



CEDEAO

Communauté Économique des
États d'Afrique de l'Ouest

ECOWAS

Economic Community
of West African States

Action plan for the development of biotechnology and bio-safety in the ECOWAS sub-region

2006 – 2010

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LIST OF ACRONYMS AND ABBREVIATIONS

AATF	African Agricultural Technology Foundation
ABI	African Bioscience Initiative
ABSF	African Biotechnology Stakeholder Forum
ABSP	Agricultural Biotechnology Support Project
DNA	Deoxyribonucleic Acid
TRIPS	Trade related intellectual property systems
WARDA	West African Rice Development Association
IAEA	International Atomic Energy Agency
APHIS	Animal and Plant Health Inspection Service
ARI	Advanced Research Institutes
ASARECA	Association for Agricultural Research Extension in East and Central Africa
ADB	African Development Bank
BCEAO	Central Bank of West African States
BCH	Biosafety Clearing House
BOAD	West African Development Bank
Bt	<i>Bacillus thuringiensis</i>
CBD	Convention on biological Diversity
ECOWAS	Economic Community of West African States
CGIAR	Consultative Group on International Agricultural Research
ITAC	International Tropical Agriculture Centre
CIGGB	International Genetic Engineering and Biotechnology Centre
CILSS	Permanent Inter-state Committee for Drought Control in the Sahel
CIMMYT	International Maize and Wheat Improvement Centre
IARC	International Agricultural Research Centre
CORAF/WECARD	Conseil ouest et centre africain pour la recherche et le développement agricoles / West and Central African Council for Agricultural Research and Development
US	United States
ECOWAP	Agricultural Policy of the Economic Community of West African States
FAO	United Nations Food and Agriculture Organisation
FARA	Forum for Agricultural Research in Africa
FDA	Food and Drug Administration
GEF	Global Environmental Facility
WG	Working Group
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
INSAH	Sahel Institute
IPGRI	International Phytogenetic Resources Institute
ISAAA	International Service for the Acquisition of Agri-biotech Applications
MSU	Michigan State University
NEPAD	New Partnership for Africa's Development
NGICA	Network for the Genetic Improvement of Cowpea
AIPO	African Intellectual Property Organisation
OECD	Organisation of Economic Cooperation and Development
GMO	Genetically Modified Organism
IGO	Inter-Governmental Organisation
WTO	World Trade Organisation
WHO	World Health Organisation
NGO	Non-Governmental Organisation
UNO	United Nations Organisation

UNIDO	United Nations Industrial Development Organisation
MLO	Modified Living Organism
PBS	Programme on the Biosafety systems
PDBA	Agricultural Biotechnology Development Programme
GDP	Gross Domestic Product
SMSE	Small and Medium-Sized Enterprises
SMSI	Small and Medium-Sized Industries
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UK	United Kingdom
TOKTEN	Acronym of a UNDP project on transfer of knowledge by expatriates in their countries of origin
AU	African Union
EU	European Union
UEMOA	West African Economic and Monetary Union
UNU/INERA	United Nations University/ University Institute for Natural Resources in Africa
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WABNet	West Africa Bioscience Network

1. EXECUTIVE SUMMARY

The agricultural sector is, and will remain for quite a long time again, a strategic sector for the economies of the majority of the ECOWAS Member States. The agricultural sector contributes for more than 30 % to the GDP and remains, in this globalised world, the only escape route left for our countries to get out of the crisis. It participates from this point of view for 60 to 80 % in the exports revenues and provides jobs to nearly 70 % of the population.

It still has many assets that need to be capitalized: the significant yet unexpressed potential of irrigable lands and water resources; the existence of crops with high potential value added (fruits and vegetables in particular); the existence of significant pastoral and fish resources.

However, despite its strategic character in the Member States' economies and its undeniable assets, the West Africa regional agriculture is still unable to meet the local food requirements. Nearly 40 million people suffer from food insecurity everyday.

The production growth noted in most of the countries is due more to an increase in acreages than to yield increase. The lack of control over the climatic hazards, the land tenure insecurity, the lack of credit and agricultural inputs are all elements in the producer environment that slow down investment, modernization and intensification of the production systems.

Thus, the Agricultural policy of the Economic Community of West African States (ECOWAP) has been assigned three major orientations:

- Enhancement of agricultural productivity and competitiveness;
- Regional integration of productions and markets;
- Controlled integration into the global trade system.

The first orientation calls for the: (i) modernization and security of smallholdings; (ii) promotion of food and cash crops; (iii) sustainable management of natural resources; (iv) management of food crises and other natural disasters.

However, the majority of the agricultural sector stakeholders agree today on the opportunities biotechnologies can offer for increasing and diversifying foodstuffs, increasing agricultural productivity, managing pests while reducing recourse to toxic pesticides in agriculture.

But, the current practice shows that, like all technologies, biotechnologies need to be managed in a responsible way. It is necessary to ensure the bio-safety of the populations and ensure access to the products for each and everyone.

From this viewpoint, the Ministerial Conference of the ECOWAS countries on biotechnology, held from 21 to 24 June 2005 in Bamako (Mali) adopted a series of guidelines and recommended ECOWAS to work out, in consultation with CORAF/WECARD and CILSS, an action plan for:

- The development of biotechnologies;
- The adoption of a regional approach to bio-safety;
- The promotion of information and communication with the stakeholders.

This document gives:

- The objectives and results expected from the Action plan;
- The main activities to be carried out for achieving each expected result and the time frame for their implementation;

- The impacts expected from the implementation of the Action plan, as well as the key beneficiaries;
- The costs of the activities and of the Action plan as a whole, as well as the funding mechanism;
- The roles and responsibilities of the stakeholders.

This document is the outcome of a long and protracted consultative process with various stakeholders interested in agri-biotechnological applications in the sub-region, including scientists, professional agricultural organizations, medias and decision makers.

The main objective of the action plan is *the development of biotechnology application in order to enhance agricultural productivity and stimulate competitiveness, while maintaining the natural resource base and creating an enabling environment in this respect.*

Developing biotechnology in the ECOWAS sub-region will help overcome certain topmost constraints to crop and animal production and will contribute significantly to the achievement of the objectives of the ECOWAS Agricultural Policy (ECOWAP), i.e., **pursuit of sustainable food security, economic and social development, and poverty reduction in the ECOWAS Member States.**

The development of biotechnology in the ECOWAS sub-region will necessarily go through implementation of key actions of which: i) good economic analysis for the identification of the top constraints to agricultural production in the sub-region, as well as selection of the proposed solutions; II) development of a public-private sector partnership capable of stimulating the mobilization of financial resources for the design and implementation of research and development operations; III) promotion of biotechnology products specific agribusiness; iv) strengthening of the seed systems and national phytosanitary legislations to facilitate dissemination of the products; v) good training of all the stakeholders so as to further develop their research-development and technology transfer capacities; VI) impact orientation of all research and technology transfer efforts, and; vii) reinforcement of the intellectual property systems to enable all the parties involved to take advantage of the development of the biotechnology sector in the region.

Biotechnology development will also necessitate setting up of a good regional cooperation mechanism on the matter. This will be made possible through establishment of a co-operation mechanism that brings together the northern partners, the development of networks of laboratories of excellence, the mobilization of the Diaspora and the development of common legislative instruments at the regional level.

A regional bio-safety regulatory framework will facilitate safe deployment of modern biotechnology products which would be coming from outside the sub-region or would be produced by the national agricultural research systems (SNRA) within the sub-region.

The development of the national capacities for the implementation of the sub-regional bio-safety regulatory framework will require pooling of the various skills on a national scale. This will facilitate handling conditions, risk assessment and management, as well as sharing of reliable information about the environmental impacts and food and seed safety, as they are relevant to modern biotechnology products. This approach will reduce investment costs potentially, which will facilitate deployment of modern biotechnology products inside the sub-region.

All the stakeholders will benefit from the biotechnology development, including researchers in the national agricultural research systems and international agricultural research centres (IARC), smallholders, groups of producers, consumer groups, Community organizations, nongovernmental organizations (NGO), the private sector, the animal and crop protection systems, the sanitary and phytosanitary services.

At the same time, the development of capacities as regards communication and sensitisation in biotechnology and biosafety in the ECOWAS sub-region will help the stakeholders to make well-informed decisions with regard to the adoption and use of biotechnology and its products.

Developing the financial capacity and the capacity of the ECOWAS Department of Agriculture, Rural Development and Environment (DARDE) will facilitate, in general, implementation of the Action plan. On the one hand, both the decision makers and the investors will be convinced that the resources of the taxpayers that are allocated for activities related to biotechnology and biosafety application to agriculture in the sub-region are profitable and economical. In addition, this will further support the need for making increased investments in the agricultural sector, since it constitutes the engine behind the economic growth of the ECOWAS Member States.

As a whole, the implementation of the Action plan offers an integrated approach to increasing production and facilitating the penetration of science and innovation in the sub-region. This will contribute to meet the increased food needs, while taking into account the potential risks for the human health and the environment as well.

The implementation of the Plan will be coordinated by ECOWAS, while the technical activities will be carried out by the key biotechnology and biosafety players of the sub-region, particularly CORAF/WECARD, INSAH/CILSS and their associate partners.

The total budget of the ECOWAS Action plan for the development of biotechnology was estimated at US\$ 23 615 000 over a five-year period.

2. CONTEXT AND JUSTIFICATION

2.1 Characteristics of West African agriculture

Agriculture is the principal economic sector of the West African countries. It provides jobs to approximately 65 % of the population who live especially in the rural areas and work according to traditional farming and processing systems. The sector contributes to approximately 15.3 % of total export earnings in terms of products and services. Excluding Nigeria, this figure can go up to 30%. It also contributes for 35 to 60% of gross domestic product (GDP) of these countries and provides the agro-processing industry with raw materials.

The sector is undergoing rapid change. Although the agricultural sector is still dominated by family farms, it has been going through profound transformations over the last 20 years. The production of almost all the commodities, except for cattle, has more than doubled between 1980 and 2000. However, this situation does not concern the countries experiencing conflicts.

The recent years have been characterised by substantial production increase, particularly of vegetable crops and livestock production of small ruminants, which were strongly stimulated by the urban demand. The actors are better organized and determined to play a significant role, as true partners, in the development and implementation of policies and strategies, for better consideration of the situation in the rural area.

However, the West African agricultural sector has many weaknesses. The yields and productivity per farmer are among the lowest in the world. The production increase noted over the last 20 years is due more to an increase in cultivated lands.

Food shortfalls constitute an extreme source of concern. The sub-region depends on food imports for approximately 19% of its food supplies. Moreover, the regional market is made up of more than one quarter of billion consumers, with the majority of whom depending on imported foodstuffs.

The national development strategies, developed and implemented over the last years, thanks to the structural adjustment programmes, have further compartmentalized the national agricultural policies and thus worsened their loose articulation with agricultural policies undertaken at the sub-regional level. Moreover, these agricultural policies were often devised without the participation of the socio-professional actors and the civil society. Thus, they often resulted in action plans, programmes and projects being partially implemented. This situation has been an obstacle to the attainment of the agricultural policy objectives, i.e., to achieve food security, to increase job creation in the rural areas and to improve integration into sub-regional and international markets.

Several other constraints prevent the ECOWAS countries' agriculture from reaching a level of sufficient productivity and competitiveness to achieve their principal development goals. Such constraints include:

- Purely agricultural constraints, which can change according to the crops, countries, geographical areas and the level of development of countries in the region, but which are essentially linked to:
 - Low production potential of the animal and plant genetic material;
 - Adverse impact of the various stresses on the performance of the varieties and breeds that are disseminated: biotic stress (insects, viral infections, fungal diseases, etc.) and abiotic stress (acidity, salinity, ferric toxicity, drought, etc.);
 - Strong pressure exerted on the environment as a whole, and on the genetic resources, the soils and water resources in particular,
 - Land pressure;
 - Seed and agricultural produce marketing problems;

- Low level of adoption of new technologies by the peasants, either because the solutions available are not adapted to their constraints, or because it is difficult for them to access the technology as a result of poor extension services, transfer of technologies and communication and high costs involved in adopting new solutions.
- Crosscutting technical obstacles, such as:
 - Low human and material capacity;
 - Inadequate level of fundamental and applied research on local biodiversity and agricultural produce processing;
 - Inappropriate farming systems;
 - Low performance of the seed systems.
- Political and institutional obstacles, such as:
 - Inadequacy of the economic environment for optimal use of technical innovations;
 - Poor coordination of the various initiatives in progress in the sub-region in aid to the agricultural sector;
 - Low level of co-operation among the regional organizations (UEMOA, ECOWAS, CILSS, CORAF/WECARD, etc.) in the implementation of the agricultural programmes;
 - Inadequacy of national and regional legislations covering the agricultural sector (such as those relating to the crop protection, seeds and GMOs);
 - Low level of mobilization of the private sector in certain new fields such as biotechnology (a paradox when we know that it is the private sector that has contributed by 80 % to the development of biotechnology in the world, during the last 20 years);

But, the West African agricultural potential is always under exploited to a large extent. West Africa has various ecosystems and thus can offer a wide range of agricultural produce. Its land resources are considerable: 284 million hectares of arable and fallow lands, 215 million hectares of rangelands, particularly in the Sahelian and Sudano-Sahelian zones, and more than 10 million hectares of irrigable lands. Approximately 24.6 % of the arable lands are currently exploited; this corresponds to approximately two hectares per rural dweller. There is still a potential of approximately 1.6 hectare per rural farmer. Only 10 % of irrigable lands have been developed for rice growing and market gardening purposes. The sub-region is struggling to integrate the technological innovations in its farming system and therefore cannot make the most of the opportunities these technologies can offer, particularly to increase the productivity and competitiveness of its products and to protect the environment.

2.2. The role of Biotechnology

2.2.1 Opportunities

Although it is not a panacea in itself, biotechnology application can supplement more conventional agricultural practices and significantly contribute to agricultural production increase in the developing countries.

In the ECOWAS sub-region, the development of research and biotechnology application can help, significantly, cope with several agricultural sector constraints. It can help not only to overcome some of the purely agricultural constraints but, through its spill-over impact, it can also contribute to I) poverty reduction through increase in the agricultural and animal farmers' income, II) improvement of food security, through yield increase and improved nutritional quality of the agricultural produce, III)

environmental protection through reduced levels of pesticides and fertilizer use iv) creation of jobs through the development of new business opportunities and the development of new businesses, (v) improvement of the women's condition through creation of jobs in their activity sectors.

The studies carried out by CORAF/WECARD have shown that biotechnologies can make considerable contribution to agriculture and livestock production, in particular for: I) development of vaccines and analysis tools for the prevention and management of epidemics; II) development of *in vitro* multiplication technologies of food crops and forest resources to ensure regular supply of the peasants with seeds and to support reforestation programmes; III) use of molecular markers to accelerate genetic selection programmes and; iv) exploitation of transgenesis to solve problems that the traditional genetic improvement method has not succeeded in solving. In the same vein, in environment and natural resources matters, the possibilities identified include: I) the use of biotechnologies for the assessment, conservation and sustainable use of biological diversity; II) better knowledge of the micro-organisms of African soils for improving de-pollution processes and sustainable land management and; III), exploration of the biodiversity for the purpose of biological pest management (bio-pesticides; insect viruses, etc). In the agro-processing industry sector, the principal potential that has been identified relates to the improvement of performances of micro-organisms in the biotechnological processes and the production and development of high value added biological substances.

The sub-region has many assets to build on. The various studies undertaken in West Africa show that the ECOWAS zone has a huge biodiversity potential, the basis necessary for a sustainable development of biotechnology. This biodiversity covers all the agro-climatic zones of the sub-region and harbours many genes of agricultural interest (genes resisting to biotic and abiotic constraints, genes which allow creation of high yield varieties and breeds adapted to the various agro-climatic conditions of the region, useful macro-molecules for the production of bio-pesticides, sources of biological fuel, etc). Thus, the development of a plant and animal seeds market, livestock vaccines, pharmaceutical products, etc, is widely possible in the sub-region, if the potential that this biodiversity offers were capitalized.

In addition, the region has a scientific and technical basis, which is certainly insufficient, but can help initiate a development process of the sector, at the country and sub-regional level as well.

The research and development as well as the conventional biotechnology-derived products, in particular molecular marker-assisted selection, tissue culture, vaccine production and artificial insemination, have been adopted in the sub-region. However, their level of adoption varies from one country to another. They helped to improve crop and animal productivity.

Modern biotechnology, on the other hand, is especially conducted under the impulse of the collaboration between the national actors and the multinationals. Emphasis is placed for the moment on marketing and industrialization. Burkina Faso is the only country in the sub-region that is experimenting transgenic cotton (*Bt* cotton) and has been conducting confined field trials for the third year now.

One of the major sub-regional initiatives in the agricultural biotechnology field is the Agricultural Biotechnology Support Programme (ABSP, phase II) coordinated by Cornell University and financed by the USAID. The objective of this programme is to develop the capacities of African NARS as regards agricultural biotechnology, through:

- Cautious selection and provision of certain products derived from genetic engineering;
- Development of a "whole series of measures for the product marketing", to facilitate their access to the producers,
- Development of the capacities of the researchers, managers of regulatory institutions, extension workers, decision makers and general public;
- Improvement of the capacity of the decision-makers to make enlightened and well-advised decisions.

Currently, some work within the framework of the project is being carried out in Mali, Ghana and Nigeria, to improve resistance of tomato to TYLCV (tomato yellow leaf curl virus), a major constraint to tomato production in the sub-region.

Despite all these initiatives, the adoption of modern biotechnology in the ECOWAS space is still very timid. There is still a lot to do to be able to make the most of the benefits biotechnology, in particular modern biotechnology offers.

2.2.2 Bio-safety mechanism: a necessity

Conventional biotechnology has been used for decades in the sub-region, without giving rise to any controversy and without being subjected to any preliminary authorization. On the other hand, despite all the benefits attached to it, modern biotechnology raises concerns as to the possible effects of transgenic organisms on the health and the environment.

These concerns were at the basis of several initiatives. At the global level, the Global Environmental Facility (GEF) is supporting the biggest capacity-building initiative for biosafety. This initiative is implemented by the United Nations Environmental Programme (UNEP), the United Nations Development Programme (UNDP) and the World Bank.

The initiative aims at establishing and implementing National Biosafety Committees (NBC) which are in conformity with the Protocol of Cartagena on biosafety. More than 120 countries, including the ECOWAS countries, are involved in this initiative. This protocol seeks to guarantee adequate safety level in the transfer, handling and use of Modified Living Organisms (MLO) derived from modern biotechnology. The adverse effects are taken into consideration, while taking into account the sustainable conservation and utilization of biological diversity, as well as health risks, with special focus on transboundary movements¹ in particular. Though all the ECOWAS countries take part in this project, some of them haven't yet ratified the Protocol of Cartagena on biosafety.

The ECOWAS countries are faced with ever increasing challenges as they look into the modern biotechnology-related biosafety problems. These challenges concern:

- Promotion of a regulatory framework characterized by transparency and stability;
- Empowerment and involvement of the stakeholders in the decision-making process in order to obtain the confidence of the public;
- Harmonization of biosafety regulations with the current regulatory systems on food safety, seeds, phytosanitary requirements, importation and with other appropriate legislative or regulatory provisions;

In the same vein, it is necessary to establish acceptability criteria in order to reduce the risks to the benefit of the advantages and thus, to achieve a balance between productivity and sustainability.

2.2.3 Initiatives in progress for the development of Biotechnologies and Biosafety in the ECOWAS sub-region

The use of new technologies (including biotechnologies) for agricultural and food production and the concerns voiced by the civil society about possible risks for the health and the environment were discussed at a conference that took place at Sacramento in the United States of America (USA) in June 2003. 112 ministers in charge of agriculture, environment, health and water from 117 countries attended the conference. The discussions were focused on the developing countries' needs, and recommendations were made concerning access to new agricultural and food technologies with a view to achieving the World Food Summit goals, namely halving hunger across the world by 2015.

In pursuance of these recommendations, a West Africa regional conference was held in June 2004, in Ouagadougou (Burkina Faso) under the topic: "Controlling sciences and technologies to increase

¹ The MLO terminology is used in this document in reference to any genetically modified organisms (OGM) which could propagate naturally when introduced into an environment.

agricultural productivity in Africa: a West African perspective". This conference stressed the need for establishing:

- A public biotechnology information system by the West African States;
- A partnership between the West African research institutions and their counterparts of the North, particularly those of the United States of America, as regards agricultural sciences and technology;
- A West African biotechnology centre.

The conference also made the following decisions:

- To organize a ministerial conference on biotechnologies under the aegis of ECOWAS in Bamako, in order to adopt an action plan to promote biotechnologies and harmonize the biosafety regulations;
- To institutionalise a ministerial conference on biotechnologies in West Africa, as a first step towards the creation of an African Ministerial Conference on biotechnologies.

In other respects, the West African ministers in charge of science and technology organized, under the aegis of ECOWAS, a conference in Abuja, early November 2004. The discussions were focused on agriculture and biotechnologies. During the conference, the ministers made the following recommendations with regard to biotechnologies:

- To establish centres of excellence in priority fields, such as biotechnologies, where the Member States have comparative advantages;
- To promote research and development in the sub-region in order to generate adequate biotechnology innovations to support and stimulate the biotechnology industry;
- To promote the acquisition and marketing of recognised biotechnologies in the relevant fields;
- To encourage collaboration with the private sector and relevant national and international agencies to stimulate the biotechnology industry;
- To promote capacity building to ensure adoption of biotechnologies and effective implementation of biosafety measures.

The CORAF/WECARD, with the support of the United States Agency for International Development (USAID), started a process in 2004, which led to the development of a sub-regional programme, centred on the integration of biotechnologies (including establishment of a relevant biosafety framework) into current research activities, in order to contribute to solving the agricultural problems in the sub-region, safely and profitably.

Several other research and development initiatives in agricultural biotechnology and biosafety are ongoing in the sub-region. These initiatives were developed with the assistance of the European, American and Japanese bilateral co-operation agencies, as well as of international financial institutions such as the World Bank, the Rockefeller and McKnight Foundations.

In the same vein, the member institutes of the Consultative Group for International Agricultural Research (CGIAR) operating in West Africa are carrying out activities in the biotechnology field in order to improve agricultural productivity.

All these initiatives aim principally at:

- Building the capacity of the national agricultural research systems (NARS) to develop biotechnological products;
- Creating enabling conditions for their adoption by the users or for marketing and;
- Creating enabling conditions for the development of national and regional Biosafety mechanisms.

The Programme on the Biosafety Systems (PBS) - also sponsored by the USAID - constitutes an example of initiative aimed at addressing these concerns in three countries of the sub-region, namely Nigeria, Mali and Ghana. This programme aims at developing the capacities of the countries involved for:

- Science-based decision-making as regards biosafety and;
- Implementation of biosafety measures through a new approach.

It also aims at approaching biosafety issues more effectively as part of a sustainable development strategy, centred on the economic growth, trade and achievement of the environmental objectives. The activities planned are grouped under the following components:

- Policy formulation;
- Design of a competitive funding mechanism for the financing of biosafety research;
- Support to the definition of control measure packages;
- Support to the food safety communication system and;
- Capacity building.

Moreover, several NGOs take part in actions aimed at ensuring:

- Participation of the public in decision-making concerning biotechnology and biosafety issues and;
- Communication and access to information for all the parties involved.

This is the case for NGOs such as the International Service for the Acquisition of Agro- biotech Applications (ISAAA), AfricaBio and the Agricultural Biotechnology Stakeholder Forum (ABSF). They are working hard to achieve one or more following goals:

- Sharing with the actors involved the latest available information on biotechnology,
- Establishing a network of the institutions and organizations for achieving this objective.

The CORAF/WECARD sub-regional programme, the recommendations of the conference of ministers in charge of science and technology in Ouagadougou (Burkina Faso) and the opportunities offered by the various initiatives in the sub-region were discussed at the ministerial conference on biotechnology in the ECOWAS area, which took place in June 2005 in Bamako (Mali).

The Bamako conference formulated a series of recommendations and requested ECOWAS, in liaison with CORAF/WECARD and CILSS, to work out and circulate a detailed action plan on:

- The biotechnology application,
- The regional approach to biosafety issues and
- Communication.

This plan should include the objectives, the expected results, the activities, the expected impacts, the recipients, the costs, the roles and responsibilities of the actors, as well as the implementation schedule.

3. THE ACTION PLAN

3.1. Challenges

The West African agriculture has three main challenges to take up, namely:

- Enhancement of agricultural productivity and competitiveness to meet the food requirements of an ever increasing and highly urbanized West African population, and to increase the farmers' incomes;
- Promotion of sustainable agricultural development while taking the social and environmental issues into account;
- Establishment of effective institutional systems in the region to facilitate dissemination among the producers of improved crop varieties and animal breeds, including those derived from biotechnology.

Enhancement of agricultural productivity and competitiveness

The high population growth rate highlights the need for improving the agricultural production. However, contrary to past years, this improvement can no longer be achieved through mere increase in acreages because of the growing scarcity of arable lands. In such circumstances, agro-biotechnology applications offer other technological possibilities to increase production per area unit and to also lower the costs of agricultural inputs, thus contributing to income generation, improved nutrition and conservation of the natural ecosystems. However, there are several constraints to large-scale application of agricultural biotechnologies in the ECOWAS space, of which the most significant are:

- Limited capacity of existing human resources to apply the technology;
- Lack of financial and material resources to implement promising biotechnologies beyond the pilot projects and;
- Low level of sensitisation of peasants about the potential benefits of biotechnologies, thus limiting their adoption.

To facilitate agro-biotechnology applications within the ECOWAS, it is necessary to improve both the national and sub-regional capacities, including infrastructural requirements, improvement of collaboration between the research community and the end-users. Many countries in the sub-region do not have adequate resources to develop their own capacity for biotechnology research or training in biotechnology applications. This absence could be made up through developing co-operation and partnership in the sub-region. By developing the sub-regional organizations and agricultural research networks for specific products, it becomes easier to explore the opportunities of the regional platforms for promoting biotechnologies.

More specifically, improvements are necessary in the following fields:

- Sub-regional prioritisation mechanisms to identify the main constraints to production and the specific products that might benefit from the opportunities offered by biotechnology;
- Partnerships between the public and private sectors in biotechnology application and development of the human resource capacity and the research infrastructure and biotechnology application;
- North-South international co-operation in the field of biotechnology to guarantee effective application;
- Networking of national laboratories and biotechnology centres of excellence in the sub-region thus mobilizing the Diaspora for the implementation of biotechnology programs;
- Communication and extension capacity of the regional institutions.

In order to increase productivity to effectively contribute to the development process, it is necessary to improve access to the market of agricultural produce in West Africa. The regional markets and the integration of the West African agriculture into the global market need to be promoted through:

- Strengthening of regulatory systems and a product quality approach;
- Elimination of the trade barriers;
- Resolution of the intellectual property issues so as to promote technological development while taking the many socio-economic contexts and roles of agriculture into account.

Promotion of sustainable agricultural development

The second challenge relates to the promotion of sustainable agricultural development by taking the social and environmental issues into account. Socially, it is necessary to make efforts towards reversing the trend to impoverishment of the agricultural sector in order to make the rural area a pleasant living environment. As for the environmental level, the efforts need to be concentrated on the promotion of sustainable management of natural resources while limiting at minimum the environmental impact of agriculture.

These efforts must aim at the application of biotechnologies to develop and disseminate improved crop varieties and animal species, which can contribute to sustainable development. This will be possible through expansion of the genetic base with a view to improving resistance to pests, diseases and drought. As a result, there will be notable reduction of the use of agrochemical products which, while minimizing the risks of toxicity and the improvement of human health and the ecosystems, will also help to:

- Increase the yields;
- Intensify agriculture on a sustainable basis;
- Reduce encroachment to marginal lands and;
- Increase global productivity.

Setting up of effective regional frameworks

The third challenge relates to the establishment of appropriate and effective regional institutional mechanisms to guarantee access to new agricultural technologies, including mechanisms emanating from biotechnologies. To take up these challenges, improvements are needed for the current seed systems and the regulations governing the production, use and marketing of seeds. This must take into account the biosafety considerations with regard to the seeds and transgenic plants and animals. Moreover, the biosafety issue needs to be addressed at the sub-regional level to facilitate circulation and marketing of the biotechnological products in order to protect human and animal health, as well as the environment. This will also enable to:

- Reduce disparities among the national regulatory systems;
- Develop the capacities of the national institutions for risk monitoring, inspection and management;
- Improve the scientific and technical capacities for risk assessment and;
- Develop the capacity as regards decision-making, in the sub-region.

3.2 Objectives of the Action plan

3.2.1 Key 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.

3.2.2 Operational objectives

The Action plan has been assigned three operational objectives to help promote biotechnologies within the ECOWAS area:

- 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;
- Setting up of a steering, coordination and monitoring-evaluation mechanism of the Action plan.

3.2.2.1 Operational objective 1 (OO1): To develop biotechnological products within the ECOWAS area to enhance agricultural productivity and competitiveness and to manage genetic resources in a sustainable way

The research and development as well as the products resulting from conventional biotechnologies, in particular the molecular marker-assisted selection, tissue culture, vaccine production and artificial insemination, have been adopted in the sub-region. However, their level of adoption varies from one country to another. They helped to enhance crop and livestock productivity, even if they were not exploited at their full potential.

On the other hand, modern biotechnology has difficulties in establishing itself in the sub-region. The few and rare actions that have been carried out were undertaken under the impulse of multinational firms, in cooperation with national stakeholders. Emphasis is laid for the moment on marketing and industrialization. Burkina Faso is the only country of the sub-region making experiments of transgenic cotton (*BT* cotton) for the third year now of confined field trials.

One of the major sub-regional initiatives in the field of agricultural biotechnologies is the Agricultural Biotechnology Support Programme (ABSP, phase II) coordinated by Cornell University and financed by the USAID. The aim of this program is to develop the capacities of African NARS in agricultural biotechnology, through:

- Cautious selection and provision of certain products resulting from genetic engineering;
- Development of a “whole series of measures for the marketing of the product”, to facilitate access to the producers,
- Development of the capacities of the researchers, managers of regulatory institutions, extension workers, decision makers and the general public;
- Improvement of the capacity of the decision-makers for enlightened and well-advised decision-making.

Currently, some activities within the framework of the project are being carried out in Mali, Ghana and Nigeria, to improve resistance of tomato to TYLCV (tomato yellow leaf curl virus), a major constraint to tomato production in the sub-region.

Despite all these initiatives, there is still a lot to do before the benefits of biotechnology, particularly modern biotechnology, can be turned to good account.

Developing the biotechnology in the ECOWAS Member countries with a view to improving agricultural productivity and competitiveness and manage genetic resources in a sustainable way is conditioned by the achievement of two key results:

- Effective promotion of the application of the biotechnological tool in the national and regional agricultural research and development programmes;
- Implementation of effective regional co-operation in the field of biotechnology.

Expected results and proposed actions

Result 3.2.2.1.1: Biotechnology application is promoted across the ECOWAS sub-region

To promote the application of the biotechnological tool in the ECOWAS area and to stimulate its progressive and sustainable acquisition by the national and regional research institutions, the PADBA is implementing a number of priority actions, namely:

- To develop a framework for the identification of agricultural research priorities, based on economic quantitative analysis;
- To encourage the public-private sector partnership in the field of modern agro-biotechnology application;
- To promote the use of biotechnology in agribusiness as a business opportunity;
- To consolidate the national phytosanitary legislations;
- To improve the national seed systems;
- To train stakeholders (scientists, laboratory and field technicians), in the biotechnology aspects;
- To promote the use of more efficient molecular biology techniques in the research programmes to reduce the constraints to agricultural production;
- To institutionalise impact assessment of modern biotechnology-derived products;
- To strengthen existing IP systems within the Member States.

Action 3.2.2.1.1.1: To develop a framework for the identification of agricultural research priorities, based on economic quantitative analysis.

The CORAF/WECARD analyses have helped to identify the major agronomic constraints to agricultural and animal production in the ECOWAS sub-region, as well as the biotechnological solutions (available or to develop) that could be used to address such constraints. However, the attempts to establish regional priorities have ran up against the special interests of the various regional geo-economic blocks.

With regard to available biotechnological solutions, it has been relatively easy to define the priorities as regards technology transfer, because this has taken account of the following factors:

- Current capacity of the countries and the region to adopt them;
- Immediate impact potential of these technologies;
- Existence of a technology transfer mechanism.

Thus, the development of *in vitro* culture, artificial insemination and vaccine production techniques, for example, is regarded as a top priority. The application of these technologies should be strengthened in the very short term so as to increase at maximum their potential impact on agricultural productivity and competitiveness. At the same time, it is also important that other available biotechnological solutions to overcome some of the region's constraints (GMO for example) should be tested and validated so that the conditions of their transfer at the farm level may be examined and controlled right now.

In the medium term (from 0 to 5 years), it is the technologies based on the use of molecular markers to accelerate genetic selection, crop protection, sustainable natural resources and soil management programmes, etc, that need to be developed.

In the long run (beyond 5 years), all technologies that draw benefits from molecular and cellular biology as well as computer processing (genomic, genetic engineering, bioinformatics, etc.) will have to be promoted in the region.

The investment flow should thus follow a curve in relation to the development of the biotechnologies. However, it will be necessary to make a strategic deployment of the investments so that, as of now, the capacities of the region may also start being developed for the so-called medium and long term biotechnologies.

Thus, the PADBA, in liaison with the CORAF/WECARD and NEPAD initiatives will contribute to the material, financial and human capacity building of the key research laboratories and institutions of the sub-region so that each of them may contribute, depending on its comparative advantages, to developing application of biotechnology in the regional and national programmes.

The difficulties in identifying priorities start when you need to draw up a list of the region's cultures or priority breeds, on the one hand, and a list of the priority constraints that weigh on these resources on the other hand. The multiplicity of ecosystems and of national agricultural priorities makes the task very complicated. The CORAF/WECARD has drawn up a list (still controversial) of constraints and priority resources, because certain countries of the ECOWAS humid tropical zone do not know exactly what to do. There is therefore a pressing need for ECOWAS to fill the gaps of the previous initiatives and to define a mechanism or scientific approach towards priority identification, by taking into account criteria as diverse as economic growth, social well-being, environmental quality, capacity development and potential impacts, etc.

The definition of the investment priorities on the constraints and resources must take on board such qualitative factors as: I) existence of biotechnological solutions to the identified constraints; (ii) benefit of resorting to biotechnology to remove the constraint; III) quality and representativeness of the actors questioned for the definition of the priorities; iv) opportunity of adopting a biotechnological solution in the global context of the development policy of the countries and the region; v) adequacy with International Conventions (Convention on bio-diversity, Protocol of Cartagena, international Treaty on the phylogenetic resources, Millennium development goals, etc).

The quantitative analysis for its part must incorporate aspects such as: I) the real production potential and the critical mass of peasants or stockbreeders involved in the development of a resource; II) the potential market (supply, demand, trade rules, etc).

Thus it appears that economic analysis experts, as far as the constraints and resources are concerned, should define investment priorities in the biotechnology sector. The ECOWAS PADBA will re-experiment what was achieved in the ASARECA zone by commissioning IFPRI to undertake a similar study in the region. However, this study should take into account the agro-ecological differences as well as all the genetic resources (animal, plant and fish resources, etc.) of the region and draw up the priorities for each of them, before highlighting the general priorities and the consistent capacity building requirements.

From this point of view, the aim will be to carry out the following activities:

- To make a regional study, under the supervision of CORAF-WECARD / IFPRI;
- To get the findings of the study technically validated by the CORAF/WECARD mechanism;
- To get the findings validated by the ECOWAS decision-making authorities.

Action 3.2.2.1.1.2: To encourage the public- private sector partnership for the application of modern biotechnology to agriculture.

One of the main characteristics of the modern biotechnology sector, at the global level, is that it is sponsored at more than 80 % by the private sector. The public sector is also very efficient and effective in the fundamental research sector in the developed countries, but the main part of the human and material resources deployed for the development of biotechnological products is provided by the private sector. Thus, most of the products currently available to solve certain agricultural constraints within the ECOWAS region were developed by private sector firms (Monsanto, Aventis, Syngenta mainly).

The adoption, by the region, of the products available will necessitate in the very near future the development of a partnership between the West African public and private institutions and the holders of biotechnological products. While preserving the interests of the parties involved (holders, beneficiary populations, civil society), this partnership should ensure that appropriate solutions to the problems of the region are adapted and adopted. The ECOWAS should especially ensure that this partnership allows the potential recipients to access information on the solutions available, to facilitate the transfer of technologies, to have at one's disposal, under the best possible conditions, technical packages and seeds and to have the possibility of technical supervision and training at the initial phases of the technology transfer. The ECOWAS member countries can stimulate progressive transfer of technologies and technicalities, within the context of the *Research agreements in partnership* with the public or private research institutions of the developed countries and the international centres such as those of the Consultative Group for International Agricultural Research (IITA, WARDA, ICRISAT, IFPRI, IPGRI, CIAT, CIMMYT, etc), those of the United Nations system (ICGEB, UNU/INERA, etc), or the Francophonie, etc.

The CORAF/WECARD analyses also state that: "in spite of the possibility of negotiating for the transfer of transgenic products through marketing channels and principles defined by the WTO, it is not absolutely necessary for the African countries to go through private agencies to get GMO-based products or technology. The developed countries' public sector (public universities in particular) is also holder of many technologies and products whose access should be easier for the African countries than already patented products. If need be, there are NGOs specialised in technology transfer such as ISAAA and AATF which can, through conventions between the technology holders and with the support of certain donors such as the Rockefeller Foundation or the Gatsby Charitable Foundation, help the African countries to get transfer of technologies more adapted to their socio-economic conditions".

Thus, the aim under the PADBA is to:

- Set up an interface for the exchange and promotion of biotechnology (a regional office) which will be used as an entry point for the potential partners and will act as an intermediary between them and the decision-making authorities at the regional level; this office will be charged in priority with the task of assisting the regional and continental institutions and initiatives of the NEPAD, FARA, CORAF/WECARD, AAB, ADB and the USAID, in the development of partnerships between the private and the public sectors;
- Get institutions like AATF and ISAAA and the consultants develop control tools to be used by the policy-makers and economic operators of the region (data on the public and private sector partners of the region, the bilateral and multilateral international partners, the biotechnological products available to overcome agricultural constraints within the region, the demanding institutions and countries of the sub-region, etc.);
- Organize regularly (at least once a year), a show on the biotechnology partnership in the region in order to promote the signature of partnership research agreements between the ECOWAS national and regional research institutions and the institutions partner (interested private partners and international institutions of the CGIAR and the United Nations system, etc).

Action 3.2.2.1.1.3: To promote biotechnology use in agribusiness as a business opportunity.

For the purpose of developing the partnership with the private sector, ECOWAS will have to place special emphasis on the mobilization of the region's professional organizations with a view to developing new business opportunities. The development of biotechnology research and development in the region must go hand in hand with the development of a new economic sector materialized by the establishment of SMSEs and SMSIs using and producing biotechnological products. Taking ownership of the technology and the benefits it may bring about depends on effective mobilization of endogenous resources to finance its development. The potential of the sector is such that the economic operators will have, as of now, to take part in its promotion and develop new opportunities for creating jobs and socio-economic surpluses.

It is crucial for the ECOWAS to initiate actions targeting the private partners of the region in order to sensitise them about the socio-economic significance of the sector, mobilize them and get them invest in research-development programmes and economic activities in the biotechnology sector, with a view to enhancing the local biodiversity and human resources and overcoming constraints to agricultural productivity and competitiveness within the region. ECOWAS will have to organise, within the framework of the annual biotechnology show, awareness meetings and generate partnerships for business operations. To sustain its action on a long-term basis, ECOWAS will set up a "Business" special Committee within the framework of the PDBA coordinating mechanism.

Action 3.2.2.1.1.4: To consolidate the phytosanitary legislations at the national level.

The introduction of new diseases and pests (which can be the source of a decrease in the agricultural yields and quality) has its origins in genetic, plant or animal material exchanges. The ECOWAS countries have, in their great majority, developed cross-border movement control systems of the living genetic material as well as mechanisms for testing and certifying the pesticides used to control crop and livestock pests and diseases. However, these systems are effective but in very rare countries and one can observe that:

- National legislations are not strengthened as regards phytosanitary issues or they are not responsive to the commitments of the International Conventions relating to environmental protection;
- Quarantine and containment principles are very little enforced;
- Controls and phytosanitary certificate requirements are very summary when they do exist;
- Pesticides are often used anarchically thus causing several human and environmental tragedies;
- Transhumant livestock vaccination practice is optional;
- Follow-up mechanisms of the implementation of regulations, when they exist, are inoperative.

Therefore, given the emergence of new potential risks, the countries must immediately consolidate their legislative, institutional and operational systems in order to ensure biological safety in the broad sense and biosafety in a restricted meaning. This goes through adapting the national legislations to the new international legal context and strengthening incentives and deterrents on plant and environmental protection.

ECOWAS should use the various platforms at its disposal to sensitise the policy-makers about the matter and help them, through technical cooperation and financial assistance, to reinforce the phytosanitary systems. To that end, ECOWAS will:

- Get national consultants of its member countries to assess the state of things as well as the capacity building needs;
- Assist the countries in drafting national bills;
- Advocate for the acceleration of the process at the policy-making level, in particular during ministerial Biotechnology meetings.

Action 3.2.2.1.1.5: To improve the seed systems at the national level.

One of the keystones for the adoption and dissemination of the new agricultural produce is the regular availability of seeds within the national agricultural systems. The adoption of biotechnological solutions also go through this reality; but it poses singular problems in addition to those which were at the roots of the failure by national and international research systems in the region to adopt several improved varieties that have been produced. The weak official seed distribution system (by the State or by private producers) is in general the weak point of the promotion policies of research-improved varieties, but this weakness, sometimes, is made up for by the possibility for the peasants themselves to produce seeds for the future growing seasons (based on traditional seeds). However, like for the hybrid seeds the use of which has been one of the main driving forces behind the green revolution in the developed countries, the seeds of biotechnological products, such as the GMOs, cannot be reused directly by the peasants: if the new variety does not include a genetic mechanism which prevents its re-use, its use as a seed must be authorized by the owner of the variety which holds the plant breeder's rights.

Thus, it will be necessary for the countries wanting to adopt biotechnological products such as GMOs, in addition to strengthening the traditional seeds sector, to take specific measures in connection with the GMO seeds distribution sector. This implies that as a preliminary step, the political authorities should set up at the national level, institutions or mechanisms facilitating negotiations with the holders of plant breeder's rights and patents as well as with the national economic operators of the seeds sector, over conditions under which they can be used and re-used by the peasants.

For the other biotechnological products such as those derived from tissue culture, the improvement of the distribution of planting equipment (banana or pineapple stumps, cocoa or palm tree seedlings, etc.) requires setting up a network of secondary multipliers and distributors around small *in vitro* culture units where will take place the clean-up and primary multiplication of vitro seedlings. It goes without saying that a training activity for these producers and distributors should take place before their setting in motion and that it would be necessary to support, through voluntary action, the development of these small SMSEs

The problem for ECOWAS goes beyond the context of borders, because their porosity is such that any solution that would be proposed should be a regional one. However, the aim will be to support the national initiatives in order to better coordinate the actions at the regional level.

Thus, the activities to be carried out at the country level will consist of:

- Organizing advanced courses for the key stakeholders of the seed chains (administrative and scientific authorities, primary and secondary seed producers and distributors, development NGOs, journalists, etc.) on:
 - National seeds and biosafety legislations;
 - Variety testing and certification procedures;
 - Seeds quality control;
 - Seeds multiplication and distribution;
 - GMO seeds management;
 - Monitoring of phytosanitary and biosafety measures;
- Getting national consultants of member countries to assess capacity building requirements for the seeds sector;
- Getting the adoption and implementation of the ECOWAS seeds harmonised regulatory framework accelerated;
- Assisting internal working groups in drafting national strategies for strengthening the seeds sector;

- Setting up an advocacy mechanism to assist the countries in mobilizing funds (with the FAO, UNDP, foundations, etc.) and human resources (NGOs and bilateral and multilateral technical co-operation) for the development of seeds distribution networks at the national level;
- Assisting the countries in the negotiations for equitable use of biotechnological products, within the framework of the public-private sector partnerships;

Actions 3.2.2.1.1.6: To provide the stakeholders with biotechnology training.

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.

ECOWAS, through progressive approach, should: 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. The region could use CORAF/WECARD and the NEPAD as instruments for the implementation of this policy.

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 should 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 will be selected basing on their effective participation in a research programme that calls upon the contribution of a particular biotechnology to move forward. CORAF / WECARD will be able to implement this strategy.

Action 3.2.2.1.1.7: To develop the capacity of national and regional institutions with a view to biotechnology research.

The studies carried out in the ECOWAS region have drawn up the list of national and international laboratories working in the field of biotechnologies and having certain comparative advantages. Some of these laboratories already have a pole or centre of excellence status of the CORAF/WECARD or of the NEPAD WABNet network. These are expected to work for agro-biotechnological research and application in West Africa as well as for gradual transfer of know-how towards the countries of the region. The material, human and functional capacity building of these laboratories can yield beneficial results for the whole region in the short run. The PDBA should thus develop a competitive funding initiative for applied research in biotechnology in order to strengthen the laboratories that can currently:

- Use molecular markers, artificial insemination, in vitro culture, etc, to accelerate the genetic selection, crop protection or genetic resource management programmes;
- Test and evaluate useful GMOs for agriculture in the sub-region.

Action 3.2.2.1.1.8: Put in place a competitive funding mechanism open to laboratories and centres of excellence to promote the use of more efficient molecular and cellular biology techniques in the research programmes to reduce constraints to agricultural production and better manage genetic resources.

Mettre en place des fonds compétitifs ouverts aux laboratoires et centres d'excellence pour l'utilisation de la biotechnologie moléculaire en vue de réduire les contraintes de production agricole et pour une meilleure gestion des ressources génétiques

To be able to make the most of the benefits modern biotechnology offers, the ECOWAS should not only encourage the adoption of biotechnological products or the application of technologies available to overcome its immediate constraints. ECOWAS should also adopt a more aggressive approach, following the example of the Asian (India, China, Indonesia, Malaysia, etc.) and Latin American countries (Brazil, Argentina, Mexico, etc.). It should promote advanced fundamental research to anticipate solutions to the new constraints threatening the regional agriculture in the near or remote future, but also to invest in the global biotechnological products market. Following the example of the above-mentioned countries, the region has a major asset at its disposal, i.e., its biodiversity. This should form the basis for generating new biotechnological products and the region should, in the long term, produce its own pest scouting tools, bio-pesticides, bio-fuels, GMOs, vaccines, etc, by using its biodiversity and its researchers. Better still; ECOWAS should devote its efforts to the development of new biotechnological tools by incorporating molecular computing aspects into the fundamental biotechnological research programmes. All these go through the development of capacities of the national and regional fundamental research programmes. To achieve such a goal, the ECOWAS should put in place a funding programme for the biotechnology fundamental research open to the laboratories and centres of excellence identified by the procedure indicated above. The validation of the research topics as well as the allocation of the funds will be achieved through the CORAF / WECARD selection processes. The aim will be:

- In the medium term:
 - To develop new molecular markers, vaccines and diagnostic tools for agricultural production and genetic resources management, including forest resources;
 - To produce bio-pesticides and bio-fertilizers;
- In the long term:
 - To carry out fundamental research in order to exploit as much as possible the local biodiversity

The laboratories of excellence to be supported should be selected in conjunction with the two international sub-regional stakeholders in that field, namely, CORAF/WECARD and the NEPAD.

In parallel, certain national initiatives also need support. ECOWAS should rely on the CORAF/WECARD competitive funding programme to achieve its goals. This programme has the advantage of not only putting in place a transparent system in the selection of the national laboratories for the development of their capacities, but it also supports the integration of efforts for the resolution of problems common to the countries of the region.

Action 3.2.2.1.1.9: To institutionalise socio- economic impact assessment of products derived from modern biotechnology.

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. Thus, ECOWAS should adopt, as a guiding principle, the institutionalisation of comprehensive impact assessment (environmental, health and socio-economic) of GMO introduction into the West African agricultural system. To that end, it shall condition all its actions in favour of any GMO adaptation or adoption tests to a simultaneous study to be undertaken on the impact study. It will be able, if need be, to commission independent studies to assess these impacts and notify the policy-makers of the region. It shall therefore include, in its current operating budget, headings relating to the impact assessment for the adoption of new products and technologies in West Africa, including biotechnological products. The PDBA for its part will make a study on the impact of all products currently available and potentially transferable in the region.

Action 3.2.2.1.1.10: To strengthen existing IP systems in the Member States.

Most of the ECOWAS countries are members of the World Trade Organization (WTO) and are therefore compelled to implement the Trade Related Intellectual Property Systems (TRIPS) provisions, either through adoption of new laws in relation to these agreements, or by adaptation of pre-existing legal instruments.

The adoption of biotechnologies poses very important intellectual property problems relating primarily to the use of the transgenic products and particular genes for which there are patents or other intellectual property protection mechanisms. One should remember that the 70 varieties of transgenic plants which are recorded for marketing worldwide belong to only three multinational corporations, namely Monsanto, Syngenta and Aventis which produce almost all GMO products worldwide.

To benefit from the GMOs and to avoid being in contradiction with the international agreements, the ECOWAS countries need to adapt their national legislations. Since the ECOWAS countries also belong to the African Intellectual Property Organization (AIPO), the national representations of these organizations should be mobilized by ECOWAS with a view to not only re-examining the national legislations in order to adapt them to the new global context, but also assist the countries in setting up the administrative and technical institutions in charge of intellectual property issues. Within the context of the Convention on biological diversity, non-traditional intellectual property aspects such as those relating to the rights of the local communities, the equitable access to technology and genetic resources, the use of traditional knowledge, etc, will have to be taken into account in the preparation of the laws.

Thus, ECOWAS will combine its efforts with those of the AIPO to solve intellectual property problems within the region. If need be, it could engage the services of specialized international NGOs such as AATF and ISAAA.

Thus, ECOWAS will promote the development of human resources in this field, with the assistance of these partners.

As for the problem of farmers re-using transgenic seeds, which is matter of global political options, ECOWAS shall discuss the issue with the biotechnology development partners in Africa and the holders of biotechnological products, as well as within the framework of the exchanges of views among the regional institutions (NEPAD, ECOWAS, UEMOA, CILSS, etc), in order to ensure that the interest of the farmers of the sub-region is protected.

Thus, the following priority activities will be carried out within the framework of the PDBA:

- To get a harmonized regional strategy as regards Property Rights adopted within the ECOWAS;

- To assess the state of things and draw up capacity-building requirements as regards intellectual property rights, by national consultants of its Member States;
- To organize training and information workshops on intellectual property for the national and regional actors;
- To assist the countries in preparing national bills;
- To plead for an acceleration of law adoption processes by the policy-makers, during the ministerial meetings on biotechnology.

Result 3.2.2.1.2: To implement effective co-operation in the field of agricultural biotechnology in the ECOWAS sub-region

Action 3.2.2.1.2.1 Setting up of a North-South biotechnology panel of experts including all the stakeholders and partners

The experts meeting in preparation for the ECOWAS Ministerial conference on biotechnology, held in Bamako in June 2005, stressed the interest in mobilizing the development partners and implementing a regional biotechnology and biosafety programme. They are not only the international technical and financial, bilateral and multilateral partners, but also regional partners including the research and support institutions for agricultural development, political and socio-economic institutions, as well as the private sector.

The Ministerial conference requested the ECOWAS biotechnology ad hoc panel to work towards the formation of an experts group representing these partners. Meetings of this group should be organized to promote exchanges among the major partners and to harmonize biotechnology and Biosafety development policies within the ECOWAS, as well as the strategies for financing the sector.

Action 3.2.2.1.2.2: To set up a network of national biotechnology laboratories and centres of excellence.

As indicated earlier, 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. There are two complementary approaches in the region:

- The CORAF/WECARD approach which uses specialized basic centres entrusted with certain tasks to be carried out to the benefit of the national programmes and with their collaboration, on the one hand, and thematic networks involving the countries concerned, on the other hand. This approach comprises moreover a research financing system using competitive funds;
- The NEPAD WABNet approach that gives greater importance to the use of a centre of excellence as a "Hub" networked with regional centres consisting of national laboratories with good capacities in specific fields. This network of laboratories and centres of excellence will be charged with implementing projects adopted by the NEPAD African Bioscience Initiative (NEPAD-ABI).

The ECOWAS could rely on these two models and create a coordinating mechanism of the activities of the national and international laboratories and centres, by taking on board the centres of the Consultative Group of the region, namely IITA, WARDA and ICRISAT. As a supplement to the mechanisms set up by the CORAF/WECARD and WABNet/NEPAD-ABI, ECOWAS should plan setting up, for the coordination of its biotechnology Programme, a special committee charged with:

- Defining the terms of reference that will facilitate identifying the centres of excellence on a competitive basis;
- Defining mechanisms for synergy creation between the CORAF / WECARD programmes and those of WABNet / NEPAD- ABI;
- Identifying the priority topics to address within the framework of the selected centres of excellence.

For the mobilization of the local private partners, ECOWAS will have to sensitise the private sector for them to invest in the development of private research laboratories, which made biotechnologies a success on other continents.

Action 3.2.2.1.2.3: To mobilize the Diaspora for the implementation of the regional biotechnology programme.

West Africa is characterized by a high brain drain which, even though it has not been quantified with accuracy, constitutes nevertheless a significant dead loss for the economic and social development of the countries. The budgets allocated for the national education and higher education of these countries are colossal; but a large part of such investments yield no return, because the critical mass of researchers and high level personnel it generates only benefits the developed countries. These can not only offer better conditions to West African human resources so that they may fully express themselves, but also, they can provide them with decent living standards incomparable with those that would have been offered to them if they were working in their countries of origin.

In view of this reality, the ideal thing would be to set up a system whereby the researchers of the Diaspora could contribute to the development of their region while not jeopardizing the good living and working conditions they have managed to acquire. The aim will be first to see which cooperation mechanisms could be developed between the institutions that employ them and the countries of the region. Subsequently, within the framework of this co-operation, they could be mobilized on a short-term or medium-term basis through collaborative contracts between the institutions involved, following the example of the TOKTEN project developed in Mali. The priority for ECOWAS is thus:

- To assess the situation of this Diaspora in the field of biotechnology around the world;
- To establish contacts with the Diaspora and their employers to discuss opportunities for collaboration;
- To establish mechanisms of co-operation between the Diaspora and the research and development support institutions, and the private sector of the region;
- To assist in the drafting and implementation of projects involving the diaspora within the framework of these mechanisms.

The projects to be developed will cover all capacity-building aspects, in particular training, technology transfer, research, and technical assistance.

Action 3.2.2.1.2.4: To set up a mechanism to harmonize common phytosanitary and zoosanitary legislations within the ECOWAS

As mentioned above, the borders of the ECOWAS countries are open, by definition. Consequently, the adoption of phytosanitary legislations at the country level will be of some interest only if these regulations are in keeping with those of the neighbouring countries. Just like for biosafety, a regional approach is simply needed for the phytosanitary aspects. ECOWAS should therefore ensure that the national legislations are incorporated into a regional framework.

In general, there are two approaches: one approach that consists of starting from pre-existing national legislations and then harmonize them at the regional level; and another one that consists in defining

the outlines of a regional legislation and having it validated and adapted at the national level. The second option has already been successfully tried in the region by INSAH / CILSS with regard to phytosanitary regulations in the Sahel countries. ECOWAS will have to draw inspiration from this model and extend it to its other Member States. INSAH / CILSS, based on its experience, will have to be charged with drafting and proposing such legislation. This option is certainly the most effective one, because the various countries of the region stand at so different levels in terms of legislation to the point that trying to harmonize them would be simply impossible.

ECOWAS should - in collaboration with UEMOA, CILSS, and the other actors concerned - set up an effective mechanism for the harmonization of phytosanitary and zoosanitary legislations. To that end, ECOWAS will:

- Develop the mechanism;
- Have it validated technically;
- Have it adopted by the decision-making authorities and;
- Have it implemented.

Action 3.2.2.1.2.5: To set up a regional seeds regulatory framework within ECOWAS (seed trade, certification, phytosanitary rules).

Like for the pesticides, INSAH/CILSS has developed a seed regulatory framework for the Sahel countries, which is being extended to the ECOWAS area as a whole. Based on an analysis of the countries' current practices as regards seeds (production, multiplication, distribution, legislation and regulations) and laws, decrees, by-laws, technical regulations (production, multiplication, certification and phytosanitary standards), a team of experts has proposed a draft framework convention instituting a common regulation as regards conventional and transgenic seeds. This draft convention was submitted to the 39th session of the Council of Ministers of CILSS countries (January 2005). It defines the quality standards for the production and marketing of seeds and addresses all seeds marketed in the sub-region (9 varieties have already been harmonized). Moreover, it proposes a framework defining the relationship between the seed producers, the research partners, the controllers and actors of the private sector.

During the same Ministerial Council of the CILSS countries, a draft body and operating system of a regional consultative framework or CRC (French acronym) was also proposed. The goal of this CRC is to implement the common regulation and to facilitate the introduction, use and circulation of seeds and GMOs in the sub-region. Its role is also to serve as an expert focal point for the countries of the sub-region (scientific support, information and communication, capacity-building).

The aim for ECOWAS will be to capitalize on the CILSS efforts and to see to what extent the CRC could widen its sphere of action to include the other ECOWAS Member States. ECOWAS should, as a matter of priority, support:

- Development of the organizational and operational elements of the CRC;
- Operability of the CRC in all its components.

Action 3.2.2.1.2.6: To have a harmonized regional strategy on property rights adopted in the ECOWAS member countries.

As is the case with the phytosanitary and zoosanitary legislations as well as the field crop seeds and biosafety regulation, ECOWAS member countries should have a common approach to the management of issues such as intellectual property rights (IPRs). The above-cited complexities in the member countries impact on the regional economic and social integration organizations such as ECOWAS. A harmonized system, which not only complies with the commercial conventions signed by the member countries, but also contributes to a better operation of technical instruments of

economic co-operation (e.g., OHADA -Organization for the Harmonization of Business Law in Africa). First and foremost, consensus should be built on the policy approach to IPRs related to biotechnology products because the various countries of the region have often adopted opposing options. This will be done during high-level meetings between the various ministers of the member countries involved with IPRs (trade, agriculture, health, etc.). The resolutions to be adopted by this meeting will then be used as a springboard for writing a draft regional strategy, which will first be validated by the experts of the sub-region and then by the political authorities of ECOWAS.

3.2.2.2 Operational Objective 2 (OO2): To Develop a Regional Approach to Biosafety

To date, it can be seen that the processes of development and implementation of national biosafety framework in West Africa have been slow. This can be attributed to many causes, including:

- absence of political support in the field of biotechnology and biosafety;
- lack of communication between stakeholders, even within the same country;
- lack of coordination between the concerned ministries in the member countries;
- poor regional co-operation on the subject.

Even if the majority of the member countries have ratified the Cartagena Protocol on Biosafety, no investment has been carried out in support of the creation of an enabling environment for the use of modern biotechnology.

For the sub-region to quickly make the most of the benefits associated with modern biotechnology, it is essential to set up biosafety regulatory frameworks at national and regional levels.

Within this context, CORAF/WECARD has undertaken to develop a Programme on Biotechnology and Biosafety (PBB) for Central and Western Africa. This programme aims to bring an added value to national efforts at the development and safe utilization of biotechnology products through an efficient sub-regional biosafety framework. Though validated in technical terms, the implementation of PBB has not begun yet. This action plan is an opportunity to support the implementation of this programme in the ECOWAS member countries.

In this process, it is very encouraging to note that the Global Environment Facility (GEF) and the World Bank are turning towards a sub-regional approach, with all the United Nations (UN) agencies and centers of excellence participating.

A regional approach to the development of biosafety is thus recommended, because it provides several opportunities and advantages, which will add value to national initiatives. Furthermore, in the case of member countries, which lack adequate capacity to develop their own national regulatory system, regional co-operation is the most appropriate way to help them conform to the Cartagena Protocol.

The regional approach to biosafety will take the form of a common regulatory framework to which all the member countries adhere. This framework aims to:

- guarantee access to biotechnology under conditions of minimum risks, to all the countries of the region,;
- ensure an acceptable safety level in the utilization of biotechnology products, based on a common foundation;
- provide a common mechanism for the assessment of the effects of GMOs on human health and the environment;
- facilitate mutual acceptance of data on risk assessment;
- facilitate the exchange of approved GMOs through the regional regulatory system.

Such an approach makes it possible to pool resources, facilitate learning from each other's experiences and cardinal information and data sharing. It allows the maximum use of the potential in terms of human, institutional, financial and technical resources.

This approach is in conformity with the spirit of regional integration implemented by institutions such as ECOWAS, WAEMU (UEMOA), CILSS and CORAF/WECARD and with the provisions of the Cartagena Protocol relating to regional co-operation, in particular article 14.

In this context, the second operational objective of the action plan aims to introduce a regional approach to biosafety (OOS2).

Expected Results and Proposed Actions

Result 3.2.2.2.1: A regional biosafety framework is established in the ECOWAS member countries.

The formulation of a regional approach to biosafety could be based on the prevailing initiatives in the sub-region, namely the CILSS common regulation on pesticides adopted in 1992 and implemented in 1994. The regional approach to biosafety of ABDP (Agricultural Biotechnology Development Programme) will be centered around two main actions:

- to create a regional biosafety regulatory framework and;
- to have national frameworks developed and adopted in harmony with the regional biosafety framework

Action 3.2.2.2.1.1: To create a regional biosafety regulatory framework (harmonization of rules and procedures)

The issue of sovereignty has very often been raised as a limiting factor in the establishment of regional biosafety regulatory frameworks. Therefore, it is of utmost importance that all the regional economic and political organizations as well as the member countries accept and adhere to the idea of establishing a regional biosafety regulatory framework. Furthermore, the factors, which will favour effective co-operation in a regional biosafety regulation within the context of the sometimes complex sociopolitical and economic situations of the countries of the sub-region, have never been discussed politically. The creation and implementation of the regional biosafety framework will require:

- to design a document instituting the common biosafety regulation in the ECOWAS member countries, which comprises proposals for:
 - regulatory framework;
 - common regional administrative procedures and forms (applications for import license/permit, inspection record forms/worksheets, handling forms, reporting format, etc.) for risk assessment and management;
 - regional technical protocols (for confinement in laboratory, research under greenhouses, analyses in private animal clinics as well as analyses of food and seed safety);
 - mechanisms governed by participatory approach for the participation of stakeholders in regional decision-making;
- to organize regional participatory consultation with all the stakeholders concerned, in order to validate the regional regulatory document and the harmonized products;
- to put in place a regional framework for coordination and biosafety regulation;
- to train the future leaders of the regional framework.

Action 3.2.2.2.1.2: To have national biosafety frameworks developed and adopted in harmony with the regional biosafety framework

National biosafety frameworks will be examined and revisited or developed to ensure that they are in harmony with the regional regulatory framework. The activities planned within this framework are:

- to organize national exchanges of views to ensure adherence to the idea of a national framework in conformity with the regional biosafety framework;
- to take stock of the situation of biosafety frameworks in the member countries;
- to examine and revisit the national biosafety frameworks to conform to the regional biosafety regulatory framework;

- to have the framework developed in the member countries where it does not exist.

Result 3.2.2.2.2: The national capacities for the implementation of the regional biosafety regulatory framework are strengthened

Placing all the countries of the sub-region at the same level in terms of information and understanding of international treaties on modern biotechnology is an important prerequisite:

- which will serve as a solid political foundation to make the member countries get involved in the process of creation and implementation of a regional regulatory framework;
- To strengthen national capacities for the implementation of regional biosafety regulatory mechanisms.

To achieve these results, the following is necessary:

- Promote understanding of the Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety;
- Strengthen the capacity (infrastructure and expertise) of the national stakeholders to implement the regulation;
- Strengthen the capacity of diagnostic laboratories.

Action 3.2.2.2.1: To promote the understanding of the Convention on Biological Diversity and the Cartagena Protocol on Biosafety.

A better understanding of the CBD and Cartagena Protocol on Biosafety will facilitate the strengthening of national capacities for the implementation of the regional biosafety regulatory framework. This requires:

- Training of officials responsible for the development and implementation of the regulatory framework;
- Effective participation of stakeholders concerned (MPs, technical officials the media, etc.) in international fora on biosafety and;
- Organization of conferences, workshops, training courses and communication campaigns for key stakeholders.

Action 3.2.2.2.2: To strengthen the capacity (infrastructure and expertise) of national stakeholders for the implementation of the regulation

The assessment of needs for capacities carried out by the member countries, which embarked on the development of national biosafety frameworks, emphasized the significant need for capacity building. These include:

- Scientific expertise in the field of biotechnological safety and techniques for risk assessment and management;
- Infrastructures required for risk assessment and management.

The strengthening of the required national expertise thus includes:

- the development of curricula for the various levels of responsibility in risk management;
- the organization of training workshops on:
 - risk assessment and management;
 - food safety;
 - monitoring-evaluation;
 - Drafting of directives, legal documents and regulatory frameworks in relation to biosafety.

Concerning the needs for strengthening the capacity of biosafety infrastructures, these mainly include the provision of appropriate and adequate equipment to the regional laboratories for functions such as:

- Biotechnological risk assessment (diagnosis);
- Risk monitoring and management.

3.2.2.3 Operational objective 3 (OO3): To put in place an effective mechanism for coordination, steering, monitoring and evaluation of the Programme

The implementation of the Action Plan for the Development of Agricultural Biotechnology and Biosafety in the ECOWAS member countries is based on responsibility shared by ECOWAS, as the principal contracting authority, CORAF/WECARD, as the main executing agency and CILSS, as the associated agency.

CORAF/WECARD would ensure the technical implementation of the Plan, under the supervision of ECOWAS, whose expertise it will benefit from whenever necessary, for the smooth execution of activities. This implementation also involves the mobilization of many other stakeholders and requires putting in place an operational mechanism for steering, coordination, monitoring and evaluation of the actions carried out within the framework of the implementation of the Plan.

This steering and coordination mechanisms comprise on the whole:

- the Annual Conference of Ministers in charge of Agricultural Biotechnology (ACMAB), the political authority which, based on expert reports decides on the major orientations and shifts towards the effective implementation of the Plan;
- The Orientation and Monitoring-Evaluation Committee (OMEC), which ensures the harmonious implementation of the Action Plan. It ensures the technical supervision of the Action Plan assesses the progress made and gives the required corrective orientations. This committee meets at least twice a year and:
 - ensures the appropriate technical and budgetary execution of the Plan;
 - gives the technical support and advice required for the preparation of the Ministerial Conference;
 - ensures the implementation of the recommendations made by the Ministerial Councils;
 - provides support in resource mobilization.

Its annual reports are submitted to the ECOWAS expert team in charge of preparing ACMAB. It is made up of:

- the representative of the ECOWAS Department of Agriculture, Rural Development and the Environment;
- the representative of the CST of CORAF/WECARD;
- the senior coordinator of the Plan implementation at the level of CORAF/WECARD;
- the two coordinators of the Biotechnology (CORAF/WECARD) and Biosafety (CILSS) components of the Plan;
- the representatives of specialized agencies (CGIAR Institutes, NGOs, Advanced Research Institutes);
- the representatives of donors;
- the Coordination and Steering Unit (CSU) in charge of leading the operational task forces and the daily supervision of the Plan's activities.

Expected Results and Proposed Actions

As part of the responsibilities assigned to it, the Executing Agency (CORAF/WECARD) should:

- Set up and strengthen (by ensuring its operation) the Coordination and Steering Unit (CSU).
- Strengthen capacities for communication and sensitization on Biotechnology and Biosafety in the ECOWAS member countries;
- Strengthen financially, the capacity of the sub-region in favour of Biotechnology and Biosafety.

Result 3.2.2.3.1: Coordination and Steering Unit (CSU) is set up and strengthened

To ensure the technical implementation of the Plan, CORAF / WECARD, will recruit a Senior Coordinator to be responsible for:

- Establishing the operational task forces within CSU;
- Organizing the working sessions of these operational task forces ;
- Putting in place a mechanism for the coordination of technical activities;
- Assisting ECOWAS in organising the Annual Ministerial Conference on Biotechnology;
- The secretariat during the meetings of OMEC.

Action 3.2.2.3.1.1: Establishing the operational task forces of CSU:

Two technical Task Forces (TFs), one on Biotechnology and the other on Biosafety will be established within CSU to monitor and evaluate the technical aspects of the Action Plan. To this effect, they are charged with:

- the development of an operational monitoring-evaluation mechanism and its implementation requirements;
- the setting up of relevant indicators for the collection of data on the execution of activities;
- the development of methods for the collection and processing of information on ways to implement the Plan;
- the distribution of tasks and responsibilities between the institutions involved in the implementation of the Plan;
- the adoption of modalities for drafting reports;

The TFs members are:

- the Scientific Coordinator of CORAF/WECARD;
- the Senior Coordinator of the Plan;
- the Coordinator of the " Biosafety " (CILSS) or " Biotechnology " (CORAF/WECARD) Unit;
- two experts (including one designated by ECOWAS and the other by the donors) for each TF;
- Any other person whose expertise is deemed necessary.

Action 3.2.2.3.1.2: Organizing regular task forces' meetings.

Quarterly meetings and when necessary, extraordinary meetings of these task forces, will be organized to monitor and evaluate the Action Plan.

Action 3.2.2.3.1.3: Setting up a coordination mechanism for technical activities

Two Technical Coordination Units (TCUs) will be established to coordinate the activities of the Plan:

- A TCU in charge of "Biosafety" will be established at INSAH/CILSS, which is an interstate institution with a comparative advantage with regard to sub-regional regulatory initiatives in the field of pesticides, phytosanitary, seed and biosafety issues. This choice is also justified by the fact that the bulk of priority biosafety activities involves institutional building (political,

legislative and administrative) of the ECOWAS member States, which are fields in which INSAH / CILSS has recognized expertise;

- A TCU in charge of "Biotechnology" will be based at the headquarters of CORAF/WECARD, which is a sub-regional institution for agricultural research and development. This institution already possesses a Programme for the development of Biotechnology and Biosafety in West and Central Africa (adopted by ECOWAS) and has a comparative advantage in sub-regional coordination of agricultural research and development activities.

A unit head will be appointed to coordinate the regular activities of the Action Plan. The units' roles and tasks are:

- to coordinate and monitor the activities of the stakeholders involved in the implementation of the action plan;
- to encourage communication and collaboration between these stakeholders;
- to ensure maximum effectiveness and efficiency in the implementation of the Plan;
- to facilitate the dissemination of information on the progress of execution of the Plan;
- to establish linkages with the other relevant initiatives underway in the ECOWAS member countries;
- to manage the administrative and financial aspects relating to the execution of the activities of the Plan;
- to ensure that databases on biotechnology and biosafety are built in the region and are functional;
- to report regularly on the implementation of the Plan to CORAF/WECARD;

Action 3.2.2.3.1.4: To support ECOWAS in the organization of the Annual Conference of Ministers in charge of Biotechnology

The effective implementation of biotechnology and biosafety as well as the actions to be addressed within the context of the Plan, should be coordinated by the policy institutions in the various Member States. ECOWAS has instituted a ministerial conference on biotechnology to serve this purpose. Annual meetings of this conference will be organized to examine general issues related to biotechnology and biosafety in the ECOWAS member countries and to formulate the institutional arrangements to facilitate the implementation of the Action Plan.

Action 3.2.2.3.1.5: Serve as secretariat during the OMEC meetings

In its capacity as Executing Agency of the Action Plan and technical partner of ECOWAS for the implementation of its agricultural research and development policy, CORAF / WECARD will provide technical support in the organization of OMEC annual meetings and will be in charge of their secretarial work.

Result 3.2.2.3.2: Enhanced capacities for communication and sensitization in biotechnology and biosafety in the ECOWAS member countries.

The development of some biotechnology products such as GMOs has given rise to open and often dogmatic debates worldwide, but which nonetheless have highlighted the wide gap between the research community and end-users of research products in terms of information.

It can be easily noted that from ordinary citizens to decision-makers, including journalists, lawyers, rural development stakeholders, etc., there is a feeling of distrust associated with biotechnology and more particularly with GMOs. Events such as the scandal of "HIV infected blood" in France and the emergence of *bovine spongiform encephalopathy* known as "mad cow disease" have contributed to undermining the trust between citizens and the research community.

Civil society has become very demanding to the extent that as long as all the information on conditions under which a biotechnology product has been obtained and its potential impacts have not been disclosed, it will be increasingly difficult to release it. Furthermore, the use of a biotechnological

solution involving the end-users of research products should help overcome a clearly identified constraint. It is therefore essential that the user-community is well informed of the comparative advantages of the proposed solutions, the methodologies used to obtain the products as well as their safety. The same holds true of decision-makers, information professionals, lawmakers, etc. Objective criteria using this approach will result in informed choices.

Analysis carried out by some authors, including Walter, 2002, on the level of public awareness on the issue of biotechnologies revealed that significant sensitisation needs to be done in the region. More recently, the meetings of ministers in charge of agricultural research in Sacramento, Ouagadougou and Bamako, contributed, to a large extent, to informing the policy makers of the region about what is at stake in the biotechnology sector. However, there still remains a lot to be done before they could develop and take ownership of relevant information to inform their public themselves.

In its capacity as sub-regional organization, ECOWAS will look further at and implement its communication strategy on biotechnologies through the following activities:

- to sensitize the main stakeholders of the biotechnology sector;
- to create a sub-regional facility for information and communication on biotechnology, while exploiting fully, the CORAF/WECARD information and communication system (experience sharing, professional campaign);
- to create national information and communication focal points in charge of raising public awareness on biotechnology;
- to coordinate the implementation of the information and communication strategy on biotechnologies;
- to establish relations with other regional and international organizations with experience in the field of information and communication on biotechnologies;
- to set up a communication programme in the agribusiness sector.

Action 3.2.2.3.2.1 To sensitize the main stakeholders of the biotechnology sector.

The ECOWAS information and communication strategy should start with short-term actions aimed at civil society stakeholders, information professionals (journalists and communicators), stakeholders of production chains (producers, end-users), the private sector (traders and industrialists), decision-makers, inspectors, etc. These include:

- to organize workshops for the various categories of target groups, during which the biotechnological aspects associated with their daily activities will be presented to them. The process will consist of providing highlights on the benefits of technology as well as the optimum conditions for its adoption, including aspects related to biosafety, intellectual property rights, farmers' rights and the protection of indigenous knowledge;
- to publish articles in widely disseminated journals of biotechnology and biosafety;
- to take part in TV and radio programmes on biotechnologies and biosafety;
- to produce communication and information tools (brochures, films, typical presentation, etc.) for partners (NGOs, national focal points, journalists, etc.).

Action 3.2.2.3.2.2: To coordinate the implementation of the information and communication strategy on biotechnologies

In addition to short-term activities, the ECOWAS communication strategy on biotechnology should also project into the medium- and long-terms through lasting sustainable actions. To this effect, a specialized body should be set up and charged with the development and implementation of communication activities under the ECOWAS biotechnology programme. Whilst building on what already exists, and encouraging synergy the proposed body should be housed at CORAF/WECARD, which has an efficient information and communication system, and would be strengthened for the good of the cause. This close collaboration will also allow ECOWAS to reach out more easily to the

thematic networks and national technical partners of CORAF/ WECARD, thus enabling it to broaden its target group.

Implementation of the ECOWAS information and communication strategy will require coordination duties, which could be undertaken by the Senior Coordinator of the programme. Coordination will concern communication and information activities associated on the one hand with biotechnology and on the other with biosafety and should thus involve CORAF/WECARD, WABNet and INSAH/CILSS in as a matter of priority and the implementation of activities.

Action 3.2.2.3.2.3: To establish co-operative relations with the other regional and international organizations with experience in the field of information and communication on biotechnologies.

Within the framework of the implementation of its communication and information strategy, ECOWAS will have to establish work relations with the other initiatives, networks and organizations working in the region (WABNet, UNEP-GEF project, ABSP, PBS, BCH projects, etc.). In particular, the BCH system will be very useful for the dissemination and collection of information relating to the development of new biotechnology products and the status of biosafety in the world.

Action 3.2.2.3.2.4: To set up a communication programme for the agribusiness sector

As indicated above, the participation of economic operators of the agricultural sector in the biotechnology development process is essential. Within the framework of its communication strategy, ECOWAS will specifically target these operators through the regular organization of biotechnology fora and shows in order to sensitize them on new business opportunities available in the biotechnology sector. Private partners in developed countries will be included in these events in order to establish "joint ventures" and various other forms of business partnerships.

Action 3.2.2.3.2.5: To create national focal points on information and communication for raising public awareness on biotechnology.

It will be possible to set up local information and communication units, which will be the regional body's intermediary through the national CORAF/WECARD member institutions. It may not necessitate the creation of new institutions, but rather of strengthening the capacities of national partners to take local actions. Provision should therefore be made for *strengthening the capacities of documentation and communication services* of National Agricultural Research Centers and for holding briefing workshops at local level. These services will be in constant contact with the regional body and will receive communication documents and other aids developed at regional level, for dissemination and use. They will also be used to convey national information to the regional level to promote experience sharing.

Result 3.2.2.3.3: The financial capacity is strengthened

For the implementation of the Action plan, it is essential to clarify the responsibilities of institution and to ensure the coherence and linkage of actions at sub-regional level as much as it is essential to coordinate efforts in order to optimize the funds. Fund management and cost sharing should be based on the principles of transparency and good governance. The strategy for the mobilization of financial resource for the development of Biotechnology and Biosafety in the region should include funds from other sources committed to ECOWAS within a coherent and transparent framework. Thus, to enhance the financial contribution of ECOWAS to agricultural research and development in general and biotechnologies in particular in its member States and at the same time optimize the contribution of donors, two main actions will be carried out:

- to encourage the member States to comply with their commitment to allocate 10% of their national budgets for public investments in agricultural development;
- to establish a foundation for the application of biotechnology to agriculture in the sub-region.

3.2.2.3.3.1 To encourage the member States to comply with the commitment to allocate 10% of their national budgets for public investments in agricultural development.

The heads of African States made a commitment, at the Summit of the African Union held in Maputo in July 2003, to allocate 10% of their national budgets for public investments in agricultural development. The implementation of such a commitment will have a significant impact on

agricultural development in the continent, which will be reflected in new sectors such as biotechnology. At sub-regional level, ECOWAS will maintain contact with its member States to ensure compliance with the commitment.

Action 3.2.2.3.3.2: To establish a fund for the application of biotechnology to agriculture

In real terms, it is a matter of setting up a consortium of potential bilateral and multilateral donors. Development support foundations (Rockefeller, McKnight, Bill Gates, Carnegie, etc), private stakeholders (African industrials and multinationals operating in Africa), the European Union (EU), the United Nations Economic Commission for Africa, the African Development Bank (ADB), the World Bank and the Co-operation Agencies of developed countries are likely donors to support the setting up of an integrated mechanism for the financing of Biotechnology and Biosafety in the region. This includes in practical terms:

- To organize a donor's forum for the development of biotechnologies in the ECOWAS member countries, to discuss opportunities and practical details for the setting up of a common fund. ECOWAS should put up the initial capital and undertake to regularly contribute money to it;
- To implement the resolutions adopted by the above forum by instituting the West African Fund for the Development of Biotechnology and Biosafety;
- To set up the institutions and procedures for managing the fund;
- To start the activities associated with the financing of Biotechnology and Biosafety research and development through this fund.

3.5. Beneficiaries and Expected Impact

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:

- 1) A framework for the identification of priority constraints is established;
- 2) Fruitful partnerships between the main stakeholders of the public and private sectors are established;
- 3) Legislations related to intellectual property and seed systems are strengthened in the member countries;
- 4) Operators are trained in the various aspects of biotechnology applications;
- 5) Endogenous research is encouraged to create a dynamic allowing capturing the regional and international market;
- 6) Relevant socio-economic studies are conducted to prove the positive effects of the development of the biotechnology sector.

This raises hopes that the promotion of biotechnology will have the desired effects, namely, improvement in productivity and agricultural competitiveness and sustainable genetic resource management in West Africa. Through the generated added value, this will enable ECOWAS a speedy achievement of its objectives, namely, poverty reduction, the attainment of food security as well as sustainable conservation and utilization of natural resources.

Meanwhile, for the impact of the development of agricultural biotechnology to be optimal, it is essential that efforts are integrated at regional level. The creation of linkages between the countries of the region and their partners of the north, the networking of research centres and laboratories, the mobilization of resources from the diaspora, the development of regional regulatory frameworks for the dissemination of new technologies and seeds, etc., constitute the elements which will strengthen regional integration and bring about an overall positive impact on the region. The beneficiaries will include all the stakeholders of the agro-industrial community, including NARS, producers, small holders, consumers, community-based groups, NGOs, civil society and the private sector.

The establishment of a sub-regional biosafety regulatory framework will facilitate the safe deployment of modern, imported biotechnology products or created by the NARS of the sub-region. The regional

approach is essential in this area characterized by free trade and free movement of people and goods (including seeds). "Safe" products could thus be provided to producers, small holders, consumers and private operators of the food sector in order to have the desired positive impact on economic growth. The relevance of the regional framework consists of the harmonization of rules and procedures between the member States. But for this approach to have maximum impact, the Action Plan also envisages the strengthening of national capacities for the implementation of the regional biosafety regulatory framework. This includes pooling various national expertise: 1) to accelerate procedures for processing import documents 2) to encourage risk assessment and management, 3) to facilitate the sharing of credible information on environmental impacts, food safety and seed systems associated with modern biotechnology products. This approach could also contribute to reducing investment costs for the dissemination of modern biotechnology products in the sub-region. All the stakeholders, researchers (NARS and ICAR, producers' groups, consumer groups, community-based organizations, NGOs, the private sector, animal and crop protection systems, health and phytosanitary services and representatives of port authorities) will benefit from the development of a harmonized regional framework and implemented at national level.

Once the capacities for communication and sensitization in the field of biotechnology and biosafety are strengthened in the ECOWAS member countries, , the general public would be in a position to go for informed options on the adoption and utilization of biotechnology and derived products. This will directly benefit all the stakeholders of agricultural research and decision-makers, because they will be sensitized on the potential role that biotechnology can play in reducing famine and poverty in the sub-region.

3.6 Main stakeholders' roles and responsibilities; timeframe for main actions

Main actions	Implementation	Lead Institution	Partners	Timeframe
Main objective: <i>To sustainably contribute to the food security, the economic and social development, and poverty reduction of the population, in the member States</i>				
Operational objective 1: <i>To develop biotechnology to improve productivity, competitiveness and sustainable natural resource management</i>				
Expected result 1.1: <i>The application of biotechnology is promoted in the ECOWAS member countries</i>				
Action 1.1.1: To develop a framework for agricultural research priority setting based on quantitative economic analysis	IFPRI-CORAF/WECARD	ECOWAS CORAF/WECARD	AATF, ISAAA, MSU, IITA, WARDA, ICRISAT, IPGRI, international experts	6 months
Action 1.1.2: To encourage partnership between the private and public sectors for the application of modern biotechnology to agriculture	CORAF/WECARD	ECOWAS	Private and public sectors, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI	0 to 5 years
Action 1.1.3: To promote the utilization of biotechnology in agribusiness as new opportunities	INTERFACE	ECOWAS CORAF/WECARD	Private and public sectors, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, regional and national professional agricultural organizations	0 to 5 years
Action 1.1.4: To strengthen national phytosanitary legislations	INSAH/CILSS	ECOWAS CORAF/WECARD	National programmes	0 to 3 years
Action 1.1.5: To improve national seed systems	INSAH/CILSS	ECOWAS, CORAF/WECARD	National programmes	0 to 3 years
Action 1.1.6: To train stakeholders in Biotechnology	CORAF/WECARD	ECOWAS	NEPAD-ABI, national universities, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, Canada, Japan, China, India, Brazil, Argentina, South Africa,	0 to 5 years

			France, Belgium, Switzerland, UK, ICGEB, IAEA, FAO, WHO, Rockefeller Foundation	
Action 1.1.7: To strengthen the capacity of national and regional institutions (laboratory, equipment scientific, greenhouses and experimental field) with the aim of conducting research in biotechnology.	CORAF/WECARD	ECOWAS	NEPAD-ABI, national universities, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, Canada, Japan, China, India, Brazil, Argentina, South Africa, France, Belgium, Switzerland, UK, ICGEB, IAEA, FAO, WHO, Rockefeller Foundation	0 to 3 years
Action 1.1.8: Put in place a competitive funding mechanism open to laboratories and centres of excellence to promote the use of more efficient molecular and cellular biology techniques in the research programmes to reduce constraints to agricultural production and better manage genetic resources.	CORAF/WECARD	ECOWAS	NEPAD-ABI, national universities, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, Canada, Japan, China, India, Brazil, Argentina, South Africa, France, Belgium, Switzerland, UK, ICGEB, IAEA, FAO, WHO, Rockefeller Foundation	0 to 5 years
Action 1.1.9: To institutionalise the socio-economic assessment of impacts of modern biotechnology products	ECOWAS	ECOWAS	NEPAD-ABI, AATF, ISAAA, MSU, IITA, WARDA, ICRISAT, IPGRI, international experts	0 to 2 years
Action 1.1.10: To strengthen the intellectual property (IP) systems existing in the member States	CORAF / WECARD AIPO	ECOWAS	AATF, ISAAA, MSU, IITA, WARDA, ICRISAT, IPGRI, international experts	0 to 3 years
Expected result 1.2: Co-operation in the area of biotechnology in agriculture is implemented in the ECOWAS member countries				
Action 1.2.1: To set up a panel of experts in biotechnology including all the stakeholders and partners.	CORAF/WECARD	ECOWAS INSAH / CILSS	WABNet / NEPAD-ABI national universities, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI,	6 months

			USAID, USDA, EU, Canada, Japan, China, India, Brazil, Argentina, South Africa, France, Belgium, Switzerland, UK, ICGEB, IAEA, FAO, WHO, Rockefeller Foundation	
Action 1.2.2: To set up a network of national laboratories specialized in biotechnology.	CORAF/WECARD	ECOWAS	NEPAD-ABI, national Programmes, national research institutions	6 months
Action 1.2.3: To mobilize the Diaspora as part of the implementation of the regional biotechnology programme.	CORAF/WECARD	ECOWAS	NEPAD-ABI, national universities and research institutions, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, Canada, Japan, China, India, Brazil, Argentina, South Africa, France, Belgium, Switzerland, UK, ICGEB, IAEA, FAO, WHO, Rockefeller Foundation	0 to 2 years
Action 1.2.4: To set up a mechanism to harmonize common phytosanitary and zoosanitary legislations in the ECOWAS member countries.	INSAH/CILSS	ECOWAS	Ministries and national agricultural institutions	0 to 3 years
Action 1.2.5: To set up a regional seed regulatory framework in the ECOWAS member countries (trade in seeds, certification, phytosanitary regulations).	INSAH/CILSS	ECOWAS	Ministries and national agricultural institutions	1 year
Action 1.2.6: To harmonize the regional strategy on intellectual property rights adopted in the ECOWAS member countries.	CORAF / WECARD AIPO; OHADA (Organization for the Harmonization of Business Law in	ECOWAS	AATF, ISAAA, MSU, IITA, WARDA, ICRISAT, IPGRI, international experts	0 to 3 years

	Africa)			
Operational objective 2: To establish a regional approach to biosafety				
Expected result 2. 1: <i>The regional biosafety framework is established in the ECOWAS member countries</i>				
Action 2.1.1: To create a regional biosafety regulatory framework (harmonization of rules and procedures).	INSAH/CILSS	ECOWAS CORAF / WECARD	WAEMU, AU, CBD Secretariat, PSB, GEF, national experts of UNEP, international experts, IGOS (FAO, WHO, UNIDO), relevant departmental services, OECD, EU, AGBIOS, IARC, NARS, FAO/WHO (Codex Alimentarius), health and phytosanitary systems, private sector, AATF, networks or associations dealing in food products (i.e., NGICA), consumer groups, relevant NGOs, MSU, USDA/APHIS, FDA	5 years
Action 2.1.2 To have national biosafety frameworks, which are harmonized with the regional biosafety framework, developed and adopted	INSAH/CILSS	ECOWAS CORAF/WECARD	AU, WAEMU, relevant departmental services, national authorities competent in biosafety	5 years
Expected result 2. 2: <i>National capacities for the implementation of the regional biosafety regulatory framework are strengthened</i>				
Action 2.2.1: To promote understanding of the Convention on Biological Diversity and the Cartagena Protocol on Biological Diversity.	INSAH/CILSS	ECOWAS CORAF/WECARD	UNEP, GEF CORAF/WECARD, CBD secretariat, IARC, ARI, relevant departmental services, national authorities competent in biosafety	0 to 3 years
Action 2.2.2: To strengthen the capacity of national stakeholders (infrastructure and expertise) for the implementation of regulations	INSAH/CILSS	ECOWAS CORAF/WECARD	IARC, ARI, NARS, PBS, UNEP, GEF, EU, national and international experts, private sector - interface,	0 to 5 years

			USDA-APHIS, MSU, AGBIOS UNIDO, FAO, WHO, NGOs, consumer groups, producers' organizations	
Operational objective 3: To set up an efficient mechanism for the coordination, steering, monitoring and evaluation of the Programme				
Expected result 3.1: A Coordination and Steering Unit (CSU) is set up and strengthened				
Action 3.1.1: To establish the CSU operational task forces (TF on Biotechnology and TF on Biosafety) and OMEC	CORAF/WECARD for the TF on Biotechnology INSAH/CILSS for the TF on Biosafety; ECOWAS for OMEC	ECOWAS, CORAF / WECARD	Experts in biotechnology and biosafety of the sub-region, Ministers responsible for biotechnology	0 to 3 months
Action 3.1.2: To organize ordinary meetings of these task forces	CORAF / WECARD	ECOWAS	INSAH/CILSS; Experts in biotechnology and biosafety	0 to 5 years
Action 3.1.3: To establish a mechanism for the coordination of these technical activities (biotechnology and biosafety)	CORAF/WECARD for the Biotechnology Unit; INSAH / CILSS for the Biosafety unit	ECOWAS	Experts in biotechnology and biosafety of the sub-region	0 to 3 months
Action 3.1.4: To support ECOWAS in the organization of the Annual Conference of Ministers in charge of Biotechnology	CORAF / WECARD	ECOWAS	INSAH/CILSS	0 to 5 years
Action 3.1.5: To take care of the secretariat during the OMEC meetings	CORAF / WECARD	ECOWAS	INSAH/CILSS	0 to 5 years
Expected results 3.2: Capacities for communication and sensitization on biotechnology and biosafety are strengthened in the ECOWAS member countries				
Action 3.2.1: To sensitize stakeholders [civil society, journalists and communicators,	CORAF/WECARD INSAH / CILSS	ECOWAS	WAEMU (UEMOA), national media, NGOs, national universities and	0 to 5 years

producers, end-users, private sector (traders and industrialists), decision makers, inspectors] on the benefits of biotechnology and biosafety			research institutions, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU	
Action 3.2.2: To coordinate the implementation of the information and communication strategy on biotechnologies	CORAF/WECARD	ECOWAS	INSAH / CILSS, ECOWAS WABNet, UNEP-GEF, ABSP, PBS, BCH	0 to 5 years
Action 3.2.3: To co-operate with the other regional and international organizations with experience in the field of information and communication on biotechnologies	CORAF / WECARD	ECOWAS	BCH, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, ICGEB, FAO, WHO	0 to 2 years
Action 3.2.4: To set up a communication programme in the agribusiness sector	CORAF/WECARD	ECOWAS	Interface, BCH, AATF, ISAAA, IITA, WARDA, ICRISAT, IPGRI, USAID, USDA, EU, ICGEB, FAO, WHO	0 to 6 months
Action 3.2.5: To create national information and communication units for raising public awareness on biotechnology and serving as coordinating units	CORAF/WECARD	ECOWAS	National media, NGOs, national universities and research institutions	0 to 1 year
Expected result 3.3: <i>The financial capacity is strengthened</i>				
Action 3.2 1: To encourage the Member States to allocate at least 10% of the national budget to agriculture.	ECOWAS	ECOWAS / WAEMU	Member States, AU	0 to 3 years
Action 3.2 2: To establish a fund for the application of biotechnology to agriculture.	ECOWAS	ECOWAS / WAEMU	ADB, WADB, BCEAO (Central Bank of the West African Francophone States), AU, the World Bank, member States, private sector and development partners	0 to 2 years

3.7. Provisional budget

Main actions	Activities	Budget (US\$)
Main objective: <i>To sustainably contribute to the food security of the population, economic and social development and poverty reduction in the member States</i>		
Operational objective 1: <i>To develop biotechnology to improve productivity, competitiveness and sustainable natural resource management</i>		
Expected result 1.1: <i>The application of biotechnology is promoted in the ECOWAS member countries</i>		
Action 1.1.1 To develop a framework for agricultural research priority setting based on quantitative economic analysis	To conduct a study under the supervision of CORAF-WECARD / IFPRI	25 000
	To validate the results of the study from a technical standpoint through the CORAF/WECARD mechanism	20 000
	To have the results validated by the ECOWAS decision making bodies	20 000
Action 1.1. To encourage partnership between the private and public sectors for the application of modern biotechnology to agriculture Action 1.1.3: To promote the utilization of biotechnology in agribusiness as new opportunities	To set up a regional office for the exchange and promotion of biotechnology	50 000
	To develop orientation and decision support tools for decision makers (information notes; synthesized analyses, etc.)	50 000
	To organize regular trade fairs which focus on partnership in biotechnology	500 000
	Develop tool to expose and promote commercialisable biotechnology products	100 000
	Put in place incubation units to develop biotechnology product production capacities	2 500 000

Action 1.1.4: To strengthen national phytosanitary legislations	Stocktaking and capacity building needs assessment in relation to the phytosanitary legislation of the 15 member countries	150 000
	To support the countries in drafting national bills	75 000
Action 1.1.5: To improve national seed systems	To organise advanced courses in the 15 member countries	150 000
	Stocktaking and capacity building needs assessment of the seed sector of the 15 member countries	150 000
	To accelerate the adoption and implementation of the ECOWAS harmonized seed regulatory framework	75 000
	To support internal task forces in drafting national strategies to strengthen the seed sector	75 000
	To set up an advocacy mechanism to help the member countries mobilize funds (with FAO, UNDP, foundations, etc.) and human resources (NGOs and bilateral and multilateral technical co-operation agencies) for the development of seed distribution networks at national level	50 000
Action 1.1.6: To train stakeholders in Biotechnology	To set up a fellowship programme for researchers and technicians	2 400 000
	To carry out a study to identify the universities, higher agricultural education institutions and training schools for laboratory technicians with the appropriate potential and to assess their needs for capacity building in biotechnology	50 000
	To help five identified universities and higher education institutions to create specialized courses of study on biotechnology	1 250 000

	To set up a competitive scholarship programme for studies and university research in biotechnology	3 000 000
Action 1.1.7: To strengthen the capacity of national and regional institutions (laboratory, equipment scientific, greenhouses and experimental field) with the aim of conducting research in biotechnology.	To set up a competitive financing programme for applied research in biotechnology	2 400 000
Action 1.1.8: Put in place a competitive funding mechanism open to laboratories and centres of excellence to promote the use of more efficient molecular and cellular biology techniques in the research programmes to reduce constraints to agricultural production and better manage genetic resources.	To set up a programme for financing basic research in biotechnology open to laboratories and centres of excellence	2 500 000
Action 1.1.9: To institutionalise the socio- economic assessment of impacts of modern biotechnology products	To commission an independent study for assessing the socio-economic impacts of adopting GMOs in the ECOWAS member countries	50 000
Action 1.1.10: To strengthen the intellectual property (IP) systems existing in the member States	Stocktaking and capacity building needs assessment for intellectual property by national consultants of the 15 member States	150 000
	To organize workshops for training and providing information to national and regional stakeholders on intellectual property (IP)	150 000
	To support the member countries in drafting national bills on IP	75 000
Subtotal		16 015 000
Expected result 1.2: <i>The co-operation in biotechnology in agriculture is implemented in the ECOWAS member countries</i>		
Action 1.2.1: To set up a panel of experts in biotechnology including all the stakeholders and partners.	To set up a forum of partners	100 000

Action 1.2.2: To set up a network of national laboratories specialized in biotechnology.	To help CORAF/WECARD and WABNet with their efforts to network laboratories and centres of excellence	20 000
Action 1.2.3: To mobilize the Diaspora as part of the implementation of the regional biotechnology programme.	To make an inventory of the Diaspora	20 000
	To make contacts with it and its employers to exchange views on opportunities for collaboration	50 000
	To set up mechanisms for co-operation with the Diaspora	10 000
	To assist in the drafting and implementation of projects involving the Diaspora within the framework of these mechanisms	10 000
Action 1.2.4: To set up a mechanism to harmonize common phytosanitary and zoosanitary legislations in the ECOWAS member countries	To organize a meeting of national stakeholders to develop an efficient mechanism for the harmonization of phytosanitary and zoosanitary legislations in the ECOWAS member countries	100 000
	Technical validation of the mechanism	10 000
	To have the project validated by the decision making bodies	100 000
	To implement the mechanism	100 000
Action 1.2.5: To set up a regional seed regulatory framework in the ECOWAS member countries (Trade in seeds, certification, phytosanitary regulations)	To organize a meeting of national stakeholders to outline the regional legislation based on the CILSS model	100 000
	To finalize the project	10 000
	To have the project validated by stakeholders and political decision makers	100 000

Action 1.2.6: To have a harmonized regional strategy on intellectual property rights adopted in the ECOWAS member countries.	To organize a meeting between national and international stakeholders to adopt a policy approach in order to harmonize the International Conventions related to IPRs (UPOV (plant breeders/variety rights), Bangui Agreements, etc.)	100 000
	To conduct a study to come up with a harmonized framework on IPRs	50 000
	Technical validation of the project	10 000
	To have the project validated by stakeholders and political decision makers	100 000
Subtotal		990 000

<u>Operational objective 2</u> To establish a regional approach to biosafety		
Expected result 2.1: <i>The regional biosafety framework is established in the ECOWAS member countries</i>		
Action 2.1.1: To create a regional biosafety regulatory and legal framework (harmonization of rules and procedures)	To organize a regional policy exchange of views on the regulatory and legal system	100 000
	To design a draft document on the common biosafety regulation in the ECOWAS member countries (including the legal system, administrative framework, technical directives/guidelines and mechanisms for public participation, risk communication strategy))	150 000
	To monitor and evaluate the drafting of the regional document	75 000
	To examine the established framework and procedures harmonized by the ECOWAS member States.	160 000
	To organize a regional participatory consultation among all the relevant stakeholders to validate the regulatory document and harmonized products	150 000
	To set up a regional framework for biosafety coordination and a regulatory and legal framework	200 000
	To train key stakeholders of ECOWAS and other regional institutions on the harmonized mechanism and its implementation procedures	50 000
Action 2.1.2 To adapt national biosafety frameworks so that they are in harmony with the regional biosafety framework	To organize national exchanges of views to ensure support for the idea of a national framework in conformity with the regional biosafety framework	75 000

	To make the inventory of biosafety frameworks in the member countries	150 000
	To adapt national biosafety frameworks so that they are in conformity with the regional biosafety regulatory framework	75 000
	To develop the framework in the countries where it does not exist yet	75 000
Subtotal		1 260 000
Expected result 2.2: National capacities for the implementation of the regional biosafety regulatory framework are strengthened		
Action 2.2.1: To promote understanding of the Convention on Biological Diversity and the Cartagena Protocol on Biological Diversity	Strengthen capacity of ECOWAS member States so that they can participate effectively in international conferences on Biotechnology and Biosafety	150 000
	To train officials charged with the development and implementation of the national regulatory framework	150 000
	To ensure the actual participation of the national stakeholders concerned (MPs, technical experts, media, etc.) in international meetings on biosafety	240 000
Action 2.2.2: To strengthen the capacity of national stakeholders (infrastructure and expertise) for the implementation of regulations	To develop curricula for the various levels of responsibility in risk management	50 000
	To organize training workshops on risk assessment and management	100 000
	To organize training workshops on issues related to seed and food safety.	100 000
	To organize training workshops on biosafety monitoring & evaluation	100 000

	To organize training workshops on the drafting of directives, legal documents and regulatory frameworks in biosafety	100 000
	To equip laboratories to serve as regional laboratories for risk monitoring & evaluation	2 000 000
	To equip laboratories to serve as regional diagnostic laboratories with regard to GMO food and seed safety	2 000 000
Subtotal		4 990 000

Operational objective 3 To set up an efficient mechanism for the coordination, steering, monitoring and evaluation of the Programme		
Expected result 3.1: A Coordination and Steering Unit (CSU) is set up and strengthened		
Action 3.1.1: To establish the CSU operational task forces (TF on Biotechnology and TF on Biosafety) and Technical Committee (TC)	To set up the TC	10 000
	To set up the TF on Biotechnologies	10 000
	To set up the TF on Biosafety	10 000
Action 3.1.2: To organize ordinary meetings of these task forces	To organize quarterly meetings of the task forces	450 000
Action 3.1.3: To establish a mechanism for the coordination of these technical activities (biotechnology and biosafety)	To formulate an operational monitoring-evaluation mechanism	30 000
	To implement the monitoring-evaluation activities of the Action Plan	150 000
	Implementation of coordination actions	650 000
	Accompanying measures	390 000
Action 3.1.4: To support ECOWAS in the organization of the biennial Conference of Ministers in charge of Biotechnology	To take part in the preparation of the Conference of Ministers responsible for Biotechnology	160 000
Action 3.1.5: To take care of the secretariat during the TC meetings	To organize the annual meetings of the TC	100 000
Subtotal		1 960 000

Expected results 3.2: Capacities for communication and sensitization in the field of biotechnology and biosafety are strengthened in the ECOWAS member countries		
Action 3.2.1: To sensitize stakeholders [civil society, journalists and communicators, producers, end-users, private sector (traders and industrialists), decision makers, inspectors] on the benefits of biotechnology and biosafety	To organize three workshops for the various categories of target groups	150 000
	To contribute to the wide dissemination of journals of biotechnology and biosafety	10 000
	To take part in TV and radio programmes on biotechnologies and biosafety	5 000
	To produce communication and information tools (brochures, films)	50 000
Action 3.2.2: To coordinate the implementation of the information and communication strategy on biotechnologies Action 3.2.3: To establish relations with the other regional and international organizations with experience in the field of information and communications on biotechnologies; Action 3.2.4: To set up a communication programme in the agribusiness sector	To set up a specialized body in charge of information and communication on biotechnology	50 000
	To make this specialized body function	150 000
Action 3.2.5: To create national information and communication units for raising public awareness on biotechnology and serving as coordinating units	To strengthen the capacities of national partners	160 000
	To organize 15 local information dissemination workshops	75 000
Subtotal		650 000

Expected result 3.3: <i>The financial capacity is strengthened through the creation of funds for the application of biotechnology and biosafety to agriculture</i>		
Action 3.3 1: To encourage the member States to allocate at least 10% of the national budget to agriculture.	To continue dialogue with the member States to ensure that this declaration will be implemented	0
Action 3.3 2: To establish a fund for the application of biotechnology to agriculture	To have ECOWAS put up the initial capital/funds	50 000
	To bring donors together to discuss opportunities and practical details for the setting-up of a common fund for the development of Biotechnology and Biosafety in the ECOWAS member countries	100 000
	To establish the Western African Fund for the development of Biotechnology and Biosafety	100 000
	To put in place the bodies and procedures for the management of the fund	100 000
Subtotal		3 50 000
GRAND TOTAL		26 215 000

