BRAZILIAN POLLINATORS INITIATIVE

Vera Lucia Imperatriz Fonseca
Braulio Ferreira Souza Dias

The CDB and the world Pollinators decline

In October 1998 the Brazilian Ministry of Environment (MMA) held an international workshop of experts, the "Workshop on the Conservation and Sustainable use of Pollinators in Agriculture, with Emphasis on Bees", to propose a framework for an International Initiative on Pollinators as a key element in the Convention on Biological Diversity (CBD) thematic program of work on Agricultural Biological Diversity. A total of 61 scientists attended it from 15 countries and 5 International organizations.

As a consequence of this meeting a document was produced, entitled "The Sao Paulo Declaration on Pollinators" (1) that was endorsed in May 2000 by the fifth Conference of Parties on Convention on Biological Diversity (COP5), held in Nairobi (section II of the decision V/5, that reviewed the implementation of decisions III/11 and IV/6 on the program of work on Agricultural Biological Diversity). COP5 established an "International Initiative for the Conservation and Sustainable Use of Pollinators", hereafter referred to as the "International Pollinators Initiative" (2).

An Action Plan was then prepared by FAO and the CBD Secretariat, based on the "Sao Paulo declaration on Pollinators" document, was endorsed by SBSTTA7, and recommended for adoption by CBD COP6. The Plan of Action of the IPI was accepted by member countries and adopted at COP 6 (decision VI/5)(3).

Since then, most regions of the world have established or are in process of establishing wide-ranging pollinators initiatives. The Brazilian Pollinators Initiative also keeps the core objectives of IPI. They are:

- Monitor pollinator decline, its causes and its impact on pollinator services
- Address the lack of taxonomic information on pollinators
- Assess the economic value of pollination and the economic impact of the decline of pollination services
- Promote the conservation, the restoration and sustainable use of pollinator diversity in agriculture as well as in related ecosystems

The Brazilian Pollinators Initiative

The Brazilian Pollinators Initiative (BPI) was officially established during the biannual meeting of Bees in Ribeirão Preto, organized by the University of Sao Paulo, in September 2000. Leading this Initiative were the Brazilian Ministry of Environment, the University of Sao Paulo and the Brazilian Corporation of Agricultural Research. An initial steering committee was formed, and began to work in a national agenda.

To follow its agenda, the Brazilian Pollinator Initiative (BPI), under the facilitation of FAO, participated in the preparation of project proposal submitted to the Global Environmental Facility (GEF) for funding, called "Adaptive Management for the Sustainable Use of Pollinators through an Ecosystem Approach", together with the African Pollinators Initiative and the ICIMOD, in Southeast Asia.

Parallel to the project development to GEF, several other activities characterized this initial phase of BPI. Among them, should be mentioned:

The Pollinators Symposium at the XXI International Congress of Entomology, Iguassu Falls, (Parana State, Brazil) July 2000, funded by MMA; the BPI sessions at the Biennial Bee Meetings, Ribeirao Preto (Sao Paulo State, Brazil) in September 2000 & September 2002; the publication of the book "Pollinating Bees: the Conservation link between Agriculture and Nature" (4), funded by MMA, 2002; Publication of the book "Brazilian Bees, Systematics and Identification", funded by MMA and Fundação Araucaria, 2002 (5); World Bees Checklist Workshop, Indaiatuba (S. Paulo State, Brazil) October 2002 (6); the inclusion of BPI in the Federal Government Multi-Year Work Program for 2004-7, within the program of work of MMA; the public call for projects on pollinators sustainable use, MMA September 2003 and January 2004 (see annex 1); a MOU between MMA & EMBRAPA on Biodiversity Research, October 2003; the EMBRAPA survey of activities and researchers on pollinators, 2003; the Sao Paulo Declaration on Pollinators plus 5 Forum (7), 2003, funded by FAO, MMA and USP, with two workshops, *Standard Methodologies Workshop* and *Pollinators Initiatives and the role of Information Technology: building synergism and cooperation*. The mentioned workshops were organized inside broader related forums (for instance, *World Bee Checklist* in the *Trends and Developments in Biodiversity Informatics Forum*) or in special meetings for them, in order to have data mining, to construct global databases and to develop standardized methods for evaluation of pollinator's abundance and management in crops.

The S. Paulo Declaration Forum plus 5 put together the regional pollinators initiatives (the European Pollinators Initiative; the African Pollinators Initiative; the International Centre for Integrated Mountain Development Initiative, from South Asia; North American Pollinators Campaign; and the Brazilian Pollinators Initiative) and promoted the first discussion on the role of Information Technology in the Pollinators Initiatives. A total of 77 participants from 12 countries (Brazil,

Canada, Colombia, Germany, Ghana, Italy, Kenya, Panama, Nepal, South Africa, United States of America, United Kingdom) joined these meetings. The standard methodology workshop addressed the methods related to pollinator-mediated gene flow; to bee surveys and monitoring of bees as pollinators in natural landscapes; bee management for pollination purposes. The talks presented also focused the state of the art of each regional Initiative, as well as methods used to evaluate the pollinators decline and status, their efficiency and number in some crops. The main challenges for next years were pointed out, among them the meta-analyzes of existing data and modeling in order to estimate next activities and make predictions. The IT workshop addressed the importance of the global facilities (as GBIF and other current services, for example ITIS), as tools for supporting and to join the local knowledge on bee names, checklists and regional catalogs, providing knowledge for policy makers.

Other participations of BPI were in workshops realized in 2003 in Africa: the Mabula workshop, for the development of "A guide-line for the development of a Legal and Institutional Framework for Pollinator Conservation", was a very important meeting. The next one was realized in Kenya, in the workshop on Managing Agricultural Biodiversity for next one was realized in Kenya, in the workshop on Managing Agricultural Biodiversity for Sustainable Development, organized by the CGIAR in the week before its annual meeting at Nairobi. In this workshop, BPI presented a talk on The role and maintenance of pollinator diversity in agricultural production, and had important role in the intensive discussion on this subject.

In February 2004, BPI took part of the Apimondia *Tropical Beekeeping: Research and Development for Pollination and Conservation* in *Costa Rica* discussing pollination and the pollinator initiatives. The *International Workshop on Solitary Bees and Their Role in Pollination* [(8)], held in state of Ceara, April 2004, and organized by UFC, was the second achievement of BPI for this year. The purpose of this meeting was to update knowledge on solitary bees, especially their use for crop pollination. Subjects such as rearing, building-up population techniques, standardized methodologies, losses of species diversity, population decline & management practices, assessment of the economic value of their pollination services and the economic impact of the decline of pollination services were addressed and discussed.

Brazil has many challenges to fill for the improvement of the activities scheduled for BPI. The design of the full project for five years is the goal of next two years for the GEF project. The structure of the development plan for this project is listed below. Some points are already under development, although the GEF project, already approved, is not signed yet.

Brazilian Pollinators Initiative Projects

BPI PROPOSED SUB-PROJECT 1: BEE SURVEYS & MONITORING

PROPOSED PDF-B ACTIVITIES:
-Workshop to define standard survey methods & sites
-Publish survey methods manual
-Assess existing surveys
-Pilot test of proposed assessment & monitoring
-Visit potential sites for surveys and monitoring methods
-Consolidate & publish pollen catalogs
-Develop and detail full project proposal

PROPOSED FULL PROJECT PRODUCTS:
-Assess bee diversity in x sites in major biomes & crop systems
-Monitor bee diversity in x sites in major biomes & crop systems
-Publish a synthesis report on pollinators' assessment
-Publish a National List of Endangered Pollinators
-Train experts, students and technicians on methods

BPI PROPOSED SUB-PROJECT 2: CROP POLLINATION ASSESSMENTS

PROPOSED PDF-B ACTIVITIES:
-Consolidate existing data on pollination dependant crops
-Collect complementary *in loco* data on crop pollination
-Workshop to consolidate list of pollination dependent crops
-Publish a list of pollination dependent crops (database)
-Publish updated edition of economic valuation methods
-Develop and detail full project proposal

PROPOSED FULL PROJECT PRODUCTS:
-Identify pollinators of pollination dependent crops
-Assess pollination deficit in crops
-Assess economic value of pollination to crops
-Publish assessment of economic importance of pollination to crops
-Train experts, students and technicians on methods

BPI PROPOSED SUB-PROJECT 3: STINGLESS BEES MANAGEMENT

PROPOSED PDF-B ACTIVITIES:
-Workshop on preliminary assessment of conservation status of Meliponini bees
-Select target species and sites
-Identify and visit potential partners and sites
-Select appropriate methods
-Consolidate case studies of best practices
-Develop and detail full project proposal

PROPOSED FULL PROJECT PRODUCTS:
-Assessment report on conservation & use status
-Increase by x folds the number of farmers with Meliponiculture
-Increase by x folds the availability of nesting substracts
-Increase by x folds pollination of selected crops
-Increase by x % the income of poor farming families with byproducts of Meliponiculture
-Manual of stingless bees management
-Train experts, students and technicians on methods

BPI PROPOSED SUB-PROJECT 4: HONEY BEES MANAGEMENT

PROPOSED PDF-B ACTIVITIES:
-Select protected areas
-Identify and visit potential partners and sites
-Identify priority crops to reduce pollination deficits
-Consolidate case studies of best practices
-Develop and detail full project proposal

PROPOSED FULL PROJECT PRODUCTS:
-Assessment report on abundance of honey bees in natural ecosystems
-Reduce abundance of honeybees in x protected areas with hive trapping
-Increase by x folds the use of honeybees in crop pollination
-Manual of honeybees' management
-Train experts, students and technicians on methods

BPI PROPOSED SUB-PROJECT 5: SOLITARY BEES MANAGEMENT

PROPOSED PDF-B ACTIVITIES:

-Identify candidate bees to work
-Consolidate information on selected bee species
-Identify and visit potential partners and sites
-Identify priority crops to reduce pollination deficits
-Select appropriate methods
-Consolidate case studies of best practices
-Develop and detail full project proposal

PROPOSED FULL PROJECT PRODUCTS:

-Assessment report on conservation & use status
-Increase by x folds the availability of nesting substracts
-Increase by x folds pollination of selected crops
-Manual of solitary bees management
-Train experts, students and technicians on methods

BPI PROPOSED SUB-PROJECT 6:TAXONOMIC SUPPORT

PROPOSED PDF-B ACTIVITIES:

-Assessment of bee collections
-Publish “Bees of Brazil” book
-Preliminary Checklist of Brazilian bees
-Provide supplies for Bee Taxonomy Centers
-Develop and detail Full Project proposal

PROPOSED FULL PROJECT PRODUCTS:

-7 Bee Taxonomy Centers equipped
-Data basis of bees in collections
-Checklist of Brazilian bees
-Bee taxa revisions & keys
-Regional Identification guides
-Training on identification of bees
-Bee identification services
-Train parataxonomists

BPI PROPOSED SUB-PROJECT 7: VIRTUAL INSTITUTE

PROPOSED PDF-B ACTIVITIES:

-Fully develop planning and program of training courses (themes, lecturers, materials, demands, selection process)
-Develop Information System structure and contents
-Develop and detail Full Project proposal

PROPOSED FULL PROJECT PRODUCTS:

-5 Annual International Training Courses
-10 National Training Courses
-Information System fully operational, uploaded and updated through the Internet

BPI PROPOSED SUB-PROJECT 8: POLICY & PUBLIC AWARENESS

PROPOSED PDF-B ACTIVITIES:
-Assess impacts of existing legislation and policies
-Assess availability of incentive measures and credit
-Assess public opinion in major regions and stakeholder groups
-Identify potential partners
-Regional workshops with potential partners
-Develop and detail Full Project proposal

PROPOSED FULL PROJECT PRODUCTS:
-National campaign reaching all stakeholders launched
-Public policies developed and applied
-Incentive measures developed and applied
-Inter-sectored partnerships established

Acronyms

API - African Pollinators Initiative
BPI - Brazilian Pollinators Initiative
CBD - Convention on Biological Diversity
CGIAR- Consultative Group on International Agricultural Research
COP - Conference of the Parties
EMBRAPA - Brazilian Agricultural Research Corporation
EPI - European Pollinators Initiative
FAO - Food and Agriculture Organization of the United Nations
GEF - Global Environmental Facility
GBIF- Global Biodiversity Information Facility
ICIMOD - International Centre for Integrated Mountain Development
IPI – International Pollinators Initiative
IT- Information Technology
ITIS - International Taxonomy Information Service
MMA – Brazilian Ministry of the Environment
MOU- Memorandum of Understanding
PDF B - Project Development Facility phase B
SBSTTA- Subsidiary Body on Scientific, Technical and Technological Advice
UFC – Federal University of Ceara, Brazil
USP – University of Sao Paulo, Brazil

References

The Sao Paulo Declaration on Pollinators - Assess March 28th 2004.
http://www.biodiv.org/doc/ref/agr-pollinator-rpt.pdf

International Initiative for the Conservation and Sustainable Use of Pollinators, hereafterreferred to as the International Pollinators Initiative. Assess: March 28th 2004
http://www.biodiv.org/programmes/areas/agro/pollinators.asp

COP 6 (decision VI/5). Plan of Action of IPI. Assess: March 28th 2004
http://www.biodiv.org/decisions/default.aspx?lg=0&dec=VI/5

Pollinating Bees: the Conservation link between Agriculture and Nature. Brasília, Ministry of the Environment, 313 p.

Assess: March 28th 2004 http://eco.ib.usp.br/beelab/ibp/livro_polinizadores.htm
Silveira, F.A; G. A R. Melo & E.A.B. Almeida- 2002. Abelhas brasileiras. Sistemática e identificação. Belo Horizonte, Fernando A. Silveira 253p.

World Bees Checklist workshop. Assess: March 28th 2004
http://www.cria.org.br/eventos/tdbi/wbcw

The Sao Paulo Declaration on Pollinators Plus 5 Forum. Assess: March 28th 2004
http://graviola.pcs.usp.br/%7Ewebbee/ibp/php/workshop/index.html

International Workshop on solitary bees and their role in Pollination. Assess: March 28th 2004
http://eco.ib.usp.br/beelab/ibp/pdfs/programa_abelhas_solitarias.pdf

ANNEX 1

Brazilian Pollinators Initiative Public Call MMA 2003-4

Public Call made by the Brazilian Ministry of the Environment - MMA, through the National Biodiversity Project – PROBIO, to support projects to develop management plans for native pollinators of plants of economic value (cultivated or explored through extractivism).

The Public Call was issued in two stages in September 2003 and January 2004. A total of 53 proposals were received and 13 projects were selected and are being contracted, with a total sum of R$ 1,543,702.80 (equivalent to approximately US$ 500,000.00) of financing from MMA plus counterpart funding from the implementing organizations. These projects will be implemented till the first half of 2005 in the following regions and states of Brazil (plants indicated in parenthesis):

Amazon Region (States of Amazonas (cupuassu) and Pará (assaí palm));

Northeast Region (States of Maranhão (murici), Pernambuco (cotton, soursop, acerola, mangaba, mango and passion fruit), Bahia (guava, mango, umbu and passion fruit);

Central Region (State of Mato Grosso (araticum));

Southeast Region (state of Minas Gerais (passion fruit and tomato), Rio de Janeiro (passion fruit) and São Paulo (tomato));

Southern Region (State of Paraná (passion fruit))

The target plants and pollinators of these 13 projects are:

TARGET PLANTS	TARGET POLLINATORS	STATES
Annona muricata – "graviola" or soursop (Annonaceae)	*Cotalus* spp (Nitidulidae, Coleoptera)	Pernambuco
Annona crassifolia – "araticum" or marolo (Annonaceae)	*Cyclocephala* spp (Scarabaeidae, Coleoptera)	Mato Grosso
Hancornia speciosa – "mangaba" (Apocynaceae)	Sphingidae & Hesperidae (Lepidoptera)	Pernambuco
Spondias tuberosa – "umbu" or imbu (Anacardiaceae)	*Frieseomelitta* spp & *Trigona* spp (Meliponinae, Apidae, Hymenoptera)	Bahia
Mangifera indica – "manga" or mango (Anacardiaceae)	Diptera & Lepidoptera	Pernambuco & Bahia
Gossypium hirsutum – "algodão" or cotton (Malvaceae)	*Bombus* spp & *Xylocopa* spp (Apidae, Hymenoptera)	Pernambuco
Byrsonima crassifolia – "murici" or nance (Malpighiaceae)	*Centris* spp (Apidae, Hymenoptera)	Maranhão
Malpighia emarginata – "acerola" or west indian cherry (Malpighiaceae)	*Centris* spp & other Centridini (Apidae, Hymenoptera)	Pernambuco
Theobroma grandiflorum – "cupuaçu" or cupuassu (Sterculiaceae)	*Plebeia* spp, *Paratrigona* spp & *Frieseomelitta* spp (Meliponinae, Apidae, Hymenoptera)	Amazonas
Psidium guajava – "goiaba" or guava (Myrtaceae)	*Frieseomelitta* spp (Meliponinae, Apidae, Hymenoptera)	Bahia
Passiflora edulis – "maracujá" or passion fruit (Passifloraceae)	*Xylocopa* spp, *Centris* spp, *Epicharis* spp & *Eulaema* (Apidae, Hymenoptera)	Pernambuco, Bahia, Minas Gerais, Rio de Janeiro & Paraná
Passiflora alata & *Passiflora cincinnata* – "maracujá" or passion fruit (Passifloraceae)	*Xylocopa* spp (Apidae, Hymenoptera)	Pernambuco
Lycopersicon esculentum – "tomate" or tomato (Solanaceae)	*Melipona* spp (Meliponinae, Apidae, Hym.) & Halictidae (Hymenoptera)	Minas Gerais & São Paulo
Euterpe oleraceae – "açaí" or assai palm (Palmae)	*Melipona* spp (Meliponinae, Apidae, Hymenoptera)	Pará