

Brief characterization of CIMMYT's capacity building efforts and possible links with GO FAU Program

Throughout its history since 1966, CIMMYT has sought to enhance the human resources available for agricultural research related to its own objectives. One method has been to organize training courses, either at CIMMYT itself or in the countries with which the Center collaborates. More than 4,000 professionals have participated in CIMMYT's courses, and more than 4,000 scientists have worked as visiting scientists at the center (both in HQ and regional offices) during the last 40 years. Another method has been to help candidates to study for professional qualifications or higher degrees at appropriate universities. CIMMYT's list of these identifies 862 theses presented at 165 academic institutions located in 43 countries; they were the work of 790 scientists from 75 countries. (<http://www.cimmyt.org/libtools/thesis.htm>). In 2007, we have 106 students conducting research towards their degree theses (BSc, MSc, PhD) together with CIMMYT scientists.

CIMMYT's areas of capacity building (based on our comparative advantages)

a. Improvement of wheat and maize - a core activity of CIMMYT. In relation to the target region of product, breeding/improvement and therefore also capacity building efforts are focused mainly on:

- Biotic and abiotic stresses tolerance;
- Appropriate quality profiles;
- Improved methodologies, technologies and tools for genetic improvement.

b. Conservation agriculture - water productivity and resource use efficiency. In relation to the target region the capacity building efforts in area of conservation agriculture are focusing mainly on:

- Resource conserving technologies for wheat and maize cropping systems;
- Sustainable use of soil, water and other inputs, lower production costs, better management of biotic stresses, and enhanced cropping system diversity and resilience.

c. Biotechnologies. The capacity building efforts in area of biotech are focused mainly on

- Techniques of characterization of maize and wheat biodiversity (allele mining);
- Manipulation of new alleles and genes for traits prioritized by end-users;
- Systemic integration of a range of fast-track breeding techniques, including molecular genetic fingerprinting, MAS, double haploids, genetic transformation into NARSs and SME breeding programs.

d. Genetic resources - Conservation and access to GR

- Strategies of ex-situ and in-situ conservation of genetic resources;
- Intellectual property rights and genetic resources;
- Genebank management.

e. Statistics and bioinformatics

- Field design, spatial analysis, and statistical models for assessing genotype x environment interaction of multi-environment trials;
- Statistical and population genetics models for efficient regeneration and collection of germplasm;
- Statistical analysis of microarray experiment and other applications in biotech.

f. Targeting and strategic assessment of impact & economic studies of maize and wheat farming systems.

- Economic analysis – farm, local and meso-level analyses, marketing systems analyses;
- GIS – establishment and integrating geo-spatial databases and knowledge bases, livelihood patterns and dynamics to support targeting;
- Impact assessment – Ex ante/ex post impact assessment platform and methods, targeting and priority settings mechanisms;
- Participatory research – how to collect, analyze, and use information for participatory research, joint evaluation of technologies/practices, adaptation and diffusion of agricultural technology.

STRATEGIC THRUSTS FOR CAPACITY BUILDING AND KNOWLEDGE SHARING BY CIMMYT

All CIMMYT scientists have the responsibility to identify gaps in partner NARS capacity and include relevant capacity building component into special projects wherever appropriate: Rigorous prioritization, planning and targeting process is conducted in case of each special project with the aim to identify the need for capacity building component and most suitable approach while using effectively the resources. Following are three strategic thrusts of capacity building and knowledge sharing at CIMMYT:

A) Formal training

- individual (degree students, visiting scientists, interns)
- group (courses, workshops)

Main purpose – development and strengthening of scientific approaches, skills and attitudes to problem solving strategies and knowledge dissemination.

- Currently the majority of the training activities conducted at CIMMYT are linked to specific projects.
- Training activities keep the balanced combination of practical experience in conducting of maize or wheat research (learning-by-doing; peer-learning) and the theoretical knowledge of cutting edge theories and methods to support scientists work.
- Added value: Accreditation of newly developed modules by recognized universities will be very useful for both students conducting research towards theses (add value to their work in collaboration with CIMMYT) participants of courses, and visiting scientists

B) Knowledge management and sharing

- Design of learning materials (learning modules, fact sheets, manuals, interactive tools, field guides, exercises, protocols)
- E-lectures (in collaboration with Cornell U) and e-courses
- Cereal Knowledge Bank (in collaboration with IRRI – see below)

Main purpose – wide horizontal and vertical dissemination of CIMMYT's data, information and knowledge.

- CIMMYT scientists in collaboration with learning specialists develop learning materials and modules based on the findings and methods of their research.
- Testing of suitability of internet based distance learning (e-learning) and mixed-mode technologies as an alternative delivery mechanism for sharing of CIMMYT's courses and learning materials.

C) Informal learning - continuous professional development

- Organization and support of scientific meetings and conferences
- Promotion of partnerships and networks (catalytic role) and technical support for virtual communication

Main purpose – peer-to-peer learning - support of professional development through global scientific community, networks, partnerships and collaborative research

- Identification of topics for scientific meetings/symposiums, their targeting, facilitation and evaluation;
- Promotion and support of multilateral collaboration and new partnerships/networks between NARS/ARIs, universities, private and non-governmental sector - *North-CIMMYT-South* (eg. facilitation of virtual communities, collaborative research);
- Facilitation of visiting scientists exchange and sabbatical leaves of scientists from NARS to ARI and vice versa.

The coordinating role of Capacity Building and Knowledge Sharing office consists in

- Assistance with planning, targeting, monitoring and evaluation of capacity building events;
- Coordinating capacity building components of ongoing special projects,
- Identification and approaching possible donors;
- Maintenance of database of all types of capacity building efforts at CIMMYT.
- Maintenance of database of all types of learning materials developed in CIMMYT.
- Development of learning materials:
 - Planning and design (pedagogical aspect) of new learning materials;
 - Identification of partners for development of learning materials and e-courses;
 - Conversion of outputs of research into learning materials
 - Monitoring, collecting and keeping data on impact and quality of produced materials and courses;
- Assistance with logistics + facilitation of scientific meetings and conferences
 - Monitoring, collecting and keeping data about scientific events + assistance with evaluation of impact
- On-line facilitation of networks

Cereal Knowledge Bank

IRRI-CIMMYT alliance endorsed an integrated Cereal Systems Knowledge Project to use the example of Rice Knowledge Bank (IRRI's successful project over last 7 years) to develop Cereal Knowledge Bank (CKB) which will compile information on the three world most important cereal crops. The CKB is a simple HTML-based tool which includes a global digital extension service for those who provide information and support for farmers (such as extension specialists and NGOs) and also a comprehensive, digital rice/maize/wheat-production library containing an ever-increasing wealth of information for training in the form of fact sheets, field practices and diagnosis tools, e-courses, and training materials. The strength of the CKB is that it is designed as a demand-driven system that delivers credible information, in value-added form. To those who do not have access to internet, CKB will be provided in CD-ROM.

Possible areas of collaboration between CIMMYT and GO-FAU Program:

- Development (and improvement) of learning materials based on CIMMYT's comparative advantage (see table in page 1)
- Development of quality standards for learning materials => leading towards possible accreditation of some courses by collaborating university(ies)
- Improved marketing of existing and newly developed learning materials
- Facilitation of linkages with Universities (both in developed and developing countries)
- Keeping eye on and testing suitability of distance learning (and e-learning) methods and supporting IT technologies
- Monitoring and evaluation of impact