



**Governing Council
of the
United Nations
Development Programme**

Distr.
GENERAL

DP/PROJECTS/REC/35
22 March 1990

ORIGINAL: ENGLISH

Thirty-seventh session
28 May-22 June 1990, Geneva
Item 5 (b) (iv) of the provisional agenda

PROGRAMME PLANNING

COUNTRY, INTERCOUNTRY AND GLOBAL PROGRAMMES

Assistance for a global project

Increasing Wheat Production in Warmer and Stressed
Environments - Centro Internacional de Mejoramiento
de Maíz y Trigo (CIMMYT) (GLO/90/001)

Recommendation of the Administrator

Estimated UNDP contribution: \$3,565,000

Duration: Three years

Executing agency: UNDP in association with World Bank and FAO

I. BACKGROUND

1. The Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) grew out of a collaborative programme between the Government of Mexico and the Rockefeller Foundation. The programme, established in 1943, expanded into an international institute in 1966. CIMMYT works with scientists and national programmes around the world on the improvement of maize, wheat and triticale (which is a man-made cross between wheat and rye and has considerable potential for high yields and superior nutritional quality). The first two crops provide the principal sources of calories and protein for approximately half of the world's population. They are the staple foods of some of the poorest people in many developing countries.

2. CIMMYT fulfils its mission in the following ways:

(a) Conducting research in Mexico and elsewhere;

- (b) Distributing superior germ-plasm to national programmes for higher and more dependable yields and higher nutritional quality;
- (c) Developing procedures for crop improvement and crop management research;
- (d) Conducting applied training for scientists from developing countries;
- (e) Sponsoring technical seminars and publishing information on new technological components;
- (f) Consulting with developing countries on the organization of maize and wheat research programmes;
- (g) Assigning specialists to work in regional and national programmes in Asia, Africa and Latin America. CIMMYT serves as the hub of collaborative research with maize and wheat scientists in more than 125 countries around the world.

3. The best-known contributions of CIMMYT are in wheat, with over 35 million hectares in developing countries planted with hundreds of improved varieties emanating from germ-plasm distributed by the Centre. The investment made in the development of these varieties has resulted in an impressive return estimated at approximately \$3.0 billion per year. In addition to the contributions in germ-plasm development, CIMMYT has made significant contributions to training wheat researchers in national programmes in developing countries; over 2,000 scientists have been trained in various aspects of wheat improvement during the past 20 years.

4. Wheat accounts for more than one quarter of the total world grain production and is a staple food for one third of the total world population. Since practically all of the world's wheat crop is grown in subtropical and temperate climates, many of the developing countries located in the tropics have to import substantial quantities of wheat. While some of the countries in the tropics, especially in the subtropics, are growing wheat during the drier and cooler seasons, yields are relatively low because of the short growing seasons and damage from insect pests and diseases. Based on exploratory research done by CIMMYT, the United Nations Development Programme (UNDP) has been assisting CIMMYT since 1982 to carry out research on the development of disease- and insect-resistant semi-dwarf wheat varieties which could be adapted to the warmer subtropical areas of the world. The project has assembled and identified different strains of wheat possessing agronomic characteristics suitable for warmer, subtropical regions. These strains have been tested in a number of countries (e.g., Bangladesh, India, Indonesia, Paraguay, Philippines, Sri Lanka and Thailand). Since development of wheat varieties adapted to tropical climates through plant breeding takes a minimum of 10 years, further work is justified on the basis of encouraging results already obtained. Wheat could conceivably be grown in large areas of the world with unfavourable environmental conditions such as acidity, alkalinity, salinity and aluminium toxicity as evidenced from CIMMYT's preliminary screening of certain strains of wheat which appear to be able to withstand the adverse conditions mentioned above. Obviously an expanded effort is required to screen, test and adapt these strains to a number of agro-ecological conditions through a network of co-operators in selected developing countries.

II. THE PROJECT

5. The proposed project addresses the demands of developing countries in the warmer and stressed environments, with emphasis on warmer areas. In conjunction with national programmes, it aims to develop and demonstrate the technology to boost local wheat production in a manner which is economically viable at current world prices, environmentally sound, and complementary with existing traditional crops. The ultimate objective of the project is to bring appropriate countries together in order to increase incomes to farmers and the supply of bread for consumers through increased production in warmer and stressed environments. Stabilization of production through better disease resistance is an important corollary, as is reduction in soil erosion risk in certain regions. Major elements are to:

(a) Develop more productive wheat germ-plasm for warmer and stressed environments. Use of molecular markers in monitoring incorporation of exotic genes and efforts in understanding the physiological basis of heat tolerance are important segments of this project;

(b) Upgrade strength of national agricultural research systems in wheat research through training, visiting scientist programmes, consultancies, workshops, international conferences and publications;

(c) Devise better management for wheat for the above target environments which will lead to sustainable wheat-production systems.

6. Appropriate sums from the total UNDP contribution allocated to the project will be used for biotechnology research to be conducted jointly with selected developing country institutions.

7. Training and visits will directly benefit wheat scientists and decision makers in developing countries. Better germ-plasm and agronomic techniques, partly derived from the global network and partly from their own efforts, will provide the scientists with the wares and the confidence necessary to become involved in technology transfer.

8. Results of the project will be published and disseminated through CIMMYT so as to benefit directly wheat researchers elsewhere with similar problems. Heat tolerant and disease-resistant germ-plasm from warmer areas will be distributed by CIMMYT to its world-wide network of co-operators. It should also be noted that there could be considerable extra benefit if global warming is a reality.

9. The target beneficiaries are those farmers who can take advantage of better wheat technology, especially those with underutilized land in the coolest season, available labour, unused water, and access to inputs. Many hundreds of thousands of farmers have these characteristics. The improved technology must be transferred to them. While some participating countries have good mechanisms for transfer (e.g. Brazil), others have yet to develop them. In those cases, more emphasis will have to be given in training and visits to on-farm research and to building links with extension workers.

10. The project will continue to operate from two bases, one in South-east Asia (Thailand) and one in South America (Paraguay). There will be a CIMMYT breeder at each location. There will be one agronomist, located in Paraguay. It is anticipated that funds from other sources to Bangladesh and to East Africa will continue to support CIMMYT agronomists working there so that they could also contribute to the work of the project. Support to sub-Saharan African countries in breeding will be strengthened by visits from project team breeders and from CIMMYT headquarters. Candidates from national programmes for training and visits, and locations and topics of workshops and in-country training will be decided jointly by the associated national institutions and the project team in consultation with CIMMYT. The same modality will be used for provision of support to national programmes in terms of short-term consultancies, operational supplies and equipment. The CIMMYT-based programme in Mexico and its core-funded staff in Nepal (in agronomy and pathology) and elsewhere will contribute considerable back-up to the project, especially in germ-plasm improvement. It is estimated that this support amounts to three international scientist man-years per annum. To undertake the required strategic research on the physiology of adaptation to high temperature, a project-funded associate scientist will work in Mexico.

11. The project will be an integral part of the core operations of the Wheat Improvement Programme of CIMMYT, which is expected to receive an estimated \$15 million over the next three years from the donor organizations of the Consultative Group on International Agricultural Research (CGIAR). It must be emphasized that much of this assistance will be concentrated on wheat for sub-tropical and temperate climates. Through CIMMYT's international network on wheat, close links will be developed with selected developing country programmes.

12. UNDP will provide the services of a breeder in Paraguay and one in Thailand, an agronomist in Thailand, an associate scientist in Mexico, short-term consultancies, support staff, and institutional support for biotechnology research at selected national institutions. In addition, funds will be provided for the travel of the above people in execution of the project, training, field and laboratory equipment, vehicles, conferences and publications. CIMMYT will be contributing approximately 108 man-months per year towards the execution of this project.

13. The research and training programmes described above - for which full descriptions, including the countries expected to participate, will be made available to UNDP upon project approval - will be implemented by CIMMYT in collaboration with national research institutions of developing countries. As indicated earlier, 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 CIMMYT in consultation with appropriate national agencies.

14. 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 funds, under its own direct cost component, for the consultancies required in order to undertake an independent evaluation. It is anticipated that 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 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 with regard to strengthening national wheat improvement and extension programmes and the utilization of new technologies by farmers resulting in increased production. The findings and recommendations of the mid-project evaluation might necessitate the re-orientation or modification of project goals, budget and work plans for the remainder of the project.

15. The Administrator intends, through contractual arrangements between CIMMYT and UNDP, to entrust the implementation of this project to CIMMYT with the clear understanding that the Director-General of CIMMYT 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 of the developments in the global project and, with FAO, will participate in the project advisory committee which will be established. A concerted effort will be made to link the training and research activities with field work being undertaken at the country and intercountry levels. FAO assistance will be sought in implementing national trials and the introduction of new varieties and hybrids as they are developed. The committee, which will include representatives of selected national agricultural research centres, will meet normally once a year, or at such times and places as deemed appropriate by CIMMYT. It will appraise the ongoing training and collaborative research programmes and advise on their future direction. As indicated in paragraph 14 above, towards the end of the project UNDP, in consultation with CIMMYT, will undertake a review of the accomplishments of the project to be carried out by a team of independent consultants.

16. The proposed UNDP contribution is \$3,565,000 of which \$3,415,000 will be for sub-contracts, while direct costs will account for the remaining \$150,000. The expenditures under the project through 1991 will be contained within the indicative planning figure (IPF) for global projects established by the Governing Council for the fourth cycle. The expenditures covering the remaining period of the project will be subject to approval of the fifth cycle IPF commencing 1 January 1992.

III. RECOMMENDATION OF THE ADMINISTRATOR

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

