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THE INTERNATIONAL CENTRE OF
INSECT PHYSIOLOGY AND ECOLOGY

SECOND TRIENNIAL REVIEW (OCTOBER 1986)
Schedule of Implementation of Recommendations
THIRD AND FINAL EDITION

Nairobi, October 1988

F O R W A R D

At the First Meeting of the Sponsoring Group for the ICIPE (SGI) held in Paris on May 1981, the donors made a decision to entrust major periodical reviews of the ICIPE to External Review Teams appointed by the SGI every three years. This review mechanism would accomplish at least three goals: firstly, it would provide an opportunity for the donors to satisfy themselves that the Centre is being managed cost effectively; secondly, that the quality of the research is at an international level; and thirdly, to eliminate the need for separate reviews by individual donors.

The first such external review took place in March/April 1983. Once the Governing Council (then the Governing Board) of the ICIPE had made and presented to the SGI its response to the Report of the First Triennial Review, the Council undertook to prepare a firm Schedule of Implementation of the Recommendations. In the subsequent two years, three editions of the Schedule of Implementation were presented to the SGI at its annual meetings. The Report of the First Triennial Review and the Schedule of Implementation of Recommendations, along with other documents provided, formed a strong basis for the work of the Second Triennial Review during its work in September/October 1986.

The Terms of Reference for the Second Triennial Review were developed and agreed to by the donors. Names of potential members of the Review Team were solicited from the SGI, the ICIPE Foundation and the ICIPE Board and Management; and the team was finally chosen to give a wide range of management and scientific experience that would complement that of the First Review Team. Indeed, a member of the First Triennial Review Team was selected as part of the Second Triennial Review Team to provide continuity.

The Team consisted of:

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The SGI provided the Review Team with its Terms of Reference in the following words:

"The overall objective of the review would be: on behalf of the group of ICIPE's donors to assess the content, quality and potential impact of the research and training programs of the Centre and to examine whether the work being funded is being done according to the policies of the Board and to the high levels of scientific excellence expected of such an institute under the terms of its mandate, as restructured as a result of the First Triennial Review, carried out in 1983".

During the course of the review, the Team was to pay particular attention to:

- (a) The Research Programs: The objectives of the research programs, their relevance to the problems of crop pests and animal and human arthropod vectors of diseases, particularly the needs of resource-poor farmers, and rural communities; the quality of research as judged by performance during the last three years; the balance of disciplines represented in the programs in relation to advancing knowledge and technology relevant to the goals of integrated pest management in the tropics.

- (b) The Training Programs: The objectives and scope of the training programs; the relevance of training to the needs of the developing countries; and the quality of training and the balance between ICIPE's research and training activities.
- (c) The Management: The efficiency and quality of the management from both a scientific and financial point of view; the appropriateness of the management structure in the context of the recommendations of the last Triennial Review; the role of ICIPE Foundation; and the management of off-campus research.
- (d) Resources: The adequacy and stability of funding for the pursuit of the research and training programs; the adequacy of support staff; the adequacy of buildings and equipment, bearing in mind the on-going capital development programs; the relationship between core and non-core resources.
- (e) Cooperation with National and International Programs and with Scientific Institutions in the Developing Countries: The present methods of cooperating with these organizations; the degree to which the Centre is in contact with and utilizing the intellectual resources of basic research institutes as well as CGIAR and OAU/IBAR/IAPC institutions, FAO, IAEA, UNEP and WHO and other relevant specialized agencies; and the degree to which it can help national programs, particularly in Africa.
- (f) The Potential Impact and Usefulness of the Center's Activities: The potential value of the technology developed, and the impact on national programs.

- (g) The Team undertook the review mission to ICIPE's main research facilities in Kenya from 4th to 18th October 1986. Four members of the Team individually made visits to our Cooperative Project at IITA, Ibadan; and to our institutional Collaborators in FAO, Rome; WHO, Geneva; and IAEA, Vienna. Prior to the review, the Chairman of the Second Triennial Review, Professor W.J. Kloft, participated in the ICIPE's 16th Annual Research Conference in April 1986, and had the opportunity to interact with members of the Governing Council, ICIPE Management, ICIPE scientists and other staff. Three members of the Governing Council were present in Kenya during the review Mission, but the full Governing Council met in Washington, D.C. on 30th and 31st October 1986 to review and prepare its own response to the final Report of the Second Triennial Review. The Secretary of the Review Team, Dr. John Coulter, made a verbal presentation of the highlights of the Report to the SGI at its 10th meeting on Saturday, 1st November 1986. The Chairman of the Governing Council made a verbal presentation of the Governing Council's response to the Report. The Full Report, which also includes the response of the Governing Council, was discussed by the SGI at its 11th Meeting in Montpellier, France, on 23rd May 1987.

As was the case for the First Triennial Review, the Governing Council made a decision to have a definitive Schedule for Implementation of Recommendations of the Second Triennial Review. The Governing Council reviewed and approved the Schedule at its meeting in Nairobi in April 1987, for presentation to the SGI at its 11th Meeting. We are pleased to indicate that the 11th SGI Meeting reviewed the Report at its meeting in Montpellier in May 1986. The meeting pointed out the following aspects:

- (a) The need for more experimental land and statistical and computer system for the Crop Pests Research Programme;
- (b) The need for additional emphasis being given to population dynamics in the Livestock Research Programme;
- (c) The need for closer linkage between laboratory and field work in the Tsetse Research Programme;
- (d) The need to emphasize the entomological aspects in the Medical Vectors Research Programme;

- (e) The need to have a more innovative approach for the support units for Sensory Physiology, and Histology and Fine Structure Units
- (f) The need for better equipment for Biostatistics and Computer Sciences as well as the Histology and Fine Structure Research Unit;
- (g) The need to maintain the quality of training offered at ICIPE, and to concentrate in areas where the Centre has a comparative advantage.

These issues in particular as well as other recommendations of the Triennial Review have received attention as outlined in this Third and Final Edition of the Implementation Schedule. Since the completion of the review, about 95% of the recommendations have been implemented. This document will provide background information to the next review scheduled for 1990.

The ICIPE Governing Council wishes to reiterate its appreciation to the SGI for instituting the Triennial Review mechanism, which has proved an essential and effective tool in the evaluation and direction of the ICIPE programme. Already, the impact of the First and Second Triennial Reviews can be seen in improvements in ICIPE' overall activities.

THOMAS R. ODHIAMBO
Director, ICIPE

NAIROBI
OCTOBER 1988

RECOMMENDATION

GOVERNING BOARD RESPONSE

IMPLEMENTATION

MANAGEMENT OF ICIPE

Changes since the First
Triennial Review

Research Management

20. In developing the research programmes, the interaction of the Research Programmes and the Research Support Units needs attention. This is discussed in the various research sections, but the Team recommends that a system of time budgeting be instituted so that when the Training Unit, for example, needs support from the research teams, this is calculated and recorded in the programme. Similarly, the research programmes should budget for time from the support units.

22. The Deputy Director is on a two year appointment, seconded from an overseas institution and supported by outside finances. In the light of the first review's recommendation on devolution of responsibility for

The Board notes the recommendation in para. 20 on time budgeting and will request Management to draw up a proposal for Board consideration.

The Board believes that it would be desirable to have a five-year appointment for the next Deputy Director but that the question of duration should be dealt with in a flexible manner. Since the core

The Planning and Development Unit in consultation with the Deputy Director have developed time sheets for use in budgeting. The data collected is currently being analyzed in relation to the the 1989 Budget.

A new Deputy Director has been appointed for a 5-year term beginning August 1988.

management and the consequent key role of the Deputy Director in the whole research programme, the Team recommends that a process be instituted to recruit a first-class scientist for this post, if necessary, supported by outside funding, but for a period of five years; such a process should start at least one year before the present incumbent is due to return to his previous post.

Administration

27. The Board may wish to continue to give special attention to the ICIPE salary scales for repair shop and laboratory maintenance staff and not allow these to fall to levels where qualified staff would no longer be interested in joining or continuing work at ICIPE. The Team recommends that the conditions of service and promotion of field support staff also be given special attention.

budget provides for the post of Deputy Director, the Board considers outside financing to be a secondary question.

Regarding para. 27, the Board notes that a survey undertaken in 1985 showed to the contrary, and that ICIPE salary scales for technical staff were even better than those from CGIAR-supported Centres based in Kenya.

Proposals were presented to the Executive Board of the Governing Council at its October 1987 meeting. The Governing Council approved them and are being implemented in phases, the first phase being effective from July 1988

29. In general, ICIPE salary scales remain below CGIAR standards. A general review of this issue is planned for 1987 and a document is in the early stages of preparation.

and the second phase will be effected from July 1989.

ICIPE is in a less favoured position than the CGIAR Centres in terms of funding, and therefore ICIPE cannot match their salary scales. Nevertheless, the Centre must be competitive in the international labour market, especially for research scientists. A regular but gradual revision of staff emoluments is the best policy given the Centre's special circumstances.

Financial Management

36. The Financial Manager is able to exercise his function fully as laid down in the Terms of Reference for his appointment. The approach to finance management, implemented by ICIPE, can ensure that financial outlays are justified and follow the procedures laid out in the financial rules and regulations. Strict staff rules assist in the process. There is a considerable degree of mutual respect between management and the Financial Manager. Nevertheless, the Financial Manager could be more accurately described as a Financial Controller. He does not have a clearly defined role in the programme and budgeting process though in practice, there is a good personal relationship between the Financial Manager and PDU. The Financial Manager exercises his control of the finances of the Centre through control of expenditure by budget category but he is responsible for controlling a process into which he has no efficiently designated input.

37. The Team recommends therefore, that the relationships between the Finance Division and PDU be formalized in such a way that the Financial Manager has a recognized

The Board requests the Director to take action as recommended in para. 38 for Financial Manager to have greater involvement in the planning processes of the ICIPE.

The relationship described in para.37 is formal in fact.

and well defined input into planning processes.

The Financial Manager participates in the budgeting process in "top down" process in his capacity as a member of the Senior Management team, and in "bottom up" process in his capacity as Head of the Finance Division.

INTERNAL AUDIT

39. The Team recommends therefore, that the draft work programme of the Internal Auditor be set out by a small committee, chaired by the Director. This procedure would greatly assist the Director in focussing on those areas of concern which, in an institute of such varied activities, could easily escape his attention and that of his office.

The Board does not feel that it will be appropriate for a committee to set out a work programme of internal audit as proposed. The Board will, however, consider the question of whether work programmes approved by the Director are to be made available for information to the Executive Committee of the Board.

Since the STR, the draft work programme of the Internal Auditor is being sent to all Divisional Managers, who are expected to liaise with the Heads of the respective Programmes, Units and

40. Reports by the internal audit should be channelled through the managerial hierarchy to the specific units undergoing the audit, with the responses following the same route to the Director. The internal audit committee should also ensure, on behalf of the Director, that the recommendations by the internal auditors' reports are implemented.

Departments under them. Their comments and suggestions are considered in drawing the final audit programme.

This is being done: audit reports are being sent by the Director to the Heads concerned, through the respective Divisional Managers. The responses from the Heads follow the same route. The Managers concerned are also being asked to comment on responses from the Heads of Units being

41. The Team also recommends that the reports of the internal audit be presented to the Executive Committee of the Board so that it can monitor any areas of substantial concern.

Programming and Budgeting

43. In the budget process, the Team recommends that there should be a clear presentation of

The Board wishes to discuss the the matter of submitting Internal Audit reports to the Executive Committee with the External Auditors before taking a decision.

The Board shares the Team's concern and generally endorses the approach to give higher priority to

audited. Further, the Director has instituted a formal follow-up system which ensures that the internal audit recommendations are implemented.

The Internal Auditor sends regularly to the External Auditors, copies of his internal audit reports. The Governing Board holds, once a year, meetings with the External Auditors to which the Director is not invited.

These recommendations have been

maintenance allocations as distinct from operating expenses. Maintenance categories should be created to differentiate between maintenance of capital structures and maintenance of equipment and vehicles. (In the case of vehicles, mileage logs should be established for all vehicles and be reviewed from time to time). At the same time budgeting unit should prepare specific instructions on maintenance allocations and the data required to calculate these allocations. In this area, clearer rules should be prepared, regarding reversals of under-utilized maintenance allocations to a central reserve fund while stricter guidelines should also be prepared to outline the circumstances under which maintenance funds can be utilized for expenditures in other budget categories (a special arrangement has to be instituted so that unused funds for maintenance of capital structures can be carried forward from year to year until a sufficient base has been created to assure adequate outlays when necessary. The Executive Committee of the Board should have a major role in this process, keeping in mind the special interest of core donors in this area).

maintenance of physical plant and equipment.

effected in the 1988 and 1989 Budgets. Maintenance expenses have been increased and have been distinctly categorized.

44. While recognizing the special characteristics of scientific work there is a need to establish a simple data base on unit costs that will, over time, lead to a better understanding of manpower unit costs and activity co-efficiency. Care must be taken however, to avoid an overcomplicated system. Staff must be given an opportunity to comment on the benefits of such a data-building effort but some measure of authority needs to be vested in PDU if it is to have an opportunity to test the efficacy of such a data base.

Human Resource Management

45. A first round of preparation of job content and job description has been completed but efforts must be maintained to refine these. This can be very time consuming and careful judgement has to be exercised on how to use scarce resources in this general area.

The Board concurs with the observations in para. 45.

A system of time budgeting is being evolved for Programme Leaders and research scientists in the mode of staff evaluation and project monitoring and will be incorporated into the resource budgeting process and these proposals are being implemented in preparing the 1989 Budget.

The Centre encourages promotion from within, whenever possible, but for more senior positions.

Stated objectives of the Unit, such as identifying potential candidates for promotion within the organization and advising management on improving salary levels as an alternative to general program expansion, are to be encouraged.

advertising gives a wider range of candidates to choose from; and this practice will be maintained. The Human Resources Department is doing an exercise aimed at trimming down the establishment to an optimum size. Concurrently, staff emoluments and benefits have been revised and are being implemented in two phases, the first one being effective from July 1988 and the second from July 1989. (See also para. 27). Job Descriptions are continuously being refined.

46. Implementation of sophisticated personnel management techniques should be tested against a rather small professional staff complement and the realities of the support staff labour market.

Maintenance

47. The budget processes needed for this are outlined in para. 44. There is general recognition, both among national research programme leaders and donors that the absence of maintenance is one of the root causes of the general decline in research output in Africa. Now that the Maintenance Manager is completely relieved of any capital development activities, he can devote his attention fully to this vital area of the ICIPE operations. The Team recommends that the Board continue to exercise special vigilance in this area and take a detailed look at the forward maintenance plans and needs of Mbita Point Field Station and Duduville. The Financial Manager has obviously an important role in dealing with this problem.

The Board requests the Management to make proposals along the lines of the suggestions put forward in paras. 47 and 48.

Necessary provisions have been made in the 1987 Budget for Mbita Point and Duduville and this will continue for both places in subsequent years.

48. One of the first areas of attention should be the maintenance effort at Mbita Point where the absence of any stores or spare parts has created an unnecessary slow and costly operation (for instance the need for frequent long and expensive trips to Kisumu) to obtain spare parts for the vehicles. Preliminary requirements for the establishment of stores and spare parts at Duduville should be prepared and costed, and a fund to buy these established. Timely bulk purchases should be under the control of the Financial Manager to ensure competitive prices and reliable delivery.

49. The Team recommends that special attention be paid to the equipment of vehicles used for the distant field operations, for example winches and radio communication equipment need to be provided as soon as possible. Vehicle maintenance at field stations needs particular attention.

The lack of storage facilities in the past has now been fully overcome, both at Mbita Point Field Station and at Duduville. Bulk purchasing has commenced for a selected number of items and this activity will accelerate throughout 1989.

This will be implemented during the present Plan period, and budgetary provision will be made accordingly. A Task Force has been appointed to review the entire system and will pay

attention to these matters. The Task Force presented its Report to the Management in August 1987; and its recommendations are being implemented in the course of the Plan Period. A Transport Controller position has been established and improvement in transport management is already evidenced.

Duduville Capital Development Programme

51. The Team has not looked at the details of Phase II Capital Development Programme. However, it does have concerns about the

Regarding Contract 2 of Phase II, the Governing Board will take into account the observations of the Review Team.

Preliminary drawings for the remaining segments of

proposed scale of this, both on the likely availability of funds for capital development and equipment and the additional overheads for operations. It therefore recommends that the Board examine these proposals very carefully before any final decisions are made on the scope and size of Phase II. The Team believes that a limited Phase II to include administrative buildings and library space could serve the needs of ICIPE for the foreseeable future.

52. Before completion of Phase I, allocations must be available for the proper equipping of the

Duduville
Capital
Development
Project (Phase
II) are being
re-examined in
context of
space
available in
Contract 1.
Contract 1
has been
completed. The
administration
building
started in
July 1988 and
will be
completed in
July 1989. In
the meantime,
funding is
still sought
for the
construction
of library,
outreach and
training, and
conference
facilities.

This
recommendation
is accepted

research facilities and appropriate financial arrangements must be established for building maintenance. Temporary arrangements to house essential administrative staff at Duduville Phase I, could be made by utilizing some of the space presently designated for other services (medical unit, workshops).

and will be implemented as as a temporary measure, pending completion of the rest of Phase II. A Task Force has been appointed to advise on the most effective use of space including the permanent facilities at Chiromo.

Mbita Point Field Station

53. The completion of Mbita Point Field Station, its staffing with a group of competent scientists and the development of a good research programme are development of which ICIPE can be proud. Nevertheless, there are inherent problems in the distance from Nairobi, even with good communication links. Special efforts must be made to keep the Station Manager in the mainstream of information flows (his current

The Station Manager is formally part of senior management. Information linkages with the Station will be strengthened during the current Plan

monthly participation in Management meetings are helpful in this) and he must have and be seen to have a role in policy decisions that concern the Station.

54. The cost of electricity at the Station absorbs a major part of the maintenance outlays. It would be worthwhile to install meters on the private residences to discourage excessive use, especially if the Station, expects to be connected to the regional grid in the next few years.

55. The lavishly laid out stores are empty and expensive forays to Kisumu and other distant places are now a frequent occurrence. The Team recommends that the Stores be stocked to an efficient level as soon as possible. The rather fully equipped workshops are not fully used because of lack of skilled technical staff. Action in this area must be taken promptly.

It is agreed that there is need for proper stocking of the stores to an efficient level that would minimize constant shortages of machineries and supplies and the need for constant procurement. However, by the time the Team visited the Station, the Stores had just been completed and consideration is only being given to stocking them.

Period.

Meters will of necessity have to be installed not only in residential houses, but also on the Field Station when the Field Station is eventually connected to the regional grid.

(a) Bulk purchasing is being actively pursued and 1989 will herald a significant reduction in the number of items having to be purchased from local supply sources.

(b) Provision has been made in the 1988 Budget for the positions of Senior Technicians in (i) Electronics and Instrumentation and (ii) Refrigeration. Skilled technicians already exist for carpentry, general machinery and fabrication. A Senior Technician (power supply) is already in position.

56. It must be recognised that the School and Medical Unit have no chance of becoming self-supporting and that innovative financing practices cannot alter that reality. At the

The recommendations of the Review Team are in line with policy set by the Board and which is the current practice.

same time, these facilities are needed to maintain a productive research environment. The social impact of these facilities in the general area around the Station, if properly and sensitively directed, can enhance the relationships between the researchers and the farmers in the area. Thus the Team recommends that the deficits of the School and the subsidy to the medical unit be considered part of the overhead expenses of the Station and be shown as such. This recommendation must be coupled to a clear recognition that plans for expansion of the school facilities (especially the provision of boarding facilities) cannot logically be considered as legitimate overhead expenses.

This recommendation has been effected starting with the 1988 Budget.

RESEARCH PROGRAMMES

CROP PESTS RESEARCH
PROGRAMME (CPRP)

Limitations and
Recommendations

81. Many of the problems apparent three years ago have been resolved, especially those involving physical facilities. The principal limitation of inadequate field plots that existed three years ago, still exists today and is the principal limiting factor, not only to the quality of the research being performed because of space deficiencies, but also the relevancy of the research in the very unique environment at Mbita Point to other ecological zones.

The Board has been continuously aware of the need for additional land, both in the area of Mbita Point and other ecological zones. Land (200 acres) has been obtained at Ungoye within easy reach of Mbita Point, and land at Muhaka, on the Coast, is available. The Board continues to look for opportunities to obtain additional land.

Land at Ungoye will be utilised for the following:

- (i) Large scale trials on inter-cropping, host plant resistance, application of pathogens for biological control.
- (ii) Bulk multiplication of seeds.
- (iii) Initiation of banana intercropping project.

82. The Team strongly recommends that ICIPE resolves this problem satisfactorily in the near future. It will be critical in the next phase of IPM research where tactics so far developed will be integrated. This will need to be done in large plot simulation of small farm situations. If possible, research involving IPM strategies needs to be conducted in areas of Kenya that would represent the three principal ecological zones of Africa.

Validation and standardization of IPM strategies are already being conducted in three major ecological zones in Kenya, representing three main agricultural productive areas in Africa:
MPFS - marginal sub-tropical zones;
Mtwapa - Coastal high humidity zones;
Rongo/ Kisii - High potential humidity tropical zones.

83. The need exists to upgrade the biostatistical and computer literacy of scientists in this group. This will be especially critical in the future for population modelling of insects, design of increasing complex experiments, and handling large amounts of data that will need rapid and orderly processing and interpretation.

The Biostatistics and Computer Service Unit is already providing a comprehensive training programme for both scientific and technical staff. Arrangements have already been implemented for the Crop Pests Research Programme to provide it with in-house capability in statistical analysis and computer usage. Expertise in biostatistical analysis has been provided since 1987 with the recruitment of 3 scientists. Further, Input

84. The organization and responsibility of the Insect Mass Rearing Technology Section needs to be addressed. The first review recommended consolidation of crop pest rearing, but it was not intended that this include haematophagous insects which includes sizeable investments of time, energy and resources in rearing small animals.

The Deputy Director has these matters in hand and for optimal use of resources, will ensure that vertebrate animal rearing is under veterinarian supervision while arthropods are reared by an entomologist.

Data personnel have been recruited to speed up the process.

Para. 84-85. Provisions have been made in the 1988 Budget for the rationalization of the work programme and staff of the Insect Mass-Rearing Unit. For purposes of efficient utilization of resources, various elements of insects/vector rearing under different research programmes have been consolidated under the sole responsibility of Insect Mass Rearing Technology Section as

reflected in
1988 Budget.

85. The Team recommends that the animal rearing for haematophagous insects be removed from the Crop Pests Research Programme and be transferred to the supervision of the Tick or Medical Vectors Research Programmes.

86. Facilities for rearing pest species and conducting nutritional research relating to improved as well as new phytophagous diets for insects, while vastly improved since the last review are still inadequate. There are needs for more space, controlled environmental rooms, advanced equipment, filtration devices, laminar flow hoods where work can be done in isolation from other laboratory activities to prevent contamination.

Paras. 86-87.
The necessity for expansion of mass-rearing of pest species is not an automatic conclusion. It is important to review the quality of the research utilising these insects, and determine a realistic demand for their rearing. Decisions on new equipment and space will be done in the next two years.

87. The Team recommends that these essential needs be assessed and that they may be accommodated within the existing structures.

88. The current section leader, who has received good training since the last review, has a real knack for rearing. He has been very successful in this endeavor and it is hoped that, with proper training of technical personnel and delegation of work, the principal portion of his time can be spent, not in service activities but in research in insect nutrition and artificial diets so that he can continue to grow professionally.

89. The Team recommends that the leaders of the Crop Pest Research Programme and the Chemistry and Sensory Physiology Research Units explore more fully a more equitable and satisfactory interaction in the basic investigations of biologically active materials. Bioassay and electrophysiological studies of active extracts should not be done to the exclusion of the biologist who is observing the responses under greenhouse or natural conditions.

Agreed.

He will be encouraged to address questions of insect nutrition on an experimental basis.

These two groups will be encouraged to work more closely and for SPRU to visit the field research sites more regularly to address agreed research questions
Crop Pests Research Programme and Chemistry and

Biochemistry
Research Unit
are working
closely on
pheromones and
allelochemicals.
Also, a close
working
relationship
has now
developed
between CPRP,
CBRU and SPRU.

90. The Crop Pest Research Programme has made a good beginning in strategic planning and, while there has been excellent progress in projecting desired future directions for the various sections from the scientists point of view, the entire group needs to continue to do more in-depth strategic planning. It will soon be entering uncharted waters as it attempts to test technology in the small farm situation. To accomplish this successfully, the group must obtain considerable input from national research and extension organizations, seed companies and other useful sources of knowledge. The social science interface also will be essential, especially in the planning process for larger field plot experiments to validate

Agreed.

IPM technology and for later trials to be conducted on small systems with close collaboration with extension and social groups. Combined meetings of all potentially important organizations will not only bring knowledge, ideas etc, but raise the level of awareness on current and projected research in groups in which ICIPE is participating.

91. A final recommendation concerns stability of funding for the Crop Pests Research Programme. This Programme represents a sizeable percentage of the personnel and resources of ICIPE's Programme. It carries a major responsibility for achieving the goals of ICIPE in making an impact on the farmer. It is critical to the growing cooperative endeavors with International Centres and Institutions interested in this major pest problem of the tropics worldwide. The research for the most part is long range.

Agreed.

92. As stability of funding is critical to this group in planning research for the future, the Team recommends that, within the resources possible, core funding be provided for the main thrust of this Programme.

96% of the Crop Pest Research Programme is supported by core funding, thus leaving only a small portion of intercropping experiments for special funding.

POTENTIAL USERS OF NEW
TECHNOLOGY AND KNOWLEDGE

95. As the research programme begins to move IPM technology toward implementation on actual farm systems, it is essential to move only proven technology. Initially, this may involve only 2 or 3 components. IPM is a constantly evolving strategy in which one moves a few proven components for acceptance and, as research proves other components, these can be integrated at a later date. The critical issue is to begin with well proven technology which is assured of a high chance of acceptance. One cannot wait for a "complete package" from the scientists as it will probably take forever. Initially, the system needs to be simple and workable for extension and the farmer to insure acceptance, then through success in increasing his productivity and profits he will be eager to accept new technology as it generated and integrated into the system. Sometimes IPM is made to sound complex but it

Agreed. CPRP plans to take to the farmers first only two components of the pest management strategies. These are host plant-resistance and intercropping combined with appropriate cultural practices. After about 2-3 years, the biocontrol components will be integrated with the above two; first the pathogens such as Nosema and nematodes, followed by selected promising parasitoids. Certain components of IPM package developed by CPRP are currently being demonstrated at Oyugis and Kendu Bay divisions in

can be simply the integration of two or more components to suppress pest problems. This more simple perspective needs to be kept in mind as technology is extended from research to farm systems.

96. Finally, it should be emphasized that ICIPE's Crop Pests Research Programme, which is developing IPM strategies, should end when it has done pilot experimentation on a few selected small farms and interfaced successfully with extension.

LIVESTOCK TICKS RESEARCH
PROGRAMME (LTRP)

122. Recommendations

- (1) The Team supports the principle of using the suggested orderly multi-pronged approach to

Agreed.

Western Kenya on 50 participating farmers' fields in collaboration with the Ministry of Agriculture, Kenya.

When the present work on the target borers is completed, it will be necessary to take up work on other equally important pests so as to develop control packages, for the pest complex rather than only for borers of target crops. Otherwise, while crops could be protected from one or a few pests, they would suffer losses by other pests.

provide integrated control of livestock ticks, including the continued investigations of immunological methods and the continued ecological, physiological and behavioural investigations of the E. African species of ticks responsible for the transmission of diseases to livestock.

- (2) In the immunological studies, it is recommended that the isolation, purification and characterization of potential useful antigens derived from midgut or other tick tissues continue at ICIPE, with cooperation from CBRU. Assays of the protective value of antigenic fractions could be carried out in rabbits or in sheep, but should also be run in pilot experiments with cattle at a relatively early stage.

Isolation, purification and characterisation studies are in progress in:

(i) Potentially useful antigens are being isolated from midgut, salivary gland, cheliceral receptors, haemocytes, and moulting hormones in collaboration with CBRU and the University of Neuchatel.

(ii) At present, these antigens are being assayed in rabbits, and the rabbit accommodation

has been materially increased to cope with the increased work load. Suitable accommodation is now available and it is planned to carry out cattle and sheep experiments in the near future.

- (3) When a purified immunogenic fraction has been identified and there is reason to believe that an effective vaccination regime has been worked out for cattle, the large-scale production of a vaccine (by advanced biotechnology) could be considered, provided that there is some reason to believe (from population model data) that the large-scale use of such a vaccine could have an appreciable effect on the tick population. The production of potentially immunogenic sub-units should be contracted out to a professional group, but the assays of various products from the group should be run at ICIPE.

In general, the Board agrees, but the point which is not clear involves production of antigens. Clearly, this can be done on a small scale, using recombinant DNA techniques at ICIPE. Large scale production, involving fermentation technology or eucaryotic cell culture on a large scale, must be carried out with a suitable partner.

- (4) The Team recommends that serious attempts be made to collaborate/cooperate more closely with ILRAD, hopefully to the benefit of both institutions and recommend efforts to expand cooperation with other local institutes with similar interests and responsibilities.

See para. 109.

In principle, ICIPE looks for areas of collaboration at all times.

(i) Collaboration with ILRAD, KARI, and UNEP is active. Since the review, a collaborative epidemiological study on East Coast Fever on Rusinga Island has been almost completed.

(ii) Collaboration with KARI on genetic studies at Mutara ranch have been initiated and are in the process of being written up for publication.

(iii) In the study area of tick population modelling, a joint modelling group of ILRAD, KARI, UNEP and ICIPE has been formed. In the field joint collection of data in collaboration with KARI and the

Kenya Government, Veterinary Services, is proceeding at sites at Mariakani and Mtwapa, and a further collection site is planned at Isinya.

TSETSE RESEARCH PROGRAMME (TRP)

Recommendations

130. The Team recommends that:

(a) The vacant positions be replaced as soon as possible with capable scientists, especially good field workers.

Agreed. The advertised position is for a population ecologist with strong background in mathematics.

(a) The candidate is in position. In addition, two Post-doctoral Research Fellowship positions for an Ecologist and Physiologist have been advertised.

(b) ICIPE with its strengths in both physiological and ecological work should take the initiative in developing collaboration with other major programmes in centres such as ILRAD, ILCA and KETRI; and research groups in other parts of Africa, working on other Glossina species. The Team

(b) ICIPE is taking initiative in developing collaboration with relevant organizations and the following activities are on-going with ILRAD:
(i) Studies are under way on the

recognises that effective collaboration depends on willingness of both parties but potential benefits are great enough to make intensive efforts worthwhile.

- (c) Since the pressure of odour baited traps on the population could lead to the selection of individuals with behavioural patterns avoiding this trapping system, insecticide

Agreed.

on the use of DNA probes to identify trypanosome infected tsetse in the field.
(ii) Identification (using tsetse blood meal analysis) of tsetse hosts in temporary tsetse habitants.
KETRI - Epidemiology of animal trypanosomiasis
Kenya Government - Ministry of Livestock Development, suppression of tsetse population using low cost tsetse control approaches in Kenya Coast and Nguruman.
ILCA - Productivity of livestock in tsetse control areas (Kenya Coast)

The insecticide-impregnated screens have been developed by the Tsetse group in Zimbabwe and are in use there. The ICIPE intends to

impregnated screens should be used in a form of time sequence.

compare its results on the odour-baited traps with the Zimbabwe work, through closer collaboration which resulted from a joint review undertaken in June 1987.

- (d) An epidemiologically important question is the role of biting flies as vectors of trypanosomiasis. Mechanical transmission for Tabanidae is known. In Stomoxys calcitrans, regurgitation as one transmission mechanism has been worked out using radioisotopes as model substances. The occurrence of regurgitative transmission by biting flies would change epidemiological predictions of population models.

The Board would not approve a major effort in research on biting flies other than tsetse at the present time.

- (e) In close cooperation with CBRU work continues in increasing the efficiency of the odour-baited traps. The

This collaboration will continue.

work on precursors, the breakdown of which leads to active compounds, is interesting.

- (f) In the field of biological control of tsetse fly population, the role of virus-like particles and tsetse immune mechanisms should be investigated in close cooperation with CBRU.

While the Board agrees that these projects have interest, emphasis should be placed on exploiting the results of field studies.

The role of virus-like particles among other pathogens of tsetse and also tsetse immune mechanisms are being investigated in collaboration with the Cell Biology Unit and Chemistry and Biochemistry Research Unit.

MEDICAL VECTORS RESEARCH
PROGRAMME (MVRP)

Recommendations

144. The Team recommends that:

- (a) Entomological studies should in future take precedence over clinico-epidemiological investigations and should emphasize ecological and population aspects.

The Board emphasizes that clinico-epidemiological studies are being carried out by the Ministry of Health with ICIPE's collaboration.

(b) Ecological studies have to be designed and conducted more carefully with the help of an ecologist; the goals of such studies should be clearly defined.

The Board intends, at the next in-depth review in April 1987, to assess the quality of the ecology being carried out by this team. Outside experts will be asked to aid in this review.

Dr. J.L. Petersen of Georges Memorial Laboratory in Panama reviewed the ecological work of the Programme in March 1988. He commended the level of work but recommended more quantitative ecological approach. In the meantime, a Research Scientist (entomologist) has been recruited and is concentrating his research on the ecological aspects of sandflies within the programme. In addition, an ARPPIS student is already working in this area.

(c) Taxonomic expertise continues to be required in the Programme. It could be provided possibly by a postdoctoral appointment.

Taxonomy is presently confined to identification of known species and is therefore a routine process. If more advanced taxonomy is required expertise will be sought.

(b) Ecological studies have to be designed and conducted more carefully with the help of an ecologist; the goals of such studies should be clearly defined.

The Board intends, at the next in-depth review in April 1987, to assess the quality of the ecology being carried out by this team. Outside experts will be asked to aid in this review.

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(c) Taxonomic expertise continues to be required in the Programme. It could be provided possibly by a postdoctoral appointment.

Taxonomy is presently confined to identification of known species and is therefore a routine process. If more advanced taxonomy is required expertise will be sought.

(d) Biological control studies, for both mosquitoes and sandflies, should be carried out in close collaboration with the biological control unit of the Crop Pests Research Programme.

Provision has been made in the 1987 Budget for a position of a PDF in this area. The position has been advertised, and interviews held. The appointee is expected in position before end of 1988.

(e) The role of regurgitation as a possible mechanism of a direct (non-cyclic) transmission of both malaria and leishmania parasites merits study, preferably in collaboration with an overseas institute.

While this Project might be of interest, the Board does not endorse a major programme in this area.

RESEARCH UNITS

SENSORY PHYSIOLOGY RESEARCH UNIT (SPRU)

Limitations

139. The Unit is absorbed in supporting work and has no

It is not correct that the Unit has no independent lines of basic

(a) A research theme entitled Sensory

basic electrophysiological or behavioural research. Much of the input is in form of research problems and also some intellectual challenge appears to come from other units. Originality and innovation needs to be developed to a higher level, particularly in the field of insect behaviour.

research, e.g., Dr. Saini carries out independent research on sound production. The question of how much basic research is underway is, to some extent, a matter of definition of the term basic. Considerable electrophysiology is being carried out, but behavioural work requires expansion.

Biology and Chemical Basis of Insect Behaviour has been adopted. This theme is based on an interactive approach emphasizing ethology and sensory physiology. Within this theme, techniques designed to study insect behaviour and sensory coding for various stimuli are employed to investigate Chemosensory regulation of host location, feeding, mating and oviposition. In addition to these, sound production and acoustic communication in tsetse flies have been investigated extensively.

(b) Construction of proper behavioural set-ups such as wind

tunnels and other insect observation chambers are in progress at the new Duduville facilities. Current and future work will emphasize behaviour and sensory biology and this is in fact on-going with the Tsetse programme in Nguruman.

Recommendations

160. The Team recommends that:

(a) In order to avoid isolation and to stimulate innovative research, the Unit Head and the research scientist should have opportunity for international exchange and extended visits to international laboratories. Intellectual stimulation by visiting scientists should also be encouraged.

The Board believes that several programmes of ICIPE have need of increased behavioural studies. Within the limitations of personnel and funding, the Board encourages expansion of such projects; probably initiated by addition of postdoctoral fellows.

This is already being implemented. The Unit has good contact with well established laboratories conducting research in areas of interest to SPRU. There is a visiting scientist from the University of Neuchatel. Two Research Scientists visited the Pheromone Group at

the University of Lund in April 1987. Following this visit, the EAG-GC combination has been installed, and pheromone studies are in progress. The Unit is in the process of identifying a visiting scientist who will assist in behaviour studies; and a PDF will be recruited before end of 1988.

(b) It is expected that the demands on collaboration in the fields of crop pests, crop resistance and livestock disease vectors will increase. Work on medical vectors should be second priority and initiated only when there are urgent demands for support.

Work with the Medical Vectors Research Programme will start in 1988 on the return of a graduate student from Australia by about April 1988. The student has now returned.

(c) The strength of the Unit is electrophysiology. This should also be one of the main fields of work in the future of the SPRU.

This will continue to be so and electrophysiological studies will be expanded to include studies on the

- (d) Knowledge of the behaviour of the target insects in the field is valuable for the scientists in the Unit, and visits to the field study sites should be encouraged. However, field studies on insect behaviour are time consuming and demand special knowledge. Therefore, it is recommended that field work on behaviour of target insects on a larger scale should be undertaken only if and when one more scientist trained in insect behaviour is attached to the Unit.

central nervous system. This will require visiting laboratories with expertise in this area during late 1988, and this has been done. In due course, this work will be done with the aim of answering specific questions.

Field visits are on-going and have been intensified. Extensive field behaviour studies will be undertaken when additional resources and expertise become available.

CHEMISTRY AND BIOCHEMISTRY
RESEARCH UNIT (CBRU)

Limitations

168. The CBRU needs expensive equipment and in the absence of such equipment, delays are experienced in getting samples tested abroad. These delays have to be weighted against the buying of equipment. To be fully equipped, the Unit needs; an FT-NMR spectrometer, a second gas chromatograph, an ultracentrifuge and a number of other pieces of equipment.

The additional gas chromatograph will be acquired from funds available to the ICIPE-University of Lund moth pheromone project. This has now been ordered and is in use. The acquisition of an FT-NMR, a preparative HPLC, and ultracentrifuge will considerably enhance the Units research productivity and its postgraduate training activities. Donor funding is continuously being sought for these instruments, particularly the most expensive one (FT-NMR).

Recommendations

170. The Team recommends that:

(a) In the field of allelochemical work, the Unit should continue the projects on Chilo feeding stimulants, Maruca feeding deterrents and sorghum shootfly oviposition stimulants. It should also continue studies on allelochemicals involved at each stage in the colonization of crop plants by target pests. Understanding of the biogenesis and enzymology of selected allelochemicals is needed.

Identification work of Chilo and Maruca allelochemicals is in progress. A lot of progress has been made in the field of Chilo phagostimulants. An ARPPIS student has just completed his thesis on the work. Future activities will include quantification of the identified chemicals in different sorghum cultivars to lay down the groundwork for allelochemical screening for resistance and to identify the feeding deterrents implicated in the older sorghum seedlings.

(b) In close cooperation with the Livestock Ticks Research group, the Unit should continue with the

This will continue. Whole tick membrane proteins appear to be most promising

identification, purification and characterisation of potential antigens from the tick midgut. The search for antigens from other tissues of R. appendiculatus should also be continued.

- (c) The work on tsetse attractants and pheromones and on the characterisation or identification of resting and larviposition sites of Glossina spp. should be intensified.

antigens and these as well as midgut proteins are now the focus of separation and purification studies.

The work on tsetse kairomones has been extended. Emphasis in the current Plan period is being placed on tsetse attractants and their analogues and this is scheduled to be completed in 1989.

Identification of resting and larviposition sites of Glossina spp. is being carried out in the Tsetse Research Programme. The Unit is likely to get involved in the chemical ecology of larviposition of tsetse in the next plan period.

- (d) The proposal to search attractants in order to develop more efficient trapping systems be supported.
- (e) The Unit should develop a priority list on equipment in accordance with available resources.

This has already been done.

HISTOLOGY AND FINE STRUCTURE
RESEARCH UNIT (HFSRU)

Limitations

182. The First Triennial Review drew attention to the limitation on this Unit and made proposals for its improvement, but these limitations still exist. The EM equipment is old and can be used only because of excellent maintenance.

The majority of the limitations pointed out by the first TRT have been eliminated. For example:

1. Autoradiography and other techniques have been acquired.
2. An electronic engineer has been recruited to undertake the servicing of the EMs.
3. There has been some upgrading of staff through training.
4. The Unit work has been diversified by the recruitment of a PDF to examine host parasite interactions. There has been extension of techniques to include bio-chemistry and immunology.
5. A major limiting factor has been the acquisition of a new

The strategic focus of the programme of the Unit has been considerably re-focussed since the Second Triennial Review. The Units role focuses on providing an understanding of cellular biology of insects and their hosts and not merely providing instrumental back up to the core programmes, hence the change of name to that of Cell

electron microscope, and this now appears to be possible in the near future.

Biology Research Unit.

183. The rate of original scientific publication is low. It can be disputed whether the Unit will strengthen or weaken its capacity when it enters into new techniques of biochemistry, immunology and molecular biology as proposed in the Strategic Plan. Apart from increased use of such techniques, the plans for the future do not indicate much of innovation.

The Board recognizes that the rate of publication of the Unit has been low and will encourage improvement. The Board believes that innovation in this field will come from adoption of the techniques of immuno-cytochemistry, in situ hybridization and use of tissue and cell culture.

The rate of publication of the Unit appears low because of (a) the very small staff involved. This problem is being overcome by expansion of professional and support staff. The recruitment process of a Senior Research Scientist to undertake research in invertebrate cell and tissue culture, as well as Postdoctoral Fellow experienced in the general area of Cell Biology and a technician are at an advanced stage of processing. It is also envisaged that the Unit staff will be trained in the area of immunocytochemistry. This will strengthen and facilitate

expansion into new areas of research;
(b) Because the contributions of the Unit staff have been made within research papers emanating from core programmes. The style of indicating such significant contributions is being changed for the future to ensure that credit is shared equally in the resultant publications.

Recommendations

184. The Team recommends that:

- (a) The equipment, particularly the EM equipment, should be reviewed to comply with the needs of the supported programs and the research objectives of HFSRU.
- (b) The research of the HFSRU should be aimed more at original and innovative work. Scientific

A new, advanced Philips CM12 TEM with a variety of provisions has been purchased and installed at Duduville.

The work of the Unit has been restructured, 40% of the research time of

publications should be encouraged.

- (c) Sophisticated and equipment-demanding new techniques outside the field of structures, morphology and histology, should be considered only if they are necessary for the solution of problems within the mandate of the Unit and are not accessible at other collaboration units.

the Unit will be spent on Unit-initiated projects. The work is being fulfilled under one primary theme. That is, examining the functions of cellular and sub-cellular components in a dynamic functional framework and studying the mechanisms of their regulatory physiology under normal and injury conditions (i.e. to provide basic understanding of the cellular biology on insects and their hosts.

These new areas will be supported by relevant equipment (especially those to enhance research with living cells), and methodologies (e.g. modern microscopical imaging methods to include immunocyto-

The Team does not support the proposal in the strategic plan that eventually techniques of molecular biology will feature strongly in the Units research work.

chemistry at both light and EM levels, quantification of reaction and products, molecular biology techniques) for the type of innovative and original research expected from the restructuring of the Unit's work Programme.

BIostatISTICS AND COMPUTER SERVICES UNIT (BCSU)

Recommendations

196. The Review Team recommends the following to ensure that the essential statistical and computing services are provided at ICIPE:

- (a) The work of the Unit should be divided into non-scientific activities such as word processing should come under the Administration and Information Division; scientific activities should remain in this Unit. This should permit

The Board agrees in general with the recommendations with the provision that they should not interfere with the proposals on biostatistics and computer facilities required by ICIPE now being prepared by the user group, an outline of which will be presented to the Board in April 1987.

The Governing Council reviewed the proposals at its meeting in April 1987. It approved the training programme proposals for 1987 and 1988 and the purchase of a limited number of micro-computers. Word processing activities are carried out by

the workload demands to be met in a timely manner.

- (b) ICIPE should upgrade its biostatistics and computer capability in support of the research scientists and a biostatistician qualified in population modelling. Since December 1987, BCSU has been upgraded to the status of a Research Unit to strengthen biomathematical research in ICIPE core programmes; to provide expertise in pests

secretaries attached to various units. The BCSU only provides assistance and solutions to problems arising from the use of the various word processing softwares, viz IBM Microsoft Word, IBM Word Perfect, WANG Word and conversion from one software to another. The Senior Secretary in BCSU is being given advanced training to provide such service.

Three population modellers have now been appointed, with one - a bio-statistician - as substantive Head of the BRU. The Head of the Unit has additional duties as Livestock Ticks Research Programme (LTRP) modeler.

population in addition to providing statistical and computer services to the Centre.

- (c) To meet the demands for for analysis of on-farm trials of farmer acceptance of new approaches, capability in the analysis of qualitative data is also needed. This could be met by special training of the BCSU staff.

The other two are based in the BRU (with Tsetse dynamics/migration study as additional duty) and in the Tsetse Research Programme (TRP) (with additional duties as mammalian Ecologist/modeler in LTRP and Medical Vectors Research Programme (MVRP) respectively. A fourth population modeler is to be identified and appointed for duties in the Crop Pests Research Programme (CPRP).

Training and re-training of BRU staff in specific areas for knowledge up-grading continue to be of high priority. The Senior Application Specialist (Computer Programmer) recently returned from a six-week training in SAS Institutes in the

- (d) Computer hardware and supporting software is essential not only to provide scientists with access to computer capabilities but also to provide the necessary base for training. Scientists showing special aptitude should or need to be sent to institutions to receive advanced training.

- (e) It is strongly recommended that ICIPE approach upgrading its computer capabilities in a well planned and coordinated fashion, providing microcomputer capability first, to provide advanced services such as SAS, graphics, SPSS and additional capacity for modelling and data processing and storage both in Chiromo and Mbita Point. An upgraded CPU should be purchased

USA and Canada. The Head of BRU had also participated in a course on Estimation of Insect Populations.

The capability to provide this in-house now exists in ICIPE. This was a significant issue in the selection process for new staff indicated in (b) above.

A recently completed detailed study of computer needs and facilities at the ICIPE has recommended replacement of the present CPU with a modern machine. Eleven microcomputers at the AT level, configured for fast processing and and capable of being

for the VS80. The last step should probably involve the acquisition of a Main Frame Computer to be located at Duduville. The future plans should be prepared and costed with all staffing and space limitations fully worked out. All planned purchases should include computers that are fully compatible.

upgraded to the new 30386 chip and large random access internal discs, have been purchased. All machines are compatible with IBM, and are able to run SAS. The Wang VS80 is gradually being replaced with series of micro-computers, mainly IBM compatibles (20-30 megabytes hard disk). The Wang VS80 itself is to be discarded and replaced with networking of these micros and MINI-VAX with 8 mbyte RAM, and 600 mbyte storage and a Tape Unit. In the BRU, a logical network (4 micro and laser printer, CALCOMP mechanised plotter, HP plotter and modem) has been purchased and is operational mainly for Geographic Information System (GIS) activities.

(f) The system at Mbita Point requires urgent immediate attention. Priority should be given to increasing necessary scientific computing capacity there and to providing along with a computer programmer, easily available as well as statistical advice. Advice is needed to advance computer literacy both at Mbita Point and Chiromo on a daily basis; one time courses are not an adequate alternative.

(g) Training courses should be designed for ICIPE staff. Priority should be given to one-on-one computing and biostatistical advice. Computer literacy will come through frequent use and

The situation at MPFS is improving with an IBM PC and an AST. Two more ELTECHS are to be added and networked, while the three WANG PCs are to be upgraded to IBM compatible. The Senior Application Specialist (Statistics) will provide statistical advice, while a Research Assistant with computer/statistics background is to be identified and based at MPFS. Courses being run at headquarters are being repeated at MPFS.

Training is the highest priority of BRU. Over 70 staff have attended introductory courses in micro-computers and data-base

on-line guidance tailored to the specific needs of the scientist, and not through a wide variety of courses.

- (h) Collaboration with other institutions, nationally and internationally should include sharing programmes and advice. This will be especially useful in the development of the population models. In the absence of a completed and funded Master Plan, time-sharing arrangements should be explored and pursued, as feasible.

- (i) Common data sets should be developed and made available. Data from the different projects should be standardized

management softwares. Training in this area will continue, and will be extended to cover biostatistics techniques and use of SAS.

BRU collaborates with other institutions, notably in the area of (environmental) acquisition, training, equipment sharing and modelling activities. BRU recently conducted courses in micro-computer operations and SAS for over 30 Kenya Agricultural Research Institutes Scientific personnel who had been nominated for M.Sc. courses in the USA and Canada.

A major responsibility of one of the Scientists in the BRU is to develop

and stored in such a way that they can be shared, after use by the the scientist who collected them, among projects or used in new projects.

- (j) Close cooperation between BCSU staff and the Deputy Director is highly desirable and should be actively maintained. Rather than have the separate working groups of users and producers of service, the Deputy Director should

common data set environmental measurements in Eastern and Southern Africa. This will include initially, temperature, elevation, rainfall and vegetation types and patterns of distribution. Collaboration with other organisations is high in this regard, while the acquisition of the GIS hardware and software will enable better presentation of such temporal and spatial environmental data, and their effect on pest population changes.

The BRU staff continue to be in close contact with the Deputy Director. As soon as all "User Groups" are fully operational, the Deputy Director will be invited to

chair a joint working group, which could become a "Users Group". The Review Team considers that this will serve to increase the appreciation of each group concerning the needs and constraints of the other.

chair joint sessions.

OUTREACH AND TRAINING UNIT (OTU)

201. At national level, collaboration agreements have been signed between ICIPE and Kenya, Cote d'Ivoire, Somalia and Uganda, and negotiations are going on with Burundi, Rwanda and Zaire. At international level, major collaborative work continues with CGIAR institutes, UN agencies and laboratories in Australia, United Kingdom, Switzerland and the United States of America.

202. The Review Team considers these approaches as appropriate and would like to see the agreements signed with African countries translated into concrete action. If at least some

The Governing Council and ICIPE Management are currently reviewing ICIPE's training policy. The Unit

of this action can be seen to take place in the next two years, the programme could be more generously supported.

name has been changed to Institutional building and Interactive Research Unit (IBIRU) which more appropriately reflects ICIPE's philosophy of commitment to interactive partnership in the process of institutional building and manpower development in the tropical developing world. In the meantime, the following activities are planned within the Plan period:

(a) Methodology Workshop for Zambia executed 9 - 11 June 1987 in collaboration with FAO. Its recommendations are being used to initiate collaborative research in Zambia.

(b) M.Sc. training for the Somali national has already been accomplished: Mr. Ali Nur Duale has been awarded the M.Sc. by the Sokoine University of Agriculture, Tanzania. Mr. Ali Nur Duale has now been offered a place in the 1989 ARPPIS Ph.D. class. A further request for graduate training for another Somali under the ICIPE/Somalia collaborative Agreement is being considered.

(c) Uganda: evaluation of resistant seed material being undertaken by Makerere/Sererere Research Station under a collaborative understanding.

(d) Testing for validity of ICIPE findings going on in Kenya in collaboration with national institutions at Kitale, Katumani, Busia and Mtwapa.

(e) Short-term in-service methodology/techniques training courses for Mozambican and Ugandan officers commenced. One scientist from Mozambique and two technicians from Uganda have completed their three-month training at MPFS.

(f) Joint project proposal on tsetse being developed for donor funding under ICIPE/Tanzania Collaborative Agreement.

(g) Exploratory mission to Guinea Bissau accomplished and training is to be initiated.

(h) Mission to Rwanda accomplished and collaborative PESTNET agreement being finalized.

(i) PESTNET agreement accomplished with Zambia, Zambian national being trained for Ph.D. in 1988 ARPPIS class.

(j) Ethiopia: in-service training for research officers in the FAO supported livestock tick control programme in Ethiopia started.

FAMESA

203. FAMESA is a research and development management training network which aims at improving national research management concepts and skills in

agriculture, health and industry. It is a specially funded project which is very relevant to the objectives of the OTU. The First Triennial Review recommended and the Board agreed that FAMESA activities should be located in an institute other than ICIPE. However, feasibility studies showed that re-location was difficult, the Board decided to allow FAMESA to stay at the ICIPE.

204. The Team appreciates the potential usefulness of the kind of activities proposed by FAMESA suggests that ICIPE should concentrate on the management aspects of programmes in which the Centre has special expertise.

Emphasis will be on research management aspects relevant to Agriculture, livestock and human health research institutions.

PESTNET

Recommendations for PESTNET

210. The Team recommends that:

1. As funds become available, the scheme should try out one rather than all the planned activities, the

(a) Initial efforts will concentrate on pests of maize, sorghum and where

choice depending on the technology that ICIPE is ready to deliver.

applicable, cowpea, as major staple food crops in four countries in Eastern Africa. ICIPE has worked on these crops mostly.

(b) PESTNET Agreements already signed with Somalia and Zambia, and PESTNET activities already started in the two countries. Similar action to be taken for the other two countries. Requests have been received from Mozambique and Ethiopia, and discussions are going on for possibility of signing PESTNET Agreements with the two countries.

2. In the formative stages of the scheme, the role of PESTNET Coordinator should be performed by the Head of the OTU.

The Board feels that this recommendation is unduly restrictive. Another individual might be appropriate.

3. The network should initially be restricted to a small number of countries.

Initially, PESTNET activities will be restricted in four countries.

TRAINING COURSES

Recommendations

219. The Team recommends that:

- (a) The tendency to organize more and more courses has to be restrained, especially since the number of ICIPE scientists who participate in the courses is not growing at the same pace, and research is bound to suffer.

Organisation of courses does not necessarily mean increased training duties, since many courses are staffed by non-ICIPE personnel. Management will undertake a survey to determine how much time is being spent by each scientist in training activities. The results will then be used to limit the number of courses and reward scientists for training activities.

An exercise was initiated to determine the time spent on training activities in the second half of 1987. IBIRU recognizes the importance of this exercise and is being undertaken within a wider review of training commitments by ICIPE scientists and the recognition and reward for those activities.

- (b) ARPPIS students should be more evenly distributed among the programmes and units in order to even out the workload on the scientists (who probably find it difficult to

Inevitably, students gravitate to programmes that meet their needs. The Board believes uneven distribution will be temporary and will urge that ARPPIS Academic Board monitor this.

The ARPPIS Academic Board will inform itself of the distribution of existing students between programmes and units before

decline taking on more responsibilities when asked). Quality of students should not be sacrificed to quantity in order to meet target numbers.

- (c) Programme Leaders and Unit Heads should be fully involved in the selection and placing of ARPPIS and any other students.

Programme Leaders and Unit Heads have always been involved in preliminary screening of ARPPIS students. Final selection resides with the collaborating universities.

- (d) Staff development should be planned and publicised well in advance to ensure equity and avoid ad hoc arrangements which may disrupt work plans.

selecting new students, and will be sensitive to the need to ensure an even distribution.

A new policy is being worked out now as part of a comprehensive review of staff development criteria for the 1987 - 1989 period. This review is in process.

COMMUNICATION, INFORMATION
AND PUBLIC RELATIONS

Recommendations

233. The Team recommends:

- (a) That ICIPE discontinue the proposed publication of Insect Science and Its Application by ICIPE Science Press, for

We believe that the Journal is viable, and it is definitely not a house-journal, as

economic reasons and to dispel the perception that it might be a subsidized "house-journal".

- (b) Very careful high-level editing of PESTNET and FAMESA publications.

SOCIAL SCIENCE RESEARCH
AND LINKAGES WITH USERS

Current Work, Achievements
and Future Plans

235. As mentioned above, the projects underway refer to the Crop Pests and the Livestock Ticks Research Programmes. The Tsetse Research Programme, without the involvement of a trained social scientist, is also working on related issues concerning community participation in the use of tsetse fly traps.

it is properly referred and it has an independent international Editorial Board representing various disciplines in insect science. The ICIPE subsidy will be phased out in 1990 by which time the journal is expected to be self-supporting.

Agreed.

A PDF is now being recruited by SSIRU and TRP to carry out a community study on the potential use and cost implications of the Tsetse trapping technology already developed by TRP.

One social science research project was carried out in collaboration with the Medical Vectors Research Programme but was based in the University of Nairobi.

236. In the Crop Pests Research Programme, a previous project on farmer's perception of pests had been carried out by Rockefeller Foundation Post-doctoral Fellow (anthropologist 1984-85). The results of this Project indicated that more in-depth assessment of intercropping practices and perceptions of farmers was warranted.

Crop Pests Research Programme

246. Future activities will include testing on-farm cropping patterns in farmers' field; analysing issues of total costs and perceptual readiness of the farmer; developing an information package acceptable to the farmers. Phase II of the ICIPE/Rockefeller project which has been underway since April 1986 involves preliminary field research and a larger survey to generate an overview of the local farming systems in one

The successful candidate will start in October 1988.

The ICIPE/IFPRI Collaborative Project (Awendo sugarcane based Cropping Project) will be concluded by the end of 1987. A final report will be provided to the sponsoring institutions by 1st November 1987.

The ICIPE/- Rockefeller Foundation project on Food Security and Production Constraints at the Household Level is winding up by the end of 1988. A report emanating from this work has already been submitted for publication and

site (Kisumu). At the second site in Kakamega, agronomic trials will start and farmer-managed trials will also take place. In the Awendo site, additional experiments are planned to compare intercropped fields of cane and food crops.

Livestock Ticks Research Programme

247. As described under the LTRP section, the sociological work is still in a preparatory stage. Similar research in the intercropping programme has been on-going for a full year, and this is producing useful methodology and research findings for guidance to the LTRP project. As the intercropping programme, basic data is needed on why farmers are doing what they are doing and what constraints in terms of labour, land, time, money and perception of the tick problem. It is crucial for the successful application of findings from the biological component of the ticks programme to understand farmers' perception of the importance of disease carried by ticks viz-a-viz the importance of reducing the tick burden on livestock, and, as a corollary,

should be available in 1989. A large data base has been developed.

Collaboration between the anthropologist and tick entomologists has been intensified. Planned studies include in-depth assessment of time/labour use; categorisation of farm households on the basis of population incomes, education, livestock ownership and land holding to provide a matrix for farmers' resource base and potential for technology adoption. Current work covers herd structure animal

their perception of successful reduction in tick burden (e.g. below a certain threshold) viz-a-viz absolute elimination of the tick population on the livestock. The perceptions may differ for sheep, goat and cattle. Moreover, the social scientist will have to explore the full costs of the proposed intervention versus what the farmer is doing at present in terms of cost of materials for tick control, approaches. In addition to collecting social and cultural data, attention needs to be given to collecting economic and institutional data (e.g. the role of the livestock, veterinary and/or extensions services).

248. To enhance the likelihood that this project contributes to meeting the aims of the Tick Programme, the Team strongly recommends that only the one survey of 50 farmers should be carried out which should cover a sufficiently long period to ensure understanding of seasonal variations affecting tick and livestock populations. This might require at least six months. Use of a questionnaire only is unlikely to

health and farmers disease and tick management practices. Work covers an assessment of small stock and their management.

Agreed.

yield reliable results at this stage. Consideration should be given to using more of a participatory research approach where farmers themselves assist in the study, leading to increased understanding about the real constraints influencing adoption of new approaches. Detailed assessment of this first phase will allow national determination of the need for implementing the proposed 250-farm survey.

249. Despite the longer time period proposed for the small-scale intensive survey, preliminary results can still be put to use at an early stage. The social scientist should closely work together with the ticks programme staff in the dealings with the farmers and frequently discuss with them needs and perceptions. This should assist in planning the biological experiments as well as any on-farm trials. In addition, the social scientist should interact with the tick

Discussions are underway with LTRP to initiate a participatory approach to this work. An opportunity may come through a small project by UNICEF and ICIPE on Rusinga Island which takes this approach. Collaboration with LTRP has been initiated in the survey work.

Agreed.

population modeler to ensure that the appropriate human behavioural variables enter into the model.

250. This is an innovative and potentially very important component of the LTRP. Careful and measured pacing of its development should make it better synchronized with the biological development and encourage productive interaction with the farmers, biologists and social scientists.

Tsetse Research Programme

Recommendations

253. A mid-course evaluation of the Rockefeller supported project is already planned for April 1987. At that time, it was essential that an internal assessment be made of the pilot activities, concentrating on the usefulness of the results to ICIPE programs, the scope and nature of future activities and management arrangements.

Para. 253: The April Review is required only by the ICIPE. The Rockefeller Foundation will send a representative to the April meeting and the recommendations of the Review Team will assist the RF in making decision about its future assistance to the development of the social science programme at the ICIPE.

Social Sciences Interface Research was reviewed by the Programme Committee of the Governing Council in April 1987. The review demonstrated the important contribution social science can make in the process of translating ICIPE's high science for

application by resource-poor farmers and in understanding their perception of pest problems. The Governing Council therefore has approved the incorporation of social science into ICIPE's scientific programme on a long-term basis, and requested Management to present proposals for consideration in October 1987, taking into account the modalities suggested by the Second Triennial Review. These proposals were reviewed by the Governing Council at the meeting of its Executive Board in October 1987.

The terms of reference of the in-depth review are:

1. Review substantive progress and outcome of the implementation

of the joint RF/ICRPE Project on Food Security and Production Constraints at the Household Level with specific reference to the contribution of the Project:

- (a) as a vehicle to enable the ICRPE to carry out its mandate;
 - (b) as a mechanism for facilitating the ICRPE's collaboration with both international and national research and development programmes.
2. To evaluate the contribution of socio-economic analysis to centrewide pest and vector management research with specific reference to crops, livestock pests and vectors of tropical diseases crucial to rural human and animal health in the tropics in relation to the actual and potential contribution of current socio-economic research components of the Centre's programmes.
 3. Propose organizational modalities and resources

suitable for incorporating a long-term perspective on social science interface research in the Centre's work programme.

254. Before new developments (beyond the two programs currently underway), move into the field trial stage, it will be important to have a sound conceptual basis to direct that phase.

The Board notes the recommendations presented in paras: 253-254 and the comments in para:256 and recommends that they be taken into account in preparation of the in-depth review of the social science programme planned for April 1987.

Para 254-257: The questions raised in these paras. have been answered from the outcome of the April in-depth review. These are questions to do with ICIPE direction and future orientation with respect to social science which were subjects of the in-depth review.

255. The following recommendations should help in the definition of such a sound conceptual basis:

1. That ICIPE start small and accumulate knowledge.
2. That the conceptual framework developed in the CPRP be used to define activities in further programs.

3. That the first phase of a social science project should concentrate on the clear definition of peoples perceptions of the problems being worked on by ICIPE research programmes.
4. That initially, this aspect of research should be more qualitative than quantitative since in-sight and understanding are first requirements.
5. That more detailed in-sight stemming from quantitative survey research, be a second requirement.
6. The experience from similar social science research activities in national programs and CGIAR Institutes be used in clarifying issues and assessing findings.

Social Science Research at ICIPE

256. At the end of the next three year period (1987-89), it is expected that there will be a methodology developed and tested with the ICIPE biological results. At that point, consideration should be given as to how far to extend that work into new technologies and training which would involve the extension services. Then, there will be need for deeper involvement with national programmes in order to have wider scale testing of the methodologies and technologies developed by ICIPE. The Outreach and Training Unit will need to be involved so that national institutions can take up the work at that stage.

257. In addition to the scientific assessment of the Rockefeller assisted projects, attention will also have to be given to the most effective management of social science research within the ICIPE structure. The focus of all work in this area must relate to ICIPE's biological

Agreed.

A Social Science Interface Research Unit (SSIRU) was established in January 1988 to provide scientific and administrative management of social science contributions and

scientific work and should
(a) be part of the
methodological basis for
field trials and (b) assist
in the uptake of research
findings by both individual
farmers and the national
agencies. Management options
include:

1. Training of an ICIPE's
core staff members in
social or economic
sciences.

Disadvantages: divert
the scientist from a
biological focus;
unlikely to yield
fully qualified person
with result that
work is of poor
scientific quality;
no visibility or
standing in the field
so unlikely to contribute
to ICIPE's reputation.

2. Sporadic involvement of
a social scientist on
issues or problems
emerging from the
biological work.

collaboration with
biological
scientists (see also
sub. para.4 below).

Advantage: low cost

Disadvantages: no accumulation of experience; time must be spent on identifying person and bring up to a level of knowledge to work on a biological issue; problem identified may not be the real problem; narrow problem focus may result in the real issues may be missed.

3. Location of a social scientist in a Programme section to carry out specific projects.

Advantages: able to become part of the biological team, so easy access to the specific scientist working on the problem; development of special expertise in the specific area (e.g. ticks).

Disadvantages narrow

focus and contribute .
little to other
programmes of the
Centre; additional
longer-term staff costs
to the Centre.

4. Establishment of a small support unit (1 to 2 staff members - senior social scientist and a post-doctoral fellow) to provide scientific input to all programmes.

Advantages: able to attract first class social scientist, flexibility to contribute to all ICIPE programme areas to develop common conceptual framework and methodologies to carry out appropriate research; can assist in identifying problems from the four areas requiring in-depth assessment; can assist in supervising work of other social scientists who may be hired for specific projects in the different programme areas.

Disadvantages: may

This option was adopted following a 1987 in-depth review by external reviewers of the science activity.

attempt to broaden
unnecessarily the
social science
activities, losing the
focus on ICIPE's needs;
administrative or
structural changes may
be needed in the
institution and will
take more time to
initiate; additional
longer-term staff costs
to the Centre.

LINKAGES WITH USERS: Farmers
and the community

Current Situation and
Future Activities

258. The different programmes of the ICIPE have developed different approaches to field trials. The Crop Pests Research Programme has worked with farmers in the field trials, primarily to use their fields for testing and comparing results. Farmer managed trials have not started but are being proposed as part of the social

A one day seminar is planned for May 1989 to review the linkages with other programmes and streamline research approach and field activities in order to harmonise programme research

science projects. The Medical Vectors Research Programme has met with communities to explain the research they are doing and to obtain permission to carry out experiments in different villages. The Livestock Ticks Research Programme has involved farmers in discussions of the experiments and as a result, has obtained close cooperation in Rusinga Island. The Tsetse Research Programme has active collaboration with the community, involving the Masaai population in Nguruman in the construction of traps, in discussions of the problem and in carrying out the research. They have recruited a member of the local community to the research team which has resulted in excellent communications. This is a good model for development of relations with the community at the early stages of field trials.

Recommendations

259. The Team recommends that collaboration with the users of potential new technology

priorities, farmers needs and to assess status of methodology being developed by SSIRU in collaboration with the Programmes. A background paper discussing these issues will be prepared and circulated for discussion.

This was initiated in a collaborative project on

should begin at the earliest stage possible. An understanding of the perceptions and constraints on the use of this technology, preferably before the technologies are available for field trials, can assist in conducting such trials and lead eventually to trials managed by the farmer or community itself. This will result in more realistic assessments of the eventual chances of the technologies being widely adopted.

Reduction of Food Losses through Insect Pest Management and Use of Small-Scale Low-Cost Equipment being jointly sponsored by the ICIPE, the Belgian Government, and Ministry of Agriculture, Kenya. Field trials of components of ICIPE's CPRP package being implemented are inter-cropping and plant resistance. Biological control will also be introduced before the project ends. Project involves collaboration between biological and social scientists, farmers and extension personnel from the national programme.

LINKAGES WITH USERS: Government
Agencies and other National Institutions

Current Situation and
Future Activities

Recommendation

262. The Team recommends that continued attention needs to be given to establishing linkages with the official users of the research results in the government agencies both in Kenya and in other countries where ICIPE is working. Such linkages should be established not only at the central level but also at the district level where, with close involvement of district staff, IPM technologies suited to specific local conditions could be tested for application across a wide range of farming systems.

The Board agrees with the recommendation made in para. 262.

LINKAGES WITH OTHER SCIENTIFIC
INSTITUTIONS AND INTERNATIONAL
COOPERATION

International Organizations

265. The joint FAO/IAEA Division of Isotope and Radiation Applications of Atomic Energy for Food and Agricultural Development in Vienna, a United Nations Agency, has supported ICIPE over a period of approximately 10 years, setting up and equipping a C-level laboratory at Chiromo and sending experts to ICIPE for 3-month visits. There are also prospects for a second facility at Mbita Field Station. Also, senior scientists and a senior technician from ICIPE have received training at the IAEA Seibersdorf laboratory. At present, other than the continuing 3-month visits to ICIPE of IAEA radioisotope experts, there are no continuing projects with ICIPE. It would appear that collaboration between IAEA and ICIPE has been better in previous years.

The Board notes that IAEA has two continuing projects with ICIPE involving radioisotope and electronic equipment maintenance.

In view of anticipated increase in the use of radioisotope techniques at the ICIPE particularly in Molecular Biology, present collaboration with IAEA in research and training will be integrated. ICIPE and IAEA will collaborate in conducting an annual African Regional Training Course for the Use of Safe Handling of Radioactivity in Insect Science. The first course was organized in Nairobi from 20th September to 10th October 1987. Its

266. The Food and Agriculture Organization of the United Nations (FAO) is well acquainted with ICIPE's work and several sections have good relationships with ICIPE. It might, however, be useful if priorities for research and the planning of research projects were to be discussed with particular FAO sections at an early phase. Such discussions could promote mutual interests.

The Board supports ICIPE's efforts to involve FAO in its programme to the extent possible.

collaborative project with IAEA on the repair and maintenance of electronic scientific equipment will continue.

Logistics will be developed to improve intercommunication between ICIPE and the FAO and similar institutions with which the ICIPE collaborates in research. Discussions for intensification on these linkages have already been held in Rome during February 1987 at the highest levels. Already, ICIPE and FAO have jointly undertaken a workshop in Zambia; they are jointly planning one in Somalia; and are examining the possibility of closer cooperation

267. From the discussions at the World Health Organization (WHO), it is evident that there is high regard for the potential of ICIPE as a major scientific institution in Africa, but the views on its ability to fulfil that potential vary considerably. This is, of course, in specific reference to its work in medical vectors. There is no one at WHO who is familiar with the work of ICIPE in the area of agricultural and veterinary aspects. On the question of the diffuse nature of ICIPE's activities, the need for keeping a clear and limited focus in the medical vectors work was emphasized.

268. ICIPE has a major role to play both in promoting entomological work in the region and in

The Board notes that ICIPE's work is concentrated in four programmes of which only two are of Medical Vectors by nature.

in training and carrying out FAMESA national workshops. Further, ICIPE is executing field projects with the ECA/FAO Joint Division for Agriculture.

IBIRU and the Information Department of the Division of Administration and Information will step up dissemination of information about ICIPE and its activities.

ICIPE will maintain its role as a mentor in providing

strengthening entomological institutions at the university and government levels. In the opinion of WHO staff, ICIPE's leadership role in this area has not been clearly defined, though its potential is great.

269. The training programme is meeting an important need. Concern was expressed about the usefulness of the Ph.D. projects, some attention will need to be given to the trade-off between teaching theory and methodology and developing practically-oriented entomologists who can contribute to basic science and to its application in their countries.

270. Collaboration with the Tropical Diseases Research (TDR) Programme (managed by WHO), could include training (with small research grants), and the involvement of ICIPE scientists in the promotion of some of the activities in Africa.

The Board re-affirms its previous decisions that professional training at ICIPE is through ARPPIS.

direction and guidance to institutions interested in Entomology and entomological professional services.

ICIPE is in collaboration with the TDR programme on opportunities for short-term training and already ICIPE has trained four TDR students from Nigeria and Ethiopia and a candidate from Somalia is expected

in October 1987. A number of ICIPE scientists have received training grants for TDR.

International Centres

275. The Team recommends that ICIPE should explore other potential cooperations similar to IITA where appropriate. That would include the cooperating International Centres stationing a scientist at Mbita Point. For example, a plant pathologist would be desirable to interact with the Crop Pest Research Programme as it attempts to develop IPM and small farm cropping systems.

276. The Team endorses the need for a more equitable arrangement with the IRRI cooperation. There are a number of ways in which this cooperation can be improved but it is essential to have at least one of the current two scientists at IRRI for the immediate future with perhaps a concept of a rotating position at IRRI with an ICIPE

ICIZE will endeavor to explore these possibilities within funding limits.

A new 10 year Agreement with IRRI was signed in August 1987 and this caters for (i) the rotation of the scientist at IRRI every three years at the time of the

entomologist spending a reasonable time interval basis (at least two years) before rotating out.

277. The relationships between ICIPE and ILRAD have improved and there are examples of collaboration at the working scientist level. Clearly, the technical grounds for the two institutes, one concentrating on the vector, the other on the disease, to collaborate are very strong. ICIPE has considerable strength in the ecological area, ILRAD in the laboratory area, so closer cooperation could be of mutual benefit.

278. ILRAD has triannually a training course for the use of radiation and radioisotopes, presented by a scientist from IAEA in Vienna. ICIPE is planning a course for 1987 on radioisotopes which will be

major review of the project; and (ii) IRRI placing a scientist (Plant Breeder/Agronomist) at ICIPE to work on rice pests. An IRRI breeder is already at ICIPE.

ICIPE recognises the mutual strengths and potential benefits of collaborative interaction between the two institutions.

There is already involvement of ILRAD scientists in the discussions pertaining to the organization of the ICIPE/IAEA

dealing with insects and other arthropods as vectors. Coordination and collaboration would be beneficial.

279. The Team recognises that true collaboration often takes much time to promote and nurture and in the end depends on individuals. It endorses the idea of the Nairobi cluster as a useful forum for discussion and exchange of ideas.

course; and the plan is to invite ILRAD scientists to participate formally as lecturers.