Case Study of Successful Research Partnership

A- SUMMARY

Title : PRO*MUSA*: A Global Programme for *Musa* Improvement

Duration: Initiated 1997 and on-going

Objectives:

The programme's general objectives, as defined by the participants in the inaugural meeting, are provided below:

To increase the productivity of bananas and plantain for home consumption and local and export markets in an environmentally sustainable manner.

To foster the development of improved *Musa* varieties with a wide genetic base, and consumer acceptability and to disseminate those varieties to farmers through participating National Agricultural Research Systems (NARS).

To facilitate and stimulate partnerships among NARS, Advanced Research Institutes (ARIs), and International Agricultural Research Centres (IARCs) to increase the efficiency and cost-effectiveness of global *Musa* improvement efforts.

It should be noted that these objectives are set at different levels. The first objective is considered as a long term goal, the second as the purpose of the programme and the third as a specific reason for establishing a global programme. It should also be noted that the third objective may now be considered too narrow, and the programme participants may decide to broaden the range and types of potential partners.

In addition to these general objectives, a number of specific objectives were identified related to the research activities of the different working groups.

Activities:

Programme level:

Identify research needs and priorities at global level;

Develop collaborative projects to address priorities;

Identify necessary resources to allow research to be conducted;

Organise meetings, workshops etc.;

Generate, distribute and exchange information (research results etc.).

Working Group level:

Identify research needs and priorities specific to the working group

Develop and implement collaborative projects

Generate, distribute and exchange information amongst working group members

Provide input into overall programme strategy

Area: Commodity chain

Region: Global

B. STAKEHOLDERS

Beneficiaries:

Small holder banana farmers, who will benefit from an increasing availability of a wide range of improved, high yielding and disease/pest resistant varieties;

Banana researchers from ARIs and IARCs, who will benefit from new and innovative partnerships and will have greater opportunities for accessing funds for research;

Banana researchers from NARS, who will benefit from the opportunity to work in partnership with ARIs and IARCs and will have increased opportunities for accessing new tools and technologies;

All partners in PRO*MUSA* benefit from:

global prioritisation of research needs;

close interactions with other research teams within their area of specialisation;

improved access to information and resources;

improved possibilities for funding;

participation in programme meetings and conferences

Research partners : 22 ARIs, 2 IARCs and 25 NARS. Participation is based on a high level of scientific expertise and on comparative advantage.

Donors and budget: (including in-kind contributions of participating organisations)

A summary of the budget of PRO*MUSA* is provided below (all costs in US$):

Activity	**1997**	**1998**	**1999**	**2000**	Total
Research	N/A	N/A	2,500,000	3,800,000	**6,300,000**
Meetings	86,800	119,000	31,000	100,000	**336,800**
Coordination and secretariat	77,200	85,750	83,750	99,000	**345,700**
Publications	5,200	10,500	7,000	20,000	**42,700**
Total costs	**169,200**	**215,250**	**2,621,750**	**4,019,000**	**7,025,200**

Research costs for 1999 and 2000 are based respectively on 60 and 107 participating researchers, and on an estimate of the amount of time and research costs spent by these researchers on activities contributing to the objectives of PRO*MUSA*.

Funds for the coordination and secretariat functions provided by INIBAP, including the costs of meetings and publications, have been covered by unrestricted funds provided to INIBAP, in addition to contributions provided by CTA for publications and by UNDP for the inaugural meeting.

C- PROJECT RESULTS AND IMPACT

Main results:

PRO*MUSA* focuses on research related to banana genetic improvement which has a global or regional significance. It operates as a consortium and activities take place in five thematic working groups (Genetic improvement, Sigatoka/leaf spot diseases, Fusarium, nematodes and viruses).

Two global PRO*MUSA* meetings have so far been held (involving all working groups) and a third is planned for 2000. One important result of bringing together all the major players in *Musa* improvement has been the possibility to prioritise research needs at the global level.

One clear area of concern is the narrow genetic base of present breeding efforts and the need to broaden this base.

Individual working groups meetings have been held on a more *ad-hoc* basis, taking advantage of other events where working group members are together. Such meetings have proved valuable in enhancing information exchange and encouraging the development of partnerships. The different PRO*MUSA* working group meetings have allowed strategic research priorities and activities to be defined for a wide range of thematic areas. This will help to avoid the unnecessary duplication of efforts and to accelerate progress.

Working group interactions have resulted in some clear outputs:

In the area of *Musa* viruses, a meeting of specialists working on the unique virus Banana Streak virus allowed a common understanding to be developed on the significance of the virus and for research needs to be prioritised on the basis of the most recent advances.

In the area of disease evaluation, meetings of the Fusarium and Sigatoka working groups have resulted in the revision of the technical guidelines for *Musa* disease evaluation and a restructuring of INIBAP's International *Musa* Testing Programme. The new structure of IMTP will allow greater participation by NARS and provide an important framework for the feedback of information on the performance of improved hybrids to breeding programmes. The technical guidelines, having been developed by the recognised experts in the respective fields, correspond well to the needs of both researchers and evaluators.

As a result of collaborations through PRO*MUSA*, a number of new initiatives are being developed.

1. Management of the risks linked to the diffusion of new plantain material infected by the Banana Mild Mosaic Virus in Latin America.

Partners: Pathology Unit at University of Gembloux, Belgium; CIRAD-FLHOR France; LPRC IRD, France; CIBCM, University of Costa Rica; Virology Laboratory, CORPOICA, Colombia; CRBP, Cameroon.

2. DNA markers to improve plantains and starchy bananas

Partners: Department of Agriculture and Botany, University of Reading, UK; Catholic University of Leuven, Belgium; J.W. Goethe University, Germany; Institute of Experimental Botany, Czech Republic; CRBP, Cameroon; National Agricultural Research Organisation, Uganda.

3. A Survey of Banana leaf spot pathogens and evaluation of resistance in *Musa* germplasm in South East of Asia:

Partners: CIRAD-FLHOR, France; J.W. Goethe University, Germany; New Zealand Horticultural and Food Research Institute; National Research Centre on Banana, India; MARDI, Malaysia; Horticultural Research and Development Institute, Sri Lanka; UPLB, Philippines.

In the area of *Musa* genomics, an initiative is being developed with a focus on genome mapping, using genetic, cytogenetic, physical, and expression charts of the transcriptome. This will build on various ongoing research projects which have allowed genetic maps to be constructed, genes cloned, expression assays performed, promotors tested and gene constructs transferred into cultivars. However PRO*MUSA* participants have agreed that there would be a great benefit from bringing together the various research teams, in order to bring about a more comprehensive understanding of the *Musa* genome. The creation of tools to study the genome and transcription itself will make a major contribution to rapid progress in *Musa* improvement research. A *Musa* genomics meeting was therefore organised by the PRO*MUSA* Secretariat in April 2000, at which a *Musa* Genomics Consortium was established and a strategy developed.

2. Dissemination of the results

The PRO*MUSA* Secretariat, has begun to develop a range of mechanisms aimed at establishing and ensuring a good flow of information between members of the various PRO*MUSA* working groups (Fusarium, Genetic Improvement, Nematology, Sigatoka, Virology.

In order to facilitate the exchange of information between the members of the different working groups, the Secretariat has set up a number of Email Listservers. One general listserver is available to those people interested in the Programme as a whole, while specific Listservers are available for each of the Working groups. In addition INIBAP, as a partner in the programme, provides access to its information services for the dissemination of PRO*MUSA* results. Thus a PRO*MUSA* section is published in INIBAP's journal INFO*MUSA* twice yearly, thus helping to keep PRO*MUSA* participants and other interested parties informed of progress. INFO*MUSA* is distributed to more than 2000 subscribers, most of whom are based in developing countries. This therefore ensures a good circulation of information to NARS scientists.

In addition, a PRO*MUSA* website has been developed, providing information not only about the programme itself, but also about the participants in the programme. Thus the web site allows easy access to information on what research is being done where and how the priorities identified by the programme participants are being addressed.

Finally, information is disseminated through specific publications which are produced as a result of programme activities. For example the proceedings of the PRO*MUSA* meeting on Banana Streak Virus were published by INIBAP on behalf of PRO*MUSA* and have been widely distributed amongst the *Musa* research community.

Impact of the project

Banana and plantain (*Musa*) is a crop of global significance for food security and yet is one of the world's most under-funded and under-researched crops. This project has therefore had the effect of focusing researchers attention on a neglected crop, and has allowed researchers from a wide range of backgrounds to come together to address in a concerted manner, the major needs identified at the global level. Because there are relatively few researchers working on *Musa*, it is essential that efforts are made to maximise outputs through the creation of synergies. PRO*MUSA* provides the framework within which collaborative partnerships and joint projects can be developed, and already it is clear that indeed innovative partnerships are being developed between programme participants. However as the programme has only been in existence for just 3 years, it is considered too early to be able to measure significant impacts on end-users directly attributable to the programme.

Having said that, it is also clear that the programme is having a positive impact on the development of new partnerships. For example, a new collaborative project involving KUL, Belgium and the Institute of Experimental Botany, in the area of *Musa* cytogenetics, is the result of contacts made through PRO*MUSA*.

Similarly, PRO*MUSA* is helping to ensure that greater funding is made available for *Musa* research. It is clear to donors that projects developed in the framework of PRO*MUSA* address priorities identified at the global level, and that the best expertise is available to address the constraints.

A further area where PRO*MUSA* is starting to have an impact is in the encouraging the participation of the private sector in *Musa* research. Up to now, the private sector has not participated in such research and has shown little interest in collaborating with public sector research on bananas. However in 1999, the private sector was represented at a PRO*MUSA* meeting on *Musa* molecular genetics, and for the first time expressed some interest in further collaboration in this area. PRO*MUSA* is therefore providing a framework within which the private sector could collaborate with the public sector in *Musa* research.

It is also clear that the exchanges of information, close collaboration and scientific exchange visits which have been facilitated within the PRO*MUSA* framework, have resulted in the publication and transfer of technical information, allowing numerous scientists to acquire new and valuable methodologies.

D-PARTNERSHIPS

Respective roles of the different stakeholders and co-ordination mechanism for:

Project design

PRO*MUSA* was developed through a participative process involving all the major players in *Musa* research. The project design was the result of an extended consultative process and was agreed by the participants in the programme. The programme consists of a series of inter-linked thematic working groups co-ordinated by a Secretariat. The portfolio of thematic working groups is determined by the programme participants and remains flexible. It was agreed during the planning process that the programme direction and oversight would be provided by a Steering Committee composed of representatives of the key stakeholders (NARS, ARIs and IARCs).

Project implementation

The project is implemented by the participants themselves, working in the framework of the various working groups. The overall programme strategy and medium term work plans are developed by the participants on the basis of research priorities and activities developed within each working group. These plans are presented to the Steering Committee for approval. The role of Secretariat and co-ordinator has been awarded to INIBAP as a partner in the programme. In its role as programme co-ordinator, INIBAP is able to make a scientific input into the programme, while in providing the Secretariat, it is also responsible for organising meetings and workshops as necessary, ensuring effective inter-group contacts and facilitating information flow, including the dissemination of research results. A Programme Support Group composed of major donors and stakeholders provides visibility and support for the programme.

Project management

Project management is provided by the Steering Committee, working largely through the Secretariat. The Secretariat reports six-monthly to the Steering Committee on the basis of reports provided by programme participants.

Result dissemination

The responsibility for the dissemination of results is largely that of the Secretariat, taking advantage of the information service available at INIBAP. This is done is several complementary ways. A twice yearly PRO*MUSA* newsletter is published in INFO*MUSA* and widely distributed by INIBAP. This provides a regular update of project progress. In

addition, more detailed research results are submitted for publication as scientific reports in INFO*MUSA*. On a more frequent basis, information is circulated to project participants using email listservers, while information is also made available to a wide audience via the PRO*MUSA* web site.

Added value of the partnerships

Research results:

Involvement of a wide range of partners allows opportunities for information exchange and technology transfer between partners. It also facilitates access to the best expertise and facilities and allows inter-dependant projects to be developed. A wide range of partners in the programme also allows the bottom-up priority setting mechanism to be sensitive to end-users needs. This in turn ensures the relevance of research and the rapid uptake of new technologies.

Dissemination of results

Involvement of INIBAP as secretariat and co-ordinator allows the participants in PRO*MUSA* to benefit from the already well developed and extensive information network of INIBAP. Thus results are rapidly disseminated to a wide and varied audience.

Impact

The involvement of INIBAP as a partner in PRO*MUSA* also allows results (in the form of improved varieties) to be rapidly disseminated to the final end-user, the farmer. INIBAP has an established system in place to ensure the safe international movement of *Musa* germplasm and close contacts with national programmes in banana producing countries through four regional networks. Thus INIBAP is able to accelerate final impact at the farm level. Moreover, the involvement of NARS in the programme provides a mechanism for feedback to researchers.

E- CONCLUSION

PRO*MUSA* is the first global programme of its kind and it has now been in place for three years. It is clear that the programme is providing a framework for collaboration between a wide range of partners. These include ARIs IARCs and NARS. The programme has been able to generate greater interest and focus on *Musa* research and most of the major players in *Musa* improvement research are participating and the programme is now recognised by the donor community. However, it is clear that for a programme such as PRO*MUSA* to be successful and sustainable a number of issues must be addressed. These include:

Maintenance of goodwill and the desire to collaborate amongst researchers;

Ensuring objectivity in the priority setting process (collective needs must take precedence over individual priorities);

Ensuring the continued availability of funds (including to cover the non-negligible co-ordination and transaction costs) and proving to donors that efficiency is indeed resulting from investment in the programme

Maintaining a regular information flow amongst programme participants, bearing in mind that not all participants have the same access to the latest communication tools.

Ensuring compatibility between researchers benefiting from technologies developed and ensuring a free and open spirit of collaboration.