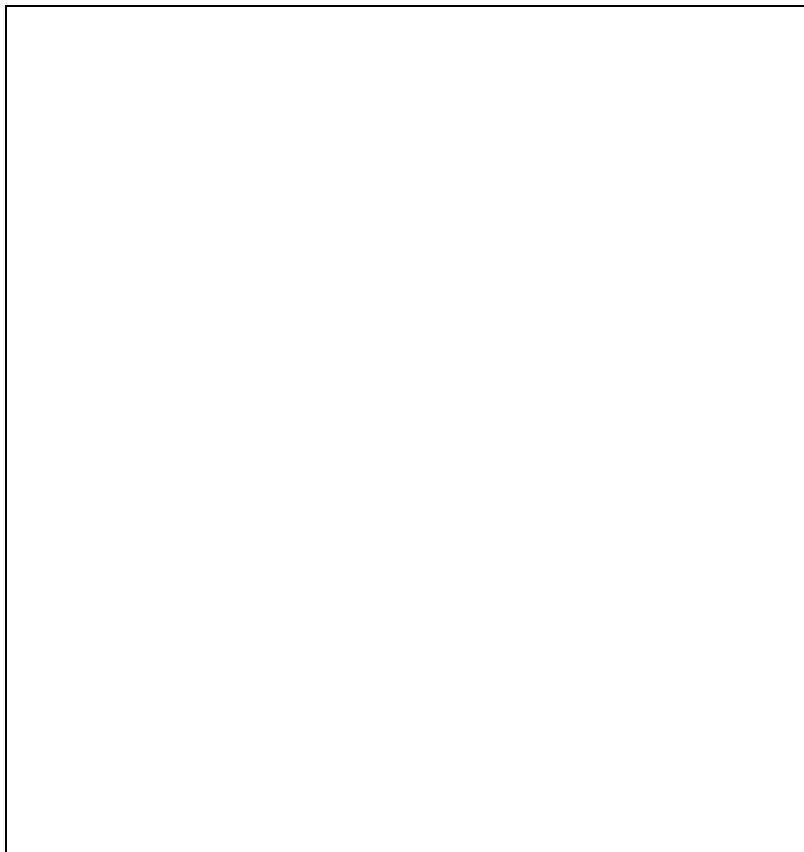


SDC - Swiss Agency for Development and Cooperation

Sectoral Policy Document

CROP PROTECTION



Crop protection

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Crop protection

PURPOSE AND OBJECT OF POLICY

Policy at the subsectoral level lays the groundwork for Swiss Development Cooperation (SDC) policy on crop protection in agriculture. It is at the subsectoral level that the objectives, priorities and principles of crop protection programs and projects are defined. Subsectoral policy helps shape concepts and strategies in SDC agricultural operations at regional and national levels. It is directed at SDC decision-makers and executing agents in Switzerland as well as in developing countries.

Subsectoral policy is primarily confined to crop protection in agriculture, with a particular focus on food production. However, some aspects of the policy can also be applied to post-harvest protection and forest crop protection.

A. THE IMPORTANCE OF CROP PROTECTION

World population will increase by 2.5 billion by the year 2025, and overall food requirements in developing countries will double. More food will have to be produced in ways that generate income for poor rural populations and that also make food affordable to poor people in cities.

Growing demand must be met primarily by increasing production on land already under cultivation (productive and marginal lands), and by reducing post-harvest losses. Efforts to intensify production to meet these objectives

should be sustainable, i.e. they should conserve natural resources and make minimal use of external inputs.

Crop protection¹, - the reduction of losses caused by pests² - is one obvious strategy for increasing the food supply. Pre-harvest and post-harvest agricultural losses are estimated to amount to one-third of potential production. Quality aspects (pest-free and residue-free agricultural products) are becoming increasingly important in light of market liberalization and the importance that many developing countries attach to exports.

High-input biased intensification of agricultural production and less diversified farming systems cause crop protection problems to multiply. Simple solutions which cannot be properly sustained are often applied to pest problems without adequate understanding of underlying causes or of the farming systems involved. New plant varieties with vertical resistance to specific diseases are being widely adopted over large areas. But as pests adapt to and overcome plant resistance, these varieties quickly become less useful and must be replaced by other new varieties. The rapidly increasing and often unskillful use of pesticides in developing countries is proving to be basically unsustainable. It weakens the natural defenses of agro-ecological systems and induces new crop protection problems and forms of resistance; this in turn calls for new active agents and an increased investment of resources. The use of pesticides endangers the health of users and consumers as well as the environment (soil, water). The economic consequences of pesticide use include rising ecological costs, a greater burden on the balance of payments in developing countries caused by pesticide imports, and less effective chemical crop protection for the individual farmer.

Therefore, instead of treating symptoms, it is necessary to try new, primarily preventive approaches that are based on a holistic analysis of causes. Efforts to intensify agricultural production will continue as a result of the need for food security among rapidly growing populations in developing countries. But changes in agricultural systems and in the intensity of land use have impacts on the pest problem. Crop protection aspects must accordingly be

¹ Crop protection includes all measures that help protect cultivated plants and shield harvested products intended for human consumption, either in the field or in storage prior to consumption, and that protect against damage by other organisms and thus against crop loss.

² The term "pest" refers to all organisms that cause crop losses (e.g. insects, fungi, weeds, microorganisms, etc.). The term "pesticide" refers to all products used to control pests (e.g. insecticides, fungicides, herbicides, etc.).

incorporated as an integral part of sustainable efforts to intensify production; they will become even more important in the future.

B. SUMMARY OF EXPERIENCE

Sustainable increases in productivity and sustainable use of natural resources are the primary objectives of SDC agricultural projects. Since intensified use of resources and changes in resource use both have impacts on pest problems, crop protection is a component of all SDC agricultural projects.

Crop protection is always an important part of SDC activities in the agricultural sector, particularly in nationally and regionally important commodity programs (potatoes, beans, millet, maize). To date, emphasis has been primarily on the breeder approach. SDC also supports activities - admittedly few in number but substantial in terms of financial commitment - that focus primarily on crop protection. The starting point in most cases is a pest problem that is important on a regional or supra-regional level, where the main focus is on reduction of crop losses. Implicitly, efforts are also made to achieve ecological goals (preservation of ecosystems, biodiversity, soil, water) and economic objectives (reduction of pesticide imports, reduction of hard currency expenditures). All activities apply to agricultural systems with staple foods that are important to small-scale farmers. Annex 1 gives an overview of crop protection in SDC agricultural projects.

The experiences of SDC and GTZ (German Society for Technical Cooperation) with crop protection were the subject of a joint study. The findings of this study, in terms of the most important strengths and weaknesses of both development agencies, have been classified according to target areas (Annex 2) and type of activity (Annex 3).

Four central problems constitute obstacles to the promotion of economically and ecologically sustainable crop protection:

1. **Boundary conditions are unfavorable.** National policies (subsidies and credits), limited capacity to implement and monitor legislation on pesticides, and the influence of the pesticide trade on decision-makers all favor chemical crop protection.
2. **Ecologically sustainable crop protection strategies are complex.** The application of simple formulas must be replaced by observation, analysis, and situation-appropriate decision-making and action. Farmers need additional knowledge and modified risk behavior. This imposes greater requirements with regard to training and extension services.
3. **Chemical crop protection strategies are assumed to be economical.** Compared with calendar pesticide application, ecological strategies often provide insufficient returns to the individual farmer in the short term. Analyses of economic benefits over several years are seldom made. The long-term costs of chemical strategies at the farm level are poorly understood by farmers, and ecological and health costs are externalized. Moreover, decision-makers have no clear idea of overall economic benefits.
4. **Institutional weaknesses exist.** Conditions are not well suited for developing and propagating more ecological crop protection strategies, owing to a combination of top-down extension strategies and the ways in which research is organized and carried out. Crop protection research is rarely interdisciplinary, seldom has an on-farm focus, and is usually carried out independent of crop management research. There is too little cooperation between crop protection extension services and other extension organizations (governmental organizations, non governmental organizations (NGOs)).

C. POLICY

1. CONCEPTUAL BASIS: INTEGRATED PEST MANAGEMENT (IPM)

The concept of Integrated Pest Management (IPM) is subject to differing interpretations, ranging from simple combination of pesticides with other techniques to ecological habitat management strategies. All actors involved in pest management, from pesticide dealers to ecologically motivated grass-roots NGOs, talk about IPM. A coherent pest management policy presupposes a clear conceptual basis.

SDC regards IPM as a component of sustainable agriculture, which links objectives in productivity with the need to conserve resources. IPM is thus one strategy that farmers can employ to make agricultural production systems more sustainable.

SDC uses the following definition of IPM: "IPM is a strategy that employs every acceptable economic, ecological and toxicological technique available to keep pest populations below economic thresholds. This strategy purposely gives preference to the use of natural regulating mechanisms."

SDC regards IPM, from a developmental perspective and from the viewpoint of farmers, as a process that enables farmers to develop solutions to their own crop protection problems and make situationally appropriate decisions through experimental learning and their own research (supported by research and extension services). The goal is to increase farmers' income and to ensure that it can be sustained over time, and to reduce environmental and health risks. The salient features of the concept are listed below:

- Farmers are the most important decision-makers and shapers of IPM.
- IPM is specific to each situation (in spatial and temporal terms). General principles can be applied, but there are no universally valid prescriptions.
- Crop management is carried out in such a way that economic loss does not occur. Every possible attempt is made to avoid the need to combat pests.
- Principles, decision-making criteria, and concrete options for action are developed and imparted through applied research and extension services.
- Preference is given to methods of biological control, use of varieties with durable resistance (horizontal, multiple resistance), measures that improve agronomic management, and more stable and frequently diversified cultivation systems.
- The use of pesticides is limited. Preference is given to rapidly degradable pesticides and preferably to biological pesticides with narrow-range effects.

2. REASONS FOR SDC'S FIRM COMMITMENT TO INTEGRATED PEST MANAGEMENT

2.1 IPM is consistent with SDC development policy

IPM complies with important principles of development expressed in official SDC guidelines and is consistent with the basic principles of SDC agricultural and environmental programs:

Food security

Preventing and reducing crop losses are appropriate strategies for achieving food security based on domestic foods. Post-harvest protection ensures a decentralized supply of food until the next harvest.

Self-reliance

IPM starts with farmers' knowledge about ecological and economic conditions and about the effects of particular measures. This places greater demands on the agricultural knowledge system and on the farmers as planners. IPM makes use of and strengthens tried and true participatory

approaches, enhancement of local problem-solving abilities, South-South cooperation, and technological cooperation with the North. Developing countries thus become less dependent on imported agricultural inputs.

Support of the poor

When pest management projects focus on food crops or subsistence production, small-scale farmers are the main beneficiaries. Within limits, IPM is especially well suited to small-scale farming because it makes use of on-farm labor and farmers' knowledge instead of purchased inputs.

Environment and health

If deliberate efforts are made to strengthen the natural defenses of ecosystems, it is likely that there will be little or no need for chemical inputs to manage pests. Soil and water pollution from toxic substances will thereby be reduced, biodiversity can be maintained, and disposal problems with unused chemicals can be avoided. Moreover, the health of both crop producers (risks in pesticide use) and consumers (less chemical residue in food) will be safeguarded.

2.2 IPM is a concept of the future

SDC policy needs to take account of expected developments at the global level. The following projections are based on current trends:

International boundary conditions

Sustainable agriculture and the linkage between increasing productivity and conserving the environment are central concerns in different international agreements (Agenda 21) and international organizations (CGIAR³, FAO). Sectoral agreements, codes of conduct, guidelines (PIC, (Prior Informed Consent) London Guidelines), and self-imposed standards of conduct devised by industry will have greater impacts in the future and will create better conditions for IPM.

National policies

IPM will become national policy in many developing countries. Structural adjustments will lead to reductions in pesticide subsidies. It is unclear whether structural adjustments will lead only to a reduced role for the state, or whether they will also produce a needed strengthening of official state functions in areas like crop protection and pesticide legislation, and related

³ CGIAR = Consultative Group on International Agricultural Research

enforcement and control. The liberalization of agricultural markets and export opportunities are creating incentives for residue-free products and more ecological production methods. Growing environmental awareness and the active involvement of NGOs emphasize the need to implement IPM policies.

Donor policies

Development agencies and development banks will adopt IPM as their own policy. More environmentally sound pesticide management, promotion of alternative strategies to manage pests, and greater reluctance by donors to finance pesticide deliveries are trends that will become more important as a result of the greater priority now being given to environmental objectives. Many donors will invest greater resources in programs offered by private operators and concerned with pesticide management for cash crops. There is a danger that IPM will be neglected in subsistence farming because it is a public responsibility heavily dependent on external support.

The role of the private sector

Pest management for cash crops will become increasingly privatized through the engagement of consulting firms that focus on IPM primarily for business reasons. Parts of the private sector will shift from the sale of products per se to the sale of IPM systems with service support, as a result of which biological pesticides and IPM-compatible pesticides will gain in importance. Synergies and opportunities for cooperation with industry can be expected. On the other hand, suppliers in emerging countries with inferior products not subject to environmental regulations will exploit their competitive advantage to gain market share.

Technology

Resources are increasingly being poured into genetic engineering, producing IPM component technologies (resistant varieties, biological pest management). The main contribution of research, however, will come in the form of a better understanding of the complex interrelationships in agroecosystems and the development of decision-making tools and options for action.

3. SDC OBJECTIVES AND PRIORITIES

SDC's main objective is to promote economically and ecologically sustainable farmer-managed pest management strategies in order to improve and stabilize yields. This will help to maintain and promote sustainable, diverse and productive farming systems.

SDC support for pest management is based on the concept of Integrated Pest Management (IPM) because IPM links production objectives with environmental objectives and is fundamentally concerned with strengthening local capacities for problem-solving and empowering farmers. It also promotes human health.

Small-scale farmers are the main target group. The main target area is food crops in rainfed and irrigated production systems. Priorities are:

- A. Promoting improved and promising IPM strategies that can be easily understood and implemented by farmers
- B. Strengthening public-sector research and linkages to other actors
- C. Assisting developing countries to formulate and implement national pest and pesticide management policies
- D. Supporting regional and supra-regional programs in strategically important areas
- E. Improving coordination of international support measures
- F. Helping to formulate an accountable Swiss pesticide policy

4. PRINCIPLES

The principles below should be understood as general guidelines. Principles 1-11 relate to the selection and the focus of bilateral pest management activities, either as a part of broad-scope agricultural projects or as independent subsectoral projects. These principles must be adapted to local conditions in all cases. The remaining principles deal with the focus of international projects and with Switzerland's responsibilities. Principles specifically concerned with reducing pesticide use focus on the objectives of the special Swiss funding mechanism to support developing countries in solving environmental problems of global significance.

PROMOTING IMPLEMENTATION OF IPM (PRIORITY A)

1) Farmers should receive benefits in the short term

In principle, IPM concepts can be applied anywhere. SDC activities should be initiated selectively wherever significant economic benefits can be expected at the farm level. This will inevitably involve two different situations. One situation involves traditional cultivation systems and subsistence crops where pests regularly cause considerable crop losses. The other situation involves pesticide-induced crises caused by high-input biased intensification, where farmers are continually forced to increase the amount of pesticides they use in order to maintain yield levels. Priority is also given to measures that affect what farmers consider to be their main crops, and which also show promise of success in the short term, in order to build consensus in favor of IPM.

2) Concentrating on situations with favorable preconditions

A thorough review should be conducted at the project planning stage to determine if the following prerequisites, which are necessary for successful implementation of IPM, are present:

a) There should be no incentives inimical to IPM, such as easy availability of subsidized pesticides or credit programs that are biased towards input-oriented technology packages. At the very least, the legislative framework should not constitute a hindrance to IPM.

b) Interest in IPM should be present among farmers' organizations, local officials, and traditional authorities. Participant analysis should be carried out to make a realistic determination of interest and power relationships.

c) Solid, research-based knowledge must be present with regard to the following: the economic significance and dynamics of pests; interactions between crops, pests, natural regulating mechanisms and crop management techniques; and promising alternatives for action. Such knowledge is the foundation for the always-necessary site-specific research carried out in cooperation with farmers.

3) Farmer-managed decision-making tools

Farmers should be assisted in developing their own simple criteria for pest management. Economic damage thresholds expressed in quantitative terms are seldom appropriate for small-scale agriculture. Researchers and extensionists must support farmers in such a way that they can establish proper decision-making criteria (simple qualitative indicators) by themselves. Government warning systems are rarely appropriate and are seldom sustainable.

4) Striving for gradual improvement

IPM does not require radical changes in farming systems; it always begins with local agricultural practices. Improvements should be made wherever farmers see the greatest need for improvement. There are many examples which show that simple measures with tangible benefits for farmers can be introduced on the basis of an overall analysis, and thereby serve as a starting point for additional measures. For example, measures that promote soil fertility may improve resistance capabilities in plants. Or restrictive use of pesticides might constitute the first step in regenerating natural regulating mechanisms in the ecosystem.

5) Enhancing farmers' knowledge

Small-scale farmers understand and employ many practices (crop rotation, traditional pest management methods, diversity of species and varieties, sound plant nutrition) that are components of IPM. But they are not experts in perceiving the full dimensions of the pest problem, in understanding natural regulating mechanisms, or in pesticide application, which is often associated with modernism. IPM requires farmers to be more observant and more analytical, and to be able to adopt measures suitable to their needs in each situation. Participatory research, experimental learning (e.g. in farmer field schools), and teaching farmers to teach others are the strategies preferred to achieve these aims. These strategies should always include both

socioeconomic aspects (e.g. risk assessment) and biological aspects (e.g. recognition of pests, beneficials, relationship between economic damage and pest incidence).

STRENGTHENING PUBLIC-SECTOR RESEARCH (PRIORITY B)

6) The need for greater public commitment

Chemical methods of pest management are developed and promoted by the private sector, but developing alternative strategies requires research financed by the public sector as well. This is especially true of IPM applied to food crops in small-scale agricultural systems. Privately funded research on IPM is much more likely in the case of export crops. IPM is in the public interest and is worthwhile in overall economic terms, i.e. when ecological and health costs are considered. Over the long term, public resources will be used more effectively if they are applied to programs that promote IPM rather than being used to subsidize pesticides. In the short to medium term, developing countries will need external financial support. SDC supports governmental IPM programmes on a selective basis, on the condition that they are rooted in agricultural policies conducive to IPM.

7) Promoting farmer-oriented approaches

Research programs should always be conceived so as to include a participatory diagnosis of problems and potentials from the farmers' point of view and should, from the very outset, contain an implementation component. Funding for research programs should be contingent upon the inclusion of farmers and/or intermediary organizations to plan and control research. Pest management research has traditionally been a domain dominated by entomologists and pathologists. In an effort to make IPM research more relevant to farmers, SDC will promote cooperation in present and future programs among agronomists, breeders and extensionists, making a particular effort to include social scientists. It will encourage flexible forms of interdisciplinary cooperation without creating donor-driven project islands.

8) Fostering exchanges and inter-institutional cooperation

Greater dialogue among the most important sectors active in crop protection (research, crop protection services, private and public extension services, industry) is needed to achieve conceptual clarity, establish common priorities and coordinate different measures. This will require support for

national IPM fora, inter-institutional project steering mechanisms, inter-project coordination, and workshops.

STRENGTHEN NATIONAL POLICY-MAKING (PRIORITY C)

9) Improving the policy relevance of IPM programs

Successes and benefits in IPM programs need to be measured, presented in understandable terms, and disseminated. Indicators of success, such as cost-benefit ratios, and reduced pesticide use and corresponding risk reduction, should always be taken into account in project monitoring. Negative impacts of pesticides on beneficials, development of pesticide resistance, and the consequences of the pesticide treadmill must also be assessed in ecological and economic terms. The target public in this case does not just include decision-makers at the national level; in many countries it also includes opinion-makers at the level of the kinship group, the village or the district.

10) Strengthening the role of the government

If pest management is to be environmentally sound, national governments will have to be encouraged to assume particular responsibilities. These will include responsibilities with regard to laboratories (to control the composition of pesticides and residues in food products), regulatory mechanisms (legislation and enforcement), and monitoring and risk assessment procedures related to pesticides (environmental and health impacts). Programs that regulate the use and application of pesticides must be institutionally established at a high level and enjoy wide support in order to be effective. SDC supports sectoral adjustment measures and bilateral actions to achieve this end, provided that they are part of a politically well-grounded overall concept.

11) International conventions and standards as a benchmark

The FAO Code of Conduct for the Distribution and Use of Pesticides, and the London Guidelines are regarded as a good foundation for policy at the international level by all parties concerned (government authorities, industry, NGOs). Developing countries must have the structures, know-how, access to data banks and information necessary to implement these international agreements effectively. SDC supports measures that will help developing countries implement international agreements and that will also facilitate their participation in international policy dialogue.

REGIONAL AND INTERNATIONAL COOPERATION (PRIORITIES D AND E)

12) Promoting South-South and North-South cooperation

The search for solutions to major regional and supra-regional problems with pests requires international cooperation. Collaborative networks and regional programs are both appropriate and cost-effective. There is a great need for cooperation with specialized institutions in the North - if possible in Switzerland. In the case of classical biological control, this cooperation is a definite prerequisite. SDC supports programs such as these that emphasize three strategic areas:

1. Breeding in the framework of IPM to achieve durable resistance;
2. Classical biological control of exotic pests;
3. Development of non-chemically based strategies to control large-scale pest problems (e.g. grasshoppers / locusts).

13) Accumulating and exchanging experience with IPM

IPM is not widely used in agricultural practice in developing countries. There is a need to summarize experience with IPM and disseminate it in a user-friendly manner in order to give IPM greater international visibility. In exchanges of experience at the international level, it is important to take account of extension services, training services, and decision-makers in order to avoid restricting participation in such exchanges only to specialists or researchers. Workshops and papers that present syntheses are suitable means for this purpose.

14) Coordination of donor policies

Greater harmony is needed among donor programs at the national, regional and international levels. There is a particular need to clarify confusion over what is meant by IPM. SDC accordingly supports initiatives such as the IPM working group in CGIAR and the proposed creation of an IPM facility (FAO, UNEP⁴; UNDP⁵, World Bank). Moreover, there is an increased need to coordinate policies on pesticide donations (for which the OECD⁶ would be the appropriate forum), as well as programs to control pests that have supra-regional effects (grasshoppers / locusts). SDC supports only

⁴ UNEP = United Nations Environment Programme

⁵ UNDP = United Nations Development Programme

⁶ OECD = Organisation for Economic Cooperation and Development

programs that are coordinated at the appropriate level and thus have a complementary effect.

THE RESPONSIBILITY OF SWITZERLAND (PRIORITY F)

15) Implementing environmentally acceptable pesticide policies in all SDC programs

SDC exercises self-restraint in the use of pesticides in all development cooperation activities (e.g. rural development projects, revolving funds, credit programs). Under no circumstances does it finance, directly or indirectly, the acquisition or use of class 1a and 1b pesticides banned by WHO⁷ or chlorinated hydrocarbons.

16) Contributing to Swiss pesticide policy that affects developing countries

SDC is not directly responsible for formulating and implementing pesticide policies. However, the following objectives are among those pursued by SDC in policy discussions and reviews:

- Alternatives to pesticides should be given preference in balance of payments assistance measures and in Stabex financing. When there are no alternatives, only selective pesticides compatible with IPM should be considered.
- Recognized environmental criteria should be applied as a condition for granting export risk guarantees (Swiss ERG).
- Observance of the currently voluntary FAO Code of Conduct should be made mandatory by law.

SDC will engage in dialogue and exchanges of experience with industry, and is willing to collaborate in developing and distributing biological pesticides, and to assist in formulating responsible pesticide policies for developing countries.

⁷ WHO = World Health Organisation

5. SDC PARTNERS

Contact with all relevant actors is maintained in partner countries where SDC finances crop protection projects. Governmental institutions are SDC's main research partners. The linkage between research, extension and education is a central feature of IPM programs, although selection of the main partner will depend on local circumstances. Cooperation with NGOs and farmers' organizations is actively encouraged.

At the international level, SDC supports programs carried out by research and development organizations (CGIAR, FAO, CABI⁸) on the principle of subsidiarity. SDC participates in international exchanges of experience.

SDC does not act as the sole executing agent for projects which focus primarily on crop protection. The execution of such projects is commissioned to institutions with the necessary conceptual and technical know-how. SDC's role is concerned with ensuring that crop protection projects are compatible with development policy.



SDC makes use of experts and specialized Swiss institutions (Swiss Federal Institute of Technology, research institutes) for conceptual support.

⁸ CABI = Centre for Agriculture and Biosciences International

Annex 1: Crop protection in SDC agricultural projects 1994

	areas of activity				operational priorities		
	Pre-harvest pest management		Post-harvest management	Pesticide control	Re-search	Extension	Education
	Pests	Diseases					
A) REGIONAL/INTERNATIONAL							
Biocontrol IITA, Africa	*						
Grasshoppers, Africa	*						
Pestnet IRRI, Asia							
ICP-FAO, Asia							
PRM-Maize, Central America							
Profrijól Beans, Central America							
PRECODEPA Potato, Central America							
PROFRIZA Beans, Andes mountains							
ROCAFREMI millet, Africa							
Great Lakes Beans, Africa							
Postcosecha, Central America							
B) NATIONAL / LOCAL							
PLI, Madagascar							
Phytopharmacy, Madagascar							
MIP-EAP, Nicaragua							
PROINPA Potatoes, Bolivia							
FORTIPAPA Potatoes, Ecuador							
SEINPA Potatoes, Peru							
Potatoes, Pakistan							
Potatoes, Nepal							
Potatoes, Bhutan							
Fruticultura, Ecuador							
Rice, Laos							
BASWAP P/harv.pest man.Bangladesh							

Bold-face type: crop protection projects
Normal type: projects that incorporate crop protection

 = very important
 = important

Protection des végétaux

—* = biological pest control

Annex 2: Experiences with crop protection, classified according to target areas

Target area	Strengths	Weaknesses
Production/ Productivity	Reduced harvest losses; higher yields	Sustainability partially threatened by policy measures or changes in cultivation system
Ecology	Natural regulating mechanisms strengthened; less soil and water pollution by toxic substances	Results difficult to quantify; no long-term monitoring; returns to farmers and partners not sufficiently clear
Technology	Successful technology transfer; optimal use of complementarities; comparative advantages for different institutions (North and South)	Failure to adjust in some cases due to excessive complexity and lack of pragmatic approaches Too little attention given to socio-cultural aspects and traditional PS strategies
Institution-building / institutionalization	Development of local capabilities; increased acceptance of IPM/biological control at all levels; local problem-solving capacity created in some areas	Research links to general extension service and crop management programs often weak; structures tend to be too highly disciplined; project islands sometimes created
National economy	Less dependence on imports (food, crop protection agents) accompanied by corresponding hard currency savings	Indirect economic returns (ecology, health) that are difficult to perceive Greater burdens on public services
Disadvantaged population groups	Small-scale farmers are main beneficiaries when IPM is applied to food crops and subsistence farming	Gender effects uncertain (e.g. post-harvest management, weed control)

Annex 3: Experiences with crop protection, classified according to type of activity

Activity	Strengths	Weaknesses
Classical biological control	Durable effect; highly profitable in long term; minimal ecological risks; promotes North-South technological cooperation; partially self-sustaining	Investments at risk (success difficult to gauge, high research costs); not widely applicable
Integrated pest management (research)	Success most apparent in pesticide-induced crises; educates policymakers; often has indirect impacts (prevents unnecessary pest control measures); promotes interdisciplinary cooperation	Approaches often too specialized; socio-economic aspects ignored; unclear concepts and varying interpretations; competing ideas; institutionalization difficult
Crop protection extension service	Successful implementation of simple concepts; improved selection and application of pesticides; crop protection research more closely related to implementation	Detached from general extension service; extensionists have little knowledge of IPM; structures sometimes difficult to sustain (warning systems); often overly dependent on pesticides.
Post-harvest management	Generates income (farmers, craftsmen); strengthens farmers' market position; clear, simple activities	Difficult to reach smallest farms; communal management of agricultural stocks restricts women's control over food
Pesticide control, residue analysis	Creates market transparency; eliminates "black sheep" (dealers); benefits agricultural exports; prerequisite for IPM	Carried out at too low an institutional level to influence policy; difficult to implement results based on control; biological inputs excluded; long-term financing uncertain

Annexes

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