UNITED
NATIONS

DP

Governing Council
of the
United Nations
Development Programme

Distr.
GENERAL

DP/PROJECTS/REC/19
7 April 1986

ORIGINAL: ENGLISH

Thirty-third session
2-27 June 1986, New York
Item 5 (b) of the provisional agenda

PROGRAMME PLANNING

COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

Assistance for a global project

International Centre of Insect Physiology and Ecology - Field Testing and Demonstration of Integrated Pest Management Strategies (GLO/86/001)

Recommendation of the Administrator

Estimated UNDP contribution:	$6 000 000
Duration:	Four years
Executing Agency:	UNDP

I. BACKGROUND

1. The International Centre of Insect Physiology and Ecology (ICIPE) was established in Nairobi, Kenya, in 1970, on the initiative of a group of eminent entomological scientists. It aims to provide a resource base for fundamental studies on insect physiology and ecology of world-wide economic importance. ICIPE fulfils two major functions:

/...

(a) The creation of an institution unique in its cultural, educational and scientific aspects, where a diversity of scientific talent from developing and developed countries can pursue advanced research under the guidance of eminent scientists, making maximum use of the natural and human resources of developing countries; and

(b) The dissemination of basic knowledge of the biology of several groups of pests important in many developing countries. Such knowledge is essential to permit these countries to develop practical integrated pest control systems which will minimize the economic damage of insecticide residues on human population and their environment.

2. Since 1972, UNDP has been assisting ICIPE in its research and training programmes. The general objectives of the current project are:

(a) To continue to seek new knowledge that will lead to the development of long-range, effective and environmentally acceptable pest management techniques;

(b) To continue to collaborate closely with the international agricultural research centres, and to strengthen the co-operative linkages of ICIPE with the national programmes in tropical countries and applied research institutions, in order that ICIPE research results can be incorporated effectively into experimental and pilot schemes for pest control; and

(c) To help build up human resources in the field of pest management research and practice in Africa and other tropical regions through training and study workshops.

3. The research under the UNDP project is concentrated on the following crop insect pests that affect crop and livestock and, in some cases, human beings: tsetse flies; African armyworms; mosquitoes; ticks; foraging termites; sorghum shoot flies; cereal stem borers; and grain legume pod borers. The tsetse fly causes human sleeping sickness in 26 African countries, and animal trypanosomiasis in over 11 million square kilometres in Africa. Without the tsete, an additional 1.5 million tons of meat could be produced each year. The brown ear tick causes East Coast fever, kills as many as half the calves in many parts of Africa and causes large numbers of cattle to suffer ill health. The anopheles mosquito causes malaria, affects an estimated 100 million people and causes one million deaths a year in Africa alone. The sandfly transmits leishmaniasis, causing debilitation and death among an estimated 400,000 people a year in parts of Africa, the Arab States and Latin America. The stem borer and the African armyworm destroy subsistence crops such as maize, millet, cowpeas, sorghum and rice. As virtual epidemics of these pests often occur, emergency control measures are frequently resorted to, in the form of synthetic insecticides. Though temporarily effective, these measures are very costly and contaminate the environment. Moreover, the target pests and vectors often develop resistance to the insecticides.

4. From the foregoing description, it is evident that the work of ICIPE, which is being financed by UNDP, supplemented by contributions from a group of other donors, transcends the boundaries of research on human, animal and plant pests and diseases. In the last eight years, ICIPE has grown into a first-class scientific research institution, internationally recognized and respected. While many of the pests and diseases problems have been the object of practical eradication and/or control measures by various national, regional and international organizations for several decades, no simple methods of control are available. Therefore, ICIPE has had to adopt a different strategy to what appear to be intractable pest problems. First, it has brought together, within a single intellectual and scientific environment, a multiplicity of disciplines and specializations, many of which were not traditionally associated with entomological research: plant host-insect relations; sensory physiology; chemical communication; pheromonal physiology; epidemiology; insect immune mechanisms; the basis of plant resistance to insect attack; insect population modelling; insect pathology; as well as the more traditional entomological studies. These specializations have all concentrated on the target species, in an attempt to make breakthroughs for innovative pest management technologies without the already known drawbacks of chemical approaches to insect control. Second, it has adopted an open strategy for each of the target insects. In each case, ICIPE is exploring lines of study which hold promise as new avenues for pest management. Third, while not neglecting short-term tactics for pest control, ICIPE has not felt compelled to devote most of its resources to fire-fighting efforts which might result in short-term control of pest outbreaks.

5. Some of the significant research results obtained at ICIPE to-date are:

(a) The establishment of several methods for controlling sorghum shootfly which, when employed together, will significantly reduce crop loss;

(b) Identified maize genotypes which are resistant to stem borers;

(c) The discovery that a variety of cowpea developed by the International Institute of Tropical Agriculture in Nigeria repels the cowpea borer with natural chemical deterrents;

(d) The discovery that the oil of a common African shrub has an active pest-repellent component and might serve as a natural means of preserving stored grain in villages;

(e) The development of a sandfly-trapping technique useful for monitoring populations and of potential value for controlling flies in villages;

(f) The development of tick resistance in laboratory animals by inoculation with tick tissue;

(g) The isolation, identification and synthesis of a tsetse mating

stimulant which might be useful in attracting male flies to traps;

(h) The discovery of virus-like particles in tsetses that may cause sterility.

6. Through its African Regional Postgraduate Programme in Insect Science (ARPPIS), which trains personnel for scientific leadership in pest management in tropical developing countries, ICIPE has established a successful model of co-operation among developing countries. ARPPIS is a collaborative Ph.D. degree programme between the ICIPE and African universities. At present 12 universities are participating in ARPPIS; it has 24 Ph.D. students from 9 African countries at this time, with a schedule of admitting up to 8 new Ph.D. students every year, while a similar number complete their studies each year.

7. ICIPE research programmes are closely linked with the work of such international centres as the International Laboratory for Research on Animal Diseases (ILRAD), the International Institute of Tropical Agriculture (IITA), the International Rice Research Institute (IRRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Maize and Wheat Improvement Centre (CIMMYT), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) Tropical Diseases Research Programme, the West African Rice Development Authority (WARDA) and a number of national institutions in both developing and developed countries.

8. On account of the sustained long-term support and encouragement of UNDP, a number of bilateral and multilateral donors have increased their financial support to ICIPE, recognizing the importance of ICIPE research in developing pest-management systems for the developing world. Thus, in addition to directly financing ICIPE, UNDP has been instrumental in encouraging the support of other donors. Recently, UNDP assisted in the establishment of a consortium of bilateral and multilateral donors for ICIPE called the Sponsoring Group for ICIPE (SGI). SGI helps to assure continuity of donor support. The World Bank provides SGI with secretariat services.

9. The results and accomplishments of ICIPE were critically evaluated in January 1986 by a UNDP-commissioned consultant mission consisting of two prominent scientists. This mission, in speaking very favourably of the progress of the UNDP project at ICIPE as a whole, strongly recommended the continuation of UNDP assistance for a further four-year period to consolidate and expand current research and training in key areas which have shown promise for application at the level of the small farmer.

II. THE PROJECT

10. The general objectives of the project are to:

(a) Conduct large-scale demonstrations, with national programmes and relevant international research centres in varying ecological zones, of the

integrated control of crop borers of maize, sorghum and cowpea and of the biological control of livestock ticks;

(b) Incorporate newly discovered attractants from natural products, in the control of the tsetse fly at the village level;

(c) Conduct ecological studies of the sandfly to facilitate its control and provide an understanding of the epidemiology of the disease vectors in collaboration with national health authorities;

(d) Provide training for scientific leadership in pest research and development work in Africa through the African Regional Postgraduate Programme in Insect Science (ARPPIS) based at ICIPE; and

(e) Develop mechanisms at the regional level for the exchange of pest management research information.

11. The research undertaken by ICIPE thus far has yielded highly significant pointers for innovative pest management pathways which need intensified investigations and development. This project will focus mainly on these facets. It will also undertake demonstrations of the different components once they are combined into coherent integrated pest management strategies, for the crop and livestock pests and disease vectors mentioned above. Within these objectives, the project activities will be carried out under the following three categories.

A. Research and development

Crop pests

12. Crop pests research will be conducted to:

(a) Investigate resistance of varieties to crop borers;

(b) Evaluate traditional cropping patterns in different ecological zones;

(c) Identify and test natural biological control agents for crop borers;

(d) Evaluate the socio-economic basis of various pest management strategies;

(e) Prepare an integrated package of control strategies for field testing; and

(f) Collaborate with national programmes in selected countries to demonstrate the feasibility of these integrated pest-management methods for farmers with poor resources.

Livestock tick research

13. Livestock tick research will pursue two approaches for controlling ticks. The first will look at the indirect immunity of cattle to tick population, thus making cattle more tolerant to tick attacks. The second will isolate and characterize antigens, produced in cattle, that are detrimental to tick growth and development. In both cases field trials will be conducted with national programmes in selected African countries to determine feasibility of integrated control methods.

Tsetse fly research

14. Tsetse fly research will continue to improve trapping methodology by incorporating a newly discovered attractant chemical found in buffalo urine. This trap will be evaluated at village levels for tsetse population suppression and monitoring. The general aspect of this work will be to complete the population model in order to provide assistance to national programmes in routine surveillance of the tsetse fly.

Sandfly vector research

15. Research on sandfly vectors of leishmaniasis will continue to:

(a) Locate and evaluate breeding sites;

(b) Identify sandfly sperms and their ability to carry disease;

(c) Determine wild animal reservoirs; and

(d) Identify and monitor leishmaniasis in Eastern Africa in collaboration with national health authorities for the purpose of strategic planning for sandfly control.

B. Training

16. Training in methodologies and practices developed by ICIPE wil be given to selected young scientists at the post-doctoral and pre-doctoral levels, in order to establish a critical mass of scientific leadership in selected tropical developing countries. In this regard, ARPPIS is a major mechanism for developing scientific leadership in pest management in Africa.

C. Collaboration

17. Ongoing collaboration will be strengthened under the African Regional Pest Management Research and Development Network (PESTNET). The national programmes initially selected for inaugurating this network include those of Kenya, Uganda, Tanzania, Malawi, Zimbabwe, Burundi, Rwanda, Somalia, Sudan and Ethiopia, together with relevant international centres. A planning workshop held in October 1985 with selected countries in Africa, established PESTNET

projects for two fields: crop borers and livestock ticks. PESTNET has the following objectives: (a) the generation of scientific information and methodologies which can be adopted in pest management within Africa; (b) the exchange of scientific information and experience between participating institutions; (c) the testing of methodologies, technologies and their validation in different ecological zones; and (d) the training, at different levels, for developing scientific leadership in Africa in pest management.

D. Research support services

18. ICIPE currently operates four support research units for chemistry and bio-chemistry, histology and fine structure, sensory physiology, and bioassay. In addition, the following units have been established: insect and animal breeding; field stations (at Mbita Point, Muhaka and Kajiado); outreach management; workshops in areas such as electronics, mechanics, woodworking, glass-blowing; laboratory management; and library and documentation. Some of the laboratories listed above are reasonably well-equipped, with modern scientific apparatus and equipment which play a significant role in fundamental and applied research at ICIPE. Items of equipment including field vehicles, now requested from UNDP, will supplement those already available and will be used to meet the specific needs of the research and hold programmes enumerated above. None of the funds requested from UNDP will be used for capital costs.

19. The Administrator intends, through contractual arrangements between ICIPE and UNDP, to entrust the implementation of this project to ICIPE with the clear understanding that the Directorate of ICIPE will seek the advice of the Food and Agriculture Organization of the United Nations (FAO) on technical aspects of the project. In consultation with FAO and other concerned agencies, UNDP will make a concerted effort to link the activities to be undertaken at the country and intercountry levels. A review of all ICIPE research and training programmes is made each year at the annual research conference in June, when practical and urgent questions of pest control receive the careful attention of scientists. This review is of crucial importance in view of the participation of ICIPE consultants, collaborators and scientific representatives of UNDP and international and African agencies and institutions with particular interest in the work of ICIPE. Additionally, in order to assess and advise ICIPE on its programmes of work, particularly as to the emphasis to be given to reach, training and demonstration activities during the project period, each year ICIPE will invite representatives of UNDP, UNEP, the specialized agencies of the United Nations family, donor agencies, African scientific institutions and the international research centres to participate in the open meetings of the ICIPE Governing Board and its Programme Committee, as it deems appropriate. Furthermore, the Support Group for ICIPE, referred to in paragraph 8, commissions a full-scale review once every three years.

20. Towards the completion of the project, consideration will be given for mounting a thorough evaluation of the project by a UNDP-appointed team of

independent and prestigious consultants to assess project results and accomplishments. Such an assessment will not be needed if the SGI review takes place as scheduled.

21. As indicated above, UNDP funding has acted as a catalyst for marshalling support from other donors. In earlier years, the UNDP contribution accounted for as much as 64 per cent of the total operating budget. At present, it accounts for 25 per cent of the budget. On the whole, UNDP assistance has sustained the development of ICIPE into a stable institution; more importantly, however, it has enabled the Centre to undertake research in those areas with long pay-off periods: those returns are now beginning to accrue as components of integrated pest control for the benefit of small farmers.

22. The proposed UNDP contribution is $6 million, of which $5,542,000 will be for sub-contracts, while direct costs will account for the remaining $458,000.

III. RECOMMENDATION BY THE ADMINISTRATOR

23. The Administrator recommends that the Governing Council approve this project.
