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PROGRAMME PLANNING

COUNTRY, INTERCOUNTRY AND GLOBAL PROGRAMMES

Assistance for a global project

Development of Efficient and Environmentally Acceptable Tsetse  
and Tick Control Technology for the Developing Countries of the  
Tropics - the International Centre of Insect Physiology and  
Ecology (ICIPE) (GLO/90/006)

Recommendation of the Administrator

Estimated UNDP contribution:	\$6,200,000
Duration:	Five years
Executing agency:	UNDP in association with World Bank and FAO

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 serves as a resource base for fundamental studies on the physiology and ecology of insects of world-wide economic importance. ICIPE brings together diverse scientific talents from developed and developing countries to pursue advanced research under the guidance of eminent scientists, making maximum use of the natural and human resources of developing countries. By providing basic knowledge of the biology of several groups of pests important in many developing countries, it enables them to develop practical integrated pest

control systems which will minimize the economic damage of insecticide residues on human populations and their environment.

2. Since the early 1970s, the United Nations Development Programme (UNDP) has been assisting ICIPE in its research and training programmes. The general objectives of the current project are to:

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

(b) 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;

(c) 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 continued financial assistance of UNDP is helping to support ICIPE in the further development and dissemination of information gained on pest biology and ecology for better pest management. The primary focus of the ongoing project is placed on the application of research results for the benefit of small farmers. Thus far, ICIPE research has pointed out some significant paths for innovative pest management which need intensified investigation and development. This project 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.

4. Over the years, ICIPE has made substantial progress in the understanding of the biology and ecology of major insect pests in tropical Africa. It is now recognized as a respected international scientific institution, staffed predominantly by African scientists. The information generated by ICIPE scientists has been utilized for the establishment of a network in several African countries where field trials are being conducted in collaboration with national scientists.

5. Through the use of integrated pest management (IPM) strategies, ICIPE has now demonstrated the potential for a viable, sustainable management of two of the major vectors of the livestock diseases in the tropics: tsetse flies and ticks. Studies on tsetse ecology and behaviour, particularly host-seeking behaviour, have led to the development of an odour-bait trapping technique whose pilot trial results are impressive: 90-99 per cent population suppression of one of the major tsetse species. This trap technology has proved to be of great utility among livestock-keeping communities in the areas where it is applied with their participation. In addition to being technically efficient, this tsetse super trap is cheap, easy to make and environmentally sound. Further, studies on population dynamics, tsetse reproductive biology and disease-vector/animal-host relationships are likely to lead to an improved trapping efficacy with a consequent decrease in the transmission of trypanosomiasis.

6. The research thrust on ticks, to date, has clearly demonstrated the feasibility of an integrated tick control methodology that makes use of ecological, immunological, and tick population dynamics as well as disease-vector/animal-host relationships and traditional livestock management knowledge. A major component of this strategy has been to demonstrate the feasibility of host vaccination as a major means of achieving tick control. Thus far, considerable progress has been made towards the development of an anti-tick vaccine which, together with ecological (including population modelling), biological and traditional management-based strategies, is intended to contribute significantly to efforts being made by other institutions in the domain of tick management. This integrated approach holds great promise, particularly in view of the advances being made in research on vaccines and drugs against the disease by institutions such as the International Laboratory for Research on Animal Diseases (ILRAD) and others.

7. In the area of human resource development, UNDP support has been instrumental in ICIPE's successful education and training programmes. At leadership level, more than 30 students from 9 different countries in Africa have completed Ph.D. training through the African Regional Post-graduate Programme in Insect Science (ARPPIS) and returned to serve in the universities or research institutions. More than 460 scientists from 41 countries in Africa, Asia and South America have benefited from specialized group training courses on new advances in insect science and pest management. In addition to these, ICIPE has, since 1973, organized more than 30 scientific meetings attended by more than 2,000 participants from all over the world. Through exchange of knowledge, these meetings have contributed towards better understanding of insect pest problems in the tropics.

8. The project being proposed will build on these achievements as it pursues the twin goals of interactive technology development and application and human resource capacity-building. The previous UNDP-supported projects at ICIPE provided a wealth of scientific knowledge of significance to the conservation of the environment, while for this project the accent will be on joint technology "testing" and development with the users, with greater focus on tsetse and tick control technologies.

## II. THE PROJECT

9. In order to achieve the long-term goal of increased livestock productivity, this project seeks to reduce the incidence of both tsetse-transmitted and tick-borne diseases through sustainable vector control. Thus the specific objectives of this project are:

(a) For tsetse: to improve the efficacy of the tsetse super trap; to prevent re-invasion of tsetse into controlled areas; to develop a reliable intelligent geographic information system (IGIS) for use in the monitoring of tsetse movement and population dynamics; and to undertake socio-economic studies;

(b) For ticks: to develop an anti-tick vaccine; to investigate the potential of the "anti-tick pasture" concept and tick trap; to develop dragon-flies and indigenous chickens as biocontrol agents and to develop a mathematical tick populations model;

(c) To strengthening the scientific capability of the national agricultural research and extension services of collaborating countries through training and interactive research.

10. As ICIPE continues to translate the large body of accumulated knowledge into technology, mission-oriented basic research will continue to play an important role in providing backstopping support in specialized areas of research and development. At present, four research units provide this crucial support: Chemistry and Biochemistry, Sensory Physiology, Cell Biology, and Biomathematics. Additionally, the Social Science Interface Research Unit provides a framework for a participatory approach in the process of technology design, from development to application.

11. Experience during the past several years at ICIPE has attested to the crucial role of this network of research support units within ICIPE in helping to provide special insights in programme research problems and assisting in the development of innovative technologies for pest management. Further, the structure embracing core programmes and support units brings together a multidisciplinary team of scientists in which programme research interacts closely and continuously with chemical ecology, cellular and molecular biology, sensory physiology, arthropod behaviour, and development of appropriate insect pest management.

12. During the next five years, ICIPE intends to strengthen the interactive research and training thrust through at least five elements:

(a) Wider interactive network activities which will be facilitated by the ICIPE-sponsored Pest Management Research and Development Network (PESTNET) within Africa, Asia and South America;

(b) Leadership training in insect science and pest management, to be implemented by the very successful and innovative ARPPIS, based at ICIPE;

(c) Post-doctoral research fellowship programmes as well as research "associateship" and professional fellowship schemes;

(d) Research management training to be implemented through the ICIPE-sponsored Financial and Administrative Management of Research Projects in Eastern and Southern Africa (FAMESA);

(e) Specialized group training courses for practitioners and front-line staff from national agricultural research and extension services.

13. ICIPE will continue and extend its co-operative research and development activities with ILRAD, the International Livestock Centre for Africa (ILCA), the United Nations Environment Programme (UNEP), the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA) and national programmes in Africa, Asia and South America. Similar training programmes will be expanded beyond Africa to increase the participation from Asia and South America.

14. In addition to these activities, it is envisaged that information documentation and exchange will constitute an important instrument of training and co-operative linkages. It is for this reason that PESTNET plans, during the five-year project period, to establish a regional pest management and information systems service as an information exchange mechanism.
15. The ICIPE Governing Council is advised by the Programme Committee on scientific policy. The Programme Committee reviews annually, at the annual research conference, the progress of research and training activities. Representatives of UNDP, FAO, WHO, IAEA and UNEP as well as national programmes and other donors are usually invited to the annual research conference to review the progress of research and its impact and to advise on future research thrust. Internally, ICIPE monitors the progress of each research project by annual staff peer reviews and more importantly through internal research review by external assessors. The Support Group for ICIPE (SGI), which is a consortium of ICIPE donors, appoints every three to four years an external team to review ICIPE scientific progress as well as its management. The third external review is being undertaken in February/March 1990 and the fourth one will be held in 1993 or 1994. Finally, ICIPE is host to international study workshops to review its projects with experts from all over the world. One such workshop was held in December 1989 and its recommendations on programme thrust and networking form the basis of this project proposal.
16. UNDP will provide funds for the following: six senior scientific staff; two senior staff for training and networking; equipment and supplies; training costs including post-doctoral research fellowships, post-graduate scholars and training of technologists; and conferences and workshops.
17. UNDP direct costs will be used for financing end-of-project evaluations and contingencies to be made available for special workshops and closely related activities to facilitate inter-institutional and intercountry co-operation. These will be considered strictly on merit on a case-by-case basis and subject to availability of funds.
18. The proposed UNDP contribution is \$6,200,000 of which \$5,900,000 will be for sub-contracts, while direct costs will account for the remaining \$300,000. Financial provision will be made under the direct cost component for the participation of specialists from FAO, WHO and other agencies in project advisory committee meetings, in-house reviews and to render other types of assistance which may be required by ICIPE. Details of this collaboration would be worked out between ICIPE and agencies concerned, and the actual costs incurred would be reimbursed directly by UNDP.
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 FAO on technical aspects of the project. In consultation with FAO and other agencies concerned, 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 having a 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 research, training and demonstration activities during the project period, each year ICIPE will invite representatives of UNDP, UNEP, the specialized agencies of the United Nations system, donor agencies, African scientific institutions and the international research centres concerned 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 15, commissions a full-scale review once every three years.

20. In order to assess the impact of the project activities, two evaluations will be undertaken, one midway in the course of the project and one at the end. These assessments will be carried out by teams of 2 to 3 independent consultants appointed by UNDP. The findings and recommendations of the mid-project evaluation might necessitate the reorientation or modification of project goals, budgets and work plans for the remainder of the project.

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 11 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 \$6,200,000 of which \$5,900,000 will be for sub-contracts, while direct costs will account for the remaining \$300,000. The expenditures under the project through 1991 will be contained within the indicative planning figure (IPF) for global projects established by the Governing Council for the fourth cycle. The expenditures covering the remaining period of the project will be subject to approval of the fifth cycle IPF commencing 1 January 1992.

### III. RECOMMENDATION OF THE ADMINISTRATOR

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

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