Complementary study on a West African Regional Action Plan to control fruit fly

FINAL REPORT
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LIST OF ABBREVIATIONS

ACA	Agence pour la Commercialisation Agricole (Guinea)
ADB	African Development Bank
ADEx	Association de Développement des Exportateurs (Benin)
AES	Fondation Agir pour l'Education et la Santé (Chaired by Senegal)
AFFI	African Fruit Fly Initiative (ICIPE)
AJEX	Association des Jeunes Exportateurs (Mali). Exportation by air
AMELEF	Association Malienne des Exportateurs de Légumes et Fruits (Mali). Exportation by air
ANADER	Agence Nationale d'Appui au Développement Rural (Côte d'Ivoire)
ANCAR	Agence Nationale de Conseil Agricole et Rural (Senegal)
AOM	Agrumes et Oléagineux du Mali (Mali). Exportation by ship
APAD	Association des Planteurs de l'Arrondissement de Diouloulou (Senegal)
APEFEL	Association des Professionnelles de l'Exportation de Fruits et Légumes (Mali). Exportation by air
APRAN	Association pour la Promotion Rurale de l'Arrondissement de Nyassia (Senegal)
APROMA B	Association Interprofessionnelle de la Mangue du Burkina Faso (Burkina Faso)
AU/IBAR	Inter-African Bureau for Animal Resources of the African Union
AUMN	Associations des Unions Maraîchères des Niayes (Senegal)
BNARI	Biotechnology and Nuclear Agriculture Research Institute (Ghana)
BSA	Base de Surveillance et d'Avertissements Agricoles. Decentralized services (Senegal)
CAFEX	Centre d'Appui aux Formalités d'Exportation (Guinea)
CAPE Unit	Community-Based Animal Health and Participatory Epidemiology Unit
CEPS	Customs, Excise and Preventive Service (Ghana)
CERPA	Centre Régional de Production Agricole (Benin)
CGIAR	Consultative Group on International Agriculture Research
CIDA	Canadian International Development Agency
CILSS	Comité Permanent Inter-Etats de Lutte contre la Sécheresse au Sahel
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement (France)
CLCPRO	Comité de Lutte Contre le Criquet Pèlerin dans la Région Occidentale
CMA/AOC	Conférence des Ministres de l'Agriculture de l'Afrique de l'Ouest et du Centre
CNRA	Centre National de Recherche Agronomique (Côte d'Ivoire)
COLEACP	Europe-Africa-Caribbean-Pacific Liaison Committee
COMESA	Common Market for Eastern and Southern Africa
COPROMANG	Coopérative des Producteurs de Mangues de Bamako (Mali)
CTA	Technical Centre for Agricultural and Rural Cooperation (ACP - EU)
DHort	Direction de l'Horticulture
DLCP	Division Législation et Contrôle Phytosanitaire (Mali)
DNA	Direction Nationale de l'Agriculture (Mali)
DNCC	Direction Nationale du Commerce et de la Concurrence (Mali)

DPV	Direction de la Protection des Végétaux
DPVC	Direction des Protections des Végétaux et du Conditionnement (Burkina Faso)
DPVCQ	Direction de la Protection des Végétaux et du Contrôle de la Qualité (Côte d'Ivoire)
DRDR	Direction Régionale du Développement Rural (Senegal)
EC	European Commission
ECOWAS	Economic Community Of West African States
EDIF	Export Development and Investment Fund (Ghana)
EMQAP	Export Marketing and Quality Awareness Project (Ghana)
ENSA	Ecole Nationale Supérieure d'Agriculture (Senegal)
EPA	Environmental Protection Agency (Ghana)
EU	European Union
FAGE	Federation of Associations of Ghanaian Exporters (Ghana)
FAO	Food and Agriculture Organization
FARA	Forum for Agricultural Research in Africa
FP2A	Fédération de Producteurs de l'Agro-Alimentaire (Senegal)
FPHG	Fédération des Planteurs de Haute Guinée (Guinea)
GAEC	Ghana Atomic Energy Commission (Ghana)
GEPC	Ghana Export Promotion Council (Ghana)
GIS	Geographical Information System
GSB	Ghana Standards Board (Ghana)
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (Germany)
GVMC	Ghana Vegetable Marketing Company Limited (Ghana)
HDU	Horticultural Development Unit (Ghana)
HEII	Horticulture Exports Industry Initiative (Ghana)
IAEA	International Atomic Energy Agency
IAPSC	Inter-African Phytosanitary Council (IPPC – Yaoundé, Cameroon)
ICG	International Core Group
ICIPE	International Centre of Insect Physiology and Ecology (Kenya)
IITA - Benin	International Institute of Tropical Agriculture (Benin) (Agricultural Research for Development in Africa)
INERA	Institut de l'Environnement et des Recherches agricoles (Burkina Faso)
IPPC	International Plant Protection Convention
IRAG	Institut de Recherche Agronomique de Guinée (Guinea)
ISRA	Institut Sénégalais de Recherche Agricole (Senegal)
ITA	Institut de Technologie Alimentaire (Senegal)
ITFC	Integrated Tamale Fruit Company (Ghana)
MRL	Maximum Residue Limit
MOFA	Ministry of Food and Agriculture (Ghana)
NARP	National Agricultural Research Project (Ghana)
NHTF	National Horticultural Task Force (Ghana)
OCAB	Organisation Centrale des Producteurs-Exportateurs de Bananes, Ananas, Mangues (Côte d'Ivoire)
OIE	World Organization for Animal Health

OMOA	Organic Mango Outgrowers Association (Ghana)
OPV	Office de Protection des Végétaux (Mali)
PACE	Pan-African Programme for the Control of Epizootics
PADL	Projet d'Appui au Développement Local (Burkina Faso)
PAEP	Projet d'Appui à l'Entreprenariat Paysan (Canadian project in Senegal)
PAFASP	Programme d'appui aux filières agro-sylvo pastorales (Burkina Faso)
PAMPEAG	Papaya and Mango Producers and Exporters Association of Ghana (Ghana)
PATTEC	Pan African Tsetse and Trypanosomiasis Eradication Campaign (Ghana)
PCDA	Programme Compétitivité Diversification Agricole (Mali)
PCPEA	Projet cadre des exportations agricoles (Guinea)
PCQ	Poste de Contrôle Phytosanitaire et de Qualité. Decentralized services (Senegal)
PDMAS	Programme de Développement des Marchés Agricoles du Sénégal (Senegal)
PIP	Pesticides Initiative Programme (EU programme)
PMCU	Programme Management and Coordination Unit
POA	Plan Opérationnel Annuel
PPRSD	Plant Protection and Regulatory Services Directorate (Ghana)
SIPEF	Société Internationale pour la Plantation et le Financement (Guinea)
SNPVDS	Service National de la Protection des Végétaux et des Denrées Stockées (Guinea)
SPEG	Sea-Freight Pineapple Exporters of Ghana (Ghana)
SPVCP	Service Protection des Végétaux et Contrôle Phytosanitaire (Benin)
SRDR	Services régionaux de développement rural (Guinea)
STDF	Standards and Trade Development Facility (FAO - OIE - World Bank - WHO - WTO)
TEM	Tropical Expression Mali (Mali). Exportation by ship
TIPCEE	Trade and Investment Program for a Competitive Export Economy (USAID)
UCAD	Cheikh Anta Diop University (Senegal)
UEMOA/WAEMU	West African Economic and Monetary Union
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
VEPEAG	Vegetable Producers and Exporters Association of Ghana (Ghana)
WAFFI	West African Fruit Fly Initiative
WB	World Bank
WHO	World Health Organization
WTO	World Trade Organization

Conversion table
1 euro = 655.957 CFAF

1. CONTEXT

The damage caused by plant feeding flies to fruit intended for international markets has for many years been recognized as a problem with a heavy economic and social impact at local, national and global level. Like other continents, Africa is affected.

The discovery in 2003, first in East Africa and then from 2005 onwards West Africa, of a new and invasive species of exotic fruit fly (Bactrocera invadens) originating from South Asia, resulted in a rise in interceptions and destructions of mangoes arriving into the European Union (EU), with serious economic losses for West African exporter countries and a growing risk of losing access to international markets. The limited resources of African national agricultural and research institutions have so far prevented investment in research or development and deployment of effective control strategies on a regional scale. Faced with the extent of damage observed on crops and the lack of accurate information on the best ways to combat the scourge, professional organisations (such as COLEACP) have mobilized to seek the coordinated intervention of multilateral and bilateral donors (USAID, World Bank, EU, Coopération Française, etc.) with a view to equipping producers with effective and accessible means of control commensurate with the economic and social challenges posed by fruit fly.

In early 2007, a study on the extent of the damage inflicted on fruit production by fruit flies was commissioned at the request of the Member States of the Economic Community of West African States (ECOWAS/CEDEAO) and conducted with European funding by the consultancy firm Italtrend. The conclusions of this study were submitted in April 2008. They are based on an analysis of abundant literature on the subject and on interviews with over 300 stakeholders in field visits to eight fruit producing countries in West Africa (Côte d'Ivoire, Senegal, Mali, Burkina Faso, Ghana, Guinea, Gambia and Benin).

Based on the information collected, the study provided an estimate of the damage caused by fruit fly to the fruit and vegetable industries in West Africa, and recommended various pest management methods to reduce and prevent these losses. This study was also able to identify specific problems related to fruit fly damage at national level, as well as selected solutions applied in certain countries to combat this pest. Finally, the report proposed specific actions in the form of a Regional Action Plan, accompanied by a logical framework with specific activities to be conducted at regional and national level.

Under the auspices of the ECOWAS Commission, a Regional Workshop was held in Bamako, Mali, from 29 July to 1 August 2008, which approved the results of the study with a few minor amendments. One of the key recommendations requested by participants was to take the necessary steps to mobilize donor resources for this Regional Action Plan in a coordinated manner so as to avoid duplication of effort and achieve tangible and effective results.

However, given the tragic and premature disappearance of the Italtrend Mission Leader, certain aspects could not be sufficiently considered in the original study:

- The breakdown of action at regional and national level and the linkages between the two levels were only briefly outlined;
- the implementation rationale required further elaboration to ensure that all the links necessary for the complete success of the Programme are taken into account;
- the budgetary aspect was lacking, since the cost of the planned actions was not indicated;
- the institutional operating set-up and implementation rationale were not mentioned, although these are crucial elements for the success of a programme;

- since the intention is to replicate the West African Regional Programme in other regions of the African continent, it is essential that all of its implementation modalities be properly defined.

Accordingly, the World Bank, using funds available in the EU funded Trust Fund[1], and the STDF/WTO, agreed as part of their 2009 activity programme to co-finance a complement to the Italtrend study. The complementary study would be led by COLEACP and would address the issues outlined above, i.e. estimating costs of a Regional Action Plan to control fruit fly as well as proposing a viable institutional implementation mechanism to carry out the plan. To this effect, a three person expert mission was conducted between May and July 2009, with support and advice from the ICG[2] at all stages.

2. METHODOLOGY

For a detailed analysis of the methodology used, please refer to Annex 1.

The methodology comprised several stages:

2.1 Definition of an operating framework

The first stage was to define a coherent generic operating framework that takes into account all essential activities as well as any related prerequisites for achieving the Programme's objective.

This first phase divides activities into three distinct operational levels: regional, national and local.

2.2 Drafting of a survey grid

For a rapid updating of national fruit fly situations[3], a survey grid derived from the previous phase was developed by the Mission. It provided a coherent and identical survey grid in each of the eight target countries. This grid was revised by the ICG.

2.3 Field surveys

The third stage consisted in bringing together a working group in each country and completing the survey grid. The purpose of this survey was to quickly update the "gap analysis" of the national situations in the eight target countries (Côte d'Ivoire, Senegal, Mali, Burkina Faso, Ghana, Benin, Gambia and Guinea), and to validate the generic operating framework defined in stage 1.

"Gap analysis" is a technique used for determining the steps to be taken to progress from a current state to a desired future state. This consists initially of listing the characteristics of the various factors of the current situation (as things currently stand), then determining the characteristics of the desired future situation (as they should be) and finally identifying the steps to progress from the current state to the future state.

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[1] Under the European Union programme known as AAACP (All ACP Agricultural Commodities Program).

[2] The "international core group" (ICG) brought together experts with concrete experience of implementing, managing or evaluating regional programmes in issues similar to that of invasive fruit flies (e.g. desert locusts, avian flu and so forth). These "peer reviewers", by virtue of their previous experience in a similar field, made pertinent critical comments and constructive suggestions for the institutional set-up proposed by this study.

[3] National situations have changed since the time of the Italtrend study, and of the present mission. These changes should be considered in drawing up the budget and institutional set-up.

The proposed generic operating framework was unanimously endorsed in each of the eight pilot countries.

2.4 Awareness raising for donors interested in fruit fly control in the eight countries surveyed

After each Working Group meeting (see previous point), an additional day in situ was used in order to present donors with the main conclusions of the Italtrend study and the current state of budgeting work prior to a donor round table in September 2009.

2.5 Assessment of the capacity of specific regional institutions to implement all or part of the regional programme

In order to propose a coherent institutional set-up, a list of regional institutions was drawn up in collaboration with local representations of the European Commission, the World Bank and the World Trade Organization.[4] The Mission held meetings with these institutions and assessed their capacity to contribute to the implementation of the regional action plan at different stages (programme supervision/programme management).

2.6 Summary of surveys, identification sheet, institutional set-up and budget

A single institutional set-up is proposed, specifying the roles of each entity concerned, the conditions for sustainability of the solutions provided by the overall institutional arrangements and the budgetary implications.

A budget is provided, distinguishing between budgetary implications at regional and national activities and categorizing activities by results.

The budget costing only provides totals for each activity, distinguishing the regional part from the national part. It gives no indication of costing for each country. Countries will thus be encouraged to adopt a proactive, demand driven approach to obtain programme benefits, rather than simply requesting pre-assigned amounts under the Programme.

Nevertheless, when the Programme is launched the overall costs and needs can be determined on request for each country at each stage, through its national fruit fly committee, based on updated data (since the situation will have changed between the time of this study and the start of the Programme).

3. DESCRIPTION OF STAKEHOLDERS

For a detailed description of stakeholders, please refer to Annex 2.

Stakeholders include:

- Official institutions
- Non State players
- Other institutions

Each of these stakeholders, to the extent of their capacity, can play a constructive role in raising awareness concerning the need for coordinated action and/or in developing and implementing pest prevention and management solutions.

[4] The reports of the visits have been appended.

3.1 Official institutions

3.1.1 Regional institutions

Regional institutions in West Africa that should play an important role in fruit fly management are the following: ECOWAS, UEMOA, CMA /AOC, CILSS, FARA, IITA.

Other international organizations such as ICIPE or IAPSC could be stakeholders in the Programme, since they have worked on this subject or have pest related competencies. However, since the scope of the additional study has been limited to the West African region, the COLEACP team did not conduct meetings with them. The role and functions of these institutions are described in detail in Chapter 13 and Annex 15.

3.1.2 National institutions with fundamental responsibilities in fruit fly management

In each country, two Ministries are the Programme's main stakeholders: the Ministry of Agriculture (primarily for scientific and technical aspects) and the Ministry of Trade (primarily for business and trade aspects), and their combined efforts must rise to the challenge posed by fruit fly to the country and its economy. The Finance Ministry is another important stakeholder, in view of its budgetary powers.

3.1.3 Official national surveillance and control structures

Responsibilities are not distributed in the same way in the various countries, but they can be grouped according to whether their functions relate to plant health and protection or to pesticides:

3.1.3.1 Plant health and protection

Surveillance authorities in the field of plant health and protection

Their role is to set up a network of traps distributed representatively across the various agro-ecological zones of the country, and to collect all data on the country's quarantine and endemic organisms. This activity is essential, as it provides the basis for controls, rapid alert systems, etc.

This role may be handled by a public authority or a private organization accredited by the competent authority which retains the risk management function.

They will be direct beneficiaries of the Programme.

Control and inspection authorities in the field of plant health and protection

The inspection and control authorities verify the absence of pests, especially at entry points, so as to prevent their propagation. Since the sanitary level differs between neighbouring countries, it is necessary to ensure that the authorities responsible for controls do their job properly. They are also responsible for carrying out inspections on specific farms to guarantee that they are free from pest contamination. These inspections are particularly important in the case of produce for export. In addition, the inspection and control authorities are responsible for signing the international phytosanitary certificates and reporting phytosanitary information.

They will be direct beneficiaries of the Programme.

Diagnostic authorities for plant health and protection

These include bodies with several types of responsibilities: (i) risk analysis (ii) rapid alert systems, and (iii) doing inventories on orchards and zones at risk. Few countries have these types of structures.

Diagnostic laboratories for plant health and protection

Diagnostic laboratories are essential for the rapid and accurate determination of pests that have been detected either by the surveillance network or by the authorities responsible for control. It is essential for these laboratories to have trained taxonomists on their staff who can identify the different types of fruit fly. It is also important to have a regional benchmark laboratory that can support the national laboratories in accurately determining the various pests and confirming their diagnosis prior to any obligatory declaration.

They will be direct beneficiaries.

3.1.3.2 Pesticides

The authorities responsible for pesticides have not been included because other programmes have specific activities in this field, such as the PIP/COLEACP Programme. There are plans for a second phase of this programme, and measures may be taken to ensure that the pesticides necessary for fruit fly management will be quickly approved.

3.1.4 Extension services

Extension services have the role of channelling knowledge between researchers and producers and providing technical assistance to the latter in the form of training, monitoring and advice.

They will be direct beneficiaries.

3.2 Non-State Players

3.2.1 The private sector

Fruit and vegetable producers may be classified according to their size and commercial outlets, as follows:

- Farmers producing only for the local or regional market. These are small-scale producers with small, old orchards and a low technical level. They are generally grouped in smallholders' organizations which may take the form of cooperatives, producers' associations or village committees.
- Commercial producers who export fruit and vegetable produce (especially mangoes), with modern orchards, large land areas, and in house technical expertise. They are relatively few in number, and are concentrated in certain regions such as Niayes in Senegal or in Northern Côte d'Ivoire. Nevertheless, they account for the bulk of exports.
- A third, "mixed" category of producers who sell on the local market but may supply fruit and vegetables for export depending on exporters' demand.

These three categories are direct beneficiaries of the Programme.

Mention should also be made of the workers employed by independent companies who carry out the harvesting on the producers' sites (known as "fixers" or "pisteurs" in French). They have a role to play in the Programme, by improving the sorting of harvested fruit and advising producers on orchard hygiene measures to prevent fruit fly contamination. They are not a substitute for the extension bodies, but may be effective vectors for good harvesting practices.

They are indirect beneficiaries of the Programme.

Fruit, in particular mangoes, only goes to a packing centre if intended for export to countries with very high quality requirements (such as European Union countries), and there are very few such centres. In the case of trade within West Africa, it seems that very little produce exported in the subregion goes through the packing centres, and it is generally transported in bulk form.

The packing centres are direct beneficiaries.

Exporters do not form a homogeneous category. Some have their own packing centres, while others are also producers. In general, they belong to a professional organization or exporters' association.

In order to avoid diluting the focus of the programme objectives, fruit processing companies will not be considered directly.

They will be indirect beneficiaries.

Agrochemical companies play an important role in manufacturing and distributing the pesticides, traps and lures essential for fruit fly management. In some countries the replace the technical assistance services in recommending products and methods of use.

3.2.2 Civil society

Certain NGOs are involved at local production level in fruit fly management (very restricted operations in the field but often bringing concrete results, provided their resources permit long-term action).

Although consumers' organizations in West African countries are still at an embryonic stage, recent examples[5] have shown that they can really have the power to force distributors to offer safe, quality products. They are indirect beneficiaries.

Finally, consumers will be indirect beneficiaries of the Programme.

3.3 Other institutions

3.3.1 Private/public organizations

Depending on the country, there are various types of private sector/public sector coordination organizations, such as task forces or Fruit Fly Management Committees. Where they exist, these organizations are essential forums for advancing programmes such as fruit fly management. Nonetheless, their representativeness and effectiveness vary enormously, which entails adjusting their capacities so that they may play an effective role.

[5] In Niger, when infested rice was imported consumer organizations intervened successfully to have it withdrawn from the market.

3.3.2 Research institutes

Several West African research institutes and universities are working on the fruit fly problem. However, often for lack of organization and resources, the practical results of this research do not meet expectations, although a number of researchers have promising programmes.

For instance, IITA, in collaboration with CIRAD and with funding from the World Bank[6] and STDF, has carried out the WAFFI programme, an applied research programme on GF120 (Spinosad) spot treatment.

ICIPE is a research body based in Kenya, whose mission is to reduce poverty, ensure food security and improve the health standards of people living in the tropics by developing insect pest management tools and strategies, or by using useful insects while safeguarding the environment through research and capacity building. ICIPE's mandate covers all of Africa, and it has done extensive work on fruit fly, for which it is a key research body. However, it has mainly worked in East Africa and little in West Africa, and its outreach is limited by the lack of a regional approach to the fruit fly issue in East Africa. Wider use of the applied research methodology it has developed and its training capabilities (in English only) therefore depends on donor funded requests for intervention.

3.4 Conclusions

The foregoing analysis indicates that there are many structures and players involved in fruit fly management. All of the stakeholders therefore need to be taken into account, since they are all, private and public, essential links in the chain of effective fruit fly management.

The stakeholders that will be involved in the different programme components will vary from country to country, and choosing the most effective and efficient ones in each case will be one of the tasks of the Fruit Fly Management Committees.

4. BENEFICIARY COUNTRIES

In the Italtrend report, the Programme covered the region's seven mango exporting countries (Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Guinea, Mali and Senegal), to which Benin was added because of the presence of IITA. There would seem to be good grounds for questioning this grouping, firstly because Benin does not meet the export criterion, and also because that criterion seems too restrictive, since the Programme's twin objectives also include improving produce aimed at the domestic or regional market as well as long distance exports.

Hence a more flexible approach could be adopted, allowing for two levels of participation in the Programme:

- All interested ECOWAS member countries could be eligible to join programme activities at regional level (results of surveillance, research findings, development of educational materials in pest management and surveillance, training and so on).
- To be eligible for the national activities, interested countries would also have to:
  - Set up a Fruit Fly Management Committee with full participation of private stakeholders;
  - commit for the duration of the Programme to endow the public services responsible for pest surveillance and management activities with the resources necessary to carry out their work.

[6] Under the European Union's AAACP (All ACP Agricultural Commodities Programme).

5. ANALYSIS OF PROBLEMS

5.1 Disorganized pest surveillance

The table (see Annex 4) clearly shows that a number of functions either are not performed or not inventoried or appear to be performed by several entities.

The resources allocated for surveillance are insufficient in terms of human resources and resources for travel and information systems.

A summary of fruit fly surveillance for each country is presented in Annex 3. Certain countries have dedicated surveillance structures, but their effectiveness has not been studied. Owing to the lack of resources, pest surveillance is highly insufficient, and so the alerts for the appearance of these pests are random and late. Furthermore, although the obligation to do so may exist these alerts are not transmitted to a national body to centralize them, still less to a regional body.

5.2 Ineffective pest management

As regards pest management, there are two main types of stakeholder:

- Producers
- Official institutions

The vast majority of producers have orchards of very limited size. For example, in Senegal, some have between ten and 100 mango trees. Hence their financial capacity is limited, and they cannot invest in effective pest management methods.

In certain cases, fruit production is not the main activity, and producers do not devote enough time to orchard hygiene activities, which are not expensive but take time.

Finally, in many cases, producers are not sufficiently aware of the consequences for them and the local economy of failing to combat fruit flies.

The same is true of producers' organizations. Even if present, they have very limited resources, both in terms of properly trained human resources (generally no technical experts), and in terms of financial resources. Without external support, specifically under this programme, they cannot fully perform the role assigned to them, i.e. acting as the relay for awareness raising action and organizing coordinated pest management with the producers.

A summary of pest management bodies is presented in Annex 4. Even fewer resources are dedicated to fruit fly management than to surveillance. There are no indications of an organized fruit fly management campaign.

No short-, medium- or long-term strategy has been defined, although in certain countries such as Ghana the work under the Fruit Fly Management Committee has led to the development of a National Pest Management Plan, but it has not yet been implemented.

Extension bodies do not exist in all the countries. They are present for example in Senegal, Ghana and Gambia; but even when extension services are present, they do not have effective and coordinated action in the field of fruit flies.

5.3 Insufficient applied research

Experience and knowledge are not adequately shared between research institutions. There has been a decline in the capital available for research in West African States, with research centres and universities no longer having the human or financial resources to conduct the work required in certain agricultural subsectors, in particular that of fruit and vegetables. Work therefore lacks continuity, which prevents research from progressing effectively.

The research institutes do not provide producers with effective and inexpensive pest management methods.

Nonetheless, there is work in progress, particularly that conducted by IITA via the WAFFI programme co-funded by the World Bank and STDF.[7]

Solutions are now starting to become available to producers. However, although there are promising areas of research, particularly into biological pest management, a great deal remains to be done to achieve coherent, effective and above all inexpensive, solutions to implement in production areas.

It should be noted that some Universities are working on this issue. This is the case for example in Ghana and Mali, ENSA in Senegal and the University of Cocody in Côte d'Ivoire.

The work of the research centres is not sufficiently coordinated. Often the same research is conducted at different centres which fail to capitalize on each other's work. This means wasted resources, which are generally in relatively short supply.

Dissemination of research results should be improved so that producers and their organizations can benefit. IITA has published brochures in French and English, but they are aimed more at qualified technicians than at producers with low or zero literacy.

There is a glaring lack of economic studies, particularly into damage caused by fruit flies, which would be important for estimating the ensuing loss of income.

One of the programme components (monitoring/evaluation) will involve collecting statistically significant data, which will be processed in order to gain a better assessment of the damage caused by fruit flies.

5.4 Lack of strong competent authorities

Although national pest management committees exist or are being formed, they need to be reinforced to perform their role fully.

There is no regional pest management committee.

The competent authorities do not have sufficient trained staff to carry out their fundamental tasks.

Orchard inventories are lacking, and where they exist they are piecemeal and not harmonized at national level, still less at regional level. Some attempts have been made, particularly in Senegal and Mali, but this has not led to satisfactory results.

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[7] Under the European Union's AAACP (All ACP Agricultural Commodities Programme).

The plant protection laboratories do not have properly trained staff and lack the essential equipment for conducting their diagnostic work satisfactorily. There is a lack of documentary materials essential for recognizing the various pests, and of modern microscopes. However on the latter point, it will be useful to conduct an inventory of unused existing equipment in order to prevent needless expenditure.

The laboratories do not operate in a network. However, in some cases they use the IITA laboratory in Ibadan or European laboratories, particularly in Belgium (Tervuren Royal Museum of Central Africa) or the UK.

The plant protection laboratories are not accredited, which means that their diagnostics are not internationally recognized as valid.

6. LESSONS DRAWN FROM OTHER PROGRAMMES AND OTHER TRIALS

For a detailed analysis of programmes closely or distantly related to the fruit fly problem, please refer to Annex 6.

6.1 Fruit fly programmes

The USAID/Economic Growth Program in Senegal introduced the concept of a Fruit Fly Management Committee, which has been taken up by the present programme. Documents published by that Program could be used as a basis for brochures or simply reproduced in their present form. The same applies to a documentary film ("It's All On The Ground") on the fruit fly problem.

PDMAS has set up a shared packing centre in Senegal for the fruit and vegetable industries, which is a very interesting initiative. There are no plans for such investments under the present programme, but they could be included in other projects.

In Mali, operators also have a collective packing centre which was funded by Dutch Cooperation.

PAFASP in Burkina Faso is certainly one of the programmes that has been most committed to the fruit fly problem. It proposes using the Success Appat bait on a major scale. However, closer study of the programme suggests that it should pay more heed to the latest research recommendations, particularly following the WAFFI tests as to the minimum number of applications for the results to be convincing. Nevertheless, a fine analysis of this trial, in collaboration with the World Bank, would be highly instructive for the present programme to learn from all the consequences, positive and negative.

The WAFFI project is very important as it is a pilot project for the present programme, which has taken into account the vast amount of data and many lessons collected from the WAFFI project. The objective is to generalize the technical developments so that they can be harnessed by the producers' organizations, to continue research into aspects not yet mastered and to put together a sustainable system.

6.2 Regional projects

This section seeks to draw lessons from other regional projects as guidance for the institutional set-up for this programme.

6.2.1 Avian flu management

The avian flu management programme established round tables of financial donors and stakeholders to obtain commitment by the donors to funding integrated national action plans as part of an operating strategy adopted at a global level.

It focused its action on four areas:

- Developing a rapid alert system and emergency situations preparation system
- Implementing an effective avian flu management system
- Improving knowledge for better control of avian flu
- Reinforcing links between veterinary services and human health services

Some of these thrusts have been included in the present programme.

Raising population awareness, via appropriate communication, is a key factor for success. Rapid detection of infestation sources can limit epizootic propagation.

The objectives of the Steering Committee are:

- Supervise and guide the Programme in terms of strategy and implementation
- Approve national plans
- Approve annual reports

6.2.2 Locust management

CLCPRO is responsible for the harmonization of the Programme as well as the training of trainers. It effectively supervises evaluation missions.

The regional research centre is centralized in Nouakchott, and is a centre of excellence.

Due to the significance of this campaign and the extremely high potential damage (a locust invasion may cost around US$350 million), the National Locust Management Unit reports directly to the Agriculture Minister of each country, to avoid the resources dedicated to this campaign from being allocated to other services.

FAO centralizes the national risk analysis results, on the basis of which it launches the pest management campaign and grouped orders of the pesticides necessary for locust management. However, it is the countries which buy the products.

6.2.3 Cattle plague management (PACE programme)

During its formulation, this highly complex pan-African programme showed that the administrative workload had been greatly underestimated.

The obligation for approval of the Annual Operating Plans (AOP) by the European Union Delegations in the countries participating in the programme, as well as the European Union's very rigid procedures for mobilizing funds, greatly slowed implementation and execution.

The central level was supposed to strictly monitor the plans of the different countries, but this proved too difficult to do. Monitoring was then delegated to the regional units.

Part of the programme was funded by Great Britain (CAPE Unit), which had its own logical framework which differed from that of PACE, which has reduced collaboration and coordination between the British-directed programme and PACE.

Information systems are very important for consulting data used for decision making. This means that the data must be easily accessible, multilingual and secure. Centralization ensures homogeneity of the data collected.

Training and communication at all levels must be correctly planned and executed from the start. The results should be correctly documented and archived so that examples of best practices are available for all the countries.

Communication should be recognized as an important component that is essential for ensuring satisfactory visibility within the international community.

Evaluation, and if need be updating, of veterinary legislation is an essential component.

Experience sharing among countries enables rapid progress in all countries working on the same issue.

6.3 Experience of successful fruit fly management: Mexico

Mexico, a major fruit exporting country (avocados, oranges, limes, mangoes, onions etc.) is free from the Mediterranean fly (Ceratitis capitata); on the other hand, since 1992 it has had to implement a highly sophisticated control and eradication system for the Anastrepha fly, endemic to Central America. This campaign is decisive for promoting international trade, particularly with its big neighbour, the United States.

Mexico is a Federal Republic comprising 31 states and one Federal District. The Federal Government has more powers than in the United States, but the states still have considerable autonomy.

The pest management system is based on a pyramid system:

- At Federal level, a specialized Directorate of the Ministry of Agriculture (SAGARPA) coordinates fruit fly eradication campaigns in economically important areas. It supports the State Committees concerned in developing new pest management techniques, by providing training and supervision, as well as by supplying them with sterile males for low prevalence areas. Furthermore, it maintains a highly effective central information system accessible by industry stakeholders.
- In each State, a Phytosanitary Committee managed by producers conducts specific phytosanitary pest management actions. It is financially supported by the Federal Ministry Delegation and the Ministry for Agriculture, whose representatives participate in major decisions of the committee by sitting on their Board of Directors. By way of example, the State Committee for Nuevo Léon in the North of Mexico, which has a high citrus production, has a workforce of 135 people, including 20 per cent management.

- On the ground, engineers accredited by the Ministry and employed by the committee supervise the technicians responsible for installing traps and checking them every 15 days. If the infestation level exceeds the alert threshold, measures are taken without delay:
  - Infestation sources, including family orchards, are chemically treated by the committee;
  - produce from the infested orchard is immediately withdrawn from the export circuit. Only after four weeks without a detected fly presence may its produce be put back on the market.

Thanks to this system, Northern Mexico is free from Anastrepha flies. Further South, several States are considered to be of low prevalence. Extremely strict sanitary cordons control the flows of merchandise between these different zones.

This brief overview of the Mexican system demonstrates the real effectiveness of prevention. But this assumes long term political will, as well as the corresponding financial resources, within a suitable regulatory framework where all the players in the industry can rely on highly coherent technical standards and pest management methods.

6.4 Conclusions

A number of programmes have already accumulated interesting experience in fruit fly management, in particular the WAFFI project. However, only the programme presented herein has a regional dimension and takes into account all fruit fly related problems.

The regional programmes described above clearly show the need to take into account the intergovernmental dimension, rather than simply juxtaposing national programmes.

Hence any regional programme must have the following characteristics:

- First, have a sufficiently strong Management Unit at central level.
- Then, promote subsidiarity to avoid bottlenecks.
- Finally, the Management Unit should have sufficient operating flexibility to react rapidly and not depend on other entities whose procedures do not match the responsiveness required by such a programme.
- Very strong horizontal components are needed at regional level with regard to information systems, training design, coherence of communication, internal evaluation of results and the necessary legislative adjustments.

7. PROGRAMME SCOPE

7.1 Regional scope

In the initial study into the extent of the damage caused by fruit flies (Italtrend study), the countries selected for the Programme were mostly mango-exporting countries, with the exception of Benin, selected for hosting the headquarters of IITA, the benchmark fruit fly research centre for West Africa.

However, other countries such as Guinea-Bissau, Togo and Nigeria are also mango producers, although they officially export very little to the international markets, and also suffer from fruit fly attacks. Certain programme activities should therefore be extended to countries besides those initially

envisaged, as long as these countries formally apply for it and commit to setting up the structures necessary for implementing the Programme and also to providing them with sufficient human and financial resources.

At the start of the Programme, steps will be taken to raise awareness of the various proposed activities in all the countries in the region, including in those not yet included in the Programme so as to encourage them to join. This activity will focus on the pre-requisites for mobilizing the Programme's support, such as the creation or strengthening of national pest management committees.

The Programme will therefore operate at two levels: at regional level (West African region) and at the national level in the participating countries.

This action must also be set in the wider framework of the African continent. Although there are no similar programmes in eastern Africa, the fruit fly problem is at least as acute there as in West Africa. Pest management actions are conducted in some countries, but without any real coordination among them. Thus the present programme also has the remit to provide a generic operating framework that could be replicated in other regions of Africa following adaptation to local conditions. Links should therefore gradually be established between this programme and the institutions (including those involved in applied research) and representatives of non-State players of other regions of Africa.

7.2 The problem of plant-feeding flies

The most visible phytosanitary problem for the fruit and vegetables sector in West Africa is the fruit fly problem, since it directly affects mango exports to developed countries, particularly European Union countries, as well as trade in citruses and other horticultural products at regional and local level.

But it is the producers who suffer the most serious consequences: hence the importance of considering not only the modern export-oriented orchards but also the village orchards.

There are, however, other pests that affect production and exports of fruits and vegetables. In the case of mango exports, fungal diseases, and in particular anthracnose, are a very big problem in some regions (Senegal, Ivory Coast, Burkina Faso, Mali), and fruit producers also complain of termites which destroy their orchards (Senegal).

Although the damage caused by these other pests should not be minimized, the Programme will focus its action on fruit flies, recognized by studies as the priority, in order to ensure effective action and avoid dispersion of its resources. Other programmes could be oriented towards these other problems.

7.3 Fruits and vegetables targeted by the Programme

The Programme will focus on:

- Fresh fruits and vegetables exported to the EU which are attacked by fruit flies: this means above all mangoes, but also papayas, melons and peppers, on a smaller scale;
- the range of products that are traded on regional markets and consumed locally and are worst affected by fruit flies, primarily citruses.

Due to their trade volume and economic significance, mangoes and citruses will thus be the two main products targeted by the Programme, without neglecting more limited actions on other products in the course of implementation.

8. GENERAL PRINCIPLES OF THE PROGRAMME

8.1 A five-year regional programme with national and local components

- Fruit fly is a continent-wide scourge, with a particularly strong presence in West Africa. The Programme must therefore have a regional dimension, rather than simply juxtaposing national programmes;
- for the Programme to be sustainable, the regional institutions with the role of coordinating national policies will have to be strengthened. The Programme must thus empower and consolidate a regional institution;
- subsidiarity will be an important element of the Programme: activities will be distributed between regional, national and local levels in order to maximize efficiency. A certain number of activities are planned at regional level. This 'mutualization' of activities will increase the effectiveness and efficiency of the Programme. If this principle were not applied, a number of activities would have to be repeated at national level, at the risk of losing the coherence and efficiency that are vital between the activities conducted throughout the countries of the region as a whole;
- the Programme will set budget allocations at regional and national level, but without specifying the breakdown among the individual countries;
- activities implemented at regional level may be managed either by the Management Unit (for example, preparation of training documents) or by a regional institution (for example, rapid alert management);
- the Programme, which deals with a complex problem and involves numerous stakeholders, is set to cover a five-year period;
- the proposed programme is a regional programme with national components and not a juxtaposition of national programmes with regional coordination.

8.2 A well-defined scope of action and clear priorities

- In terms of products, the Programme primarily concerns mangoes and citruses, without excluding other crops attacked by fruit fly;
- the main industry segments - production, harvesting and packing - are involved. To avoid excessive dispersion of the Programme, the transport and processing aspects will not be directly considered. The processing aspect will be impacted by the fact that better harvesting practices will significantly increase the percentage of healthy fruit destined for processing;
- as regards pest management, the Programme will not work on isolated orchards, but on priority areas big enough for the treatments to be effective (area-wide management);
- the problem of plant-feeding flies is complex and entails a host of factors, some of which are little known (life cycle of invasive species, displacement of endogenous populations by newcomers, reinfestations due to movements of people and merchandise, etc.). The applied research aspect is therefore a very important component;
- raising the awareness of the many stakeholders will be a very important point, involving not only producers, companies in every segment of the industry and

consumers, but also the official decision-makers and other public or joint public/private sector organizations;

- instead of providing training to end users, the Programme will train the trainers who will then train them.

8.3 Flexible and participatory implementation

- The Programme lays down the general principles governing its implementation, but does not set the structures that are to carry out the activities. This aspect will be discussed by he national authorities;
- whenever necessary (and possible), and in accordance with the mandates of each party, the activities are designed and carried out in concert between the public and private sector, systematically favouring the sector more capable of most effectively conducting the planned actions;
- although this programme is not intended to resolve all SPS problems, the competent authorities must be reinforced in the areas for which they are responsible, in particular the control and coordination of actions at national level. However, practical action must be delegated to the most effective organizations for solving the particular problem concerned;
- following principles which have been tried and tested in other programmes, the Programme will be demand driven and favour cost-sharing solutions;
- the Programme will coordinate the actions of other programmes dealing with the fruit fly problem.

8.4 A strong Management Unit responsible for coordination

- As far as possible, in order to maintain the Programme's coherence, funds, whether collected at regional level or for a given country, will be placed under the supervision of the Programme's Management Unit.
- When financial donors allocate resources to a particular country, a Management Unit member will ensure the coherence of the actions with the regional plan, by participating in the National Pest Management Committee. They will help guide the activities financed by these "national" funds so that they complement the activities financed by the regional funds.
- The Management Unit must have considerable management autonomy, so as to be able, for example, to launch calls for tenders quickly, and be highly responsive. On the other hand, very far-reaching financial audits must be conducted to ensure good use of the funds allocated and great transparency in contracting.

9. GENERAL AND SPECIFIC OBJECTIVES

The logical framework is presented in Annex 13.

General objective
Raise incomes of fruit and vegetable producers, particularly small producers, thus contributing to poverty reduction.
Specific objectives
Control losses on fruit and vegetables due to fruit fly infestation, so that they are no longer a constraint on mango exports. Increase the quantity of fruit free from infestation available for sale on the local market, to contribute to improving food security.

The objectives are thus twofold, as they consider not only exports but also, and perhaps above all, feeding the population of West African countries.[8]

Between the end of the dry season and the start of the rainy season, mangoes are an important part of the diet of the very poor. Fruit and vegetable production losses due to fruit flies are high and can reach up to 80 per cent of production in the rainy season, resulting in a loss of sources of vitamins and calories.

The Programme does not focus on the mango alone. Other crops, such as citruses or cucurbits, play a role in intra-regional trade flows and in local commerce, and will also be taken into account.

10. PROGRAMME COMPONENTS

The components are outlined in terms of the expected results set out in the logical framework.

The Programme will be based on four vertical components and two horizontal components.

The vertical components, i.e. those dealing with a particular problem, are:

- Surveillance
- Pest management
- Applied research
- Capacity building

The horizontal (cross-cutting) components, i.e. those which implement the general policy and ensure coordinated action, are:

- Training/information/communication
- Monitoring/evaluation

It should be noted that the training/information/communication and monitoring/evaluation budget is allocated to the vertical components, whereas coordination of the training, information and

[8] Fruit and vegetable consumption is estimated at 30 kg./person/year in Mali (source: Agro-Ind 2002. http://www.proinvest-eu.org/files/files/AGROIND/html_fr/mali.html)

communication systems comes under the PMCU (Programme Management and Coordination Unit) budget.

10.1 Vertical components

10.1.1 Surveillance

For a detailed analysis of the surveillance component, please refer to Annex 9.

Result: Surveillance
Fruit fly surveillance to be organized at national level and coordinated at regional level, and to ensure effective and targeted pest management.
Activities • *Developing a surveillance system at regional level, including procedure manuals. This system is adapted to each country after a gap analysis* • *Implementing the surveillance system* • *Reinforcing border surveillance systems* • *Training the trainers for fruit fly surveillance agents (public or private)* • *Setting up a rapid alert unit at regional level. A correspondent will be appointed and trained in each country*

Basic principles

Surveillance consists in evaluating the fruit fly population over time and space, counting the various species and individuals of each sex, as a basis for risk analysis. The trapping system is used to carry out this surveillance. For more information on trapping, the WAFFI programme has published a data sheet giving full details (sheet no.3).

A first set of activities relates to surveillance itself:

- Firstly, surveillance is considered as an activity to be performed throughout the West African region. A sound evaluation of the infestation rate requires considering all the production areas, as well as transit areas. For countries not initially included in the Italtrend study the Programme will propose a specific surveillance activity. Subject to their declared interest and firm commitment to provide the necessary human and financial resources, the surveillance component will implement the activities planned in these countries.
- The number of traps will be representative of the density of the areas likely to contain fruit fly host plants.
- To ensure sound time representativity, collection frequency will be once a week.
- The traps must have attractants which are able to capture not only Batrocera invadens but also other flies present, such as Ceratitis cosyra or Ceratitis capitata.
- Surveillance will be reinforced at the main border posts (particularly those situated on the main trade routes).
- Apart from production areas, traps will be placed in markets, packing centres, distribution hubs and on main roads.

- To enable the surveillance system to work correctly, a Geographical Information System (GIS) will be set up, at least in the areas where surveillance will be carried out.
- A budget will be set aside for notifying and communicating surveillance results. This activity will be covered by the training/information/communication component.

Implementation system

Activities implemented at regional level (Management Unit)

- Development in the Management Unit of the surveillance master plan (definition of risk process, design of surveillance plan, writing of procedure manuals, presentation, training and revision of national surveillance plans, monitoring/evaluation of their implementation, etc.).

Activities implemented at regional level (Technical entity)

- Processing of national surveillance data. The data from the various countries will be grouped and analyzed and the summary forwarded to national level.
- Setting up of a Regional Rapid Alert Unit to collect & dispatch the alerts issued by West African countries either to other West African countries or to national bodies for infestation sources and new quarantine organisms. This unit could be situated in the IAPSC.
- Risk analysis will also be conducted at this level.

Activities implemented at national level for the eight initial countries

- The organizational set-up is based on a pyramidal system that will be adapted to local conditions.
- Local level: organization of producers, exporters, village councils, extension services: installing traps and collecting trap contents.
- Agro-ecological area level: carried out by the government plant protection service (DPV - Plant Protection Directorate) or the programme research component: collection of traps from local levels, identification and counting of insects, sending information to national level, etc.
- National level: carried out by the government plant protection service (DPV) or Research: grouping and processing of data, data dissemination, checking of work carried out at local and agro-ecological area levels.

This system is adaptable to the conditions of each country.

An information/communication activity will be conducted at the level of each National Pest Management Committee with a view to disseminating the results of the surveillance conducted in each country. This activity will be carried out in collaboration with the training/information/communication component.

This set-up must be discussed and adapted in the National Pest Management Committee, with all the players. This Committee must appoint managers for national level and the major regions. An economic damage threshold for each agro-ecological area and each period in all countries will be established, in collaboration with the research component.

If this economic threshold is exceeded, the Programme will initiate pest management operations using spot treatments (BAT) (food attractants + insecticide) and food attractant traps (torula) or any other technique validated during the Programme (effectiveness/cost/sustainability ratio). These operations will be coordinated by the pest management component.

Activities implemented at national level for other ECOWAS countries

As long as the countries formally apply and have set up a national fruit fly management committee and the authorities responsible for surveillance have been properly identified and allocated sufficient resources to do their job properly, the Programme could extend its surveillance action to them too.

An initial mission would be conducted by a Management Unit member to determine the agro-ecological areas where the surveillance areas would be set up.

A similar system to that described above would be implemented, financed by the Programme under the same conditions as for the eight initial countries.

Prerequisites

- Local level: producers' and exporters' organizations, village councils, extension services
  - Organization in place with the ability to reliably collect trap contents
  - Appropriate training
- Major region level: carried out by the government plant protection service (DPV) or Research
  - There must be a specific budget line indicating that staff salaries are covered by the institution
- National level: carried out by the government plant protection service (DPV) or Research
  - Staff must be appointed and their salaries provided for in a specific national budget line
- Regional level: same institution as rapid alert system
  - Staff must be appointed, and regional/national portions of the salaries provided for in an appropriate budget line.

Budget

The provisional budget for a five-year period is 3,500,000 euros, broken down as follows:

- Regional level: 1,000,000 euros
- National level: 2,500,000 euros

The number of countries envisaged for surveillance is 15: the eight initial countries, Guinea-Bissau, Sierra Leone, Liberia, Togo, Niger and two states of Nigeria.

Logical framework and detailed budget for a five-year period: Surveillance

Activities	Output	Output indicator	Execution/ results	Execution indicator	Institutions involved	Assumptions	Budget (€)
Regional level							
• Design of surveillance plan • Assistance for implementing the national surveillance plan • Training of National Pest Management Committee members at regional level • Evaluation of National surveillance plan by regional auditors	Procedure manuals, training of National Committee members (5 people per year and per country for 5 days), Evaluation of plans (15 plans evaluated per year)	No. of procedure manuals, number of National Pest Management Committee members trained, number of evaluation reports	The National Pest Management Committees are informed of surveillance problems and are organized to implement a reliable surveillance system	Number of surveillance plans implemented	National Pest Management Committees	National Pest Management Committees set up	300,000
• Implementation of regional surveillance plan	Fruit fly infestation database (150,000 euros), training of Regional Pest Management Committee members (4 people per year for 15 days)	Databases, number of Regional Committee members trained	Rapid alert system implemented at regional and international level	Number of reports on infestations due to fruit flies disseminated at national and local level	Regional rapid alert organization		300,000
• Monitoring/evaluation	1 month's evaluation per country and per year						400,000
TOTAL							**1,000,000**
National level							
• Implementation of surveillance system at local, agro-ecological area and national levels	Area with a surveillance system implemented (around 6 orchards of 6 ha. in 3 agro-ecological areas in each country) Agro-ecological area level (motorbikes supplied, 20 days' training /: agro-ecological zone) National level (one computer per country supplied, 20 days' training)	Number of hectares monitored	Increased surveillance	Number of surveillance reports per year and per country participating in the surveillance system	Producers' organizations, extension services, DPV		1,500,000 (surveillance at local level) 400,000 (surveillance at agro-ecological area level) 300,000 (surveillance at national level)
Information/communication regarding surveillance	Preparation of annual information bulletins	Number of bulletins published	Improved awareness of surveillance results	Reading survey by monitoring/evaluation team	DPV, research		100,000
• Reinforcement of surveillance systems at border posts	Implementation of surveillance systems at border posts (around 6 per country)	Number of officers trained at border posts	Increased surveillance of imported fruits and vegetables	Number of inspections per year and per country participating in the surveillance system	DPV		100,000
• Training of trainers for fruit fly surveillance personnel (public or private)	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in surveillance related problems	Number of surveillance agents (public or private) trained	Producers' organizations, extension services, DPV		100,000
TOTAL							**2,500,000**

10.1.2 Pest Management

For a detailed analysis of the pest management component, please refer to Annex 10.

Result: Pest Management

Producers are trained in preventive pest management methods, in high infestation areas control operations are implemented and in high production areas integral fruit fly management is set up.

Activities

- *Developing a fruit fly management plan at regional level, including procedure manuals. This plan is adapted to each country after a gap analysis*
- *Raising awareness on the importance of fruit fly management among producers (via their organizations) in local languages and training of producers in GAP (Good Agricultural Practices)*
- *Implementation of pest management plan in high infestation areas*
- *Implementation of pest management plan in priority areas*
- *Training of trainers for fruit fly management agents (public or private)*
- *Training of trainers for personnel working in harvesting (sorting) and packing centres. Development of training manuals and training tools in local languages*
- *Setting up benchmark orchards in countries besides the eight initial ones*

Basic principles

- Three levels of pest management are envisaged:
  - A preventive pest management level that will be implemented nationwide through awareness campaigns and training.
  - A pest management level following alerts issued by the surveillance component
  - An integral pest management level[9] in more limited areas.
- The emphasis will be on prevention: Good Agricultural Practices (GAP): bagging, burying, orchard cleaning, orchard hygiene.
- Integral pest management will only be applied in priority areas with a minimum land area defined in collaboration with the research component, to make a real impact.
- In coordination with the research component, the Programme will recommend IPM packages[10] in accordance with the priority area agro-ecological zone.

[9] Integrated pest management must not be confused with integral management. Integrated pest management is defined as follows: "concept of crop protection which employs a set of methods satisfying ecological, economic and toxicological requirements, attaching priority to deliberate use of natural limiting factors, and adhering to tolerance thresholds." Integral pest management consists of combating one or more pests on a production region or pilot area scale, involving all the producers in the area, and considering population management all year round (rather than just in periods when the flies are abundant).

[10] IPM (Integrated Pest Management) aims to limit parasite damage to economically acceptable levels within the local production framework using the most natural control methods possible. It favours the use of appropriate farming techniques and biological control methods to prevent infestation, rather than pesticides,

- The integral pest management in these priority areas (principle of "area wide management") means combating fruit flies not only on mango trees, but also on other host plants and in both commercial and family orchards.
- The types of pest management methods in priority areas will be chosen according to their economic impact. For example, GF 120 will only be used if the gains generated by its use are clearly greater than its cost.
- The priority areas will be divided out among countries by the Regional Pest Management Committee at the Management Unit's proposal.

  For the first year, the division among countries will be determined according to production of mangoes, citruses and vegetables prone to fruit fly infestation.

  In the following years, the division will also factor in the effectiveness of the implemented pest management action. This effectiveness will be measured by the Programme's monitoring/evaluation component.
- The supply of inputs under the Programme will be arranged as described in Annex 10: The Programme will pay for 100 per cent of inputs during the first annual pest management campaign at producers' organization[11] level and for 50 per cent of inputs during the second. The producers' and exporters' organizations must pay for all inputs in subsequent years. To be entitled to this subsidy, the producers' and exporters' organizations must satisfy certain conditions (also described in Annex 10).
- Phytosanitary products such as GF 120 will be applied by specialized personnel and not by individual producers (unless they have sufficient land areas to employ correctly equipped and trained personnel).
- Orders for phytosanitary products could be grouped at regional level, and distribution managed at national level
- Particular attention will be paid to the distribution of products necessary for pest management and recommended by the Programme in countries and areas participating in this activity
- In order for the pest management system to be able to work correctly, a GIS system will be set up, at least in areas of pest management following alerts and pest management in priority areas. The GIS system will be used by the producers' and exporters' organizations.
- Where pest control activities exist under other programmes, coordination will take place in order to prevent duplication and optimize resources.
- A budget will be set aside for notifying and communicating the results of pest control actions. This activity will be managed by the National Pest Management Committees in collaboration with the training/information/communication component.

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which are only used advisedly and selectively when no other solution is available or economically viable. IPM also promotes the use of plant genetic resources, with the use of plants best adapted to certain ecological conditions and resistant or tolerant to specific diseases and insects.

[11] This first year should not be confused with the first year of the Programme. If, for example, a producers' organization signs an agreement during the second year of the Programme, it will still benefit from 100 per cent subsidization of inputs for the duration of one year and 50 per cent the next.

Implementation system

Activities implemented at regional level (Management Unit)

- Development by the Management Unit of the pest management master plan: design of pest management plans, writing of procedure manuals, presentation, training and revision of pest management plans within the National Pest Management Committees.
- Awareness-raising tools on the fruit fly management issue and on means of preventive pest management (video, design of radio messages, development of posters translated into local languages …) will be created in partnership with the training/information/communication component.
- The Management Unit trains one or two consultants per country in the various pest management methods, who are known as national reference consultants. They will then be responsible for conducting training at national level. The choice of consultants is made by the country's National Pest Management Committee.
- The Management Unit must be able to centralize the orders for the various inputs in order to obtain better prices. On the other hand, products must be distributed at national level under the aegis of the National Pest Management Committee. Coordination must be implemented between the agro-chemical companies present in the country or neighbouring countries.
- Some products may need to be re-packed. The Pest Management Committee will sub-contract this function to private operators in the country or the region (via agro-chemical companies for example).

Activities implemented at regional level (Regional Committee)

- The Regional Committee, at the proposal of the Management Unit, will assign the priority areas by country.

Activities implemented at national level for the eight initial countries

- As regards raising awareness at national level, the organization of activities will comprise a national information campaign, the training of local consultants who, in turn, will train the producers in GAP;
- for pest management in areas where the economic intervention threshold has been reached (see surveillance component), a pest management programme will be implemented by specialized operating teams using methods recommended by the research component;
- for pest management in priority production areas, once the priority areas have been determined, integral pest management activities will be implemented with producers' organizations;
- for post harvest management, activities will comprise training personnel involved in harvesting and post-harvesting;
- Information/communication activity conducted by National Pest Management Committees with a view to disseminating the results of pest control actions. This activity will be conducted in collaboration with the training/information/communication component.

Activities implemented at national level for other ECOWAS countries

Due to lack of knowledge of the most effective conditions for fruit fly management in a given country, an investigation phase will be implemented, for the purpose of selecting pilot orchards as was done for the eight initial countries under the WAFFI programme.

Prerequisites

- Local level: producers' and exporters' organization, village councils, extension services:
  - Demand driven;
  - organization in place with the ability to conduct successful pest management;
  - appointment of an manager.
- Post-harvest level:
  - Demand driven;
  - packing centre with a quality manager.
- Government plant protection service (DPV) level:
  - Dedicated personnel must be appointed, and their salaries provided for in a specific budget line.

Budget

The provisional budget for a five-year period is 8,500,000 euros, broken down as follows:

- Regional level: 1,000,000 euros
- National level: 7,500,000 euros

Logical framework and detailed budget for a five-year period: Pest management

Activities	Output	Output indicator	Execution/ results	Execution indicator	Institutions involved	Assumptions	Budget (€)
Regional level							
• Design of pest management plan • Assistance for implementation of national pest management plan • Training of National Pest Management Committee members • Evaluation of national pest management plan	Procedure manuals, training of National Committee members (5 people per year and per country for 5 days), Evaluation of plans (8 plans evaluated per year)	No. of procedure manuals, number of National Pest Management Committee members trained, number of evaluation reports	The National Pest Management Committees are informed of pest management problems and are organized to implement a reliable pest management system	Number of pest management plans implemented	National Pest Management Committees	National Pest Management Committees set up	400,000
• Training of trainers for fruit fly management agents (public or private)	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in pest management related problems	Number of pest management agents (public/private) trained	Producers' organizations, extension services, DPV		100,000
• Training of trainers for harvesting and post-harvesting personnel	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in harvest and post-harvest related problems	Number of pest management agents (public/private) trained	Producers' organizations, packing centres, exporters, processing companies		100,000
• Monitoring/evaluation	(30 days/country/year)						400,000
TOTAL							**1,000,000**
National level							
• Raising awareness and training of producers	Raised awareness among fruit and vegetable producers of the fruit fly problem, and trained in GAP (10 meetings of 20 people per agro-ecological area twice a year, with distribution of posters). Video created	Number of producers trained	Reduced fruit and vegetable infestation due to fruit flies	Number of orchards with trained producers	Producers' organizations		2,000,000
• Pest management in high infestation areas	Implementation of pest management system (cost of 130 euros/ha./year)	Number of pest management teams trained	Reduced infestation in areas pinpointed by the surveillance component	Reduced infestation in orchards where the component has operated	Producers' organizations		2,300,000
• Pest management in priority areas	Designation of priority areas and implementation of IPM in them (cost of pest management per ha. and per year: around 200 euros (10 treatments/year with GF 120)	Number of hectares where IPM is implemented	Reduced infestation in priority areas	Reduced infestation in priority areas	Producers' organizations		2,300,000

Activities	Output	Output indicator	Execution/ results	Execution indicator	Institutions involved	Assumptions	Budget (€)
• Information/communication regarding pest management	Preparation of annual information bulletins	Number of bulletins published	Improved awareness of pest management results	Reading survey by monitoring/evaluation team	DPV, research		200,000
• Setting up of pilot orchards	Designation of pilot orchards (50,000 euros/country/year in 7 countries for 2 years)	Number of pilot orchards set up	Good knowledge of agro-ecological areas	Number of research reports	Producers' organizations, Research, DPV		700,000
TOTAL							**7,500,000**

10.1.3 Applied research

For a detailed analysis of the research component, please refer to Annex 11.

Result: Applied research

New, effective and inexpensive pest management methods made accessible to producers.

Activities

- *Research into IPM, biological control, control products and any other research potentially effective in fruit fly management. Development of manuals on new fruit fly management processes implemented*
- *Setting up a research team and a centralized Internet-accessible information network on fruit flies*
- *Dissemination of research results via seminars, brochures, documents*

Basic principles

- This component will only be oriented towards research the results of which may be directly applied on the ground. Moreover, such research should focus on methods that are likely to provide low-cost pest management solutions, in particular those requiring the fewest inputs (e.g. biological pest management).
- The research component will be technically managed by IITA, with significant involvement of ICIPE. It will be coordinated with the other components, especially the surveillance and pest management components.
- The financial and administrative aspect of the research component will be managed by the Management Unit.
- Work will be prioritized annually by a Scientific Committee, the members of which will be appointed in a personal capacity according to their involvement in the fruit fly problem; a donors' representative and an organization representing the private sector will participate in meetings as observers. The costed proposals for priority research areas will be submitted to the Steering Committee for a financing decision.
- Certain donors have expressed a wish to finance research conducted in research centres or national universities directly. Provision has therefore been made for nationally-based research. Research topics will, however, have to be approved by the Scientific Committee and must not duplicate those dealt with at regional level.
- The national research centres, as well as Universities with genuine know-how in the field of fruit fly management, will be associated with research requiring field station work.
- Each research topic must be accompanied by a progress and result disclosure requirement.
- A centralized information network will be set up, which may be hosted either by IITA or by CORAF.

Implementation system

Activities implemented at regional level

- An indicative list of research themes is appended (see Annex 11).

  The main applied research topics relate to improving or developing integrated pest management techniques: biological pest management, optimizing spot treatments, improving trapping of females …

- Research Team

  The Research team will be led by an international researcher, and be supported by a team of local researchers with recognized experience in the field of fruit flies.

- Dissemination

  Research progress may be disseminated in a number of ways, for example:

  - Presentation seminars in each country, every year. A wide panel of stakeholders will be invited.
  - Technical brochures will be systematically issued for each result obtained.

Activities implemented at national level

- Donors wishing to make financial contributions to research institutes or national universities may finance research directly.

Prerequisites

- The current IITA unit working on fruit flies should be operational at the start of the Programme.
- The current unit must coordinate with ICIPE.

Budget

The provisional budget for a five-year period is 4,300,000 euros.

- 3,900,000 euros at regional level
- 400,000 euros at national level

Logical framework and detailed budget for a five-year period: Applied research

Activities	Output	Output indicator	Execution/ results	Execution indicator	Institutions involved	Assumptions	Budget (€)
Regional level							
• Research into IPM, biological pest management … • Writing documents presenting new pest management methods	Implementation of research protocols on topics proposed by the Scientific Committee (see indicative list in Annex 11)	No. of protocols written and implemented	New, effective and inexpensive pest managements techniques made available to producers	Cost of pest management/ha.	Research		2,000,000
• Operational research team	Research team set up (1 international researcher + team of regional researchers)	Number of regional researchers in the team	Improved scientific level of researchers	Number of publications	Research bodies		1,100,000
• Coordination seminars • Internet-accessible information system	Coordination seminars (one 4-day seminar/year with 30 people) Installation of an information system (150,000 euros)	Number of seminars Number of Internet connections	Improved exchanges between researchers	Number of researchers in the coordination seminars	Research bodies		400,000
• Dissemination of research results via seminars, brochures, documents	Presentation seminars, (1 day's presentation of the research themes/year/country with 40 people invited) brochures (500 brochures/country/year), documents	Number of presentation seminars, number of brochures, number of documents distributed	Improved awareness of results obtained by research. Publications.	Survey on impacts of communication tools	Producers' organizations, packing centres, exporters, processing companies		400,000
TOTAL							**3,900,000**
National level							
• Research into IPM, biological pest management …	Implementation of research protocols on topics proposed by the Scientific Committee using national funds	No. of protocols written and implemented	New, effective and inexpensive pest managements techniques made available to producers	Cost of pest management/ha.	Research		400,000
TOTAL							**400,000**

10.1.4 Capacity building

For a detailed analysis of the capacity building component, please refer to Annex 12.

Result: Capacity building

The regional and national organizations necessary for effective fruit fly management are in place. Measures are taken at the end of the Programme to secure the future of the Regional and National Committees.

Activities

- *Developing a regional GIS (Geographic Information System) for orchard inventories*
- *Creating or reinforcing the National Fruit Fly Management Committees*
- *Capacity building of organizations*
- *Capacity building of authorities responsible for control tasks*
- *Reinforcing the national diagnostic laboratories (training technicians, supply of recognition materials (books, documents …) and equipment (microscopes, information systems)*
- *Designation & reinforcement of a benchmark laboratory (training, equipment), and training the trainers for field technicians in fly detection. Developing training manuals at regional level*

Basic principles

- At the start of the Programme, National Fruit Fly Management Committees must be set up if they do not already exist. If they do exist, their capacities must be upgraded;
- they must be joint public-sector/private-sector bodies;
- a gap analysis will be conducted in each country at the start of the Programme to specify the priority actions to be conducted, define the roles of the various players and establish the mandates/skills/operational capacities of the national players in the field who are most likely to contribute to the surveillance and control activities provided for under the National Action Plan;
- the Committees will prepare annual activity programmes to be submitted to the Regional Steering Committee for decision;
- they will organize field activities and supervise the national awareness-raising and training campaigns of many of the stakeholders concerned;
- the producers' and exporters' organizations are an essential component of the Programme and must therefore be strengthened;
- diagnostic laboratories must exist at national level and be reinforced, particularly in terms of taxonomy, including networking with a benchmark laboratory.

Organizational system

Activities implemented at regional level (Management Unit)

- Design or adaptation (if already present) of a GIS at regional level;

- setting up a GIS at national level.

Activities implemented at regional level (Benchmark Laboratory)

- Benchmark laboratory:
  - Reinforcing the IITA Ibadan benchmark laboratory
  - Training of laboratory technician trainers

Activities implemented at national level

- National Fruit Fly Management Committees: refer to paragraph 13.7 for details of the objectives of the National Committees, as well as for their composition. The objective of this activity is to reinforce them and make them operational very quickly.
- Professional organizations:
  - Reinforcing the capacities of the managers of the producers' and exporters' organizations.
- At government plant protection service (DPV) level:
  - Training in import and export controls;
  - training in legislation concerning phytosanitary problems, particularly the importance of phytosanitary certificates in international trade;
  - training in action to be taken in case of interception notifications (for example at European Union level).
- At border post level:
  - Training of border post personnel in sampling methods, in taxonomy, in recognizing new species.
- At post-harvest level:
  - Training packing-centre personnel in detecting fruit fly holes during sorting in the packing centres. This training will be conducted by previously trained consultants.
- Diagnostic laboratories:
  - Improve taxonomy capacities at national level;
  - provision of materials where necessary;
  - liaison with IITA and ICIPE diagnostic laboratories;
  - training field technicians.

Prerequisites

- The national fruit fly management committee must to be in place in order to be eligible for capacity building for programmes, enabling them to obtain the necessary official recognition;
- the producers' and exporters' organizations must have legal status, and have a manager capable of applying pest management measures;
- the government plant protection service (DPV) must allocate a specific budget line to surveillance, control and diagnostic laboratory personnel, providing appropriate premises and means of transport.

Budget

The provisional budget for a five-year period is 1,900,000 euros, broken down as follows:

- Regional level: 400,000 euros
- National level: 1,500,000 euros

Logical framework and detailed budget for a five-year period: capacity building

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
Regional level							
• Designing a GIS	Development of an information system enabling geographic information management	Number of GIS set up in the countries	Improved orchard inventories in West African countries	Number of orchards inventoried	Research		200,000
• Reinforcing a regional benchmark laboratory	Training of laboratory technician trainers at regional level (2 technicians/year), Materials supplied when necessary (cost of a microscope: 10,000 euros)	Number of national laboratory technicians trained by regional trainers	Accreditation of benchmark laboratory	Accreditation certificate	Regional diagnostic laboratory		200,000
TOTAL							**400,000**
National level							
• Creation or reinforcement of National Committees	Official National Pest Management Committees set up (computers supplied, salary for permanent staff paid for the first 3 years)	Number of officially recognized National Committees	Exchange between public and private sectors on the fruit fly problem, and problem solving	Number of reports	National Pest Management Committees	Governments and the private sector are collaborating	300,000
• Capacity building of professional organizations	Training of professional organization managers (10 managers/country/ year for 5 days)	Number of professional organization managers trained	Number of professional organizations capable of organizing for coordinated fruit fly management	Number of professional organization producers involved in fruit fly management	Professional organizations		400,000
• Capacity building of inspection bodies and border posts	Training of inspection body technicians (5 technicians/country/year for 15 days)	Number of inspection body technicians trained	Improvement in inspections	Number of inspection reports	DPV		400,000
• Reinforcement of diagnostic laboratories	Training of laboratory technicians (2/country/year) Equipment supplied when necessary	Number of laboratory technicians trained Laboratory and equipment audit	GLP implementation	GLP implementation reports	Diagnostic laboratories		400,000
TOTAL							**1,500,000**

10.2 Horizontal (cross-cutting) components

Basic principles

The cross-cutting components are:

- Training/information/communication
- Monitoring/evaluation

10.2.1 Training/information/communication component

The training/information/communication component will coordinate the relevant activities.

The activities of this component are assigned to the three main components: Surveillance, pest management and research.

The component manager will ensure the coherence of the various media.

The component will handle the general information system, including the general programme website, the setting up of the shared work space and any other tool boosting the efficiency of national/regional work.

As regards Training, the regional programme will be primarily involved in shared methodologies and designing shared training modules, leaving their adaptation and application on the ground up to the technical components.

10.2.2 Monitoring/evaluation component

The monitoring/evaluation component will coordinate the relevant activities.

It will draw up the monitoring/evaluation manuals comprising, among other things, procedure manuals, verification indicators and evaluation grids.

It will select a pool of consultants to perform monitoring/evaluation of the components. A contract will be drawn up between the Programme and the consultants. None of the consultants can operate in their own country.

The manager for this component will be responsible for compiling the data provided by the consultants, and supplying regular operating reports.

The monitoring/evaluation budget is built into each component as regards field audit missions.

Budget

The budget of the managers of the two cross-cutting components is built into the Management Unit budget.

The overall information system budget is valued at 500,000 euros.

The evaluation component budget is valued at 300,000 euros (external consultants' costs, and training of component auditors).

10.3 Management Unit

The Management Unit is composed of:

- 1 director
- 1 administrative and financial director
- 1 surveillance technical manager
- 1 pest management technical manager
- 1 training/communication/information manager
- 1 monitoring/evaluation manager

Staff will be recruited at regional level and must have the skills and experience required for regional projects of this scale. Provision has been made for international experts' fees.

Each manager will have one assistant. The Management Unit has been sized based on other successful programmes of similar complexity.

Working with many countries and many institutions means that there must be a strong Management Unit.

At national committee level, a Management Unit member will participate in at least one annual meeting to coordinate with the regional programme. In addition to their theme specialization (e.g. Surveillance), an expert could handle one or more countries for all problems.

The budget, besides the salaries of this Unit, comprises:

- An annual financial audit;
- a mid-year review;
- an end-of-year review;
- regional steering committees twice a year.

In order for the Programme to start as quickly as possible, at the start of the Programme it is planned to obtain the assistance of an international expert with a good knowledge of the fruit fly problem and the execution of regional programmes.

This expert would have a twofold mission:

- Help draw up the Master Operating Plan;
- present the Programme to the various countries to explain its scope, benefits, prerequisites etc.

The estimated five-year budget for the Management Unit is 5,000,000 euros.[12]

[12] The following hypotheses were used to calculate the budget for this component: It has been estimated that the fees of the Project Director and Administrative and Financial Director will amount to 120,000 euros per year (for five years), while those of the Component Managers will amount to 96,000 euros per year (for five years). There are plans to employ four administrative and financial assistants (18,000 euros per year, for five years).

11. LOGICAL FRAMEWORK

The logical framework reproduces the elements set out in chapters 9 and 10, as compiled and presented in Annex 13.

11.1 Assumptions and risks

The success of the Programme depends on political and socio economic stability in the participating countries. Political conflicts could prevent implementation of the Programme to its full extent and throughout the country. Furthermore, a severe economic crisis would prevent countries from endowing the competent authorities with the necessary financial and human resources for the Programme to operate properly.

The public sector and private sector must be willing to collaborate. Since the underlying principle of the Programme is the synergy between public and private sector action, non-participation of either sector would be a significant hindrance to its success.

Furthermore, the government plant protection service (DPV) must have effective and sufficient financial and human resources to fulfil its obligations under the Programme. This is the responsibility of the relevant Ministry, in association with the Finance Ministry.

Pest management assumes having access to the inputs necessary for its application. The Programme plans to reinforce the availability of inputs both when they are paid for (on a diminishing scale) by the Programme, and also afterwards when the producers will be buying them. Phytosanitary product importers must therefore be involved in their distribution, and the existence of a harmonized regulatory framework at regional level would be a plus.

Producers must be convinced of the benefit of pest management, and that the actions proposed by the Programme will bring them a substantial improvement in their output.

Integral pest management in high production areas assumes that all producers participate. It may be that some of the smallest ones will see no benefit in participating in these actions. The authorities must therefore be legally empowered to operate in orchards even if the owner does not want to cooperate in the campaign. In this case, if the owner sells his produce, then the authorities can recoup their pest management expenses from the proceeds of the sale.

One of the major components of the Programme is the research component. The team that worked on the WAFFI programme is particularly well placed to continue and expand the research work already under way, but for budgetary reasons this team may no longer be operational when the Programme starts. The formation of a new team would significantly delay the start of this programme component. It is therefore important for the current WAFFI team to obtain bridge funding, enabling it to still be operational when the Programme starts up its activities.

11.2 Prerequisites

At regional level, the prerequisite is that the Regional Coordination Committee (see paragraph 13.6) should be operational.

At national level, the Fruit Fly Management Committees must be set up and include both public sector and private sector, and must have official status.

The public sector must have designated the entities that will work on the Programme, and have committed to allocating to its services a sufficient budget to successfully carry out the planned activities.

12. BUDGET

The estimated duration of the Programme is five years.

The budget reproduces the details set out above in chapter 10.

Results	Main activities	Regional	National	TOTAL
Surveillance	Design, manuals, training costs	300,000		
	Local level surveillance costs		1,500,000	
	Surveillance cost at agro-ecological area		400,000	
	Surveillance cost at national level		300,000	
	Reinforcement of surveillance systems at border posts		100,000	
	Surveillance cost at regional level	300,000		
	Information/communication		100,000	
	Training of trainers		100,000	
	Monitoring/evaluation	400,000		
TOTAL Surveillance		**1,000,000**	**2,500,000**	**3,500,000**
Pest management	Design, manuals, training cost …	400,000		
	Awareness raising/orchard hygiene training		2,000,000	
	Pest management cost in priority areas		2,300,000	
	Pest management cost following alerts (see surveillance)		2,300,000	
	Information/communication		200,000	
	Harvesting/post-harvesting training	200,000		
	WAFFI, new countries		700,000	
	Monitoring/evaluation	400,000		
TOTAL Pest management		**1,000,000**	**7,500,000**	**8,500,000**
Research	Research costs	2,000,000	400,000	
	Costs of research team	1,100,000		
	Seminars and information system	400,000		
	Dissemination and Web information system	400,000		
TOTAL Research		**3,900,000**	**400,000**	**4,300,000**
Capacity building	Pest Management Committees		300,000	
	GIS	200,000		
	Reinforcing laboratories	200,000	400,000	
	Reinforcing professional organizations		400,000	
	Reinforcing DPVs, border post inspections		400,000	
TOTAL Capacity building		**400,000**	**1,500,000**	**1,900,000**

Results	Main activities	Regional	National	TOTAL
Monitoring/ evaluation		400,000		
TOTAL Monitoring/ evaluation		**400,000**		**400,000**
Communication/ information		400,000		
TOTAL Training/ communication/ information		**400,000**		**400,000**
TOTAL ACTIVITIES		**7,100,000**	**11,900,000**	**19,000,000**
Management Unit		5,000,000		
TOTAL Management Unit		**5,000,000**		**5,000,000**
Contingencies		1,000,000		**1,000,000**
TOTAL		**13,100,000**	**11,900,000**	**25,000,000**

The budget has been broken down into activities to be conducted at regional level and at national level.

It covers the activities described in detail above.

It should be noted that the budget for national activities is larger than the one for regional activities. This difference would be even more pronounced if the research aspect, included voluntarily at regional level, was not taken into account.

The budget only indicates amounts for each activity, distinguishing the regional aspect from the national aspect. It deliberately gives no indication of costing per country, in order to encourage countries to adopt a proactive approach to applying for programme support (demand driven) and avoid countries simply claiming predetermined amounts.

13. INSTITUTIONAL SET-UP OF THE PROGRAMME

13.1 Institutional conditions for the Programme to work properly

In the light of the activities planned under the Programme, a number of institutional preconditions for coordinated and efficient implementation can be pinpointed:

- The Programme must be executed both at regional level and in the various countries concerned, which implies the existence of strong coordination, capable of distributing efforts according to needs, ensuring the necessary information flows (upward and downward), particularly in terms of surveillance, harmonizing pest management methods and, wherever possible, achieving economies of scale. However, this double level of implementation must not have the effect of subordinating the start of the regional level activity to the signing of all agreements necessary for implementing the national activities in the various countries concerned.
- Since the producers and professional fruit producers' or exporters' organizations are the main players in fruit fly management, it is essential for the private sector to be

closely associated with the execution of the Programme, through the professional associations that represent the beneficiaries' interests.

- The institutional framework must be sufficiently flexible to enable donors wishing to participate in fruit fly management to join in without waiving their own fund commitment rules.
- Finally, to ensure maximum effectiveness in programme operations, at regional level there must be a centralized monitoring of activities (including those conducted at national level), to assess national implementation capacities and adapt the operating levels accordingly.

13.2 Operating levels

Under the principle of subsidiarity, the Programme must be implemented at a twofold level:

- At regional level for the following activities: scheduling, coordination, research monitoring, training, information, communication, development of educational material and surveillance system design …
- At national level, for field activities, especially those relating to the local surveillance system and means of fruit fly management.

Each programme component will therefore have two implementation levels, except for the research component, which will follow a regional approach. To enable effective coordination between regional and national levels, the national implementation level will be carried out by delegating authority from the regional level.

13.3 Special case of the research component

In order to prevent dispersion of the research effort and to maximize effectiveness by concentrating the human and material resources on one regional "centre of excellence" for fruit fly research, the research component will be placed under the responsibility of IITA, which has the appropriate expertise and competence, and has already conducted research programmes in this field with EU/World Bank/WTO funding. IITA must share its findings with the national/regional research institutes, and may wherever necessary call on the latter under special agreements. It must also maintain close collaboration with ICIPE, a research institute with a pan-African remit which possesses high-level expertise in the field of fruit flies, particularly in East Africa.

The annual research programmes and activity reports of the research component must be approved both by the programme Steering Committee and the Scientific Committee.

13.4 Programme supervision

In the absence of a specific regional body with the remit of coordinating crop protection actions, the regional economic communities appear to be the appropriate authorities for supervision of the Programme. There are two of them in West Africa:

- ECOWAS, which has the advantage of covering all the countries in the region prone to be affected by fruit flies; ECOWAS considers this programme a priority, and has played a very active role in its creation;
- UEMOA, which is also very interested in the Programme, and is also entitled to implement it in its area; the UEMOA area does however exclude Ghana and Guinea, as well as Nigeria, whose political and economic weight is unmatched in the Region, which means that UEMOA may have difficulty being the Programme's sole supervisor;

Thus there appear to be two possible options:

- Programme supervision is the sole responsibility of ECOWAS, which will carry out this function on behalf of both institutions, in close concertation with UEMOA;
- programme supervision is jointly performed by both institutions, through a joint ECOWAS/UEMOA committee (as exists, for example, in common customs tariff matters). This latter option is certainly a possible but more complex to put into practice, since it is difficult to envisage a programme of this scale being jointly implemented between two organizations with different procedures.

A third option, of dividing programme supervision by component or country between the two institutions, could also be envisaged, but clearly presents more drawbacks than advantages: dividing by country (UEMOA member countries, and ECOWAS members who are not UEMOA members) would damage the overall coordination of the Programme, and hardly seems to comply with the spirit of regional institutions; dividing by component (for example, the research component with UEMOA and the other components with ECOWAS) risks greatly damaging the internal cohesion of the Programme. This option should therefore be avoided.

The choice of programme supervisor is an eminently political issue and largely depends on programme funding, i.e. on the respective contributions made by ECOWAS and UEMOA out of their own resources to funding the Programme, as well as on the institutional channels (ECOWAS, UEMOA or direct support to countries) which the donors decide to use for external funding. If most funding is channelled by ECOWAS, then the first option becomes the obvious one. If the Programme obtains funding from both institutions, the delegation of overall programme supervision to ECOWAS could be envisaged, leaving the choice between the first and second options.

13.5 Programme management and execution

Whatever option is selected with regard to overall supervision, the Programme must have broad autonomy: firstly, because it is not in the remit of regional institutions to be involved in day-to-day management of development programmes as execution agencies - their role must be limited to programme supervision; and secondly, because the financial and contracting rules of the two organizations appear to be extremely restrictive[13], and not suited to the requirements of a development programme.

Programme execution could be entrusted to a specialized execution agency (such as UNOPS or GTZ). This solution, however, would increase the cost, reduce the Programme's regional visibility, and not contribute to the establishment of long-term fruit fly management mechanisms after the end of the Programme. Accordingly it is not recommended, and implementation by a Management and Coordination Unit (PMCU), as a genuine programme manager, seems vastly preferable. Paragraph 13.6 specifies the two functions of this Management Unit: administrative and financial management and technical management.

This Management and Coordination Unit must have broad administrative and financial autonomy with regard to the supervisor's internal rules. If the supervisor is ECOWAS, it has precedents for the creation of an autonomous entity of this sort, in particular the Water Resources Management Centre, which has legal status, financial autonomy and its own bank account which receives payment of the community budget allocated to it, the capacity to recruit its contractual personnel and negotiate directly with donors, under the guidance of the Department of Agriculture. The PMCU could therefore be a rough model for a regional fruit fly prevention and management

[13] As also shown by the experience, for example, of the management of the UEMOA cotton industries support programme.

centre (a mandate that could possibly be extended to other crop pests) that could continue beyond the end of the Programme under the auspices of a Regional Committee.

To facilitate scheduling and management, all the funding obtained should preferably go into a common fund (Pool Fund or Basket Fund), to which all donors so wishing can contribute. Such a solution would facilitate cash flow management and account management of the Programme, by avoiding the need to divide costs between various funds, each with its own eligibility, accounting and contracting rules. This common fund would be managed by the PMCU under common rules acceptable to all donors, in particular the European Commission. Donors' contributions to the fund could be general contributions or earmarked for a particular aspect, whether national or regional.

This system does not, however, exclude the possibility of certain contributions being individualized and not going through the common fund, if a donors so requires. In this case, the PMCU would have to adopt different procedures according to the origin of the funds, which will complicate management, but still remains feasible. This system also enables donors that are unwilling or unable (particularly lenders) to contribute to regional actions but want to finance an activity in a given country to join in the Programme. In this case, it is recommended that the beneficiary country of the funding delegates management to the PMCU, or at least grants coordination authority[14], thereby maintaining the principle of centralization of programme funding. However, experience shows that this case is relatively rare.

A third case may arise, where a financial backer may wish to help a country directly but not to go through the Regional Unit, in the case of a loan, for instance. In this case, it is the National Pest Management Committee of the country in question that would manage the funds. However, to maintain the coherence of the Programme, some UGPC personnel would participate in the National Pest Management Committee and guide the activities funded by these "national" funds so that they complement the activities financed by the regional funds. Obviously this third option greatly complicates the management and coherence of the Programme, but since this case may be frequent it must be considered.

Thus a permanent secretariat will have to be set up for the National Pest Management Committee. The ensuing costs have not been included in the budget presented, and would have to be covered by the country receiving such funds.

13.6 Regional implementation

Programme Management and Coordination Unit (PMCU)

Under the supervision of a steering committee, the programme supervisor would entrust the PMCU with overall execution of the Programme. The Unit would itself ensure the implementation of the regional activities, and delegate execution of the national ones to the national authorities (national committees). It would perform, for the entire Programme, the scheduling of activities, monitoring and tracking of activities conducted by the national bodies, and administrative & financial management.

The PMCU would not have the administrative and financial responsibility for funds intended for a particular country not going through the regional level.

To perform its functions, the PMCU would need, besides a director, five management staff: two component technical managers (sharing the pest management and surveillance components), an administrative and financial manager, a training/information/communication manager and a monitoring/evaluation manager.

[14] Solutions adopted by the EUMOA cotton industries support programme.

Another solution could be to separate the Management Unit into two: the Technical Management Unit would be responsible for implementing the Programme's various activities and for coordinating them, and an Administrative and Financial Management Unit which would be responsible for administering funds and transferring them according to the activities decided by the Technical Unit. All in all, the latter seems more complicated to implement than the former.

The headquarters of the Programme must satisfy some selection criteria:

- Be in a country for which fruit and vegetable production is important
- Have easy links with the other countries
- Enjoy consensus among the other countries participating in the Programme
- As far as possible, have a close relationship with a regional institution
- Be easily able to open an account in a banking institution

Bearing in mind these criteria, one of the options could be Cotonou. It presents the advantage of proximity to IITA, which is in charge of the research component, reinforces the Programme's autonomy with regard to the regional institutions, and presents certain advantages in terms of air and logistical links with Abuja, where the headquarters of ECOWAS is situated.

Other options could be Ouagadougou or Bamako.

However, this decision is clearly political and must be left to the programme supervisor.

Steering Committee

The Programme would have a Steering Committee, which will play a particularly important role given the need for coordination of activities. This committee will be intended to become, at the end of the Programme, the regional fruit fly management committee, responsible for coordinating pest management on a long-term basis at regional level. It should be chaired by the President of the ECOWAS Commission (or their representative), while, depending on the option selected, UEMOA could hold the Vice-Chair or Co-Chair. The Committee would aim to maintain close coordination between the activities of the Programme and those of the programmes of the two regional entities, while working to harmonize the policies and activities of both institutions in respect of fruit fly prevention and management in West Africa. The following should also be Committee members:

- Representatives of the beneficiary States appointed by the national fruit fly management committees (there could be one or two representatives for each country, according to the scale of the national fruit fly management activities);
- the donors participating in programme funding;
- as observers, donors not participating in funding of the Programme;
- COLEACP, as the association representing fruit and vegetable exporting professionals for all ACP countries and European importers;
- Regional institutions with recognized competence:
  - ROPPA, as representative of the producers' organizations and technical arm of ECOWAS;
  - CORAF, as regional governing body in agricultural research and as technical arm of ECOWAS;

- CMA AOC, as a coordinating body for the region's Agriculture Ministers and as technical arm of ECOWAS in policy development for the agricultural industries.

The Steering Committee will in particular have the function of defining the main programme guidelines, approving the budgets and annual activity programmes, particularly the budgets and activities of the Programme's national aspects. The budgets for the national aspects would initially be divided among the countries according to the economic significance of mangoes in them. The budgets would then be adjusted according to the operational and organizational capacities of the national players, and the effectiveness of pest management actions, as judged by independent technical audits conducted under the Programme.

Scientific Committee

A Scientific Committee would also comprise resource persons appointed in an individual capacity for their scientific expertise in the field of fruit fly management. The committee should include people from outside the region who could bring experience from other regions (particularly Eastern and Southern Africa).

In addition to researchers, a representative of a donor particularly interested in the research component and a private sector representative (exporter, producers' associations) will participate in Scientific Committee meetings as non-decision making observers.

The Scientific Committee will review the research options (technical and financial proposals) submitted to it annually by the research component and decide on the order of priority of the most promising proposals for effective and inexpensive pest management.

Decisions made within the Scientific Committee must subsequently be endorsed by the Steering Committee.

13.7 Implementation of the Programme's national components

The body responsible for coordinating implementation of the national aspects would be, in each country, the National Fruit Fly Management Committee. This committee should have legal status (essential for playing the role of programme manager at the national level). It could have associate status, or hold special status under Ministerial arrangements. In any case, it should be a joint public/private authority, which would appoint its own Chairman internally. Special attention should be given to the balance between public and non-public sector (private sector, producers' organizations, civil society, etc.) representation, so as to ensure that one sector does not feel disadvantaged in relation to the other and stop contributing to the public/private dialogue that is essential between national players. Wherever possible, and since the subsector's producers and businesses are most affected at the economic level, the chairmanship of the National Fruit Fly Management Committee should be held by a private sector representative or, at the very least, alternate between a public and private sector representative. A permanent secretary, appointed by the committee, would be responsible for executing its decisions and supervising, under the authority of and in collaboration with the PMCU, the use of the technical and financial resources channelled to the committee by the Programme. The management of funds will, to the extent possible, be entrusted to national structures with expertise in such areas or to programmes in countries which have a management unit. Indeed, it does not seem appropriate to weigh down the National Committees with burdensome administrative and financial structures. In the case of funds specifically earmarked for a country, these will be managed via the donor's usual disbursement channels in that country. Depending on the scale of the national programmes, the permanent secretary, working part-time or full-time, could be paid by the committee on the programme funds, or perform duties pro bono.

The main roles of the national committees would be as follows:

- Organize field activities, define the role of the various players and select, according to skills and operating capacities, the field players in pest surveillance and management.
- Develop the annual activity programmes at national level in pest surveillance and management, and send them for approval to the PMCU and the programme Steering Committee.
- Select the priority areas for integral fruit fly management, according to their economic importance and the availability of field players in the area.

The composition of the National Committees could be as follows:

- Government service responsible for crop protection (generally the government plant protection service (DPV)).
- Fruit producers' associations or their national governing bodies.
- Mango exporters' associations (if they exist), or associations for other fruits prone to fruit fly attack.
- The competent extension service(s).
- The competent national agricultural research institute.
- A PMCU representative.
- The financial donors represented in the country.
- NGOs.
- Possibly consumers' organizations.
- And any other organization whose participation is deemed useful by members.

The national organization of the pest surveillance and management campaigns must remain flexible and adapt to local conditions, particularly with regard to the organizational level of producers and the operational capacity of the public services concerned. Since capacity-building of public services can only be a marginal element of the Programme, it is important to find skills and operating capacities in situ, and entrust operational tasks to authorities able to perform them best and for the lowest cost.

A priori, surveillance activities in most countries should however be conducted under the aegis of the government plant protection service (DPV) or Research Institute, which could, for field actions (trapping), be supported by local field players. For pest management activities, there will need to be a distinction between the design and general organization of pest management, which could be determined by the government plant protection service (DPV) and the field actions, which should be performed by producers' associations.

The programme organigramme is presented in Annex 14.

13.8 Starting up the Programme

Procuring the funds that make up the total budget is likely to be a long and arduous task and yet technical assistance to combat fruit fly is needed urgently.

ECOWAS has decided to devote a major budget line to the fruit fly problem and these funds would be available at the beginning of 2010. UEMOA has also planned a budget line for fruit fly for the 2010 financial year.

Part of the PMCU might therefore be recruited to work on a number of activities as of the beginning of 2010. It could begin setting up or strengthening national fruit fly management committees, devise the first awareness-raising modules for national players, prepare various procedural manuals, assist ECOWAS in the creation of an autonomous management unit, and encourage donors to participate financially in the Programme.

14. ACKNOWLEDGEMENTS

The entire consultant team extends its warm thanks to the workshop participants, who have brought substantial improvements to the initial scheme, and to the members of the European Commission Accompanying Committee, the World Bank and the WTO. The people met in the regional institutions also provided valuable assistance in determining the best options for the institutional set-up.

ANNEXES

1. ANNEX 1: DETAILED ANALYSIS OF METHODOLOGY

The methodology used comprises several steps:

1.1 Defining an operating framework

The first step consisted of exploiting the study produced by the consultants (Italtrend) and other documents made available to the Mission by an international core group (see below) in order to define a coherent generic operating framework that covers all the essential activities and possible prerequisites that are instrumental in meeting the objective set out in the Programme. This first phase divides activities at three distinct levels of operation: regional, national and local. It produced a preliminary identification sheet.

Advice and support during the first stage were received from an international core group of experts (ICG) with concrete experience of setting up, managing or evaluating regional programmes on themes that are similar to invasive fruit flies (e.g. locusts, avian flu, etc.).

The ICG's role in giving advice and support to the Mission consisted of:

- Making relevant documents available, in particular regarding the institutional set-ups used and the costing of actions;
- revising and amending the documents provided by the Mission.

1.2 Drafting of a survey grid

To ensure quick updating of national fruit fly situations, a survey grid derived from the previous phase was developed by the Mission. It provided a coherent and identical survey framework in each of the eight target countries. This grid was revised by the ICG.

1.3 Field surveys

The third step consisted in bringing together a working group in each country and completing the survey grid. The purpose of this survey was to concisely update the "gap analysis" of the national situations in the eight target countries (Côte d'Ivoire, Senegal, Mali, Burkina Faso, Ghana, Benin, Gambia and Guinea), and to validate the generic operating framework defined in point 1.

This highly technical updating was achieved with a small number of participants representing the main stakeholders:

- Representatives from the relevant public sector (Ministry for Agriculture, Plant Protection Directorate, Ministry for Trade);
- a representative from the National Programme of Agricultural Investment (PNIA);
- representatives from the private sector (representing producers, exporters, "fixers" ("pisteurs") and processors);
- a representative from a research institution present in the relevant country;
- a miscellaneous representative (phytosanitary laboratory, border control, etc.);
- a donors' representative, chosen with the approval of the lead donor that has shown specific interest for the fruit fly issue.

Working Group meetings took place in the eight countries. The list of participants has been appended.

All the stakeholders, as defined above, did not take part in all the meetings, although all were contacted.

However, the general operating framework as presented and discussed was approved in all the countries where it was presented.

1.4 Awareness raising for donors interested in fruit fly control in the eight countries surveyed

After the Working Group meeting (see previous point), an additional day *in situ* was used in order to inform donors interested in the fruit fly issue about the main conclusions of the Italtrend study as well as progress on budget design, which will lead up to the organization of a round table of donors in September 2009.

The presentation was given in the eight countries except for Mali and Gambia.

With regard to Mali, the World Bank via its PCDA programme took part in the Working Group meeting with the other stakeholders. The FAO, the lead donor for Agriculture, was not available on the day of the presentation.

There are no donors in Gambia addressing this issue to any extent. It was therefore not possible to set up meetings.

1.5 Assessment of the capacity of certain regional institutions to implement all or part of the regional programme

A list of regional institutions was drawn up in collaboration with the European Commission, the World Bank and the World Trade Organization.[15] The Mission met these institutions and assessed their potential capacity to contribute to the implementation of the regional action plan (programme supervision/programme management) in order to put forward a coherent institutional set-up.

1.6 Summary of surveys, identification sheet, institutional set-up and budget

This stage consisted of using the data gathered from national surveys and preparing a complete identification sheet of the Regional Action Plan.

A single institutional set-up is proposed, specifying the roles of each entity concerned, the conditions for sustainability of the solutions provided by the overall institutional system and the budget implications.

A budget is provided, distinguishing between the different levels and by result.

The budget costing only provides totals for each activity, distinguishing the regional part from the national part. It gives no indication of costing for each country. In this way, countries will be encouraged to adopt a proactive, demand-driven approach to obtaining support under the Programme, rather than simply requesting pre-assigned amounts.

This will not prevent an assessment of all needs and costs from being made for each country, in collaboration with the national fruit fly committees when the Programme begins. This will be done

[15] The reports of the visits have been appended.

on request and based on updated data (since the situation will have changed between this report and the beginning of the Programme).

2. ANNEX 2: DETAILED ANALYSIS OF STAKEHOLDERS

The stakeholders include:

- Official institutions
- Non-State players
- Other institutions

Each of these stakeholders is concerned by the fruit fly scourge and, within the means at their disposal, can play a constructive role in raising awareness on the need for coordinated action or in developing and implementing prevention and control solutions.

2.1 Official institutions

Official institutions can be divided into:

- Regional institutions
- National institutions with fundamental functions in fruit fly management
- National public services and their local offices
- Extension services

Among the official institutions, a distinction can be made between regional institutions and national institutions with a role in defining and implementing agricultural and plant health policy in the country or region.

In addition, at the national level official bodies are responsible for verifying that the legal standards are complied with.

2.1.1 Regional institutions

Regional institutions that play an important role in fruit fly control are the following: ECOWAS, UEMOA, CMA/AOC, CILSS, FARA, IITA.

These institutions have been visited by the Mission. A description of them is appended.

Other international organizations such as ICIPE or IAPSC could be stakeholders in the Programme, since they have worked on this subject or have skills in the field of pests. However, since the scope of the additional study has been limited to the West African region, it was not possible to conduct meetings with them.

2.1.2 National institutions with fundamental functions in fruit fly management

The players

Two Ministries are the Programme's main stakeholders: the Ministry of Agriculture (primarily for the scientific and technical aspects) and the Ministry of Trade (primarily for business and trade aspects). Their collaborative actions must rise to the economic challenge posed by the fruit fly threat to the country and its operators.

The Ministry of Agriculture is the Ministry in charge of plant protection services (Plant Protection Directorate or DPV), the diagnostic laboratories and phytosanitary inspections both on the national level and for border controls. It is thus a key stakeholder in the Programme.

It is also responsible for proposing legislation aimed at organizing effective action to combat the often disastrous consequences of pests affecting agricultural productivity. It also has international responsibility to prevent pest propagation, both for its own territory (imports) and for the territory of third countries (exports).

It is thus vital to raise awareness among the highest authorities so that sufficient manpower and financial means are raised to meet the appropriate prevention and management objectives.

The Ministry of Trade manages trade relations with third countries. In this respect, it intervenes by entering into agreements with foreign countries and drafting regulations, including phytosanitary regulations.

In addition, it uses trade statistics to monitor trade.

Several other ministries may be more indirectly involved. For example, the Ministry responsible for Research, which in several countries is the Ministry of Research, the Ministry of the Environment or the Finance Ministry, through Customs.

The mandates in the Programme

The Ministry of Agriculture has a very important part to play in the successful implementation of the Programme:

- It takes part in setting up or strengthening the National Fruit Fly Management Committee.
- It officializes the National Committee by official order, if this has not already been done.
- It provides the national government services (e.g. DPV) with sufficient financial and human resources to perform the fundamental functions that fall within their competence.
- It defines an agricultural policy that addresses the fruit fly issue.
- It is in constant contact with the other stakeholders, and in particular producers' organizations and the private sector.

The mandate of the Ministry of Trade includes:

- Monitoring trade flow data, particularly at the subregional level.
- Drawing up trade agreements with third countries in accordance with regional treaties, as far as possible protecting the country against further fruit fly infestation or the arrival of new species that are not present.

2.1.3 Official national surveillance and control structures

Annex 3 sets out the functions of the national surveillance and control structures.

Responsibilities are not distributed in the same way in the various countries, but they can be grouped according to whether their functions relate to plant health and protection or to pesticides.

2.1.3.1 Plant health and protection

For plant health and protection, a distinction is made between:

- Surveillance authorities
- Control and inspection authorities
- Diagnostic authorities
- Diagnostic laboratories

Surveillance authorities in the field of plant health and protection

Their role is to set up a network of traps distributed representatively across the different agro-ecological areas of the country and collect all data on the country's quarantine and endemic organisms.

This is an essential activity as it provides guidance for controls, alerts to be activated, etc.

This role may be given to a public authority or a private organization that has been accredited by the competent authority.

The players

In most countries, this role is performed by the plant protection service (DPV). In other cases, it is assumed by the Directorate of Horticulture (Senegal) or Research (IITA for Benin or CNRA for Côte d'Ivoire).

However, at present there are serious shortcomings in the manner this function is carried out, and it therefore needs to be considerably strengthened.

The mandates in the Programme

The National Fruit Fly Management Committee will be responsible for designating the public authority (DPV, Directorate of Horticulture or Research) or private organization that will take charge of this activity. The main mandates are as follows:

- Setting up a National Surveillance Plan.
- Introducing it, and possibly delegating part of its functions to third parties (for example, producers' organizations).
- Collecting, processing and disseminating the collected data.
- Issuing warnings at national and international levels immediately when an alert threshold has been crossed or on the appearance of pests that have not been inventoried.

Control and inspection authorities in the field of plant health and protection

The inspection and control authorities are able to verify the absence of pests, especially at the entry points, and thereby prevent their propagation. Since the sanitary level differs between neighbouring countries, it is necessary to ensure that the competent authorities responsible for controls carry out their mission correctly.

Furthermore, the inspection authorities are responsible for performing inspections on certain farms, and thereby guaranteeing that they are free from pest contamination. These inspections are particularly important in the case of produce for export.

In addition, the inspection and control authorities have the fundamental mission of signing the international phytosanitary certificates.

The players

The DPVs are given the role of control and inspection. International health certificates are indeed issued, but without the rigour or reliability that can legitimately be expected.

At the present time, none of the countries has an inspection service that meets international standards.

The mandates in the Programme

The DPVs role will be:

- To set up a more efficient control system at the border, in particular to determine new invasive species and measure the infestation rate of the country's endemic or established pests.
- To improve controls when phytosanitary certificates are delivered.

Diagnostic authorities in the field of plant health and protection

These authorities cover several institutions: (i) the risk analysis organizations; (ii) the rapid alert activation organizations; and finally (iii) institutions conducting inventories on the orchards and zones at risk.

Few countries have these types of structures.

Diagnostic laboratories in the field of plant health and protection

Diagnostic laboratories are essential for quick and accurate determination of pests that have been detected either by the surveillance network or by the competent authorities responsible for control. It is essential for these laboratories to have taxonomists sufficiently well trained in recognizing different types of fruit flies.

It is also important to have a regional reference/benchmark laboratory that can support the national laboratories in accurate determination of the various pests.

The players

The national laboratory is attached to the DPV, research institution or university, depending on the country.

During recent workshops in the countries, the IITA laboratory in Ibadan was unanimously recognized as having the potential to become the reference laboratory.

The mandates in the Programme

National laboratories will be responsible for:

- The determination of pests
- The training of field technicians

2.1.3.2 Pesticides

For pesticides, distinctions are drawn between:

- Approval authorities
- Control authorities (verification of MRLs)
- Analysis laboratories

These authorities have not been included in this programme, as other programmes have specific actions in this field, such as the PIP/COLEACP. There are plans for a second phase of that programme, and measures may be taken to ensure that the pesticides necessary for fruit fly management will be quickly approved.

2.1.4 Extension services

Extension services have a role of communicating knowledge between research and producers, and providing technical assistance to these same producers in the form of training, monitoring and advice.

The players

In some countries, extension services are substantial (Senegal, Ghana (1,800 people), Gambia) whereas they are nonexistent in other countries (Mali, for example).

When they exist, they are State organizations.

The mandates in the Programme

The following activities may be delegated to extension services:

- Training producers
- Surveillance action on the ground
- Management action at the production level

2.2 Non-state players

Non-State players are subdivided into:

- The private sector: production companies, packing centres, processing companies, transporters, exporters and distributors, agrochemical companies.
- Civil society: consumers' organizations and NGOs

2.2.1 The private sector

This category comprises the following sectors:

- Small-scale producers with small orchards and a limited technical level, who mainly sell on local markets
- Commercial-scale producers who export their produce
- Producers who can sell alternatively on the local market and the export market (depending on exporter demand)
- "Fixers" (pisteurs)
- Packing centres
- Processors
- Agrochemical companies

2.1.1.1 Small producers and their organizations

Small producers have small and relatively old orchards (generally one or two hectares for mangoes) and a low technical level. They do not generally practise orchard hygiene.

They are affiliated in producers' organizations.

Producers' organizations are important in West African countries as they are a relay between producers and the relevant authorities or programmes.

They may be organized as cooperatives, producers' associations or perhaps village committees.

They grow local varieties.

The players

During the Bamako workshop, it was noted that there are 300 producers' organizations in Mali. There are also powerful organizations in Burkina Faso, such as APROMA B, that affiliate mango professionals.

In Côte d'Ivoire, the Interprofessional Fund for Agricultural Research and Consultancy (FIRCA) finances the setting up or consolidation of cooperatives, even if the political context is not very favourable.

The other countries also have farmers' organizations of various kinds. However, none of them have significant technical or financial resources, and it will be necessary to strengthen them.

The mandates in the Programme

Producers' organizations have a central role in the Programme as field activities will preferably be organized at their level. For example:

- Surveillance action on the ground.
- Management action at the production level: awareness-raising, training, management activities.

2.1.1.2 Commercial-scale producers who export their produce

There are in fact relatively few producers in this category. They are concentrated in certain regions such as Niayes in Senegal or in Northern Côte d'Ivoire.

There are only a few units in Mali and practically none in Guinea. In Gambia, almost all mango exports come from Radville Farms.[16]

However, these industrial operations account for the bulk of exports.

They grow export varieties.

2.1.1.3 Producers selling either on the local or the export market

These are generally small producers, but who have contacts with an exporter or "fixers" (pisteurs). They have more modern orchards and produce export varieties.

2.1.1.4 "Fixers" (pisteurs)

Fixers are workers employed by a company to bring in the harvest on the producers' sites.

This is a very developed practice in Mali, and exporters who do not have their own orchards use them.

In some countries like Côte d'Ivoire, exporters send their own employees to pick mangoes.

Fixers have a role to play in the Programme, by improving the sorting of harvested fruit and advising producers on orchard hygiene measures to prevent contamination by fruit flies.

2.1.1.5 Packing centres

Fruit, in particular mangoes, only goes through a packing centre if intended for export to countries with very high quality requirements (e.g. European Union countries).

When fruits are destined for the local or regional market, transport is in bulk form.

When fruit goes through a packing centre, it can be sorted, thus avoiding the spreading of pests.

There are very few packing centres in West African countries.

Senegal, for example, has the greatest number, with 20 centres spread over the whole of the country, ten of which are fairly well organized.

Burkina Faso has two well organized centres where more than 70 per cent of exported mango production is packed.

Côte d'Ivoire also has packing centres, eight of which are certified Globalgap companies.

In Gambia, only Radville Farms has a packing centre.

[16] Radville Farms is a subsidiary of a UK company.

When a packing centre is used, even for the local and regional market, it becomes possible to control the spread of fly-infested fruit. It is, however, necessary to evaluate the cost and ascertain whether it is economically viable.

Here again, exporters do not form a homogeneous category. Some have packing centres, while others also include production activities.

Generally speaking, there is a professional organization that affiliates exporters within an association.

2.1.1.6 Processors

In some countries, part of fruit/vegetable production is processed by means of drying, production of pulp or juice and juice concentrates.

In order to prevent dispersion of the objectives of this programme, this category will not be considered directly.

2.1.1.7 Agrochemical companies

Agrochemical companies play an important role in manufacturing and distributing the pesticides, traps and lures that are essential for fruit fly management.

In certain countries they replace technical assistance services by recommending products and methods of use.

2.2.2 Civil society

Some NGOs are involved in fruit fly management at the local production level (with very restricted operations on the ground that often bring concrete results, if their resources permit long-term action).

Ultimately, consumers will be the main beneficiaries of the Programme.

Consumers' associations are starting to appear in West Africa. The economic crisis has made them vigilant about food security and nutritional balance. They help make institutions aware of the need to control parasites, which decrease the supply of healthy, pest-free produce for local consumption.

Although their professionalism is not yet fully developed, they have an important role to play, in particular with regard to the political decision-makers who shape agricultural policy.

2.3 Other institutions

The other organizations that are stakeholders in the Programme are:

- Joint public/private organizations
- Research institutes and universities

2.3.1 Private/public organizations

Private-sector/public-sector coordination organizations take a number of forms, depending on the country, such as task forces or Fruit Fly Management Committees. These organizations, when present, are essential forums for ensuring the advancement of programmes in such areas as fruit fly

management. Nonetheless, they vary in terms of their representativeness and effectiveness, which entails adjusting their capacities so that they play an effective role.

The players

Most countries have more or less official Fruit Fly Management Committees.

In Senegal, for example, a Fruit Fly Management Committee was set up in the wake of an initiative by USAID. It brings together the competent authorities and the private sector. However, it does not have official status.

Guinea also set up a National Fruit Fly Management Committee in March 2009.

During the workshop held in Bamako, Mali, the PCDA Programme was mandated by the other stakeholders to provide the Ministry of Agriculture with information and raise awareness about the importance of setting up a National Management Committee.

Ghana has a Management Committee that has already met several (six) times and drawn up an Action Plan.

In Benin, the Ministry of Agriculture has drafted an order setting up a Management Committee, but the order has not yet been signed.

Burkina Faso does not have a formalized Management Committee, but a large number of activities are organized by PAFASP and APROMA B (the Mango Professionals' Association of Burkina), which constitute an interprofession, and with the technical collaboration of INERA and the Plant Protection Services.

Gambia is the only West African country not to have a Management Committee.

The mandates in the Programme

The Management Committees' mandates vary and may differ slightly from one country to the next. But the Committee is essential for organizing the Programme: so much so that the setting up of an official National Management Committee is one of the prerequisites for organizing the activities provided for by the Programme.

The Management Committee's missions are as follows:

- To set up an action plan for surveillance and control
- To coordinate the different actions to be implemented
- To raise awareness on this issue
- To raise funds
- To participate in managing donors' funds intended for the national level.

2.3.2 Research institutes

Several West African research institutes and universities are working on the problem of fruit flies. However, often for lack of organization and resources, the practical results of their research have not met expectations, although certain researchers have promising programmes.

Moreover, with funding from the World Bank and STDF, IITA in collaboration with CIRAD has implemented the WAFFI programme, an applied research programme into using GF 120 (Spinosad) spot treatment.

The mandates in the Programme

Research is an essential part of the Programme, as it is intended to provide producers with new, more efficient and cheaper means of control. The means of control must meet the criteria of sustainable agriculture and be environment-friendly.

3. ANNEX 3: FUNCTIONS OF THE COMPETENT AUTHORITIES

Functions	Details
PHYTOSANITARY (pests)	
Phytosanitary regulations	Drawing up legislation
Risk analysis	
Surveillance (at the central level)	Collecting and processing data (databank, list and map of pests, etc.) Surveillance of crop pest populations Issuing agricultural alerts and raising awareness about crop protection
Decentralized surveillance	Surveillance of pest populations Phytosanitary alerts to producers
Rapid alert	At the national and international levels
Controls: inspections at the national level	Delivering phytosanitary certificates Control of sanitary quality of agricultural produce (in particular for exports)
Training agents	In-house training of agents
Controls: entry points	Phytosanitary border police Surveillance of imported plants at border posts
Trade facilities	Phytosanitary certificate facilitation services to private businesses
Combat campaign	Organizing and coordinating actions to combat pests
Laboratory	Identification of pests Inventory of the main pests IPM strategies In-house training of agents in plant protection
Disseminating requirements and sheets	File of phytosanitary requirements (importers/exporters) Drawing up and disseminating technical sheets on pests
PHYTOSANITARY PRODUCTS (pesticides)	
Regulations: phytosanitary products	Drawing up legislation
Phytosanitary management	Phytosanitary index File of phytosanitary products
Approval	Approval of products Relation with Regional Committees
Controls of phytosanitary products	Maintenance of equipment for phytosanitary treatment Management of pesticide stocks (including obsolete/out of date) Control of sale and use of pesticides
Controls: inspections at the national level	Control of phytosanitary quality of agricultural produce Control of sale and use of pesticides Monitoring adequate practices of sanitary protection of crops
Controls at entry points	Border police controlling agro-pharmaceutical products
Laboratory	Support for the securitization and quality of phytosanitary treatments Conducting phytosanitary experiments In-house training for agents in plant protection
Experimentation	Conducting phytosanitary experiments Conducting studies of environmental impacts

4. ANNEX 4: FUNCTIONS PERFORMED BY THE COMPETENT AUTHORITIES BY COUNTRY

Functions	Details	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
PHYTOSANITARY (pests)									
Phytosanitary regulations	Drawing up legislation	DPV Division of Legislation and Plant Quarantine		SNPVDS Phytosanitary Control Service		In existence?			
Risk analysis				SNPVDS Phytosanitary Control Service					
Surveillance (at central level)	Collecting and processing data (databank, list and map of pests, etc.) Surveillance of crop-pest populations Issuing agricultural alerts and raising awareness about crop protection	DPV Division of Agricultural Alerts		SNPVDS Phytosanitary Control Service/ SNPVDS Laboratory Crop Protection and Pest Control	OPV				
Decentralized surveillance	Surveillance of pest populations Phytosanitary alerts to producers	Decentralized services BSA				In existence?			
Rapid alert	At the national and international levels			Laboratory with SNPV					
Controls: inspections at the national level	Delivering phytosanitary certificates Control of sanitary quality of agricultural produce (in particular for exports)	DPV Division of Legislation and Plant Quarantine		SNPVDS Phytosanitary Control Service	DNA via DLCP	DPVC	SPVCP	PPRSD/ GSB	DPVCQ
Training agents	In-house training for agents			Laboratory				PPRSD with Ghana University	
Controls: entry points	Phytosanitary police on borders Surveillance of imported plants at border posts	DPV Division of Legislation and Plant Quarantine PCQ Decentralized Services		SNPVDS Phytosanitary Control Service/ Customs					

Functions	Details	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Trade facilities	Phytosanitary certificate facilitation services to private businesses			CAFEX	DNA via DLCP	DPVC	SPVCP	PPRSD	DPVCQ
Management campaign	Organizing and coordinating actions to control pests	DPV Division of Crop Protection		SNPVDS Crop Protection and Pest Control				PPRSD	
Laboratory	Pest identification Inventory of the main pests IPM strategies Support for the securitization and quality of phytosanitary treatments Conducting phytosanitary experiments In-house training for agents in plant protection			Laboratory				Laboratory	
Disseminating requirements and sheets	File of phytosanitary requirements (importers/exporters) Drawing up and disseminating technical sheets on pests			SNPVDS Phytosanitary Control Service SNPVDS Phytosanitary Control Service SNPVDS Crop Protection and Pest Control					
PHYTOSANITARY PRODUCTS (pesticides)									
Regulations: phytosanitary products	Drawing up legislation	DPV Division of Legislation and Plant Quarantine		SNPVDS Regulation and Approval of Phytosanitary Products					
Phytosanitary management	Phytosanitary index File of phytosanitary products			SNPVDS Regulation and Approval of Phytosanitary Products				PPRSD	
Approval	Approval of products Relation with Regional Committees			SNPVDS Regulation and Approval of Phytosanitary Products	DNA via DLCP	DPVC	SPVCP	PPRSD	DPVCQ

Functions	Details	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Controls of phytosanitary products	Maintenance of equipment for phytosanitary treatment Management of pesticide stocks (including obsolete/ out of date) Control of sale and use of pesticides	DPV Division of Crop Protection		SNPVDS Regulation and Approval of Phytosanitary Products				PPRSD	
Controls: inspections at the national level	Control of phytosanitary quality of agricultural produce Control of sale and use of pesticides Monitoring adequate practices of sanitary protection of crops	DPV Department of Plant Legislation and Quarantine Phytosanitary Control and Quality Office (PCQ) decentralized services		Laboratory					
Controls at entry points	Border police controlling agropharmaceutical products	DPV Department of Plant Legislation and Quarantine						CEPS	
Laboratory	Support for the securitization and quality of phytosanitary treatments Conducting phytosanitary experiments In-house training for agents in plant protection							Laboratory	
Experimentation	Conducting phytosanitary experiments Conducting studies of environmental impacts			SNPVDS Regulation and Approval of Phytosanitary Products/ Laboratory				EPA	

Functions	Details	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
SECTORS									
Development policy	Agricultural and rural advice service. Conception, formulation and implementation of sustainable agricultural development policies. Implementation of national development policy for horticultural crop production: fruits, vegetables, flowers and ornamental plants	Ancar Ancar Department of Horticulture		SRDR	DNCC			GEPC/ EDIF	
Evaluation	Evaluation and monitoring of programmes, projects, etc.	Department of Horticulture							
Technical itineraries	Defining technical itineraries, quality standards, support to producers' organizations, etc. Adapting of IPM methods	Department of Horticulture DPV Department of Agricultural Alerts		 Laboratory					

Source: Italtrend reports.

5. ANNEX 5: FRUIT FLY SURVEILLANCE SYSTEMS BY COUNTRY

Current surveillance systems are either nonexistent or need to be improved to make reliable and regular data available.

Country	Comments
Senegal	• Surveillance structure with ISRA (Multi lure and Tephri-trap traps). But is it monitored? • Producing a daily inventory of information on fruit fly populations during the whole mango campaign • Obtaining information on the efficacy of different attractants (pheromones, proteins and local products) • Collecting important data on the biology of Bactrocera invadens and Ceratitis spp and their behaviour on the different varieties of mango; • Establishing the important factors that affect the efficacy of mass fruit fly trapping in the area
Gambia	
Guinea	
Mali	• Fruit fly surveillance is performed by the Institute of Rural Economy (*Institut d'Economie Rurale*, IER), the Integrated Framework Programme (*Projet Cadre Intégré*) and the Office of Plant Protection (*Office de la Protection des Végétaux*, OPV)
Burkina Faso	• No particular surveillance structure • INERA has made several studies on fruit flies: 2002-2006/2007
Benin	• Surveillance is performed by IITA
Ghana	• No organizations dedicated to fruit fly surveillance
Côte d'Ivoire	• Surveillance is performed by the National Centre of Agronomic Research (*Centre National de Recherche Agronomique*, CNRA) • Recognizing pests • Determining periods of outbreak

Source: Italtrend reports

6. ANNEX 6: LESSONS LEARNED FROM OTHER PROGRAMMES

A list of programmes classified by theme and country is provided in Annex 8.

6.1 Fruit fly programmes

6.1.1 USAID/Economic Growth Programme

Outline of the programme

The USAID/Economic Growth Programme in Senegal has done a great deal of work on the fruit fly issue.

On its initiative, a Fruit Fly Management Committee bringing together the public and private sectors was set up in Senegal.

An action plan to control fruit flies has been drawn up, which includes some of the proposals made by the present Mission.

A documentary film has also been made.

A large number of documents on fruit fly control have been published.

However, because of shortage of funds, the activities provided for in the action plan have not been organized.

The programme run in collaboration with Virginia Polytechnic Institute & State University (Virginia Tech) aims to provide support to the Senegalese government and the private sector in order to develop capacity in fruit fly management and control for flies attacking mango production.

The programme has four components:

- Developing research capacities in combat actions
- Improving Good Practices
- Strengthening GAP practices and popularization
- Respect of the environment

The programme works in partnership with DPV, ANCAR and ENSA.

The actions organized in the four components of the programme are set out in the document entitled "Year 1 Work Plan".

Lessons learned

The concept of Fruit Fly Management Committee has been included in this programme.

However, the regional concept has not been taken into account and is missing from this approach.

6.1.2 USAID TIPCEE Programme

Outline of the programme

The aims of the TIPCEE Programme in Ghana are:

- To improve competitiveness of the private sector on international markets (quality)
- To develop a GIS on the number and size of farms
- To give farmers technical assistance on quality standards
- To provide manuals on several crops

6.1.3 World Bank: PDMAS Programme

Outline of the programme

The Agricultural Markets and Agribusiness Development Programme (PDMAS) in Senegal, the successor of the Agricultural Export Promotion Programme (PPEA), has set up collective packing centres that enable producers' associations to sort fruit for export, when they do not have their own packing centre.

Among the components of "Support for the competitiveness of agricultural produce", PDMAS has backed the development of a national system of quality and certification management and the setting up of a rural database.

PDMAS has also strengthened the capacities of professional exporters' organizations in the management of the supply chain and technical support with the setting up of the Fondation Origine Sénégal (FOS)/fruits and vegetables (monitoring, evaluation and dissemination of information).

It has supported the national plant control service for accreditation by Europe.

Lessons learned

The setting up of packing centres is a very interesting initiative. However, the present programme does not provide for such investments, which could be covered by other programmes.

6.1.4 World Bank: PAFASP Programme

Outline of the programme

The Agricultural Diversification and Market Development Programme (PAFASP), a World Bank programme in Burkina Faso, offers decentralized training programmes at the beginning of the mango season (December-January) to help producers to face problems caused by fruit flies and anthracnose. Sessions are attended by about 60 people in five regions.

On the basis of research results, PAFASP recommends using Success Appat as a biological and conventional product to control fruit flies. A demonstration test on 2,000 ha. has been programmed via producers' organizations based on a APROMA B - INERA and DGPV consortium. The protocol has been written by PAFASP.

PAFASP also has a programme to control anthracnose.

Lessons learned

PAFASP in Burkina Faso is undoubtedly one of the programmes that has been the most active in fruit fly control. It recommends using Success Appat on a large scale. However, closer analysis of the programme suggests that it should take greater note of the latest advances in research, particularly following the trials in the WAFFI programme relating to the minimum number of applications for the results to be convincing. Even so, an in-depth analysis of this trial in collaboration with the World Bank would be very instructive for the Programme in order to draw all the conclusions, both positive and negative.

6.1.5 World Bank: PCDA Programme

Outline of the programme

The overall aim of the Agricultural Competitiveness and Diversification Programme (PCDA) in Mali is to help remove critical constraints on the development of a certain number of commercial agricultural sectors where Mali has a comparative advantage and strong market opportunities.

PCDA has four components: the first is a production component based on the improvement of irrigation techniques, the second is based on knowledge of markets and sectors, the third addresses access to financing, and the fourth deals with infrastructures and marketing.

PCDA works relatively little on the fruit fly issue.

6.1.6 Programme conducted by the World Bank and STDF[17]: WAFFI

Outline of the programme

The WAFFI programme is an IITA programme that has the scientific backing of CIRAD.

Its general objective is to reduce the percentage of infested fruits (70 per cent of healthy fruit) and to be able to select 100 per cent of healthy fruits for export.

The main activities of the programme are as follows: helping to set up a Fruit Fly Management Committee, helping to organize research and development of pest management, assisting in disseminating information and training tools, support for pest evaluation and for installing the appropriate technologies for fruit fly management, help for developing knowledge of taxonomy and fruit fly recognition, and assistance for developing post-harvest treatments (hot water) and detecting the arrival of new flies (Bactrocera zonata).

The programme has planted 45 pilot orchards in 15 different agroecological areas in which management methods have been and continue to be tested.

The programme is financed by the World Bank and STDF.

Lessons learned

The WAFFI programme is a very important one as it is a pilot for the present programme, which has included a large amount of data as well as the lessons learned from the WAFFI programme.

[17] Within the framework of the European Union AAACP programme (All ACP Agricultural Commodities Programme).

The present programme aims to generalize the techniques developed to make them available to producers' organizations, to continue research on those aspects that have not yet been mastered and to build a sustainable system.

6.1.7 European Union: PIP Programme

Outline of the programme

PIP targets private businesses that export fruit and vegetables to the European Union, to help them achieve compliance with the new regulations and private-sector requirements with regard to MRLs and traceability.

COLEACP/PIP and CTA have published a brochure describing different methods of fly management. Moreover, since 2006, COLEACP/PIP have been implementing a biological efficacy trials programme in collaboration with Plant Protection Products (PPP) manufacturers, with the aim of securing registration by the Sahel Pesticides Committee (CSP) for three insecticides to be used to control fruit flies on mangoes. Finally, COLEACP/PIP plans to develop a specific training activity on flies, which will allow duly trained public and private trainers to relay the message to producers on the ground.

6.1.8 STDF project: fruit fly letter

COLEACP has joined forces with CIRAD to raise awareness of public and private operators in West and Central Africa's horticultural sector about the need to control fruit fly by issuing a letter. The letter is currently financed by STDF.

6.1.9 Other programmes conducted by other donors

Helvetas (Swiss Cooperation) is working on organizing sectors, in particular the organic mango sector. In this way, Helvetas works indirectly on the fruit fly issue.

GTZ has programmes on the approval of pesticides, in particular in Ghana.

FAO is working at the regional level on legislative aspects so that national and regional regulations allow for efficient control of fruit flies.

There is also Australian research[18] into fruit flies in the Pacific Island countries, and in particular Fiji, Tonga and Malaysia.

The main results of this programme are as follows:

- Better scientific knowledge of the different species of fruit flies in Southeast Asia and the Pacific.
- Knowledge of the geographical distribution of different fruit fly species.
- Development of efficient control strategies at the production level using the technology of protein-based lures.
- A data base providing access to a large quantity of data on fruit flies has been set up.

CIRAD, in addition to its collaboration with IITA Benin, is working in the Indian Ocean via its office in Réunion.

[18] Management of Fruit flies in Pacific Islands.pdf.

6.2 Regional programmes

This section covers the lessons to be drawn from regional programmes, in order to provide guidance for the institutional set-up of the Programme.

6.2.1 Avian flu management

Outline of the programme

The general objective of the European Union's "Emergency Programme on Avian and Human Flu in Africa (EPAHIA)"[19] is to "contribute to reducing the socio-economic impact of avian flu and the loss of human lives by helping the African ACP countries to prepare for the combat against avian flu at the animal level and the possible pandemic at the human level".

It is an Africa-wide programme involving the whole continent.

The African Union reference institution is AU/IBAR.

Each participating country has prepared a "minimum package" of activities involving an Integrated National Action Plan based on the directives provided by AU/IBAR.

AU/IBAR coordinates action and ensures that all stakeholders are represented. A Pilot Committee involving all stakeholders works with the Management Unit that has been set up. The Management Unit is run by the regional office of the WHO.

There is a Project Support Unit (PSU) which harmonizes the different projects run at the AU/IBAR level.

The Project Coordination Unit (PCU) is run at the AU/IBAR level. It assists in the implementation of the project and monitors and evaluates it from the technical and financial points of view.

The programme is coordinated with the Regional Animal health centres Coordination Units (RCU) which work at the national level with the Technical Coordination Committees. The Committees are responsible for preparing and approving national Action Plans in coordination with the competent Ministries and NGOs. Close cooperation is encouraged between the human health services and veterinary services.

The programme has established round tables between the financial donors and stakeholders to obtain pledges by donors for funding plans.

Lessons learned

A key factor of success is the raising of the populations' awareness levels.

Rapid detection of centres of infestation helps to limit the propagation of the epizootic.

6.2.2 Locust management

The CLCPRO deals with the harmonization of the programme and the training of trainers. It supervises evaluation missions in an efficient manner.

The research centre is centralized in Nouakchott and is a centre of excellence.

[19] 0610a draft financing agreement 30 mln Programme AI 6-10-062.doc.

As the campaign against locusts is such an important one and the potential damage extremely high (an invasion of locusts may cost some US$350 million), the Locust Control Team is directly attached to the Ministry for Agriculture, thus preventing the means earmarked for this campaign from being shifted to other departments.

The FAO plays its part as a clearing house for risks. It also places pooled orders. However, it is the countries that buy the products.

6.2.3 Cattle plague management

When this highly complex programme was designed, the administrative workload was considerably underestimated.

The fact that the European Union Delegations of participating countries have to approve PoAs together with the European Union's very rigid procedures for raising funds were the cause of serious delays in the setting up and implementation of the programme.

The different countries' plans were supposed to be strictly monitored at the central level, which proved to be too heavy to carry out. The monitoring was then delegated to the regional units.

Part of the programme was financed by Great Britain (CAPE Unit) which had its own rationale (a different logical framework to that of PACE), which limited collaboration and coordination reduced between the programme conducted by Great Britain and PACE.

Information systems are vital for consulting the data used in decision-making. Data must therefore be easily accessible, multilingual and secure. Centralization of data leads to homogeneity of the data collected.

Training and communication at all levels must be correctly planned and executed from the very beginning. Results should be properly documented and archived so that the examples of best practices are available for all the countries.

Communication should be recognized as an important component that is essential to ensure that there is a satisfactory level of visibility within the international community.

Evaluation and when necessary updating of veterinary legislation is a vital component.

Sharing experience among countries helps all countries working on the same theme to advance together.

7. ANNEX 7: FRUIT FLY MANAGEMENT SYSTEM BY COUNTRY

Country	Preventive control	Curative control	Trapping	Comments
Senegal	• Orchard hygiene • Early harvest	• Chemical treatment • Field trial of insecticides (with PIP/COLEACP and ISRA): lamda cyhalothrin (Karate), bifenthrin (Talstar), and Spinosad (Succes Appat)	• Method with methyl eugenol • More traditional methods: "net" beauty cream, nutmeg, basil	• One company (SEBIMANGO) has spent about 750 Euros/ha. to control fruit flies for a very low level of damage of 4%
Gambia		• Efficacy trial with lamda cyhalothrin (Karate), bifenthrin (Talstar), and Spinosad (Succes Appat)	• Method with methyl eugenol, taphinyl acetate, Torula (yeast)	
Guinea		• Producers and fixers are not aware of MRL problems when chemical products are used		• There is no organized control apart from an attempt to organize meetings between producers and monitoring agents in the Foulaya Region (Maritime Guinea)
Mali	• Orchard hygiene: burying fallen fruit • Problem of working hours	• Chemical treatment • Field trial of insecticides (with PIP/COLEACP and ISRA): lamda cyhalothrin (Karate), bifenthrin (Talstar), malathion, imidacloprid, and spinosad (Succes Appat) • Problem of cost	• Terpinyl acetate, trimedlure, methyl eugenol, cuelure, buminal, and buminal associated with borax. • Addis-type trapping	
Burkina Faso	• DDPV, Spinosad (Succes Appat), lamda cyhalothrin (Karate), Suneem • Risk that MRLs will be exceeded	• Tephi traps, Mac Phail • Parapheromone, methyl eugenol, terphil acetate, protein hydrolysat, Torula		
Benin			• Tephi traps • Terphil acetate, methyl eugenol, trimedlure	

Source: Italtrend reports

8. ANNEX 8: LIST OF AGRICULTURAL PRODUCTION AND FRUIT FLY PROJECTS

Subject	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Production	Agricultural Export Promotion Project, PPEA (World Bank, WB) (replaced by the Agricultural Markets and Agribusiness Development Project for Senegal, PDMAS): *Guide to mangoes* Food and Agricultural Organization (FAO): *Orchard management* Pesticide Initiative Programme (PIP): *Good Agricultural Practices (GAPs)*		French cooperation: O*rchard inventory Identification of limiting factors*	PIP: *GAPs*	SNV (Netherlands Development Organisation): *Support and advice for producers* FAO: *GAPs* PIP: *GAPs*	PIP: *GAPs*	PIP: *GAPs* Horticulture Export Industry Initiative, HEII (WB): *Supply of mango seedlings at 50% of cost price to 2,000 farmers in the north of the country* Export Marketing Quality and Awareness Project, EMQAP (African Development Bank, AfDB): *Increase in production and productivity* Trade and Investment Program for a Competitive Export Economy, TIPCEE (United States Agency for International Development, USAID): *Use of Geographical Information System (GIS) to establish farm numbers and sizes;* *Technical assistance for farmers in relation to quality standards;* *Several crop manuals.*	PIP: *GAPs*
New varieties	Association for the Promotion of the Nyassia District, APRAN (Senegalese NGO)						HEII (WB): *MD2 development* *R&D for production of quality seedlings*	

Subject	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Agricultural diversification				Agricultural Competitiveness and Diversification Project, PCDA (WB): *€35 million; eight people*				
Packing plants	PPEA (WB) (replaced by PDMAS): *Feltiplex collective packing plant*						HEII (WB): *Development of post-harvest infrastructure*	
Training	CARE Canada: *Training for small-scale growers* PIP			PIP	PIP	PIP	PIP HEII (WB): Supply of training material with a view to sector strengthening EMQAP (AfDB)	PIP
Certification	FAO: *Organic certification* PIP: *GlobalGAP* Centre for the Promotion of Imports from developing countries, CBI (The Netherlands)			PIP: *GlobalGAP*	PIP: *GlobalGAP*	PIP: *GlobalGAP*	PIP: *GlobalGAP* GTZ (Germany):	PIP: *Global GAP*
Fruit fly management	Rural Entrepreneur Assistance Project, PAEP (Canada)		FAO: *Fruit fly initiative in Guinea*				GTZ (Germany): *Development of an integrated pest management system*	

Subject	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Sterilization of males	International Atomic Energy Agency, AIEA/FAO: *Training in the production of sterile males*							
Biopesticide production	"Act for Education and Health" (AES) Foundation, (Senegalese presidency)							
Pesticides	Technical Cooperation Programme (TCP)/FAO: *Pesticide residue control in conjunction with the Ceres-Locustox Foundation, the Department of Horticulture (DHort), and Senegal's National Fruit and Vegetable Producer and Exporter Organization (ONAPES)* PIP			PIP	PIP	GTZ (Germany): *Support with regard to pesticide approval for the Plant Protection and Phytosanitary Control Service (SPVCP)* PIP	PIP HEII (WB): *Food safety (pesticides), laboratory accreditation, and assistance with GAP implementation for small farmers*	PIP

Subject	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Processing	European Union, EU/United Nations Industrial Development Organization, UNIDO/West African Economic and Monetary Union, UEMOA: *HACCP training*		Italian cooperation: *Kankan juice factory* Libya: *Privatization in 2002 of a Libyan-Guinean joint-venture owning a processing plant*				TIPCEE (USAID): *Technical assistance on pineapple concentrates*	
Facilitation of public-private dialogue	USAID PIP			PIP	PIP	PIP	PIP	PIP
Assistance with fruit marketing	APRAN							
Sectoral organization				HELVETAS Mali: *two people* TradeMali (USA): *three people*				
Sectoral studies	USAID: *Studies on value chains (mango)*		USAID: *Studies on value chains (mango)*		Local Development Support Project, PADL/UK (AfDB): *Local development, attributable in particular to the mango industry*			

Subject	Senegal	Gambia	Guinea	Mali	Burkina Faso	Benin	Ghana	Côte d'Ivoire
Export development	Cooperation for the Development of Emerging Countries, COSPE (Italian NGO) CBI (The Netherlands)				Agricultural Diversification and Market Development Project, PAFASP (WB): *Promotion of export sectors*	WB: *Support for export sectors*	EMQAP (AfDB): *Export promotion and improvements to infrastructure* Millennium Challenge Account (USAID): *Assistance for agribusiness enterprises seeking to export goods* TIPCEE (USAID): *Increase in pineapple exports (training in quality systems)*	

Source: Italtrend reports

9. ANNEX 9: SURVEILLANCE COMPONENT

Result: Surveillance
Fruit fly surveillance is organized at national level and coordinated at regional level, and ensures effective and targeted pest management

Activities

- *Developing a surveillance system at regional level, including procedure manuals. This system is adapted to each country after a gap analysis.*
- *Implementing the surveillance system.*
- *Reinforcing border surveillance systems.*
- *Training the trainers for fruit fly surveillance agents (public or private).*
- *Setting up a rapid alert unit at regional level. A correspondent will be appointed and trained in each country.*

Basic principles

Surveillance consists in evaluating the fruit fly population over time and space, counting the various species and individuals of each sex.

The trapping system is used to carry out this surveillance.

For more information on trapping, the WAFFI programme has published a fact-sheet giving full details (fact-sheet No. 3).

A first set of activities relates to surveillance itself:

- Firstly, surveillance is considered as an activity to be performed throughout the territory of all eight countries. A sound evaluation of the infestation rate requires considering all the production areas, as well as transit areas.

  Subject to requests for programme support received from other ECOWAS countries which are in a position to provide the corresponding local resources, the surveillance component could be implemented in these countries.

- The number of traps will be representative of the density of the areas likely to contain fruit-fly host plants.

  The following criteria will be taken into consideration:

  - Number of agro-ecological areas
  - Surface area of mango trees
  - Surface area of citrus trees
  - Surface area of other trees
  - Transit points

- To ensure sound time representativity, collection frequency will be once a week.
- The traps must have attractants which are able to capture not only *Bactrocera invadens* (methyl eugenol), but also other flies such as *Ceratitis cosyra* (terpinyl acetate) and *Ceratitis capitata* (trimedlure).

- Surveillance will be reinforced at the main border posts (particularly those situated on the main trade routes), so as to achieve the following objectives:
  - Determination of the infestation rate for endemic fruit flies from third countries (sampling);
  - determination of potential new invasive species.
- Apart from production areas, traps will be placed in markets, packing centres, distribution hubs and on main roads.
- A budget will be set aside for notifying and communicating surveillance results. This activity will be managed by the National Pest Management Committees in collaboration with the training/information/communication component.

Organizational structure

Activities implemented at regional level (Management Unit)

- Development by the Management Unit of the surveillance master plan
  - Tasks:
    - Design of the surveillance plan.
    - Drafting of procedure manuals.
    - Presentation of the procedure to and provision of related training for National Fruit Fly Management Committees.
    - Review of the national plans developed by the National Committees.
    - Establishment, in conjunction with the research component, of economic intervention thresholds for mangoes and citrus fruit.
    - Establishment of a financial mechanism to ensure the sustainability of this component. This mechanism may vary according to the country.
    - Ongoing monitoring/evaluation will be set up to check whether surveillance is being carried out correctly. This monitoring/evaluation will be carried out at the three levels described below, but mainly at national level. Supervision of sub-national levels is the responsibility of the national level.

      The Management Unit will be responsible for establishing evaluation grids, hiring consultants to carry out the monitoring/evaluation and providing them with the related training.

Activities implemented at regional level (Technical entity)

- This system would be as follows at regional level (same institution as rapid alert system):
  - Tasks
    - Data consolidation
    - Data processing
    - Reporting to national level
    - Supervision of national level

- Equipment and services provided
    - Information systems
    - Computers
    - Training

- Setting up of a Regional Rapid Alert Unit to collect and dispatch the alerts issued by West African countries either to other West African countries or to national bodies for infestation sources and new quarantine organisms.

Activities implemented at national level for the eight initial countries

- The organizational set-up is based on a pyramidal system that will be adapted to local conditions.
- This system would be as follows:
    - Local level: producer and exporter organizations, village councils, extension services:
        - Tasks
            - Distribution of traps to producers and installation
            - Collection of trap contents
            - Information for producers
        - Equipment and services provided
            - Motorcycles provided under the Programme
            - Fuel supplied by country
            - Remuneration
            - Training provided by Regional level
    - Agro-ecological area level: carried out by the government plant protection service (DPV) or Research:
        - Tasks
            - Collection of trap contents at local levels
            - Insect identification and count
            - Reporting to national level
            - Data dissemination to sub-agro-ecological area levels
            - Supervision of sub-agro-ecological area levels
        - Equipment and services provided
            - Supply of equipment (microscope), motorcycles
            - Tools for the rapid communication of insect count results
            - Country required to provide fuel, insurance and maintenance
            - Comprehensive training in taxonomy

- National level: carried out by the government plant protection service (DPV) or Research:
  - Tasks
    - Data consolidation
    - Data processing
    - Data dissemination
    - Reporting to regional level
    - Supervision of sub-national levels
    - Training of sub-national levels
    - An information/communication activity will be conducted at the level of each National Pest Management Committee with a view to disseminating the results of the surveillance conducted in each country. This activity will be carried out in collaboration with the training/information/communication component.
  - Equipment and services provided
    - Information systems
    - Computers
    - Training

This system is adaptable to the conditions of each country.

It will depend on the agro-ecological areas in the countries concerned. At a first approximation, distribution would be as follows:

- Senegal: 3 agro-ecological areas
- Mali: 2 agro-ecological areas
- Burkina Faso: 2 agro-ecological areas
- Gambia: 1 agro-ecological area
- Guinea: 3 agro-ecological areas
- Côte d'Ivoire: 3 agro-ecological areas
- Benin: 4 agro-ecological areas
- Ghana: 3 agro-ecological areas

In each agro-ecological area, three six-hectare areas will be selected on which nine traps will be laid: three for each type of fruit fly (*Bactrocera* spp., *Ceratitis cosyra* and *ceratitis capitata*) with the most effective bait for each.

To ensure that surveillance can be as reliable as possible, producers are not directly involved; they would merely give authorization for traps to be laid in their orchards.

This set-up must be discussed and adapted in the National Pest Management Committee, in conjunction with all other players. This Committee must appoint managers for both the national level and the major regions.

An economic damage threshold for each agro-ecological area and harvest period will be established for all countries in collaboration with the research component.

If this economic threshold is exceeded, the Programme will initiate pest management operations using spot treatments (Bait Application Technique, BAT) (food attractants + insecticide) and food attractant traps (torula). These operations will be coordinated by the pest management component.

Activities implemented at national level for other ECOWAS countries

Provided that the countries make a formal application and have set up a National Fruit Fly Management Committee and the authorities responsible for surveillance have been properly identified and allocated sufficient resources to do their job properly, the Programme could also extend its surveillance action to such countries.

An initial mission would be conducted by a Management Unit member to determine the agro-ecological areas where the surveillance areas would be set up.

A system similar to that described above would be implemented.

Prerequisites

- Local level: producer and exporter organizations, village councils, extension services
  - Organization with the ability to reliably collect trap contents
  - Appropriate training.
- Major region level (maximum of six per country): carried out by the government plant protection service (DPV) or Research
  - There must be a specific budget line indicating that staff salaries are covered by the institution.
- National level: carried out by the government plant protection service (DPV) or Research
  - Staff must be appointed and their salaries provided for in a specific budget line.
- Regional level: same institution as rapid alert system
  - Staff must be appointed and their salaries provided for in a specific budget line.

Budget

The estimated budget for a period of five-years is 3,500,000 euros, broken down as follows:

- Regional level: 1,000,000 euros
- National level: 2,500,000 euros

The surveillance component is set to cover 15 countries: the eight initial countries, Guinea-Bissau, Sierra Leone, Liberia, Togo, Niger and two Nigerian States.

Logical framework and detailed budget for a five-year period: Surveillance

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
At regional level							
• Design of surveillance plan • Assistance with implementation of national surveillance plan • Training of National Pest Management Committee members at regional level • Evaluation of national surveillance plan by regional auditors	Procedure manuals ,training of National Committee members (5 people per year and per country for 5 days); evaluation of plans (15 plans evaluated per year)	Number of procedure manuals; number of National Pest Management Committee members trained; number of evaluation reports	The National Pest Management Committees are informed of surveillance problems and are organized to implement a reliable surveillance system	Number of surveillance plans implemented	National Pest Management Committees	National Pest Management Committees set up	300,000
• Implementation of regional surveillance plan	Fruit fly infestation database (150,000 euros), training of Regional Pest Management Committee members (4 people per year for 15 days)	Databases, number of Regional Committee members trained	Rapid alert system implemented at regional and international level	Number of reports on infestations due to fruit flies disseminated at national and local level	Regional rapid alert organization		300,000
• Monitoring/evaluation	1 month's evaluation per country and per year						400,000
TOTAL							**1,000,000**
At national level							
• Implementation of surveillance system at local, agro-ecological area and national levels	Surface areas for which a monitoring system has been implemented (around six orchards of 6 ha. in three agro-ecological areas in each country) At agro-ecological area level (provision of motorcycles, 20 days' training/agro-ecological area) At national level (one computer provided per country, 20 days' training).	Number of hectares monitored	Increased surveillance	Number of surveillance reports per year and per country participating in the surveillance system	Producer organizations, extension services, government plant protection service (DPV)		1,500,000 (surveillance at local level) 400,000 (surveillance at agro-ecological area level) 300,000 (surveillance at national level)
•Information/communication regarding surveillance	Preparation of annual information bulletins	Number of bulletins published	Improved awareness of surveillance results	Reading survey by monitoring/evaluation team	DPV, research		100,000

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
• Reinforcement of surveillance systems at border posts	Implementation of surveillance systems at border posts (around 6 per country)	Number of officers trained at border posts	Increased surveillance of imported fruit and vegetables	Number of inspections per year and per country participating in the surveillance system	Government plant protection service (DPV)		100,000
• Training of trainers for fruit fly surveillance personnel (public or private)	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in surveillance-related problems	Number of surveillance agents (public or private) trained	Producer organizations, extension services, government plant protection service (DPV)		100,000
TOTAL							**2,500,000**

10. ANNEX 10: PEST MANAGEMENT COMPONENT

Result: Pest Management

Producers are trained in preventive pest management methods, control operations are implemented in high infestation areas, and integral fruit fly management is set up in high production areas

Activities

- *Development of a fruit fly management plan at regional level, including procedure manuals. This plan is adapted to each country after a gap analysis*
- *Raising awareness on the importance of fruit fly management among producers (via their organizations) in local languages and training of producers in GAPs (Good Agricultural Practices)*
- *Implementation of pest management plan in high infestation areas*
- *Implementation of pest management plan in priority areas*
- *Training of trainers for fruit fly management agents (public or private)*
- *Training of trainers for personnel working in harvesting (sorting) and packing centres. Development of training manuals and training tools in local languages*
- *Setting up of benchmark orchards in countries besides the eight initial ones*

Basic principles

- Three levels of pest management are envisaged:
  - A preventive pest management level that will be implemented nationwide through awareness campaigns and training;
  - a pest management level following alerts issued by the surveillance component;
  - an integral pest management level in more limited areas.
- The emphasis will be on prevention: Good Agricultural Practices (GAPs): bagging, burying, orchard cleaning, orchard hygiene.
- In order to ensure a real impact, integral pest management will only be applied in priority areas with a minimum land area defined in conjunction with the research component.
- The integral pest management in these priority areas (principle of "area-wide management") means combating fruit flies not only on mango trees, but also on other host plants and in both commercial and family orchards.
- The types of pest management method in priority areas will be chosen according to their economic impact. For example, GF-120 will only be used if the gains generated by its use are clearly greater than the cost.
- Priority pest management areas are defined on the basis of the following criteria:
  - Orchard density;
  - priority for export areas.

- In coordination with the research component, the Programme will recommend IPM packages[20] in accordance with the priority area agro-ecological zone.
- The priority areas will be divided out among countries by the Regional Pest Management Committee at the suggestion of the Management Unit.

  For the first year, the division among countries will be determined according to production of mangoes, citrus fruit and vegetables prone to fruit fly infestation.

  In the following years, the division will also factor in the effectiveness of the implemented pest management action. This effectiveness will be measured by the Programme's monitoring/evaluation component.
- The supply of inputs under the Programme will be arranged as described in Annex 10: the Programme will pay for 100 per cent of inputs during the first annual pest management campaign at producers' organization level and for 50 per cent during the second. The producers' and exporters' organizations must pay for all inputs in subsequent years. To be entitled to this subsidy, the producers' and exporters' organizations must satisfy certain conditions (also described in Annex 10).
- Phytosanitary products such as GF-120 will be applied by specialized personnel and not by individual producers (unless they have sufficient land areas to employ correctly equipped and trained personnel).
- Orders for phytosanitary products could be grouped at regional level, and distribution managed at national level.
- Particular attention will be paid to the distribution of products necessary for pest management and recommended by the Programme in countries and areas participating in this activity.
- In order for the pest management system to be able to work correctly, a GIS system will be set up, at least in areas of pest management following alerts and pest management in priority areas. The GIS system will be used by the producers' and exporters' organizations.
- Where pest control activities exist under other programmes, coordination will take place in order to prevent duplication and optimize resources.
- A budget will be set aside for notifying and communicating the results of pest control actions. This activity will be managed by the National Pest Management Committees in collaboration with the training/information/communication component.

Organizational structure

Activities implemented at regional level (Management Unit)

- Development by the Management Unit of the pest management master plan
  - Tasks:
    - Design of the pest management plan
    - Drafting of procedure manuals

[20] IPM (Integrated Pest Management) aims to limit parasite damage to economically acceptable levels within the local production framework using the most natural control methods possible. It favours the use of appropriate farming techniques and biological control methods to prevent infestation, rather than pesticides, which are only used advisedly and selectively when no other solution is available or economically viable. IPM also promotes the use of plant genetic resources, with the use of plants best adapted to certain ecological conditions and resistant or tolerant to specific diseases and insects.

- Presentation of the procedure to and provision of related training for National Pest Management Committees
- Review of the national plans developed by the National Committees
- Ongoing monitoring/evaluation will be set up to check whether pest management is being carried out correctly. This monitoring/evaluation will be carried out at pest management organization level

  The Management Unit will be responsible for establishing evaluation grids, hiring consultants to carry out the monitoring/evaluation and providing them with the related training

- Awareness-raising tools on the fruit fly management issue and means of preventive pest management (video, design of radio messages, development of posters translated into local languages, etc.) will be created in partnership with the training/information component.
- The Management Unit trains one or two consultants per country in the various pest management methods, who are known as national reference consultants. They will then be responsible for conducting training at national level. The choice of consultants is made by the country's National Pest Management Committee.
- The Management Unit must be able to centralize the orders for the various inputs in order to obtain better prices. On the other hand, products must be distributed at national level under the aegis of the National Pest Management Committee. Coordination must be implemented between the agro-chemical companies in the country or neighbouring countries.
- Some products may need to be re-packed. The Pest Management Committee will sub-contract this function to private operators in the country or the region (via agro-chemical companies for example).

Activities implemented at regional level (Regional Committee)

- The Regional Committee, at the suggestion of the Management Unit, will assign the priority areas by country.

Activities implemented at national level for the eight initial countries

- Awareness-raising activities at national level will be organized as follows:
  - A national campaign will be implemented by the National Fruit Fly Management Committee with the backing of the coordination component in order to inform all producer organizations, exporters, government plant protection services (DPVs), extension services and NGOs involved in the production of fruit and vegetables prone to fruit fly infestation of the existence of this programme. All modern and effective means of communication (radio, video, etc.) will be used.
  - The national reference consultants (one or two consultants per country trained at regional level) will, in turn, train national relays whose mission is to pass on the information and provide training at local level. National relays may be local consultants, government plant protection services (DPVs), NGOs, extension services, researchers, *inter alia*. The Programme provides the relays with awareness-raising tools.
  - Awareness-raising for producers is conducted by the national relays through their organizations by means of the above-mentioned tools. Producer

organizations are required to apply for these activities (demand-driven), which are free of charge, with all costs being covered by the Programme.

- Information/communication activity conducted within National Pest Management Committees with a view to disseminating the results of action taken. This activity will be carried out in collaboration with the training/information/communication component.
- Monitoring/evaluation is set up by the coordination component to measure the impact of these campaigns and possibly change the messages disseminated.

- A pest management programme will be implemented in areas where the economic intervention threshold has been reached (see surveillance component), as follows:
  - Specialized operating teams will be appointed and trained for each agro-ecological area.
  - The National Fruit Fly Management Committee will select the organizations most capable of effectively conducting these operations, namely the government plant protection service (DPV), the extension service or private bodies.
  - The proposed method, which will be updated upon implementation of the Programme to take state-of-the-art research into consideration, will combine male annihilation techniques (MAT), Macpherson/Torula and bait stations. These techniques ensure fast and effective action.
- Pest management activities in priority production areas will be as follows:
  - The National Fruit Fly Management Committee will define the priority pest management areas, taking into consideration the criteria set out in the basic principles, in particular the economic impact of the measures taken. If the priority areas exceed the allocated budget, an audit will be conducted of the various proposals and the one with the greatest economic impact selected.
  - Training of national consultants in pest management techniques.
  - Signature of a protocol with the selected producer organizations.
  - Activities organized at producer organization level.
    - First year following signature of protocol (if preventive pest management is insufficient):
      - Implementation of preventive pest management over the entire priority area
      - Training of a quality manager (possibly a producer)
      - Training of other producers by the quality manager
      - Training in integrated pest management, IPM (biological pest management, spot treatments)
      - GIS/GPS mapping of the area by the quality manager
      - Discussions with regard to, and implementation of, subscriptions by the organization to secure the future of the operation
      - Visit to demonstration orchards (WAFFI)
      - Supply of small-scale equipment (for pruning, weeding, etc.)

- An audit at the end of the first year to measure progress as regards prophylactic management. If this is considered satisfactory, more sophisticated pest management methods are made available (for example, "Success Appat" or another integrated pest management technique) in the following years. This audit would be conducted by the coordination component through national firms.

- First year following signature of protocol[21] (if the level of preventive pest management is considered sufficient) or second and subsequent years

  - Implementation of integrated pest management over the entire priority area. The exact "IPM package" depends on the agro-ecological area and producer organization and is defined in conjunction with the research component
  - Further training for a quality manager (possibly a producer)
  - Further training for other producers by the quality manager
  - Supply of detection traps with bait. Reporting to national level
  - Supply of sprays and overalls
  - Supply of food or sexual lures (paid for in full by the Programme in the first year of use; payment of 50 per cent in the second year. Products are payable by the producer organization in subsequent years)
  - Mandatory record-keeping
  - Audit at the end of the first year of use with a view to the renewal of IPM and 50 per cent payment of the products. This audit will be conducted by the monitoring/evaluation component through national firms
  - The Programme will ensure that the required pest management products will be available at organization level even if they are not paid for by the Programme

- At harvest and post-harvest levels, the activities organized will be as follows:

  - Training for harvest workers in the detection of fruit fly stings (punctures). This training will be conducted by previously trained consultants.
  - Training for post-harvest workers in the detection of fruit fly stings during sorting in packing centres. This training will be conducted by previously trained consultants.
  - Training in fruit fly management issues for the quality manager, should one exist.

[21] This first year should not be confused with the first year of the Programme. If, for example, a producers' organization signs an agreement during the second year of the Programme, it will still benefit from 100 per cent subsidization of inputs for the duration of one year and 50 per cent the next.

Activities implemented at national level for other ECOWAS countries

Due to lack of knowledge of the most effective conditions for fruit fly management in a given country, an investigation phase will be implemented, as was done for the eight initial countries under the WAFFI programme.

To be eligible, countries must meet the following conditions:

- Countries must formally apply for this component;
- the Pest Management Committee must be fully operational;
- the roles of the various public and private organizations in fruit fly management must be clearly established;
- the financial and human resources of public-sector organizations must be in place;
- the surveillance system must be set up.

Prerequisites

- Local level: producer and exporter organizations, village councils, extension services
  - Demand-driven
  - Organization in place with the ability to conduct successful pest management
  - Appointment of a manager
  - Implementation of a subscription collection system to ensure sustainable pest management actions
- Post-harvest level:
  - Demand-driven
  - Packing centre with a quality manager
- Government plant protection service (DPV) level:
  - Personnel must be appointed and their salaries provided for in a specific budget line

Budget

The estimated budget for a five-year period is 8,500,000 euros, broken down as follows:

- Regional level: 1,000,000 euros
- National level: 7,500,000 euros

Logical framework and detailed budget for a five-year period: Pest management

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
At regional level							
• Design of pest management plan • Assistance with implementation of national pest management plan • Training of National Pest Management Committee members • Evaluation of national pest management plan	Procedure manuals, training of National Committee members (5 people per year and per country for 5 days), evaluation of plans (8 plans evaluated per year)	Number of procedure manuals, number of National Pest Management Committee members trained; number of evaluation reports	The National Pest Management Committees are informed of pest management problems and are organized to implement a reliable pest management system	Number of pest management plans implemented	National Pest Management Committees	National Pest Management Committees set up	400,000
• Training of trainers for fruit fly management agents (public or private)	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in pest management-related problems	Number of pest management agents (public/private) trained	Producer organizations, extension services, government plant protection service (DPV)		100,000
• Training of trainers for harvesting and post-harvesting personnel	Training of African consultants (2 per country and per year)	Number of consultants trained	Improved skills in harvest- and post-harvest-related problems	Number of pest management agents (public/private) trained	Producer organizations, packing centres, exporters, processing companies		100,000
• Monitoring/evaluation	(30 days/country/year)						400,000
TOTAL							**1,000,000**
At national level							
• Raising awareness and training of producers	Raised awareness among fruit and vegetable producers of the fruit fly problem, with training provided for them in GAPs (10 meetings of 20 people per agro-ecological area twice a year, with distribution of posters) Video created	Number of producers trained	Reduced fruit and vegetable infestation due to fruit flies	Number of orchards with trained producers	Producer organizations		2,000,000
• Pest management in high infestation areas	Implementation of pest management system (cost of 130 euros/ha./year)	Number of pest management teams trained	Reduced infestation in areas pinpointed by the Surveillance component	Reduced infestation in orchards where the Component has operated	Producer organizations		2,300,000

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
• Pest management in priority areas	Designation of priority areas and implementation of IPM in them (cost of pest management per ha. and per year: around 200 euros (10 treatments/year with GF-120)	Number of hectares where IPM is implemented	Reduced infestation in priority areas	Reduced infestation in priority areas	Producer organizations		2,300,000
• Information/communication regarding pest management	Preparation of annual information bulletins	Number of bulletins published	Improved awareness of pest management results	Reading survey by monitoring/evaluation team	DPV, research		200,000
• Setting up of pilot orchards	Designation of pilot orchards (50,000 euros/country/year in 7 countries for 2 years)	Number of pilot orchards set up	Good knowledge of agro-ecological areas	Number of research reports	Producer organizations, Research, government plant protection service (DPV)		700,000
TOTAL							**7,500,000**

11. ANNEX 11: APPLIED RESEARCH COMPONENT

Result: Applied research

New, effective and inexpensive pest management methods made accessible to producers

Activities

- *Research into IPM, biological pest management, pest management products and any other research potentially effective in fruit fly management. Development of manuals on new fruit fly management processes implemented*
- *Setting up of a research team and a centralized Internet-accessible information network on fruit flies*
- *Dissemination of research results via seminars, brochures, documents*

Basic principles

- This component will only be oriented towards research the results of which may be directly applied in the field. Moreover, such research should focus on methods that are likely to provide low-cost pest management solutions, in particular those requiring the fewest inputs (e.g. biological pest management).
- The research component will be technically managed by the IITA (Agricultural Research for Development in Africa), with significant involvement of the ICIPE (International Centre of Insect Physiology and Ecology). It will be coordinated with the other components, especially the surveillance and pest management components.
- The financial and administrative aspect of the research component will be managed by the Management Unit.
- Work will be prioritized annually by a Scientific Committee, the members of which will be appointed in a personal capacity according to their involvement in the fruit fly problem; a donors' representative and an organization representing the private sector will participate in meetings as observers. The costed proposals for priority research areas will be submitted to the Steering Committee for a financing decision.
- Certain donors have expressed a wish to finance research conducted in research centres or national universities directly. Provision has therefore been made for nationally-based research. Research topics will, however, have to be approved by the Scientific Committee and must not duplicate those dealt with at regional level.
- The national research centres, as well as universities with genuine know-how in the field of fruit fly management, will be associated with research requiring field station work.
- Each research topic must be accompanied by a progress and result disclosure requirement.
- A centralized information network will be set up, which may be hosted either by the IITA or by the West and Central African Council for Agricultural Research and Development (WECARD/CORAF).

Organizational structure

Activities implemented at regional level

- Projected research objectives (non-exhaustive and for guidance only)

Research topics	Importance	Comments
Test using ½ dose/hectare of GF-120	+	Simple protocol
Test to be carried out on citrus fruit	+	Simple protocol
Male annihilation techniques (MAT)	++	
Weaver ants	+++	To be completed (red ants) Ghana, Guinea, Benin, Mali Major effort in terms of training Minor effort in terms of research
Biological pest management with Fopius in all countries Mass rearing (Cotonou) Packaging (Cotonou) Special consignment (Cotonou) Inoculative releases	+++	Cf. ICIPE
Contamination of adults (bait stations)	+++	Metarhizium Benin, Senegal, Mali
Contamination of larvae (2 tests)	+++	Metarhizium Benin, Senegal, Mali
Fruit bagging	++	Interest on the part of Ghana, Côte d'Ivoire, Burkina Faso, Mali, Benin
National and regional varieties (attractivity/agro-physiology difference)	+	Senegal, Benin, Mali
Improved trapping of females	++++	Senegal, Benin, Burkina Faso, Mali
Post-harvest treatment (immersion)		Mali
Detection of places of refuge in adverse periods	++++	Senegal, Benin, Burkina Faso, Mali

- Research Team

  The research team will be led by an international researcher and supported by a team of local researchers with recognized experience in the field of fruit flies. A four-wheel-drive vehicle will be provided for their travel in Benin and the region, unless one is supplied by the national research centres and/or universities.

- Dissemination

  Research progress may be disseminated in a number of ways, for example:

  - Annual presentation seminars in each country. A wide panel of stakeholders will be invited;
  - technical brochures will be systematically issued for each result obtained.

Activities implemented at national level

- Donors wishing to make financial contributions to research institutes or national universities may finance research directly.

Prerequisites

- The current IITA unit working on fruit flies should be operational at the start of the Programme.
- The current unit must coordinate with the ICIPE.

Budget

The estimated budget for a five-year period is 4,300,000 euros.

- 3,900,000 euros at regional level
- 400,000 euros at national level

Logical framework and detailed budget for a five-year period: Applied research

Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
At regional level							
• Research into IPM, biological pest management, etc. • Writing of documents presenting new pest management methods	Implementation of research protocols on topics proposed by the Scientific Committee (see indicative list in Annex 11)	Number of protocols written and implemented	New, effective and inexpensive pest managements techniques made available to producers	Cost of pest management/ha.	Research		2,000,000
• Operational research team	Research team set up (1 international researcher + team of regional researchers)	Number of regional researchers in the team	Improved scientific level of researchers	Number of publications	Research bodies		1,100,000
• Coordination seminars • Internet-accessible information system	Coordination seminars (one 4-day seminar/year with 30 people), installation of an information system (150,000 euros)	Number of seminars Number of Internet connections	Improved exchanges between researchers	Number of researchers in coordination seminars	Research bodies		400,000
• Dissemination of research results via seminars, brochures, documents. This activity will be managed by the training/information/communication component	Presentation seminars, (1 day's presentation of the research themes/year/country with 40 people invited), brochures (500 brochures/country/year), documents	Number of presentation seminars; number of brochures; number of documents distributed	Improved awareness of results obtained by research Publications	Survey on impacts of communication tools	Producer organizations, packing centres, exporters, processing companies		400,000
TOTAL							**3,900,000**
At national level							
• Research into IPM, biological pest management	Implementation of research protocols on topics proposed by the Scientific Committee using national funds	No. of protocols written and implemented	New, effective and inexpensive pest managements techniques made available to producers	Cost of pest management/ha.	Research		400,000
TOTAL							**400,000**

12. ANNEX 12: CAPACITY BUILDING COMPONENT

Result: Capacity building

The regional and national organizations necessary for effective fruit fly management are in place

Activities

- *Developing a regional GIS (Geographic Information System) for orchard inventories*
- *Creating or reinforcing the National Fruit Fly Management Committees*
- *Capacity building of professional organizations*
- *Capacity building of authorities responsible for control tasks*
- *Reinforcing the national diagnostic laboratories (training technicians, supply of recognition materials (books, documents, etc.) and equipment (microscope, information systems)*
- *Designating and reinforcing a benchmark laboratory (training, equipment) and training the trainers for field technicians in fly detection. Developing training manuals at regional level*

Basic principles

- At the start of the Programme, National Fruit Fly Management Committees must be set up if they do not already exist. If they do exist, their capacities must be upgraded;
- they must be joint public-sector/private-sector bodies;
- a gap analysis will be conducted in each country at the start of the Programme to specify the priority actions to be conducted, define the roles of the various players and establish the mandates/skills/operational capacities of the national players in the field who are most likely to contribute to the surveillance and control activities provided for under the National Action Plan;
- the Committees will prepare annual activity programmes to be submitted to the Regional Steering Committee for decision;
- they will organize field activities and supervise the national awareness-raising and training campaigns of many of the stakeholders concerned;
- the producers' and exporters' organizations are an essential component of the Programme and must therefore be strengthened;
- diagnostic laboratories must exist at national level and be reinforced, particularly in terms of taxonomy.

Organizational structure

Activities implemented at regional level (Management Unit)

- Design or adaptation (if already present) of a GIS at regional level
- Setting up a GIS at national level

Activities implemented at regional level (Benchmark Laboratory)

- Benchmark laboratory
  - Reinforcing the IITA benchmark laboratory
  - Training of laboratory technician trainers

Activities implemented at national level

- National Fruit Fly Management Committees: see paragraph 13.8 for details of the objectives of the National Committees, as well as their composition. The purpose of this activity is to strengthen them and make them rapidly operational.
- Professional organizations:
  - Capacity building for producer organization managers.
- At government plant protection service (DPV) level:
  - Training in import and export controls;
  - Training in legislation concerning phytosanitary problems, particularly the importance of phytosanitary certificates in international trade;
  - Training in action to be taken in the event of interception notifications (for example at European Union level).
- At border post level:
  - Training of border post personnel in sampling methods, taxonomy and the recognition of new species.
- At post-harvest level:
  - Training of packing-centre personnel in the detection of fruit fly stings during sorting in the packing centres. This training will be conducted by previously trained consultants.
- Diagnostic laboratories:
  - Improvement in taxonomy capacities at national level (two people per country and per year);
  - Provision of materials where necessary;
  - Liaison with IITA and ICIPE laboratories;
  - Training of field technicians.

Prerequisites

- The Fruit Fly Management Committee must to be in place and have obtained official recognition.
- Producer organizations must have legal status, and have a manager capable of applying pest management measures.
- Government plant protection services (DPVs) must allocate a specific budget line to diagnostic laboratory personnel and provide appropriate premises.

Budget

The estimated budget for a five-year period is 1,900,000 euros, broken down as follows:

- Regional level: 400,000 euros
- National level: 1,500,000 euros

Logical framework and detailed budget for a five-year period: Capacity building

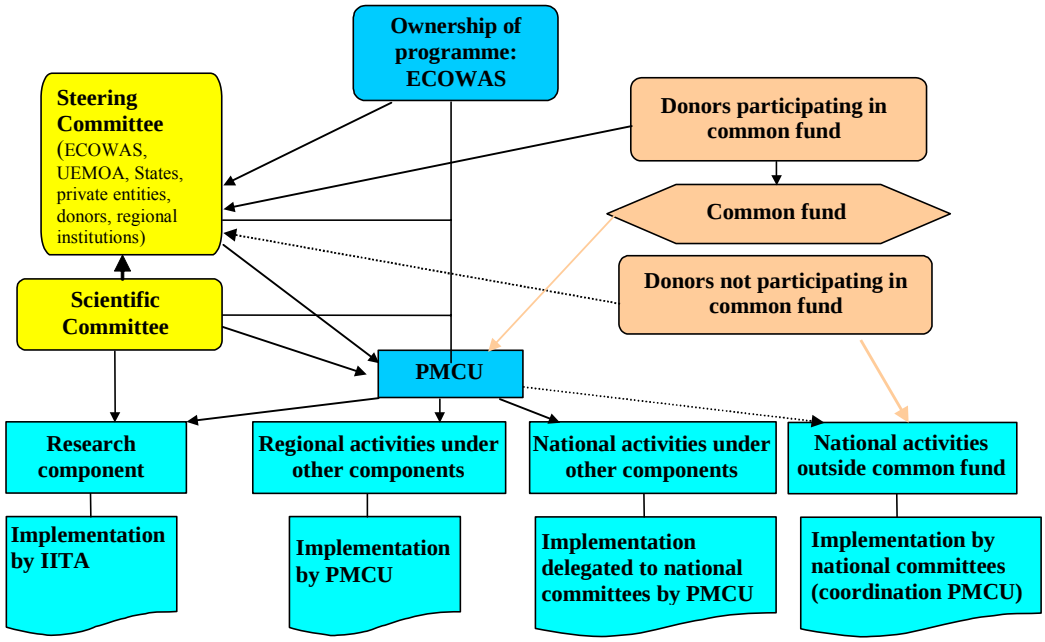
Activities	Output	Output indicator	Execution/results	Execution indicator	Institutions involved	Assumptions	Budget (€)
At regional level							
• Design of a GIS	Development of an information system enabling geographic information management	Number of GIS set up in the countries	Improved orchard inventories in West African countries	Number of orchards inventoried	Research		200,000
• Strengthening of a regional benchmark laboratory	Training of laboratory technician trainers at regional level (2 technicians/year), materials supplied when necessary (cost of a microscope: 10,000 euros).	Number of national laboratory technicians trained by regional trainers	Accreditation of benchmark laboratory	Accreditation certificate	Regional diagnostic laboratory		200,000
TOTAL							**400,000**
At national level							
• Creation or strengthening of National Committees	Official National Pest Management Committees set up (computers supplied, salary for permanent staff paid for the first 3 years)	Number of officially recognized National Committees	Exchange between public and private sectors on the fruit fly problem, and problem-solving	Number of reports submitted	National Pest Management Committees	Collaboration between governments and the private sector	300,000
• Capacity building for professional organizations	Training of professional organization managers (10 managers/country/year for 5 days)	Number of professional organization managers trained	Number of professional organizations capable of organizing coordinated fruit fly management	Number of professional organization producers involved in fruit fly management	Professional organizations		400,000
• Capacity building for inspection bodies and border posts	Training of inspection body technicians (5 technicians/country/year for 15 days)	Number of inspection body technicians trained	Improvement in inspections	Number of inspection reports	Government plant protection service (DPV)		400,000
• Reinforcement of diagnostic laboratories	Training of laboratory technicians (2/country/year) Equipment supplied when necessary	Number of laboratory technicians trained; laboratory and equipment audit	Good Laboratory Practice (GLP) implementation	GLP implementation reports	Diagnostic laboratories		400,000
TOTAL							**1,500,000**

13. ANNEX 13: LOGICAL FRAMEWORK

Programme description	Indicators	Sources of verification	Assumptions
OVERALL OBJECTIVE			
Greater income for fruit and vegetable producers, in particular small producers, thereby contributing to poverty reduction	• Poverty reduction in production areas • Increased income for fruit and vegetable producers	• Annual sample surveys under the Programme by the monitoring/evaluation teams	• Political and socio-economic stability
SPECIFIC OBJECTIVES			
Control of fruit and vegetable losses due to fruit fly infestation, so that they are no longer a constraint on mango exports *Increase in the quantity of fruit free from infestation available for sale on local markets, thereby contributing to improved food security*	• Mangoes losses as a result of fruit fly infestation in priority areas have fallen by 50% between the start and end of the Programme • Number of interceptions in the European Union of mango imports has declined by 80% between the start and end of the Programme • Mango exports to the EU have increased by 50% between the start and end of the Programme • Local market supply of healthy mangoes has increased by 30% over equivalent potential production between the start and end of the Programme	• Monitoring/evaluation reports by the monitoring/evaluation component • Interception notifications from the European Union (http://mkaccdb.eu.int/madb_barriers/indexPubli_sps.htm) • Trade statistics (http://comtrade.un.org/, http://www.trademap.org/) • Annual surveys by the monitoring/evaluation component of five local markets per country during the lean season	• No deterioration in conditions of trade for mangoes imported from West Africa into the EU (importers are not favouring other sources of supply)
EXPECTED OUTCOME			
RE1: Fruit fly surveillance is organized at national level and coordinated at regional level and ensures effective and targeted pest management	• Over the last year of the Programme and in each participating country, the unit in charge of surveillance at national level reports infestation levels at least once every 15 days during the production period to agro-ecological area managers and the organizations responsible for collecting trap contents • Whenever infestation levels exceed the economic intervention threshold defined for each country and each month, the unit in charge of surveillance at national level alerts the specialized pest management teams within three working days	• Surveillance management unit bulletins • Document establishing alert thresholds • Pest alert bulletins and intervention reports	• Willingness of professional organizations and competent authorities to cooperate • Government plant protection services (DPV) are allocated resources to carry out their functions
RE2: Producers are trained in preventive pest management methods, control operations are implemented in high infestation areas, and integral fruit fly management is set up in high production areas	• In areas where a monitoring/evaluation report is issued, orchard hygiene practice has increased by 50% • In areas where the surveillance component reported high infestation, infestation has declined by 50% • In priority areas, infestation has been reduced on a long-term basis by 50% from implementation of the IPM Package to the end of the Programme (after two years)	• Monitoring/evaluation reports • Report by intervention agencies • Monitoring/evaluation reports • Monitoring/evaluation reports	• Importers of phytosanitary products are interested in, and producers convinced of, the benefit of pest management • Regulatory action has been taken to make automatic treatment for all orchards in priority areas mandatory

Programme description	Indicators	Sources of verification	Assumptions
RE3: New, effective and inexpensive pest management methods are made available to producers	• Two new fruit fly management methods for mangoes have been developed and disseminated and have reduced pest management costs by 50% without affecting efficiency • The new fruit fly management methods have been disseminated to producer organizations, extension bodies and government plant protection services (DPV)	• Publications by the research component • Monitoring/evaluation reports • Survey of professional organizations, producer organizations and government plant protection services (DPV)	• Researchers studying fruit flies are available from the very start of the Programme, which requires bridge financing for the IITA
RE4: The regional and national organizations necessary for effective fruit fly management are in place. Measures are taken at the end of the Programme to secure the future of the Regional and National Committees.	• The Regional Pest Management Committee has been set up, meets at least four times a year, and all stakeholders, in particular the private sector, are represented and attend meetings • The National Committees of the countries taking part in the Programme have been set up and allocated permanent resources at the end of the Programme. The private sector participates in meetings	• Minutes of Regional Committee meetings • Minutes of National Committee meetings	
RE5: All stakeholders are informed of the solutions recommended by the Programme	• The satisfaction index of professional organizations is at least 80%	• Monitoring/evaluation reports • Surveys of professional organizations	
RE6: The main components (surveillance and pest management) are monitored and evaluated in a transparent manner by independent consultants	• Each year and for the duration of the Programme, a monitoring/evaluation report is issued for each country and each component and 50% of the critical points reported are resolved within the following year	• Monitoring/evaluation reports	

14. ANNEX 14: PROGRAMME ORGANIGRAMME



15. ANNEX 15: ANALYSIS OF THE REGIONAL INSTITUTIONS LIKELY TO PARTICIPATE IN THE PROGRAMME

This analysis is based on the consultant's visits to the institutions concerned.

15.1 West African Economic and Monetary Union (UEMOA)

UEMOA encompasses the eight West African countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo) which use the CFA franc as currency.

Agricultural policy and means of implementation

The Union's agricultural policy (PAU), defined in 2001, focuses on three areas: (1) The adapting of production systems and the improvement of the production environment; (2) the further development of the common market in the agricultural sector and the management of shared resources; and (3) the integration of UEMOA agriculture into regional and world markets. The fruit fly problem relates to both areas (1) and (2). Area (1) is principally aimed at enhancing the competitiveness of agricultural subsectors, although it should be noted that the large subsectors identified as priorities (rice, maize, livestock/meat, poultry farming and cotton) do not include arboriculture. As part of area (2), there are plans to harmonize regulations on seeds and pesticides.

The Department of Rural Development, Natural Resources and the Environment (DDRE) is responsible for conducting this agricultural policy, under the authority of a commissioner. The Department has four Directorates (Agriculture and Food Safety, Animal and Fisheries Resources, Environment and Water, and Natural Resources and Renewable Energy). The Directorate of Agriculture and Food Safety, *inter alia* responsible for the development of agricultural subsectors and crop protection, has a director and three programme managers. There are also plans to recruit an SPS specialist and an agri economist.

The DDRE has drawn up a three-year programme to cover the period 2009-2011 (although this will now almost certainly be pushed back a year to begin in 2010 and end in 2012). The cost of the programme is initially estimated at 67 billion CFA francs. Up to one third of the programme is to be financed by the Union's own resources. The balance is to be funded by technical and financial partners, although the greatest part of the funding has yet to be identified. In addition to bilateral financing, UEMOA may make use of the resources provided for under the regional indicative programmes of the 9th European Development Fund (EDF) (in the event of there being resources that remain unallocated) and the 10th EDF (which has allocated a total amount of €597 million to UEMOA, ECOWAS and Mauritania).

Specific action in the area of fruit fly control

In its three-year agricultural policy implementation programme for the period 2009-2011, and as part of a sub-programme for the development of agricultural sub-sectors (Area (1)), UEMOA has provided for a contribution to the regional fruit fly control programme, amounting to 1.5 billion CFA francs over two years (2010 and 2011). This contribution will fund a research programme to be conducted by the IITA and was decided on the basis of a financing request made by the IITA at the Bamako workshop.

UEMOA action in the area of crop protection

The legal framework for UEMOA action in the area of plant health and safety is provided by Regulation No. 07/2007, adopted on 6 April 2007. This Regulation provides in particular for the setting up of a regional safety committee and for the harmonization of national regulations on pesticides, in particular with regard to registration.

UEMOA's experience in conducting regional programmes

UEMOA leads a number of regional projects, most often in collaboration with ECOWAS: The Quality Programme (in which UEMOA and ECOWAS are each responsible for different countries); the Facilitation Programme (in which UEMOA and ECOWAS are each responsible for different components); and the Natural Disasters Programme (steered by a joint ECOWAS/UEMOA committee). Agricultural programmes include the multi-country support programme for the cotton sector, financed by the African Development Bank (ADB). This programme concerns four countries (Benin, Burkina Faso, Mali, and Chad), three of which are UEMOA members. Each country benefits from an ADB loan, the coordination of which is, by agreement, entrusted to a UEMOA-based project unit. UEMOA is given a grant to cover the cost of this unit and has authority over the grant. Such an arrangement entails a large administrative burden (in particular in respect of procurement, which is subject to UEMOA's complex internal procedures).

UEMOA's position with regard to the fruit fly management programme

UEMOA believes that action to combat fruit flies is consistent with its mandate for the coordination of action against crop pests, and wishes to be associated, in conjunction with ECOWAS, with the ownership of the Programme. It would like the implementation of the Programme to be entrusted to a joint ECOWAS/UEMOA committee or, failing that, for the Programme's activities to be shared out between the two bodies, by either country or activity.

15.2 Economic Community of West African States (ECOWAS)

ECOWAS encompasses 15 West African States (eight of which are UEMOA members).

ECOWAS agricultural policy

The Department of Agriculture, the Environment, and Water Resources, placed under the authority of a commissioner, comprises three Directorates: Agriculture and Rural Development; the Environment; and Water Resources. The Directorate of Agriculture and Rural Development is run by a director and three officials, each of whom is responsible for one division: Sectors and Markets; Livestock; and Agriculture.

The ECOWAS agricultural policy, ECOWAP, was adopted in 2005. It covers three areas of intervention: (i) The enhancement of agricultural productivity and competitiveness; (ii) the implementation of an intra-community trade regime; and (iii) the adapting of the external trade regime.

Since 2005, the countries and the region have been committed to the implementation of the ECOWAP. In West Africa, this agricultural policy and its investment programmes (which are currently being defined) constitute the instrument implementing the agricultural component of the NEPAD (i.e. the CAADP). In its regional action plan 2006-2010, ECOWAS proposes that the pillars of the CAADP/NEPAD and the areas of intervention of the ECOWAP be centred on six priority areas of action, for which partner institutions, considered the "technical arms" of the Commission, will be responsible. These areas of action and their relevant "technical arms" are as follows:

- **Improvement of water management**: Water Resource Management Centre (under ECOWAS)
- **Sustainable development of agricultural enterprises**: ROPPA and WECARD
- **Improved management of other natural resources**: FAO and the Sahel Club
- **Development of agricultural sectors and promotion of markets**: CMA/AOC

- **Prevention and management of food crises and other natural calamities**: CILSS
- **Institutional capacity building**: Rural Hub and ROPPA

Regional Agricultural Investment Programmes (RAIP) devised by ECOWAS and national programmes (NAIP) pertaining to 15 Member States must reflect these priority areas. National programmes are currently being prepared or approved (by national round tables), and regional programmes are to be reviewed by the Commission in the coming months, before being submitted for the approval of the Member States.

Position of ECOWAS *vis-à-vis* the fruit fly management programme

ECOWAS is very active in respect of the fruit fly issue, and considers the regional level to be the most appropriate one at which to conduct an integrated control programme. It has therefore played a key role in the development of the Programme, notably requesting that a study be carried out (Italtrend study) and organizing the Bamako workshop.

The Commission wishes to continue playing an active role and would like to include the fruit fly management programme among its priority RAIP programmes. It stands ready to contribute to the funding of the Programme and would like to lead its implementation.

ECOWAS experience in programme management

In addition to the programmes conducted jointly with UEMOA (see the above section concerning UEMOA), ECOWAS has led a Ouagadougou-based onchocerciasis control programme covering three countries in the region. In the future, ECOWAS is also to run a food safety programme financed by the French Development Agency (AFD).

15.3 Network of Farmers' and Agricultural Producers' Organizations of West Africa (ROPPA)

ROPPA is an organization encompassing farmers' organizations in 12 West African countries. The organization's ultimate aim is to represent producers from all the ECOWAS countries. Its headquarters are located in Ouagadougou. ROPPA has eight permanent staff members. The organization has defined three main areas of intervention:

- Formulation of recommendations and participation in the preparation of policies and programmes; in this respect, one of ROPPA's tasks is to reflect upon the ECOWAS strategy concerning the common policy on strengthening producers' organizations.
- Actions favouring the modernization of farms and the valorization of agricultural products: ROPPA is not able to intervene directly in such projects, but can participate in their steering committees as a representative of farmers' organizations and family farms.
- Actions aimed at strengthening producers' organizations: ROPPA is able to play an active part in projects of this sort, e.g. an AFD-funded project that aims to arrange farmers' organizations into national platforms, thus bringing together all producers' organizations at national level.

ROPPA wishes to participate in the fruit fly management programme's Steering Committee with a view to representing the farmers' organizations that are to play a key role in the implementation of the Programme. This wish seems fully justified.

15.4 Conference of Ministers of Agriculture of West and Central Africa (CMA/AOC)

The CMA/AOC is an intergovernmental organization, established in 1991, which brings together the Ministers of Agriculture and/or Livestock of 20 West and Central African countries. Fourteen of the countries involved are West African (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, and Togo). The Conference's mission is to work with other intergovernmental organizations to "build countries' capacity to pursue economic integration and the development of their agricultural economies through concerted cooperation activities".

The CMA/AOC is based in Dakar and is permanently staffed by eight officials. It conducts a number of programmes:

- A programme to establish an agricultural market information system, run in cooperation with the CTA; this programme is based on the setting up of sector-specific observatories (one of which is the Fruit and Vegetable Observatory in Conakry).
- A programme to build interaction between the States and the Chambers of Agriculture, run in cooperation with the African Capacity Building Foundation.
- The Conference has been asked by ECOWAS to reflect upon agricultural subsectors.
- It has been asked by the African Union to contribute to the preparation of the second pillar of the Comprehensive Africa Agriculture Development Programme (improvement of rural infrastructure and trade-related capacities for improved market access).

The CMA/AOC sees itself as a forum for the mobilization of the private sector. It is particularly active in respect of the fruit fly problem, which it views as a major challenge for the subregion, and organized a regional workshop on this topic at the end of 2008. It would like to be involved in the implementation of the regional fruit fly management programme, so as to help ensure that the Programme remains under the effective control of the private sector and benefits producers.

15.5 West and Central African Council for Agricultural Research and Development (WECARD)

WECARD is a regional organization encompassing agricultural research institutes in 21 West and Central African countries. It develops scientific partnerships, in particular with the IITA, WARDA, IFPRI, ICRISAT, and CIRAD, and development partnerships with key sponsors (World Bank, USAID, European Union, IFAD, DFID, and Coopération Française). One of its core missions is to promote coordination and cooperation in respect of the activities of agricultural research institutes in the region. WECARD coordinates eight research programmes, one of which concerns non-food producing crops, but does not have a specific programme aimed at fruit fly control.

WECARD recognizes the IITA's expertise in the area of fruit fly control and wishes to participate in the Programme's Steering Committee, notably with a view to ensuring interaction between national research institutes and the research activities conducted under the Programme.

16. ANNEX 16: LIST OF WORKSHOP PARTICIPANTS

COUNTRY	BODY	NAME & SURNAME	POSITION	TELEPHONE	E-MAIL
Benin	World Bank	Mr Christophe RAVRY	Agribusiness specialist		cravry@worldbank.org
	IITA - CIRAD	Mr Jean-François VAYSSIERES	Agricultural entomologist		jvayssieres@cgiar.org
	IITA - CIRAD	Mr Antonio SINZOGAN	IPM Scientist		asinzogan@cgiar.org
	IITA - CIRAD	Mr Appolinaire ADANDONON	Entomo-pathologist		adanappo@yahoo.fr
	MAEP - CERRAP	Mr H Jean AFOUTOU	Agronomist, plant protection		
	CIEVRA	Mr G Emile PADONOU	Agronomist responsible for agriculture	Tel: 977 737 18	emilepadonou@yahoo.fr
	National Chamber of Agriculture	Mr Mamadou CHABI	President	Tel: 909 410 21	cab@intnet.bj
	DAGRI - SPVCP	Mr Symphorien SAIZONOU	Head of Plant Protection Service	Tel: 970 702 29	symphonsa@yahoo.fr
	DAGRI - SPVCP	Mr Ibouraima TIAMIYOU	Coll/C/SPVCP		tiamiyoui@yahoo.fr
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COUNTRY	BODY	NAME & SURNAME	POSITION	TELEPHONE	E-MAIL
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	Ministry of Trade	Ms Denise KAMBOURA	Director-General, Fruit and Vegetable Processing Company (STFL) of Loumbila	Mobile: 226 70 21 60 18	kamboundenise@yahoo.fr
	Research institute	Dr Lenli O. CLAUDE	Researcher, INERA	Mobile: 226 76 64 20 39	pognoa@yahoo.com
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	SOBFEL	Mr Sidiki SANOGO	Director-General	Mobile: 226 70 25 84 69	dabire_remy@yahoo.fr
	Sponsor	Mr Yacouba DIALLO	PAFASP/Sector development specialist	Office: 226 50 30 42 79 Mobile: 226 70 24 29 71	yacubfr@yahoo.fr
Côte d'Ivoire	Plant Protection Service	Mr Kamou FATAYE	Head of plant protection, control and quality	Office: 225 20 22 22 60 Mobile: 225 70 90 37 54	afataye@aviso.ci
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	Cocody University	Prof. Philip KOUASSI	Researcher (supervises thesis students working on fruit fly-related issues)	Mobile: 225 05 03 40 39	kouassiphil@yahoo.fr fnhala@yahoo.fr
	Focal Point/World Bank programme	Dr François Hala N'KLO	Researcher, CNRA	Tel.: 225 01 47 80 85 Tel.: 225 05 04 53 05 Tel.: 225 23 47 24 11	nklo.hala@cnra.ci
	Sponsor	Mr Adolphe OUYA	Head of fruit and citrus fruit programmes, FIRCA	Mobile: 225 05 17 99 88	ouya1@firca.ci

COUNTRY	BODY	NAME & SURNAME	POSITION	TELEPHONE	E-MAIL
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	Research institute	Mr Lamin JOBE	Director of Research, NARI	Tel.: 220 44 83 162 Mobile: 220 99 35 283	lmsjobe@yahoo.com
	Exporter	Mr Momodou CEESAY	Director-General of the Gambia Horticultural Enterprise	Tel.: 2204394819 Mobile: 229905088	gamhort@qanet.gm
	Radville Farm	Mr Luiz A DOS SANTOS	Agronomist		radvilletbk@gamtel.gm
	Radville Farm	Mr Mamour SEY	Farm manager		radvilleopera@gamtel.gm
	Gambia Horticultural Enterprise	Gibril WILLIAMS	Farm manager		gamhort@qanet.gm
	NARI	Faye Mamadou	Pest Management Programme (PMP)		julafaye@yahoo.co.uk
Ghana	Ministry of Agriculture	Mr Joseph EDMUND	Environmental Protection Agency (EPA)	Tel.: 233 20 81 68 907	jedmund@epaghana.org
	Research institute, University of Ghana	Prof. Kwame AFREH-NUAMAH	Chairman, National Fruit Fly Task Force	Tel.: 233 24 48 73 568	knuamah@ug.edu.gh ou k.nu.amah@hotmail.com
	Focal Point/World Bank programme	Mr Kofi BINEY	Technical adviser, MOAP-GTZ	Tel.: 233 24 43 24 584	kofibiney2@yahoo.com
	MOFA	Mr Milly KYOFA-BOAMAH	PPRSD		mkyofaboamah@yahoo.co.uk
	MOFA	Mr Vesper SUGLO	Director, PPRSD		jackvesper@yahoo.com
Guinea	Ministry of Agriculture	Mr N'Famara CAMARA	Assistant technical adviser Minister	Tel.: 224 60 64 92 55	mamasta1986@yahoo.fr
	Plant Protection Service	Mr Jean-Luc FABER	Head of the Pesticide Management and Professional Approval Section	Tel.: 224 60 55 36 76	elsabang@yahoo.fr
	Ministry of Trade	Mr Mohamed Saîd FOFANA	National Director of External Trade and Competition	Tel.: 224 60 33 53 33	fofanasaid@yahoo.fr
	Research institute	Mr Fode BANGOURA	Chairman of the Fruit Fly Control Committee	Tel.: 224 642 25 34 05	f-mamoudou_bgra@yahoo.fr
	Exporter	Mr Yaya TOURE	Head of production, SIPEF	Mobile: 224 64 62 66 11	Toureyaya2002@yahoo.fr

COUNTRY	BODY	NAME & SURNAME	POSITION	TELEPHONE	E-MAIL
	Producer	Dr Deen TOURE	Mango producer in Forécariah	Tel.: 224 64 29 22 51	docteurdeen@yahoo.fr
	Research laboratory	Dr Lanciné TRAORE	Director of the National Plant Protection Laboratory	Tel.: 224 63 75 09 22	lancine-traore@yahoo.fr
	Fruileg	Mr Siaka KABA	Director-General	Tel.: 22463146816	fruilegexport@yahoo.fr
	Focal Point/World Bank programme	Mr Camara KOUMANDIAN	Researcher, IRAG/Focal Point (WAFFI), and president, Asso. Prod & Exp. of Fruit of Kindia	Mobile: 224-60-57-43-80	koumandian@yahoo.fr
Mali	Faculty of Science and Technology	Mr Youssouf Faya KEITA	Assistant agricultural entomologist	Mobile: 223 76 10 85 83	founefaya@yahoo.fr
	Ministry of Trade	Mr Mohamed SIDIBE	Coordinator, Integrated Framework Project	Office: 223 20 22 24 04 Mobile: 223 76 17 10 60	mohamed.sidibe@cadreintegre.org
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	IB Négoce	Mr Issa BAGAYOKO	Director, IB Négoce	Office: 223 75 17 91 67 Mobile: 223 66 73 72 49	ibnegoce@yahoo.fr
	Ministry of Agriculture	Mr Aboubacar DIARRA	Deputy Director, National Desert Locust Control Centre	Mobile: 223 75 17 91 67	Diarrabou2004@yahoo.fr
	Focal Point/World Bank programme	Mr Adama SIDIBE	Head of the fruit sectors programme/PCDA	Office: 223 20 22 01 82 Mobile: 223 76 17 53 58	diarrabou2004@yahoo.fr adamasidibe@pdca-mali.org
	Sponsor/HELVETAS	Mr Joseph SANOU	Awareness-raising adviser	Mobile: 223 76 07 31 26	joseph.sanou@helvetas.org
	Cooperative Union of Mango Producers	Mr Adama KONE	Administrative Secretary	Mobile: 223 75 33 67 83	
	DNA	Mr Farakoro KONE	Head of the legislation section	Tel.: 223 76 30 60 78	farakorokone@hotmail.com
	APAOS	Mr Kassoum BERTHE	General secretary	Tel.: 223 76 23 25 16	berthezie@yahoo.fr
	IER	Mr Abdoulaye CAMARA	Research associate	Tel.: 223 66 71 72 66	camarablo@yahoo.fr
	IER	Mr Sidiki TRAORE	Researcher	Tel.: 223 66 82 59 67	Sidikit202@yahoo.fr
	OPV	Mr Yves DAKONO	Responsible for phytosanitary control	Tel.: 223 74 62 34 72	yvesdakou@yahoo.fr

COUNTRY	BODY	NAME & SURNAME	POSITION	TELEPHONE	E-MAIL
Senegal	Ministry of Agriculture	Mr Younousse SEYE	Horticulture Department (Deputy Director, Head of programme)	Tel.: 221 66 78 10 77	
	Plant Protection Service	Mr Mbaye NDIAYE	Head of fruit fly programme	Tel.: 221 33 86 70 994	jonasseye@yahoo.fr
	Ministry of Trade	Mr Magatte NDOYE	Coordinator of programmes and projects	Mobile: 221 33 83 40 497	mbaye@hotmail.com
	Research institute	Dr Saliou NDIAYE	Director of Studies, ENSA THIES	Tel.: 221 33 82 32 864 Mobile: 221 77 64 30 720	magatendoye@yahoo.fr
	Exporter	Mr DIOH Simon S.	Manager, MASTER - S.A.R.L	Tel.: 221 77 63 00 076	salioundiaye@orange.sn
	Producer	Mr Ousseynou SANE	Action SUD/Support for mango producers and exporters of the Casamance region	Mobile: 221 63 82 58 2	simlatyr@yahoo.fr
	PNIA	Ms Sokhna MBAYE DIOP	Ministry of Agriculture/Directorate of Analysis, Forecasts and Statistics (DAPS)	Mobile: 221 77 63 52 825	actionsud@yahoo.fr
	Focal Point/World Bank programme	Mr Christiaan KOOYMAN	AES Foundation/Technical Director	Mobile: 221 77 65 12 043	christiaan.kooyman@fondationaes.com
	Sponsor	Mr Mamadou DABO	USAID/SAGIC	Tel.: 221 33 85 92 200	dabokl@yahoo.ca
	Ministry of Agriculture	Ms Sokhna Mbaye DIOP	PNIA Focal Point	Mobile: 221 77 65 12 043	mbaye@hotmail.com

17. ANNEX 17: LIST OF MEETINGS BY CONSULTANT

Name of consultant	Type of meeting	Date	Place
F. Plumelle	Workshop	22/06/2009	Dakar
	Meeting with J.Y. Rey, CIRAD	22/06/2009	Dakar
	Sponsors' meeting	23/06/2009	Dakar
	CoP Horti/Rural Hub	23/06/2009	Dakar
	World Bank, D. Jordy	23/06/2009	Dakar
	Workshop	25/06/2009	Bamako
	CSP CILSS	26/06/2009	Bamako
	Ministry of Agriculture	26/06/2009	Bamako
	Workshop	29/06/2009	Accra
	Sponsors' meeting (FAO)	30/06/2009	Accra
	FARA	30/06/2009	Accra
	Sponsors' meeting (Belgian cooperation)	02/07/2009	Cotonou
	Workshop	03/07/2009	Cotonou
	IITA	03/07/2009	Cotonou
	ECOWAS meeting	06/07/2009	Abuja
	World Bank meeting	16/07/2009	Paris
	Workshop	20/07/2009	Banjul
B. Samb	Workshop	22/06/2009	Dakar
	Meeting with J.Y. Rey, CIRAD	22/06/2009	Dakar
	Sponsors' meeting	23/06/2009	Dakar
	CoP Horti/Rural Hub	23/06/2009	Dakar
	World Bank, D. Jordy	23/06/2009	Dakar
	Workshop	25/06/2009	Ouagadougou
	Sponsors' meeting	26/06/2009	Ouagadougou
	Workshop	29/06/2009	Abidjan
	Sponsors' meeting	30/06/2009	Abidjan
	Workshop	02/07/2009	Conakry
	Sponsors' meeting	03/07/2009	Conakry
N. Gergely	ECOWAS meeting	06/07/2009	Abuja
	CMA/AOC meeting	08/07/2009	Dakar
	ROPPA meeting	08/07/2009	Dakar
	WECARD meeting	08/07/2009	Dakar
	UEMOA meeting	10/07/2009	Ouagadougou
	World Bank meeting	16/07/2009	Paris