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PROGRAMME PLANNING

COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

Assistance for a global project

Centro Internacional de Agricultura Tropical, Centro Internacional de la Papa and International Institute Tropical Agriculture - Human Resources Development for Generation and Transfer of Root and Tuber Crops Technology - (GLO/87/001)

Recommendation of the Administrator

Estimated UNDP contribution	\$2 300 000
Duration	Three years
Executing agency	UNDP

I. BACKGROUND

1. Cassava, potatoes and sweet potatoes are a basic component of the staple diets of many people throughout the world. Cassava, cultivated on a world-wide total of 13.1 million hectares, is almost exclusively produced and consumed in developing countries. Of the world's 18.2 million hectare potato production, 46 per cent is in developing countries, as is 98 per cent of the world's 15 million hectares devoted to sweet potatoes. Though these crops produce more energy per hectare per day than other staple crops, such as rice and maize, they receive much less attention than cereals for research to improve yields, nutritional quality and adaptation.

2. The potential of these three crops for alleviating world hunger has been recognized by the Consultative Group on International Agricultural Research (CGIAR), which has mandated three international centres to conduct research on one or more of these crops as follows:

(a) The International Centre for Tropical Agriculture (CIAT). Located in Colombia, the Centre has a special focus on the world-wide cassava production. Its cassava programme, started in 1971, seeks to increase cassava productivity in areas where it is presently grown, as well as in the acid, infertile soils of the lowland tropics. Regional trials in Colombia have shown that, with improved technology, local clones yield an average 20 tons per hectare (against a national average of 8 tons), illustrating the potential for doubling yields at selected locations without even changing varieties. This potential has been realized at the commercial level in at least one country;

(b) International Potato Centre (CIP). Located in Peru, the Centre concentrates on potatoes. A major asset is the CIP World Potato Collection, which includes many previously unavailable genetic resources that can be used by potato researchers world-wide to help overcome production problems. Its research includes the collection, classification and distribution of germ-plasm; the control of diseases and insect pests; physiology and agronomy; seed production; and storage and processing technology. In seven regions of the world, the Centre has trained large numbers of competent national scientists. Recent progress made at CIP includes: the identification of potato clones that resist late and early blight; the development of true seed in potato, which could revolutionize potato production in developing countries. Indeed, potato acreage has grown rapidly in Asia and Africa, with a 40 per cent increase in average yield in South Asia over the last 20 years;

(c) The International Institute of Tropical Agriculture (IITA). Located in Nigeria, the Centre deals with cassava for Africa, as well as sweet potato, yams and cocoyams. The IITA Root and Tuber Improvement Programme started in 1971. Its ultimate goal is to improve the research and extension capacities of national root and tuber improvement programmes by training nationals and providing improved technologies and plant material. Having identified sources of genetic resistance to cassava diseases, IITA has distributed improved disease-resistant clones to Nigerian farmers. They are getting yields of about 30 tons per hectare, compared with 10-ton yields from traditional varieties. Prospects for genetic resistance to the major insect pests of cassava, mealybugs and green spider mites, also seem good. Yields of IITA insect-and-disease-resistant lines of sweet potato average 20 to 30 tons per hectare without fertilizers, compared with traditional yields of about 8 tons.

3. Since 1980, UNDP has assisted a co-ordinated effort to transfer technology in cassava, potatoes and sweet potatoes to selected developing countries. With CIAT as lead implementing institution and CIP and IITA as close collaborators, it has supported efforts to:

(a) Strengthen the root and tuber crop research and extension capabilities of selected national programmes concerned with the three crops; and

(b) Promote the transfer of technology emerging from the international centres conducting research on these crops.

4. By the end of 1985, the UNDP project had made significant progress by strengthening the interaction of the three international centres with national programmes of developing countries and through the distribution of improved germ-plasm of the crops to country collaborators around the world. Over 450 personnel from Asian, Latin American, African and Middle Eastern countries have received training in specialized areas. This has not only strengthened the capacity of national root and tuber crop programmes to do adaptive research and extension, but has equipped personnel from countries which do not have national root/tuber crop programmes to help in establishing them. The project has also helped to bring the international centres into closer contact with the reality and needs of participating countries, and to provide a regional and global focus on problems such as the rapid propagation and transfer of disease-free germ-plasm, which transcend national boundaries.

5. During the last three years, the research and training programmes in root and tuber crop improvement of CIAT, CIP and IITA have been reviewed in depth by panels of independent consultants commissioned by the Technical Advisory Committee (TAC) of CGIAR. These panels have highly commended the programmes of these centres and strongly recommend that sustained support be continued to these activities in order to maximize their benefits to developing countries. In June 1986, the current UNDP project was evaluated by an external consultant who was assisted by an advisory committee made up of selected developing country specialists. This assessment found that while substantial progress had been made in training developing country personnel in relevant aspects of root and tuber crops, several national agencies were still unable to effectively move appropriate technology to end-users in these countries. Hence, a strong recommendation was made for the continuation of UNDP support for a further three-year period. However, it was emphasized that a new approach be devised to focus greater attention on the development of human resources in developing countries so that the three international centres can help build up the capabilities of national agencies to conduct applied and adaptive research in close co-operation with extension services.

II. THE PROJECT

6. The main purpose of the project is to facilitate the expanded development of human resources in root and tuber crop improvement programmes of selected developing countries in Africa, Asia, the Middle East, Latin America and the Caribbean in order to enable farmers to adapt new technologies designed to increase their own food supply and income as well as to augment the availability of low-cost food to urban populations. The general objectives of the project are to further strengthen and integrate the activities of CIAT, CIP and IITA to improve the effectiveness of future activities, as follows:

- (a) To provide more in-country and regional training, with training at the three international centres for individuals requiring special/advanced training;
- (b) To impart training in communications, extension and training methods;
- (c) To emphasize the training of trainers with a good balance between theoretical and practical aspects of root and tuber crop production;
- (d) To provide socio-economic training through the use of social scientists in order to change farmers' attitudes towards the adoption of new technologies;
- (e) To develop appropriate communication methodologies and to prepare basic training materials to be provided to national programmes;
- (f) To facilitate intercountry co-operation and inter-centre co-ordination through holding country/regional/centre workshops and conferences to exchange information and experiences; and
- (g) To conduct evaluations of trainees, trainers, teaching materials, course controls and methods of communication.

7. The specific project activities in support of the above-mentioned goals will be carried out under two groupings, one as joint activities and the other as programmes to be conducted by individual centres as described in the following paragraphs.

A. Joint activities

8. CIAT, CIP and IITA will collaborate in developing an integrated approach by offering educational experiences in areas critical to generating new technology and transferring appropriate technology to producers. Joint activities are designed to facilitate or enable national counterparts to assume a more active role in reaching root and tuber crop producers with improved technology. There are several non-commodity-specific issues that are considered to be equally critical to the programme of the three centres; therefore, they will be treated jointly in order to take full advantage of the expertise available in the three systems. Of high priority are training on methodologies related to farm-level diagnostic skills; product development for root and tuber crops and their marketing; training and communication skills for national research and extension personnel; the organization and management of vegetative seed production programmes; and methodologies of integrated pest management. Tentative schedules already established for these joint activities will be finalized and submitted to UNDP upon approval of this project.

B. The activities of individual centres

9. The individual international centres will focus on the specific root and tuber crops of their mandate: CIAT - cassava (global with regional responsibility for Latin America, the Caribbean and Asia); CIP - potatoes (world-wide); and IITA - cassava (regional responsibility for Africa), yams, sweet potatoes and cocoyams. In addition to the multidisciplinary production and utilized courses at headquarters and in-country courses for agronomists, extension personnel and university professors, graduate thesis research and short-term internships in special fields will be offered to outstanding professionals in the field. These activities will be carried out as follows:

1. The International Centre for Tropical Agriculture

10. The Cassava Programme is now ready to promote the development of integrated production, processing and marketing technology for small farmers so they can enter into the growing markets. The integrated research group at CIAT will work with the national root and tuber programmes in the development of pilot projects, which requires a close linkage between research and development activities. This project will play a critical role in the implementation of these integrated production-processing-marketing projects through process-oriented training that will focus on problem identification, priorities and implementation of research and development projects.

11. The strategies employed depend upon the region. With the establishment of a regional office in Asia, the efficiency of the selected process and more direct training efforts to satisfy national programme needs have been implemented. In Latin America there has been no spontaneous development of small-scale agro-industry to process cassava, as has occurred in Asia; this is primarily because of socio-economic differences between the regions. The three-year training plan contemplates:

(a) Two intensive, integrated production, processing and commercialization courses, one in Asia and two in Latin America;

(b) Ten four-month internships (six in Asia, four in Latin America) in entomology, physiology, breeding, pathology and tissue culture;

(c) Six regional workshops and refresher courses (three in Asia, three in Latin America), as well as three workshops on integrated pest control, models for cassava-based development, and tissue culture;

(d) Regional/in-country courses in Indonesia, the Philippines and four per year in Latin America; and

(e) M.Sc. theses research grants: four in Asia and two in Latin America.

2. The International Potato Centre

12. All CIP activities will be conducted in collaboration with research, extension and education agencies from strategic regions and countries of the developing world. It is envisaged that joint training and trial experiences will promote co-operation among all existent groups that can contribute to potato improvement in such a way that collaboration continues after the project has terminated.

13. Over the three years, there will be eight seed production courses in six countries (Brazil, Peru, Kenya, Cameroon, Bangladesh, Turkey). These one-month courses, directed at personnel with responsibilities for ongoing seed programmes or where new seed programmes are needed, will facilitate the bringing together of existent expertise to concentrate on seed production for the benefit of several countries in close geographical proximity to each other and with similar growing conditions and constraints. The socio-economic aspects of seed production will be addressed in such a way that participants will be able to analyse their own seed production environments systematically.

14. There will be nine one-week in-country production courses in seven countries (Cape Verde, Egypt, Indonesia, Madagascar, Thailand, Togo, Zambia). These courses will be organized on a request basis during a growing season. Directed primarily at extension workers whose work stations are in potato-producing areas, the courses will enable them to respond to farm-level problems. Special emphasis will be given to providing experience in ascertaining with farmers the most important production and marketing constraints and in communicating with them new or improved technology designed to alleviate or eliminate existent production problems. The majority of the instruction will be conducted by national specialists who are familiar not only with the language of the country but also with prevailing production systems.

15. Fifteen scholarships will be provided for M.Sc. degree-level studies to be undertaken in universities either in the scholar's home country or in a neighbouring country with similar potato-producing conditions. Thesis research will be on topics of priority to the scholar's home country as determined by national potato programme leaders. The research will be supervised jointly by national and CIP outposted scientists or solely by CIP scientists where national capacity is non-existent.

3. The International Institute of Tropical Agriculture

16. IITA will continue, expand and intensify current efforts to strengthen research and extension capabilities of selected developing country programmes concerned with cassava, sweet potatoes, yams and cocoyams as follows:

(a) Training for adaptive research to help strengthen research capabilities of national programmes for co-operative as well as independent research, including:

(i) Individualized training to acquaint researchers and technical support staff with the latest developments and techniques in root and tuber improvement in areas such as the rapid multiplication of planting materials, processing and utilization;

- (ii) The provision of three fellowships towards the Ph.D. degree (two for women) and six for the M.Sc. degree (three for women) to strengthen national programmes leadership.
- (b) Training for validative research and extension to assist national programmes to test, validate and spread to farmers new improved technologies for increasing yields. The training will consist of:
- (i) Group training courses on root and tuber research and production technology. Five 10-week courses per year will be held at IITA headquarters on the research and production technology of cassava, sweet potatoes and yams. Trainees will later act as trainers in their own countries. Limited research support materials will be provided so trainees get started with the research as soon as they return to their own countries. Some of the participants in the yearly 10-week research and production technology course will stay on at IITA for a period of about two weeks on individual attachment to sections they consider useful in acquiring more working experience;
- (ii) In-country training for research and production of root and tuber crops. This new approach will focus primarily on the countries where IITA-developed technologies on root and tuber improvement are already being utilized and there are sufficiently large numbers of trainees to be utilized as trainers. Courses will last three weeks.
- (iii) Training in rapid multiplication. Ten in-country training courses of two weeks duration are planned yearly in the rapid multiplication of planting materials and on research and production technology. The countries include Benin, Burundi, Cameroon, Ethiopia, Ghana, Guinea-Bissau, Jamaica, Liberia, Malawi, Nigeria, Sierra Leone, Sudan, Seychelles, Rwanda, Togo, Uganda, United Republic of Tanzania and Zaire.
- (c) Training for specialized research support functions so that selected individuals from national crop improvement programmes with adequate infrastructure and support staff to handle tissue culture material can provide critical support services; past experience has shown that many programmes in Africa do not have adequate facilities. Training will be practical, emphasizing the use of materials and equipment that national institutions can afford to support, and will include:
- (i) Workshops to assess training needs in root and tuber crop production. In 1988, a workshop is planned to bring together selected research co-ordinators so they may share experiences in the field of training and establish training priorities for the next three years;
- (ii) Interaction with national programmes for information exchange and research strategy, including regional workshops as well as follow-up assistance to national programmes and former IITA trainees to facilitate the exchange, testing, adaptation, validation and application of new technology. These workshops will serve as a forum for the national co-ordinators of root and tuber improvement programmes who will exchange

the research results and experience of previous years and jointly plan the research and training activities for the subsequent years. The following workshops are planned: West Africa (Togo), 1988; Central Africa (Gabon), 1989; and East Africa (United Republic of Tanzania), 1990.

Built into the activities stated under the above categories of training will be the production of appropriate training materials such as manuals, articles, bulletins and audio-tutorials.

17. The training programmes and other activities described above, for which full descriptions, including the countries expected to participate in them, will be made available to UNDP on project approval, are to be implemented by CIAT in collaboration with CIP, IITA and national research institutions of developing countries. Special conferences, seminars and workshops will be arranged as needs arise. Participants in those events, as well as the training courses for them will be carefully selected by CIAT in consultation with CIP, IITA and appropriate national and international agencies. While CIAT will act as the lead institution for the project, the focus of the activities will be defined in relation to the different strategies and existing programmes of the three co-operating international centres, which will provide substantial additional resources to this project.

18. In order to assess the impact of the project activities at the farm level and to measure the effectiveness of the various training programmes, UNDP will provide, under its own direct costs component, funds for required consultancies in order to undertake an independent evaluation. Such an assessment will be made at two different periods, midway in the course of the project and at the end. Visits will be made to selected countries around the world in order to provide adequate coverage of the countries involved so that the assessment will be meaningful. Special attention will be given in that evaluation to the outcome of the project in regard to strengthening national root and tuber crop improvement and extension programmes and the utilization by farmers of new technologies that have resulted in increased production.

19. The Administrator intends, through contractual arrangements between CIAT and UNDP, to entrust the implementation of this project to CIAT, with the clear understanding that the Director-General of CIAT will seek the advice of the Food and Agriculture Organization of the United Nations (FAO) as needed. As in the past, UNDP will follow closely all the developments in this global project and, together with FAO, will participate in the project advisory committee which will be established for the project. A concerted effort will be made to link the training and research activities with field work being undertaken at the country and intercountry levels. Close collaboration will be maintained at all times with international agricultural research centres participating in the project. The project advisory committee, which will include representatives of selected national agencies and international agricultural research centres, will normally meet once a year, or at such times and places as deemed appropriate by the three centres. It will appraise the ongoing training and collaborative research programmes and advise on its future direction. Towards the end of the project, UNDP will, in consultation with CIAT, undertake a review of the accomplishments of the project to

be carried out by a team of independent consultants. This review will take place in conjunction with the assessment referred to in paragraph 15 above.

20. The proposed UNDP contribution is \$2,300,000, of which \$2,065,000 will be for subcontracts, while direct costs will account for the remaining \$235,000. The expenditures under the project will be contained within the indicative planning figure available for global projects established by the Governing Council for the fourth programming cycle.

III. RECOMMENDATION BY THE ADMINISTRATOR

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

