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PROGRAMME PLANNING

COUNTRY AND INTERCOUNTRY PROGRAMMES AND PROJECTS

PROJECT RECOMMENDATION OF THE ADMINISTRATOR

Assistance for a global project

Technology Transfer on Root and Tuber Crops
(GLO/79/013)

Estimated UNDP contribution:	\$660 000
Duration:	Two years
Executing Agency:	UNDP

I. Background

1. Edible roots and tubers have always been a basic component of the staple diets of many people throughout the world. In fact, potatoes, cassava and sweet potatoes singly outrank the average production of energy per hectare per day produced by each of the most popular foods in tropical developing countries, including dry beans, chick-peas, rice and maize. Cassava, with a total of 13.1 million hectares of production, is almost exclusively produced and consumed in developing countries, and 98 per cent of the world's 15 million hectares of sweet potatoes is grown in developing countries.

2. Forty-six per cent of the world's 18.2 million hectares in potato production is in developing countries. In spite of the potential of these crops to produce an enormous amount of energy per hectare, they have received much less attention than cereals in terms of research on improvement of yields, nutritional quality and range of adaptation. Recognizing these facts and the three crops' potential

for alleviating world hunger, the international research centres - International Centre for Tropical Agriculture (CIAT), International Potato Centre (CIP) and International Institute of Tropical Agriculture (IITA) - have been mandated by the Consultative Group on International Agricultural Research (CGIAR) to conduct research on these crops with the objective of assisting national programmes to adapt and generate new technologies for increased production.

3. The International Centre for Tropical Agriculture (CIAT) at Cali, Colombia, devotes its efforts to generate and deliver, in co-operation with national programmes, improved technologies aimed at increasing production of cassava, field beans, tropical pastures and rice. The Cassava Programme started in 1972, and has focused attention on the evaluation, selection and improvement of cassava germ plasm, breeding for high yield, resistance to major pests and diseases and the development of simple technology based in improved agronomic practices. Selections and hybrids are now available from the programme that in regional trials have yielded 30 to 35 tons per hectare, that is, two to three times the average national yields in developing countries. Attendant yield-increasing technologies have also been developed, such as improved cultural practices, fertilization and disease, insect and weed control methods. A growing network of cassava research workers is developing mostly through training at the centre. A total of 249 professionals have received training since 1972. Additional trained personnel are needed to expand the network and strengthen the collaborative and independent research capabilities of cassava research programmes in developing countries, especially in Latin America but also in South Asia. In this region, with funding from the International Development Research Centre (IDRC) of Canada, CIAT has co-ordinated outreach efforts, including testing of cultivars and training. CIAT's Cassava Programme is now planning to expand its training activities to include short-term multidisciplinary intensive courses on cassava production to be conducted in interested countries. These courses will assist national research programmes to integrate with extension services and the diffusion of new technologies, resulting in yield increases. Parallel to its research and training activities, CIAT's Cassava Programme brings together each year scientists from national programmes on cassava to participate in workshops on specific subjects with the purpose of exchanging updated information on research methodologies and on new technologies, and to agree on future research strategies and plans. Outreach scientists with responsibility for certain geographic areas (i.e., South America, Central America, Caribbean and South Asia) help to keep network researchers well-informed and supplied with germ plasm and trial materials. Some of the countries involved are Brazil, Colombia, Mexico, Costa Rica, Dominican Republic, Ecuador, Venezuela, Guyana in Latin America and Central America. In Asia, where CIAT's co-operative programme is relatively recent, the following countries have been involved: India, Indonesia, Malaysia, the Philippines and Thailand.

4. The International Potato Centre (CIP) at Lima, Peru, conducts research into all aspects of the improvement and production of the potato. At its headquarters in Lima, Peru, and elsewhere, the Centre conducts basic research which includes the utilization of the international germ plasm collection in breeding programmes, pathology, physiology, entomology, nematology and social sciences. From the

initiation of the Centre, funds have been allocated for the development of a world-wide network of scientists whose principal role is to evaluate improved methodology. This regional programme also evaluates and distributes improved germ plasm emerging from the various breeding programmes. Seven regional locations have been established in different locations around the world, and 75 per cent of CIP training is carried out at these or in countries within the regions. Already, through the regional research programmes, large numbers of competent national scientists have been trained. In addition, the regional scientists have identified several cells of expertise within national institutions which are capable of training scientists in neighbouring programmes. It is CIP's stated policy in its long-term profile that, as early as possible, it will try to catalyze the process of horizontal transfer of existing technology between national programmes using national capabilities.

5. Within the international network of agricultural research and training centres, the International Institute of Tropical Agriculture (IITA) established the Root and Tuber Improvement Programme in 1971, with the responsibility of improving cassava, sweet potatoes, yams and aroids. It has been assigned world-wide responsibility for sweet potato, yams and aroids, and regional responsibility for cassava in Africa. It has since conducted research leading to improvement in both yield and quality, to distribute improved plant materials to national research centres where they can be of significant value to breeding or improvement programmes and to conduct training programmes to increase the capacity of developing nations to solve their food production problems with their own expertise. The staff of the Institute's Root and Tuber Improvement Programme, including breeders, pathologists, agronomists, entomologists, a biochemist/food technologist, a tissue culture scientist and farming systems scientists, a nematologist and co-operating virologists, have since the early days of the Institute, worked with some success to provide national programmes and farmers with high-yielding planting materials with resistance to diseases and pests of the cassava and sweet potato. Seeds of promising lines of cassava identified by IITA have been sent by IITA for evaluation by national programmes in Burundi, Cameroon, Congo, Ghana, Liberia, Sierra Leone, Seychelles, Tanzania, Togo, Zaire and Zambia in Africa, and to India. IITA has also developed good collaboration with Indonesia on cassava research.

6. CIAT has now submitted for UNDP consideration a proposal prepared in collaboration with CIP and IITA, designed to launch a co-ordinated effort to transfer to selected developing countries technology on three economically important crops: cassava, potatoes and sweet potatoes. Yams and cocoyams, which are also important in many developing countries, have been excluded from this proposal because of financial constraints. The project will emphasize training for developing country national programme personnel and will seek to facilitate the exchange of information, knowledge and experiences. Although the project will have a two-year duration and UNDP inputs into it will be modest, there is reason to believe that, in light of the successful research programmes already being implemented at the three international centres briefly described above, an effective groundwork will be laid to launch a programme which will strengthen collaborative relationships with selected developing country programmes and provide a much-needed mechanism for training personnel and for disseminating improved technology on cassava, potatoes and sweet potatoes.

II. The project

7. The main objectives of the project are to:

- (a) Strengthen the root and tuber crop research and extension capabilities of selected national programmes concerned with cassava, sweet potatoes and potatoes which are economically significant crops; and
- (b) Promote the transfer of technology emerging from international centres conducting research on the above-mentioned crops.

These goals will be achieved through the following means:

- (a) Strengthening, through training, the existing network of national programmes that conduct adaptive research and evaluation of emerging technologies;
- (b) Catalysing a horizontal exchange process of existing knowledge and technologies between national programmes within certain geographical spheres; and
- (c) Facilitating an effective distribution of new germ plasm emerging from research.

8. The specific project activities in support of the above-mentioned goals will be as follows:

(a) Training for adaptive research. The training activities under this heading will be directed towards improving the capabilities of national programmes to conduct co-operative and independent research on specific root and tuber crops and evaluate technology and germ plasm development by international centres and associated institutions for suitability for their respective sociological and ecological conditions.

- (i) In this regard, CIAT will conduct an internship programme on disciplinary research for cassava for up to 20 man-months in such disciplines as breeding, pathology, entomology, physiology and agronomy. Additionally, CIAT will offer a four-week training course on biological pest control for cassava, with ten participants;
- (ii) CIP will conduct four regional short courses on low-cost storage for potatoes in the most appropriate geographical areas; and
- (iii) IITA will provide research fellowships to permit agricultural scientists from developing nations to conduct at the Institute research on cassava and sweet potatoes, to become familiar with new and emerging technologies related to their crops and to strengthen the basis for collaboration between IITA and the national programmes they represent.

(b) Training for validative research and extension. This training will be directed at improving the national programmes to evaluate technology and germ plasm for economic acceptability under farm conditions.

- (i) In this regard, CIAT will assist a limited number of national programmes in conducting up to four in-country short courses on cassava production aimed primarily at extension personnel for purposes of bridging research and extension and helping to disseminate new technologies for increasing yields;
- (ii) CIP will conduct two regional short courses on agro-economic methodologies for potato research and three regional short courses on potato seed production technology in the most appropriate geographical areas; and
- (iii) IITA will provide scholarships to permit research workers and extension personnel from national programmes to participate in the 1981 and 1982 training courses on tropical root crop production technology and extension, and to organize individual programmes to meet the training needs of research and technical personnel of national cassava and sweet potato improvement programmes.

(c) Training for specialized research support functions. This training will be directed at improving the capabilities of national programmes to perform specific and specialized research techniques unutilized in direct support of comprehensive research efforts. In this regard, CIAT, CIP and IITA will collaborate in the planning, conduct and evaluation of two regional workshops on root and tuber crops tissue culture techniques.

(d) Interaction with national programmes for information exchange and strategies for solution of common problem areas. This activity will be directed at providing national programmes and international centres an opportunity to exchange scientific information and to discuss major problem areas related to the execution of research programmes and the transfer of technology, with the intent of formulating possible strategies for their solution.

- (i) In this regard, CIAT, CIP and IITA will collaborate in the planning, conduct and evaluation of a workshop on root and tuber crops germ plasm distribution and quarantine considerations;
- (ii) In addition, all three Centres will provide follow-up support to the scientific personnel trained under the project, including the channeling of information on research progress, supplying of germ plasm and technical advice on the conduct of adaptive research. Two regional workshops, one in Latin America and the other in Africa, will be conducted.

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9. The training programmes described above, for which full descriptions including the countries expected to participate in them will be made available to UNDP on project approval, will 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 training courses 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 thrust of the project's activities will be focused in relation to the different strategies and existing programmes of the three co-operating international centres in this project.

10. 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 and when needed. As in the past, UNDP will follow closely all the developments in this global project and, together with FAO, will participate in the Policy 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 Policy Advisory Committee, which will include representatives of selected national agencies and international agricultural research centres, normally will meet once a year to appraise the ongoing training and collaborative research programmes and to 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.

11. The expenditure component of the proposed UNDP assistance is:

	<u>US\$</u>
Subcontract	600,000

The proposed UNDP contribution will be contained within the Global IPF established by the Governing Council for the current cycle.

III. Recommendation

12. The Administrator recommends that the Governing Council:

(a) Approve this project; and

(b) Authorize the Administrator to make the appropriate arrangements with CIAT for the execution of this project.
