the Plan's implementation and to guide decision makers for strategic choices in biotechnology and, ii) providing an institutional support to CORAF/WECARD Biotechnology and Biosafety Program.

The total budget accepted by ECOWAS for these activities is US \$ 1,360,000 (909,964 UC) of which, \$ 650,000 are devoted to training initiatives, \$ 550,000 to the reinforcement of technical capacities of regional biotechnology and biosafety research institutions and \$ 160,000 to coordination.

3.2.5.1 Capacity strengthening activities



Human resource development is the top priority as regards building the capacities of the region in biotechnology. The studies that have been carried out all clearly point out to this constraint as being the most serious one because, even in those countries where there is minimum research infrastructure, the missing link is the critical mass of researchers, technicians and managers of biotechnology research. The universities in many ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria, Senegal, for example) have already introduced molecular biology and biotechnology modules into the curricula of the traditional courses of study (genetics, biochemistry, etc.); but very few universities

have developed a specialized course of study in this area. The strategy adopted within the ECOBIO/PA is that, "through progressive approach, ECOWAS will: I) carry out a study to identify those universities having the best potentialities and assess their capacity building requirements for biotechnology teaching; II) help these universities to create specialized biotechnology courses of study; III) develop a competitive grant programme for biotechnology studies and university research in the region. In the same vein, the agricultural colleges and the laboratory technical training schools must be identified and supported for the development of curricula and specialized training modules in biotechnology and biosafety. For the time being, ECOWAS has opted through its ECOBIO/PA, to put in place a grant programme of refresher courses for the regional researchers, research technicians and administrators to allow them, in collaboration with the bilateral and multilateral partners of the region, to build their capacities. Candidates are selected on the basis of their effective participation in a research programme that calls upon the contribution of a particular biotechnology to move forward.

3.2.5.1.1 Regional "on hand" trainings conducted

Two training events were organized for ECOWAS research institutions staff, on Common Biotechnology methods for seed cleaning and multiplication, detection and elimination of plant pathogens, diagnostic of GM plants and Biosafety procedures:



- Ten (10) researchers and technicians from the Gambia, Ghana, Liberia, Nigeria and Sierra Leone were trained for 4 weeks at Legon University (Accra) in collaboration with the Crop Research Institute (Kumassi) of CSRI, in Ghana.
- Twenty (20) from Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal and Togo were also trained at the Central Biotechnology Laboratory of CNRA (Abidjan, Côte d'Ivoire).

3.2.5.1.2 A Regional Master Program in Biotechnology and Biosafety developed and operationalized

In the view of the weakness and the dispersion of the competencies and human resources in West Africa in one hand, and taking into account the necessity to better valorise the few funding opportunities on the other hand, one of the best approach that is advised by specialists is the mutualisation of the capacity building initiatives. It is that spirit that have guided lecturers from seven universities in West Africa (U. of Abomey Calavi, Bénin; U. of Ouagadougou, Burkina Faso; U. of Abobo-Adjamé, Côte d'Ivoire, U. of Bamako, Mali; U. of Nouakchott, Mauritanie; U. Abdou Moumouni, Niger; U. Cheikh Anta Diop, Sénégal) who decided to build a single curriculum of excellence within the Faculties of Science of Technologies of West African Universities in Biotechnology and Biosafety. The main goal of that initiative is to offer to students, a high level multidisciplinary training that will prepare them for PhD studies and allow their insertion in the biotechnology production value chain. The trainees will be prepared to be operational in: 1) Research and Development in Biotechnology, Plant Breeding and Genomics, 2) Production of natural substances, quality inoculums for improved agricultural production, clean planting material, vaccines, diagnostic tools, etc.; 3) Agricultural or Agro-industrial Inter-professional organizations and; 4) Research Organizations.

Within the framework of the ECOBIO/PA's implementation, a call for a project proposal was launched by CORAF/WECARD in collaboration with the Department of Agriculture of the ECOWAS Commission, in February 2010. The Consortium of the seven West African Universities associated with 3 European Research Institutions and Universities, developed and submitted to CORAF/WECARD a proposal that was reviewed, amended and finally accepted by its Scientific and Technical committee



in May 2010. An official convention was signed between CORAF/WECARD and the Cheick Anta Diop University representing the consortium, for the finalization and the launching of the Regional Master in Biotechnology and Biosafety. The following results were achieved so far:

- An inter-institutional Agreement for the Master Program signed between 7 Universities; 3 additional English speaking Universities (University of Lagon, Ghana; University of the Gambia and the University of Ibadan, Nigeria) are currently being enrolled;
- 7 national Steering and coordination committees established
- 2 curricula (Plant Biotechnology and Microbial/Environmental Biotechnology) finalized and launched; Biosafety curriculum under construction
- Upgrading of the MSC to a PHD Program under development

- 50 MSc students undergoing training;
- An official coordinator was nominated for the project;
- A Coordination Unit (CU) constituted with national coordinators and representatives of each institution involved was also put in place;
- A Permanent Administrative and Technical Secretariat (PATS) located at UCAD (Dakar, Senegal), was put in place to assist the CU and the national coordinators;
- The Regional Master's institutional arrangement and governance procedures were finalized. Drafts of the Governance Manual and the Inter-Institutional Agreement Protocol were elaborated and are currently under assessment by the lawyers of the Universities involved in the consortium.
- A Pedagogic Manual was also developed. It specifies the organization, the content, the pedagogic approach, the coordination amongst Learning Modules, the typology of trainers, the organization of mentorship, the certified host laboratory for students, the teaching calendar, the conditions for admission of students, the evaluation mechanism of the students, the technical means needed, the Distance Learning system as well as aspects related to the evaluation of the trainings and Intellectual Property Rights issues.
- A Pedagogic Team was put in place for two curricula and the content of 2 out of 4 Options of the Master (Plant Biotechnology and Microbial, Agricultural and Environmental Biotechnology) were finalized;
- The project team also worked with the West African Biotechnology Network (RABIOTECH) to identify the convergences as well as the complementarities and define ways to interconnect the different initiatives;
- Other donors were mobilized by the Project Team and are willing to support the initiative.

3.2.5.1.3 Capacity strengthening of National Programs

The BBP Manager has participated in several training events in the region aimed at reinforcing the capacities of National Programs stakeholders in Biotechnology and Biosafety. Similarly the BBP Manager has given direct support to national programs such as Mali, Benin, Burkina Faso, Togo Ghana, and Côte d'Ivoire through its participation in various national and/or regional capacity strengthening meetings and technical workshops. Details of those supports are found in quarterly reports of



CORAF/WECARD. ***Skills of more than 100 scientists improved in tissue culture, molecular biology technics and biosafety.***

3.2.5.2 Strategic studies

3.2.5.2.1 Study to identify Regional Centres of Excellences in Biotechnology and Biosafety

Amongst actions listed for the implementation of its Specific objective n°1, the ECOBIO/PA explicitly indicate the identification and the strengthening of Centers of Excellence that operate in West Africa, as priority activity to undertake and that, in conformity with the recommendation of Ouagadougou Ministerial Conference. Indeed, various studies have shown that the region has some capacities (national

laboratories or international centres) that simply need to be strengthened so that they may form the basis, not only for training and progressive technology transfer, but also for fundamental research. Once they have been endorsed as the ECOWAS technical instruments of reference, these institutions can be used to create a flow of know-how, from the developed countries towards them, on the one hand, and from these institutions towards the countries, on the other hand. With the goal of identifying Centers of excellences that will be used for the implementation of the ECOBIO/PA and serve for the CORAF/WECARD BBP, a call for consultancy was launched in February 2010. A consultant was selected to conduct a review on the current status and capacities of the national and international research centers involved in biotechnology and biosafety activities in the region. The report is currently available and was used by CORAF/WECARD Scientific and Technical Committee, to short list the potential candidates that will thereafter be submitted to further analysis and capacity building program.



3.2.5.2.2 *Ex ante analysis of the socio-economic impact of the adoption of GM crops in WA*

Apart from the fears formulated against GMOs concerning their possible adverse impact on the environment and human health, certain NGOs are expressing worries about the possible negative socio-economic impact that might come along with the adoption of GMOs by the farming community of the ECOWAS sub-region. Even if such worries do not apply to the GMOs alone, it is important to assess the introduction of new technologies or new products into an agricultural system that is already unstable. However, the trends that consist in seeing only the potential adverse effect of GM crops is very restrictive because any serious study on the adoption potential of a technology should also take into account the evaluation of the risks related to its “non-adoption”. Indeed, numerous other voices other than the anti-GM NGOs are also rising to call on the attention of decision makers on the potential danger that Africa could face if it does not take, now, the biotechnology train that is leaving the railroad station not to come back again. Thus, the ECOBIO/PA has adopted, as a guiding principle, the institutionalisation of comprehensive impact assessment (environmental, health and socio-economic) of GMO introduction into the West African agricultural system. It is for this reason that CORAF/WECARD has launched a call for consultancy, to conduct an “*Ex ante analysis of the socio-economic impact of the adoption of GM crops in West Africa*” based on the current available information inside and outside West Africa. The report of that study is available and clearly shows that ***Biotechnology remains a very credible option for sustainably improving agricultural productivity and competitiveness in West Africa and that appropriate biosafety measures and socio-economic studies can allow the region fully benefit from that promising technology.***

3.3 Development of a regional approach to biosafety

3.3.1 *Development of a regional biosafety regulation*

In the spirit of the ECOBIO/PA, developing a regional approach to biosafety includes: 1) the development of Regional Framework and Regulations and; 2) the reinforcement of national biosafety capacities for implementing regional regulations. During a tripartite meeting held on the 7th of April 2009, ECOWAS and WAEMU Commissions and INSAH/CILSS Executive Secretariat decided to coordinate their efforts in the area of Environmental preservation and Human/Animal Health and to develop a unique Regional

Framework as well as a Common Biosafety Regulation Regime engaging the tree institutions. This agreement was further reinforced by a Road Map developed the Parties during a meeting held in Abuja (July 30th and August 1st 2009).

In conformity with the Roadmap, a Biosafety Committee was put in place for the elaboration of a Common Regional Biosafety Regulation composed with representatives of the 3 institutions and resources persons from relevant institutions in West Africa, including CORAF/WECARD. The work done by that Committee led to a proposal that was submitted to national consultations during the year 2010 and 2011. The input of the Civil Society was also collected during a workshop held in 2011 at Ouagadougou. From 2010 to date, the Biosafety Committee held a series of meetings, workshops and consultancy work aimed at finalizing the Regional Biosafety Regulation. A final version is now available and will be definitively validated during the month of November 2015 in Abuja before its adoption by the Ministers and Heads of States of the 3 regional Institutions.

3.3.2 *WAEMU initiative on Biosafety*

Within the framework of the implementation of its Common Policy for the Improvement of the Environment (CPIE), the WAEMU Commission has launched, with the support of the World Bank as Executing Agency of the Global Environment Facility (GEF), a Regional Program in Biosafety. This program aimed at filling the gap of a regional regulatory and or institutional framework as well as the lack of technical and administrative guidelines for the evaluation and management of environmental, socioeconomic and sanitary risks associated with the introduction of LMO and derived products within the WAEMU region. It is structured in 3 components: 1) A **Technical Component** relative to the development and dissemination, from existing sources, of common methods for the evaluation and management of environmental, sanitary and socioeconomics risks associated with the utilization of LMO and derived products; 2) A **Regional Regulatory and Institutional Component** consisting, in one hand, in elaborating a legal framework of biosafety for the WAEMU region and on the other hand, in setting up a regional and operational biosafety framework in conformity with the procedures of the Union in terms of preparing, adopting and diffusing the Community Regulations and 3) A **National Component** related to the implementation of the regional regulations at the national levels and to capacity strengthening in the area of Intellectual Property Rights, with the objective of giving to each beneficiary Member State, the requisite capacity to face the requirements of the Cartagena Protocol. Implementing this program, notably in its component 1, will allow the strengthening of the existing technical/institutional capacities for evaluation/management through: 1) the development of common procedures and 2) the equipment of National Biosafety Laboratories.

In that perspective, WAEMU has commissioned CORAF/WECARD to carry out a study in the region for the development of common procedures and methodologies for the evaluation and the management of risks associated to the introduction of the modern biotechnology products in the WAEMU space. The total project cost was approx. \$ US 300 000. The implementation of that project allowed the production of:

- 8 national reports of the WAEMU countries on the state of implementation of the Cartagena protocol on biosafety;
- A regional report on the state of implementation of the Cartagena protocol in West Africa;
- An harmonized regional biosafety manual of procedures

These documents are available on the WAEMU web site.

3.3.3 *The OBAMA/WA project*

Under the USAID funded FTF initiative, a special project entitled "Outreach for Biotechnology Application and safe Management in West Africa (OBAMA/WA) was developed and implemented with the aim of

facilitating the development of an enabling environment for conducting GMO research in Benin, Burkina Faso, Côte d'Ivoire, Mali, Togo and Senegal; and aligning the national legislations to the draft ECOWAS regional Biosafety Regulation. The implementation of the FTF projects facilitated sectorial analyses followed by the proposition of 24 options for legislation/decrees and other administrative decisions in the 6 countries. Out of the analyzed options, 22 propositions were validated through a consultation process and proposed for legislation/decrees. Thirteen (13) were approved and 11 have started being implemented in Burkina Faso and Côte d'Ivoire. The breakthrough events are the development and presentation for legislation, of the Biosafety bill in Benin where the moratorium was definitively lifted; and the official adhesion of Côte d'Ivoire to the Cartagena protocol.



Experts meet in Mali to validate biosafety bills

Multi-ministerial decree in Côte d'Ivoire for the use of GMO in Côte d'Ivoire

3.3.4 The West African Seed Program

The ECOBIO/PA formally recognize the fact that one of the bottlenecks that could hamper the safe, responsible and efficient deployment of Biotechnology product is the lack of appropriate seed regulation system both at the regional and national levels in West Africa. In order to face that issue, CORAF/WECARD developed a proposal in 2013 that was funded for 9 million \$ US by USAID with the goal of expanding the use of certified seeds in West African and specifically increase the availability and use of quality seeds. The implementation of the project activities has allowed:

- The establishment of an Alliance for Seed Industry in West Africa (ASIWA) under the auspices of the Hub Rural
- The gazetting of the regional regulation in 14 countries
- The establishment of National Seed Committees in the 17 ECOWAS Member States
- Capacity strengthening of more than 1000 seed producers in those countries
- The supply of more than 500 tons of breeders seeds of rice, sorghum, maize, cowpea, millet and groundnut
- The development of 32 business plans for private actors (12 in Mali; 5 in Burkina Faso, 6 in Benin, and 5 in Senegal, 4 for Niger)
- The setting and operationalizing a seed electronic platform
- Etc.

4. Conclusion

The implementation of the ECOBIO/PA by CORAF/WE CARD during the period of 2007-2015 has produced several positive results expected from its implementation:

- A regional mechanism to coordinate agro-biotechnology research and facilitate regional cooperation that field was put in place, at the ECOWAS Commission level (Steering Committee), at CORAF/WE CARD (Biotechnology and Biosafety Program), at the level of the regional partners (The Regional Biotechnology Platform and Working Groups) and at country levels. This allowed the setting of an environment conducive for facilitating the development of a myriad of projects and leverage funds for their implementation.
- Several Biotechnology products, methods, approaches were promoted through the implementation of more than 15 projects in all the ECOWAS countries and allowed the improvement of productivity and competitiveness of food safety crops such as Rice, Cassava, Yam, Cowpea in the targeted communities.
- A Regional Biosafety Regulation was developed and is under validation at the ECOWAS Commission level; the capacities of countries to appropriate that regulation and implement it were also strengthened.

This represents a very positive global outcome event though many challenges are still to be faced. These includes the full engagement of the ECOWAS Commission in supporting the Action Plan's activities because most of the funds that were mobilized by CORAF/WE CARD for the Plan implementation were from individual donors and that potential can be increased if the support from the Commission is clearly affirmed.

At the technical level the efforts started must be pursued. In particular, the capacity strengthening activities to develop the full potential of countries and the region to actually take advantage of the agricultural biotechnology must be sustained and increased.

5. Perspectives

The General Objective and the 3 specific objectives of the Actions Plan are still relevant for the next decade. However, there is a need to revisit the Actions Plan's activities in order to take into account the new environment, the emerging scientific and developmental issues as well as the new opportunities. The perspective for the next decade can be highlighted as follows:

- The Coordination system of the Biotechnology and Biosafety system in West Africa must be sustained to allow better and common decision making processes and improve the ownership of the Program by countries and the ECOWAS Commission. This should be done through:
 - o The development of the revised Actions Plan through a broad consultative process,
 - o The improvement of the functionality of the Steering Committee which must be more proactive in validating the revised Actions Plan, guiding CORAF/WE CARD and preparing the 4th Ministerial Conference due since 2010
 - o Sustaining the support to CORAF/WE CARD for the technical coordination of the Plan. In particular, the functioning of the Biotechnology and Biosafety Program must be directly supported by the ECOWAS Commission through a yearly allocated budget
 - o Improving the functioning of the Regional Biotechnology Platform as well as the Technical Working Groups
- The development of Biotechnology products must be pursued. Especially, the technologies that were proven to be highly efficient should be taken to scale in order to significantly contribute to the improvement of agricultural productivity and competitiveness of the region; this will be done through a competitive grant system for MSC and PhD programs as well as applied and basic research in Biotechnology and Biosafety conducted to solve the agricultural constraints in West

Africa. The Master program for agricultural Biotechnology will be instrumental in training researchers and the network of Centres of Excellences identified through the studies conducted during the first phase will be used to conduct strategic studies.

- Efforts should be pursued for the adoption of the Regional Biosafety Regulation and its application at country levels. That will be backed up with the biosafety capacity building efforts.





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