



GIPB GLOBAL PARTNERSHIP INITIATIVE FOR
PLANT BREEDING CAPACITY BUILDING
harnessing plant genetic resources for development



Business Plan 2009 - 2013





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This Business Plan is the result of a collaborative and proactive effort started in 2007 when the Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) initiated a stakeholder consultation process to formulate the organizational and implementation framework for the Initiative for the period 2009-2013.

A Task Force 1 discussed propositions and recommendations for longer-term strategies, outputs, outcomes and priority activities to be pursued by the GIPB.

The consolidated set of recommendations from Task Force 1 were used as the starting point for Task Force 2, that recommended strategies for: a) the implementation of the five GIPB objectives in the period 2009-2013, and b) the organization and management of GIPB, including implementation of the international partnership platform, governance, secretariat services, monitoring and evaluation.

The recommendations of the Task Forces 1 and 2 have served as basis for the preparation of the Business Plan for the initial phase of GIPB, from 2009 to 2013.

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EXECUTIVE SUMMARY

Meeting the sustenance needs – food, clothing and shelter – of the global population is ever more complex and challenging. Food security, economic development and environmental protection are inextricably intertwined in this endeavour, all made more unpredictable by the uncertain effects of climate change. The fact of a persistently expanding population (now some six billions) is at the core of the challenge, and especially because population growth continues to be highest in poor countries. Arable land is finite and largely exploited. Expansion by irrigation or clearing of forests is generally either costly or environmentally untenable. Erratic prices for inputs to production – energy, fertilizer, machinery, water – and for the products farmers sell, challenge the ability of entrepreneurs to consistently succeed. These same fluctuations impede the ability of low-income consumers to purchase adequate food.

At the same time that the challenges become more complex, our repertoire of solutions is expanding, and includes technical, policy, and social components. This paper will argue that better capacity for crop improvement is a critical part of the solution. The Business Plan of the Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) outlines an important pathway to substantial improvement in the world's ability to feed itself and progress economically in decades to come.

Crops support the nutritional needs of the vast majority of humanity, either directly consumed, or indirectly through animal products. Crops also generate income for producers (who represent the majority of the population in the developing world), for many associated support activities, and in the processing/marketing chain. There is probably no facet more fundamental to the well-being of humanity and to the health of the environment than the evolution of crop production technologies and practices. For these reasons, it is crucial to understand how the crops sub-sector of food and agriculture can be supported in ways that broadly optimize the benefits across society, and for the long-term.

Crop productivity is impacted by many factors: soil, climate, external inputs, management and genetics. Among these, genetics is a unique and powerful component. It is *unique* in that the benefits are perpetual, that is, after the initial cost of development, the benefits can continue to accrue to the users with little or no additional cost (in contrast, for example, to fertilizer, which is *used up* and needs to be purchased repeatedly). It is *powerful* in that the range of traits that are under genetic control, and the genetic variation for the expression of each of these traits, are nearly unlimited.

The improvement of crops through plant breeding is one of the most potent tools available for achieving multiple economic and social goals. Since the beginning of crop domestication, genetic change has been the basis for crop improvement, manifested in such traits as larger seed size, better flavour or nutrient content, resistance to pests and diseases, responsiveness to nutrient inputs, adaptation to diverse soil and climatic factors, and many others. This process of modifying the genetic attributes of plants has continued for more than 10 000 years. During all but the past century, this process was solely in the hands of the growers who inadvertently changed gene frequencies through selecting better types and discarding less desirable ones.

Modern-day crop genetic improvement, or plant breeding, has many characteristics in common with its evolutionary past – the process of changing gene frequencies in directions that support the



interests of growers and consumers. In much of the world, the baton has now passed from farmers to scientists, for the responsibility to create new crop varieties. Nonetheless, farmers remain a fundamental part of the process both as the curators of native genetic resources and as decision-makers. The accumulation of knowledge of genetics and of gene influence on plant behaviour now allows an acceleration of the rate of plant improvement that should excite anyone interested in a better outlook for human development.

Based on studies in several crops, it appears that, broadly speaking, the advances in crop productivity in modern times (since the application of science to crop improvement) are due approximately half to genetics and half to management. There are many remarkable examples of the application of plant breeding to benefit society. While plant breeding is generally regarded as a methodical, progressive process, there have been periods in history when advances were dramatic and brought rapid, broadly-recognized benefits.

Early in the 20th century, the understanding of hybrid vigour, and how to capitalize on it in breeding systems, brought about two major changes. First, yield improvement (mainly in maize) accelerated considerably. Secondly, the technology required to exploit this technology stimulated the broad-scale entry of the private sector into the seed industry. Both these effects were seen mainly in developed countries, but are now moving into some developing countries as well.

Another period of notable rapid impact of plant breeding was during the *Green Revolution* of the 1960s and 1970s. At a time of considerable pessimism about the ability of food supply to keep pace with increasing global population, we demonstrated that focused goals, concentrated efforts by trained scientists, an appropriate policy environment and adequate funding achieved *miracles* in wheat and rice production.

Beginning late in the 20th century, a new genetic revolution began with the better understanding of gene structure and function at the molecular level. This revolution appears to be at just the beginning stages – some products have been delivered to benefit growers and consumers, but the full potential has barely been touched. This period has also been characterized by the privatization of information and technology, which has greatly expanded funding for research, but has largely limited the benefits to private seed companies and the growers in developed countries.

Progress in plant breeding can continue to deliver improved products long into the future, and in so doing, broadly benefit both the poor and well-to-do. But there are caveats. Due to the remarkable success of the *Green Revolution* technologies in reducing some of the most serious nutrition threats, many countries built new capacity for crop improvement research by training scientists, building infrastructure and providing operating support. The payoff was generally high for the countries that followed this pathway, especially for some of the major investors such as Argentina, Brazil, China, India and Thailand. Others had less success, for many reasons. Where investment was not sustained, where key elements of an integrated approach were missing, or where civil unrest disrupted normal activity, progress was uneven.

Many developing countries that invested in a comprehensive crop improvement strategy 20 or 30 years ago began to take success for granted, without fully recognizing the consequences of neglecting sustained support, often assuming the private sector would fill the gaps. Deteriorating infrastructure, lack of young trained scientists to take over from retiring ones, and poor operating budgets eventually slowed the flow of new technology, and the populations in many of these countries are now at greater risk of hunger and the broad-ranging effects of poverty.



In addition, not only do we need to address the *traditional* challenges of food production, but we are now faced with compelling evidence of serious threats to the global food supply from the effects of climate change – new areas of drought or flooding, pests and diseases expanding their range or severity, changes in soil organic matter content, and many more subtle effects. While the long-range goal clearly needs to be to reverse climate change, in the short term, adaptation will be of paramount importance. We know that plant breeding has the ability to incorporate a remarkable range of traits into our food and fibre crops, and scientists will be called upon increasingly to identify and deploy traits that counter the impact of climate change. In the early days of the *Green Revolution*, a common refrain was that improved crop productivity gave the world some breathing space while humankind worked through solutions to getting population growth under control. In the same vein and in a new paradigm, plant breeding can be seen as giving some breathing space to getting climate change under control.

International bodies and organizations have progressively put in place a framework for managing crop genetic resources as a public good and as a common heritage for the benefit of future generations. A few are mentioned here. The International Agricultural Research Centre system, begun in the 1960s, was a major force for collecting, conserving and improving many of the world's most important crops. The Convention on Biological Diversity (1992), and the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (1996) were important steps in recognizing the need to conserve crop diversity. The International Treaty for Plant Genetic Resources for Food and Agriculture (IT), which came into force in 2004, is comprehensive in its vision of providing for secure conservation, access and benefit-sharing, and sustainable use. The Global Crop Diversity Trust (GCDT), established in 2004, came into being as a mechanism to support countries' obligations under the International Treaty for secure conservation. While conservation is vital, there remained somewhat of a gap on the side of global support for sustainable use. The launching of the IT and of the GCDT set the stage for an important and timely opportunity to complete the chain, to work from this new base to bring together all the elements required to maximise the global benefits from conservation by a new initiative for use of crop genetic resources.

This, in brief, is the background that led to some new thinking about how to *harness plant genetic resources for development*. With leadership from FAO, a broad global network of scientists, policy-makers and research administrators recognized the urgent need to renew the support to building capacity in plant breeding. This is an effective way to capitalize on the benefits from bringing a balance to conservation of plant genetic resources and their use in crop improvement to contribute to human welfare and environmental health. Thus, the Global Partnership Initiative for Plant Breeding Capacity Building was launched in Madrid in 2006, as an international partnership of organizations and individuals from the public, private and civil society sectors. Its aim is to catalyze and support complementary national, regional and global action for comprehensive systems for development and adoption of better crop varieties.

This document outlines a systematic plan to implement the goals of GIPB from 2009-2013. It is a *roadmap* based on a comprehensive stakeholder consultation process designed to formulate the strategic, organizational and implementation framework for the initiative. The beneficiaries of this initiative are the populations of countries that undertake the strengthening of plant breeding systems.

GIPB's agenda revolves around five objectives:

(1) **Support for policy development** on plant breeding and associated scientific capacity building strategy, to help allocate resources to strengthen and sustain developing countries' capacity to use



plant genetic resources for food and agriculture.

(2) **Support to education and training** in plant breeding and related scientific capacities relevant to utilization of plant genetic resources.

(3) **Facilitate access to technologies** in the form of tools, methodologies, know how and facilities for finding genetic solutions to crop constraints.

(4) **Facilitate exchange**, from public and private breeding programmes, of **plant genetic resources** that can enhance the genetic and adaptability base of improved cultivars in developing countries.

(5) **Sharing of information and knowledge** focused on plant breeding capacity building to deliver newly available knowledge to national policy makers and breeders in developing country programmes.

The consultation for development of the Business Plan delineated from four to seven priority activities for each of these objectives, and within each of them, several outputs (Appendix 1). The plan is ambitious but realistic. Among the many anticipated activities are:

- Developing advocacy materials for policy-makers
- Identifying opportunities for education and training
- Sharing information and opportunities for communication through a web-based Knowledge Resource Centre
- Mobilizing donor support for advocacy, training and research
- Supporting the definition of regional centres of excellence
- Facilitating germplasm characterization and exchange
- Promoting technology-sharing between advanced labs and developing country programs
- Facilitating public-private partnerships

For GIPB to function effectively as a long-term platform, it needs to be appropriately structured and funded. Its structure and oversight are designed to promote transparency. This structure is proposed as consisting of a *Steering Committee*, appointed by FAO, that is responsible for general oversight of the programme strategy, operating procedures and matters affecting GIPB as a whole. The *Advisory Group*, appointed by FAO in consultation with the Steering Committee and GIPB stakeholders is responsible for providing strategic guidance and advice. The *Secretariat*, hosted by FAO, is a facilitating and technical resource base for the implementation of the specific objectives of GIPB. The anticipated structure of GIPB is designed to optimize operational capacity and stakeholder participation. This should be best accomplished by a matrix of *themes by regions*. The themes correspond to the five GIPB objectives, and the geographical regions will be determined by considering logical subdivision based on institutions, crops, languages and donor interests.

Funding during the first cycle of GIPB's business plan should cover: (1) enabling the implementation of the five GIPB objectives; (2) further development and management of the Knowledge Resource Centre (website); (3) backstopping national and regional project formulation activities; (4) organizing and implementing regional and international workshops and taskforces; (5) monitoring and evaluation; and (6) facilitating the oversight, advisory and secretariat functions of GIPB. Funding needs on the order of \$US 25 million are anticipated.

The elements of our ability to address tomorrow's challenges in food security and broad global development already exist. Putting in place a system that optimizes the inter-connections and complementarities of those elements of crop genetic improvement will set the stage for a brighter future for humanity.



RÉSUMÉ

Répondre aux besoins essentiels de la population mondiale, c'est-à-dire nourriture, vêtements et logement, est de plus en plus complexe et devient un défi des plus ambitieux. Sécurité alimentaire, développement économique et protection de l'environnement sont inextricablement liés dans cette tâche, rendue encore plus difficile par les effets incertains du changement climatique.

L'accroissement continu de la population (six milliards d'habitants actuellement) est au coeur du problème, en particulier du fait que ce phénomène continue d'affecter principalement les pays pauvres. Les terres arables sont limitées et en grande partie déjà exploitées. L'expansion ayant recours à l'irrigation ou au défrichage des forêts est généralement soit dispendieuse soit nuisible à l'environnement. Les variations imprévisibles des prix des facteurs de production – énergie, engrais, machines, eau – et des produits vendus par les cultivateurs, mettent à l'épreuve la capacité des entrepreneurs à obtenir des résultats satisfaisants. Ces mêmes fluctuations limitent la capacité des consommateurs à faible revenu pour l'achat de nourriture adéquate.

En même temps que les problèmes s'aggravent, la gamme de solutions à notre disposition s'étend et s'enrichit d'éléments techniques, stratégiques et sociaux. Le présent document vise à démontrer qu'une meilleure capacité en matière d'amélioration des cultures joue un rôle déterminant dans la solution du problème. Le plan d'activités de l'Initiative de partenariat mondial pour le renforcement des capacités de sélection végétale (GIPB) présente un moyen important d'améliorer substantiellement la capacité du monde à se nourrir et à progresser économiquement au cours des prochaines décennies.

Les plantes cultivées couvrent les besoins nutritionnels de la grande partie de l'humanité, consommées soit directement soit indirectement sous la forme de produits d'origine animale. Elles créent également des revenus pour les producteurs (qui représentent la majorité de la population dans le monde en développement), pour de nombreuses activités de soutien connexes et dans la chaîne de transformation et de commercialisation. Il n'y a probablement pas d'élément plus fondamental pour le bien-être de l'humanité et la protection de l'environnement que l'évolution des techniques et pratiques de production végétale. Il est donc essentiel de comprendre comment appuyer

le sous-secteur des cultures de manière à optimiser sensiblement les avantages pour la société et ce, à long terme.

La productivité des cultures subit l'influence de nombreux facteurs: le sol, le climat, les intrants, la gestion des cultures et la génétique. Parmi ceux-ci, la génétique est une composante unique et puissante. Elle est *unique* en ce que les avantages sont permanents, c'est-à-dire qu'après le coût de développement initial, les avantages peuvent continuer d'aller aux utilisateurs, avec un coût supplémentaire limité, voire nul (contrairement, par exemple, aux engrais, utilisables *une seule fois* et qu'il faut racheter). Elle est *puissante* en ce que la gamme des caractéristiques qui sont sous contrôle génétique, et la variation génétique pour l'expression de chacune de ces caractéristiques, sont presque illimitées.

L'amélioration des cultures à l'aide de la sélection végétale est l'un des instruments les plus puissants dont nous disposons pour atteindre de multiples objectifs économiques et sociaux. Dès le début de la domestication des plantes, le changement génétique a été la base de l'amélioration des cultures, se manifestant dans des caractéristiques telles que de plus grosses semences, une meilleure saveur et une teneur supérieure en nutriments, la résistance aux ravageurs et aux

maladies, la sensibilité aux apports de nutriments, l'adaptation à divers sols et facteurs climatiques et de nombreuses autres. Ce processus visant à modifier les propriétés génétiques des plantes s'est poursuivi pendant plus de 10 000 ans. Sauf durant le siècle passé, ce processus était uniquement dans les mains des producteurs qui tout à fait par hasard ont changé les fréquences génétiques en sélectionnant les meilleurs types et en rejetant les moins bons.

L'amélioration génétique des plantes cultivées d'aujourd'hui, ou sélection végétale, présente de nombreuses caractéristiques communes avec son passé évolutionniste – le processus de changement des fréquences génétiques dans des directions favorables aux intérêts des producteurs et des consommateurs. Dans une grande partie du monde, la baguette est maintenant passée des mains des cultivateurs à celles des chercheurs, responsables de la création de nouvelles variétés de plantes. Néanmoins, les cultivateurs continuent de jouer un rôle de premier plan dans ce processus, à la fois comme conservateurs des ressources génétiques indigènes et comme décideurs. L'accumulation des connaissances sur la génétique et l'influence des gènes sur le comportement des plantes permet maintenant d'améliorer plus rapidement les plantes cultivées, ce qui devrait réjouir toute personne souhaitant voir s'améliorer les perspectives d'avenir du développement humain.

Il ressort de l'étude de plusieurs plantes cultivées que, d'une façon générale, l'accroissement de la productivité des cultures dans les temps modernes (depuis l'application de la science à l'amélioration des cultures) est attribuable plus ou moins pour moitié à la génétique et pour moitié à la gestion. Il y a de nombreux exemples remarquables de l'application de la sélection végétale pour le bien de la société. Alors que la sélection végétale est en général considérée comme un processus méthodique et progressif, il y a eu dans l'histoire des périodes où les progrès étaient spectaculaires et apportaient des avantages rapides et largement reconnus.

Au début du XX^e siècle, la compréhension de la « vigueur hybride », et la façon de l'exploiter dans les systèmes de sélection, ont apporté deux grands changements. Premièrement, une accélération très marquée de l'amélioration des rendements (principalement du maïs). Deuxièmement, les technologies requises ont stimulé l'entrée à grande échelle du secteur privé dans l'industrie semencière. Les effets se sont fait d'abord sentir dans les pays développés, mais touchent aussi maintenant quelques pays en développement.

Une autre période durant laquelle la sélection végétale a eu un impact important et rapide est celle de la *révolution verte* des années 1960 et 1970. À une époque où régnait un profond pessimisme quant à la capacité des approvisionnements alimentaires de croître au même rythme que la population mondiale, nous avons démontré que des buts précisément identifiés, des efforts concentrés de scientifiques bien formés, une politique appropriée et un financement adéquat ont fait des *miracles* pour la production de blé et de riz.

Depuis la fin du XX^e siècle, une nouvelle révolution génétique est en marche, grâce à une meilleure compréhension de la structure et de la fonction des gènes au niveau moléculaire. Cette révolution semble être seulement à ses premiers stades – certains produits sont à la disposition des producteurs et des consommateurs, mais leur plein potentiel a été à peine appréhendé. Cette période a aussi été caractérisée par la privatisation de l'information et de la technologie, ce qui a permis une large augmentation des fonds alloués à la recherche, mais qui n'a profité principalement qu'aux sociétés semencières privées et aux producteurs des pays développés.

Les progrès de la sélection végétale peuvent continuer à fournir des produits améliorés pendant



longtemps, et ce faisant, profiter largement à la fois aux pauvres et aux plus aisés. Mais il y a lieu d'être prudents. En raison du succès remarquable des technologies de la *révolution verte* qui ont réduit certaines des menaces les plus graves à la nutrition, de nombreux pays ont mis en place une nouvelle capacité pour la recherche sur l'amélioration des cultures par des spécialistes, construit une infrastructure appropriée et ont fourni un appui opérationnel. Les bénéfices ont été généralement importants pour les pays qui ont suivi cette voie, en particulier pour certains qui ont investi largement tels que l'Argentine, le Brésil, la Chine, l'Inde et la Thaïlande. D'autres ont eu moins de succès, pour de nombreuses raisons. Là où les investissements n'étaient pas soutenus, où les éléments clés d'une approche intégrée faisaient défaut ou là où des troubles civils ont perturbé les activités normales, les progrès ont été inégaux.

De nombreux pays en développement qui ont investi dans une stratégie d'amélioration des cultures il y a 20 ou 30 ans ne nourrissent aucun doute quant à leur réussite, et n'ont pas pensé aux conséquences d'un manque d'appui soutenu, supposant souvent que le secteur privé comblerait les lacunes. La détérioration des infrastructures, le manque de jeunes chercheurs qualifiés capables de prendre la relève, et des budgets de fonctionnement parfois insuffisants ont fini par ralentir le flux des nouvelles technologies. Il s'ensuit que les populations de bon nombre de ces pays risquent davantage aujourd'hui de souffrir de la faim et de subir les vastes répercussions de la pauvreté.

En outre, non seulement nous faut-il relever les défis *traditionnels* posés par la production vivrière, mais nous avons aussi maintenant des preuves indiscutables de menaces graves sur les approvisionnements alimentaires mondiaux, menaces dues aux effets du changement climatique – nouvelles zones de sécheresses ou d'inondations, ravageurs et maladies de plus en plus graves, changements dans la teneur en matière organique des sols et maints autres effets moins apparents. S'il est clair que l'objectif à long terme est d'inverser le changement climatique, il n'en demeure pas moins qu'à court terme, il s'agit essentiellement de s'adapter. Nous savons que la sélection végétale a la capacité d'incorporer une vaste gamme de caractéristiques dans nos cultures vivrières et de plantes à fibres, et les chercheurs seront appelés de plus en plus à identifier et développer des caractéristiques pouvant contrer les effets du changement climatique. Durant les premiers jours de la *Révolution verte*, on ne cessait de répéter que l'amélioration de la productivité des cultures avait donné à l'humanité un moment de répit qui lui permettrait de trouver des solutions pour maîtriser la croissance démographique. Dans le même ordre d'idées et dans un nouveau paradigme, la sélection végétale peut être considérée comme s'intégrant dans ce moment de répit pour parvenir à maîtriser le changement climatique.

Les organisations et organes internationaux ont peu à peu mis en place un cadre pour la gestion des ressources génétiques agricoles en tant que bien public et en tant que patrimoine commun au profit des générations futures. Nous en citons quelques-uns. Le système du Centre international de recherche agronomique, depuis le début des années 1960 a été très efficace pour la collecte, la conservation et l'amélioration de bon nombre des plantes cultivées les plus importantes du monde. La Convention sur la diversité biologique (1992) et le Plan d'action mondial pour la conservation et l'utilisation durable des ressources phylogénétiques pour l'alimentation et l'agriculture (1996) ont été des étapes importantes s'agissant de reconnaître la nécessité de conserver la diversité des cultures. Le Traité international sur les ressources phylogénétiques pour l'alimentation et l'agriculture (Traité), qui est entré en vigueur en 2004, est complet dans la manière dont il envisage la conservation, l'accès et le partage d'avantages sûrs ainsi qu'une utilisation durable. Le Fonds fiduciaire mondial pour la diversité des cultures (GCDT), a été créé en 2004 en tant que mécanisme pour soutenir les engagements des pays au titre du Traité pour une bonne conservation. Alors que la conservation est vitale, il reste quelques lacunes en ce qui concerne un soutien mondial pour l'utilisation durable

des ressources. Le lancement du Traité et du Fonds fiduciaire a posé les bases pour une occasion importante et adéquate de compléter la chaîne, de s'employer à réunir tous les éléments requis afin de maximiser les avantages découlant de la conservation à l'échelle du globe, par une nouvelle initiative pour l'utilisation des ressources génétiques agricoles.

Tel est en résumé le contexte dans lequel de nouvelles idées ont vu le jour au sujet de la manière *d'exploiter les ressources phytogénétiques pour le développement*. Sous la houlette de la FAO, un vaste réseau mondial de chercheurs, décideurs et administrateurs de la recherche a reconnu le besoin urgent de renouveler l'appui au renforcement des capacités en matière de sélection végétale. Il s'agit là d'un moyen efficace de tirer parti des avantages d'un bon équilibre entre la conservation des ressources phytogénétiques et leur emploi pour l'amélioration des plantes cultivées afin de contribuer au bien-être de l'humanité et à la protection de l'environnement. Ainsi, l'Initiative de partenariat mondial pour le renforcement des capacités en matière de sélection végétale a été lancée à Madrid en 2006, comme un partenariat international d'organisations et d'individus des secteurs public, privé et de la société civile. Son but consiste à stimuler et soutenir des mesures nationales, régionales et mondiales complémentaires pour des systèmes globaux en faveur du développement et de l'adoption des meilleures variétés de plantes cultivées.

Ce document présente un plan systématique pour la réalisation des objectifs du GIPB pour 2009-2013. Il s'agit d'une *feuille de route* fondée sur une consultation permanente entre les parties prenantes visant à formuler le cadre stratégique, organisationnel et de mise en oeuvre pour l'initiative. Les bénéficiaires de cette initiative sont les populations des pays qui s'emploient à renforcer leurs systèmes de sélection végétale.

Le programme du GIPB s'articule autour de cinq objectifs:

- 1) **Appuyer la formulation de politiques** applicables à une stratégie de renforcement des capacités en matière de sélection végétale et technologies connexes, afin de faciliter l'allocation de ressources destinées à appuyer et maintenir la capacité des pays en développement d'utiliser les ressources phytogénétiques pour l'alimentation et l'agriculture.
- 2) **Soutenir et l'enseignement et formation** en matière de sélection végétale et capacités scientifiques connexes concernant l'utilisation des ressources phytogénétiques.
- 3) **Faciliter l'accès aux technologies** sous la forme d'outils, de méthodologies, de savoir-faire et de mécanismes permettant de trouver des solutions génétiques aux contraintes culturelles.
- 4) **Faciliter l'échange de ressources phytogénétiques**, à l'aide de programmes de sélection végétale publics et privés, en mesure de renforcer la base génétique et d'adaptabilité des cultivars améliorés dans les pays en développement.
- 5) **Partager des informations et des connaissances** axées sur le renforcement des capacités en matière de sélection végétale afin que les responsables des politiques et les obtenteurs puissent intégrer les connaissances nouvellement acquises dans les programmes des pays en développement.

La consultation pour l'élaboration du plan d'activités décrit quatre à sept volets prioritaires pour chaque objectif, et pour chacun d'entre eux, plusieurs réalisations (Annexe 1). Le plan est ambitieux mais réaliste. Il prévoit notamment de:

- Préparer du matériel de promotion pour les responsables politiques
- Déterminer les possibilités offertes pour l'enseignement et la formation
- Partager les informations et les possibilités de communication par le biais d'un Centre pour la diffusion des connaissances accessible sur Internet



- Mobiliser le soutien des donateurs pour les activités de plaidoyer, la formation et la recherche
- Participer à la définition des centres d'excellence régionaux
- Faciliter la caractérisation et l'échange de matériel génétique
- Promouvoir le partage des technologies entre les laboratoires de pointe et les programmes des pays en développement
- Faciliter les partenariats entre secteur public et secteur privé

Pour que le GIPB fonctionne effectivement comme une plateforme à long terme, il doit être structuré et financé de manière appropriée. Sa structure et sa supervision sont conçues de manière à assurer la transparence. Cette structure pourrait se composer d'un *Comité directeur*, nommé par la FAO, et qui serait chargé de la supervision générale de la stratégie du programme, des procédures opérationnelles et des questions touchant le GIPB dans son ensemble. *Le Groupe consultatif*, nommé par la FAO en consultation avec le Comité directeur et des parties à la GIPB, aurait pour tâche de fournir des orientations stratégiques et des conseils. *Le Secrétariat*, accueilli par la FAO, est un dispositif de facilitation et une base de ressources techniques pour la réalisation des objectifs du GIPB. La structure prévue est conçue de manière à optimiser les capacités opérationnelles et la participation des parties prenantes. À cet effet, une matrice de *thèmes* par *régions* pourrait être définie. Les thèmes correspondraient aux cinq objectifs du GIPB, et les régions géographiques seraient définies sur la base d'une subdivision logique tenant compte des institutions, des plantes cultivées, des langues nationales et des intérêts des donateurs.

Durant le premier cycle du Plan d'activités du GIPB, le financement servirait à: 1) réaliser les cinq objectifs du GIPB; 2) mettre en place et gérer le Centre pour la diffusion des connaissances (site Web); 3) soutenir les activités relatives à la formulation de projets nationaux et régionaux; 4) organiser et mettre en oeuvre des ateliers et des équipes spéciales régionaux et internationaux; 5) surveiller et évaluer; et 6) faciliter les fonctions de supervision, de consultation et de secrétariat du GIPB. Les besoins de financement seraient de l'ordre de 25 millions de \$ EU.

Nous disposons déjà des éléments nécessaires pour relever les défis futurs en matière de sécurité alimentaire et de développement à l'échelle de la planète. La mise en place d'un système optimisant les interconnexions et les complémentarités de ces éléments de l'amélioration génétique des plantes cultivées ouvrira la voie à un avenir plus serein pour l'humanité.

RESUMEN DE ORIENTACIÓN

Cada vez es más complejo y problemático satisfacer las necesidades de sustento –alimentos, vestido y techo– de la población mundial. La seguridad alimentaria, el desarrollo económico y la protección ambiental están íntimamente ligados en esta tarea, y todos son más imprevisibles debido a los efectos inciertos del cambio climático. La persistencia del crecimiento demográfico (hoy en torno a seis millones) es el meollo del problema, especialmente porque el aumento de la población sigue siendo más elevado en los países pobres. Las tierras agrícolas son finitas y su mayor parte está en explotación. Ampliar la irrigación o talar bosques en general es costoso o ambientalmente insostenible. La inestabilidad de los precios de los insumos para la producción –la energía, los fertilizantes, la maquinaria, el agua– y de los productos que venden los agricultores es una dificultad para que los empresarios prosperen sistemáticamente. Estas mismas fluctuaciones impiden a los consumidores de bajos ingresos comprar los alimentos adecuados.

Al mismo tiempo que estos desafíos se hacen más complejos, nuestro repertorio de soluciones crece e incorpora elementos técnicos, normativos y sociales. En este documento se sostendrá que una capacidad mayor para mejorar los cultivos es una parte decisiva de la solución. El plan de trabajo de la Iniciativa de colaboración mundial para el fortalecimiento de la capacidad de fitomejoramiento (GIPB) esboza una vía importante para lograr un mejoramiento sustancial de la capacidad del mundo para alimentarse y progresar económicamente en los decenios próximos.

Los cultivos contribuyen a satisfacer las necesidades nutricionales de la gran mayoría de la humanidad, mediante su consumo directo o indirectamente a través de los productos pecuarios. Los cultivos también generan ingresos para los productores (que representan a la mayoría de la población del mundo en desarrollo), así como para muchas otras personas participantes a través de las actividades de apoyo, y en la cadena de elaboración y comercialización. Es probable que no haya otro aspecto más fundamental para el bienestar de la humanidad y el medio ambiente que la evolución de las tecnologías y las prácticas de producción agrícola. Por estos motivos es decisivo entender cómo se puede apoyar al subsector agrícola de los alimentos y la agricultura, optimizando en general los beneficios en toda la sociedad, y a largo plazo.

La productividad agrícola recibe los efectos de muchos factores: el suelo, el clima, los insumos *externos*, la gestión y la genética. De ellos, la genética es un elemento excepcional y vigoroso. Es *excepcional* porque sus beneficios son perpetuos, es decir, después del costo inicial de su creación, los usuarios pueden seguir acumulando los beneficios con poco costo adicional o ninguno (por el contrario, por ejemplo, de los fertilizantes, que se *utilizan* y es necesario comprarlos repetidamente). Es *vigoroso* dado que la variedad de características que se controlan genéticamente, así como la variación genética para expresar cada una de estas características son prácticamente ilimitadas.

El mejoramiento de los cultivos es uno de los instrumentos más eficaces para alcanzar numerosos objetivos económicos y sociales. Desde que se comenzó a domesticar los cultivos, el cambio genético ha sido la base del mejoramiento de las plantas, expresado en características tales como un tamaño más grande de las semillas, un sabor mejor o contenido de nutrientes, resistencia a plagas y enfermedades, capacidad de respuesta a los insumos de nutrientes, adaptación a diversos factores de suelos y climáticos, y muchos otros. Este procedimiento de modificación de los atributos genéticos de las plantas se ha mantenido desde hace más de 10 000 años. Durante todos los siglos menos el pasado, estuvo exclusivamente en manos de los agricultores, que sin darse



cuenta modificaban las frecuencias genéticas mediante la selección de tipos mejores y descartando los menos interesantes.

El mejoramiento moderno de los genes de los cultivos, o fitomejoramiento, tiene mucho en común con su pasado evolutivo: el procedimiento de modificación de las frecuencias genéticas en direcciones convenientes para los agricultores y los consumidores. En gran parte del mundo la batuta ha pasado de los agricultores a los científicos, debido a la responsabilidad de éstos de crear nuevas variedades de cultivos. Sin embargo, los agricultores siguen siendo una parte fundamental del procedimiento, como cuidadores de los recursos genéticos autóctonos y responsables de tomar decisiones. La acumulación de conocimientos de genética y de la influencia de los genes en el comportamiento de las plantas hoy permite acelerar la velocidad del fitomejoramiento, lo que debería entusiasmar a todos los interesados en una mejor perspectiva para el desarrollo humano.

A partir de estudios de diversos cultivos se observa que, en general, los adelantos en materia de productividad agrícola en la época moderna (desde la aplicación de la ciencia al mejoramiento de los cultivos) obedecen aproximadamente la mitad a la genética y la otra mitad a la gestión. Existen numerosos ejemplos extraordinarios de aplicación del mejoramiento de las plantas en beneficio de la sociedad. Si bien el fitomejoramiento en general se considera un proceso metódico y progresivo, ha habido períodos de la historia en los cuales los adelantos fueron espectaculares y produjeron beneficios rápidos y ampliamente reconocidos.

A principios del siglo XX, el conocimiento del vigor de los híbridos y la forma de capitalizarlo en los sistemas de mejoramiento produjo dos cambios importantes. Primero, el aumento de la productividad (principalmente en el maíz) se aceleró considerablemente. Segundo, la tecnología necesaria para explotar esta tecnología estimuló el ingreso en gran escala del sector privado a la industria de las semillas. Ambos efectos se observaron principalmente en los países desarrollados, pero ahora también se están produciendo en los países en desarrollo.

Otro período de notables efectos acelerados del fitomejoramiento se produjo durante la revolución verde de los decenios de 1960 y 1970. En un período de considerable pesimismo en torno a la capacidad del suministro de alimentos para mantener el ritmo del crecimiento demográfico mundial cada vez mayor, se demostró que con objetivos claros, una labor concentrada de científicos capacitados, un entorno normativo apropiado y la financiación adecuada se produjeron *milagros* en la producción de trigo y arroz.

A partir de fines del siglo XX se inició una nueva revolución genética debido a un conocimiento mejor de la estructura y función genética a nivel molecular. Esta revolución parece encontrarse en sus fases iniciales, se han obtenido algunos productos en beneficio de los agricultores y los consumidores, pero su potencial completo apenas si se ha rozado. Este período también se ha caracterizado por la privatización de la información y la tecnología, que ha incrementado considerablemente la financiación de investigación, pero ha limitado mucho los beneficios a las empresas privadas de semillas y a los agricultores de los países desarrollados.

El progreso en materia de fitomejoramiento puede seguir obteniendo productos mejorados durante muchos años y, de esta manera, beneficiar ampliamente tanto a los pobres como a los ricos. Pero hay salvedades. Debido al extraordinario éxito de las tecnologías de la revolución verde en materia de reducción de las amenazas más serias para la nutrición, muchos países crearon nueva capacidad de investigación en fitomejoramiento mediante la formación de científicos, construcción de infraestructura y suministro de apoyo operativo. Los resultados en general fueron muy positivos

para los países que siguieron esta vía, especialmente para algunos de los que más invirtieron, como Argentina, Brasil, China, la India y Tailandia. Otros tuvieron menos éxito, por muchas razones. El adelanto fue desigual donde no se mantuvo la inversión, donde faltaron los elementos clave de un enfoque integrado o donde disturbios civiles dislocaron las actividades normales.

Muchos países en desarrollo que invirtieron en una estrategia amplia de mejoramiento de los cultivos hace 20 o 30 años, comenzaron a dar el éxito por hecho, sin reconocer plenamente las consecuencias de desatender el apoyo sostenido y suponiendo muchas veces que el sector privado llenaría las lagunas. El deterioro de la infraestructura, la falta de científicos jóvenes capacitados para reemplazar a los que se jubilaban, así como presupuestos insuficientes fueron desacelerando la obtención de nuevas tecnologías, y la población de muchos de estos países hoy corren un riesgo mayor de sufrir hambre y los efectos de gran alcance de la pobreza.

Además, no sólo es necesario afrontar las dificultades de siempre de la producción de alimentos, sino que estamos ante la evidencia innegable de las graves amenazas para el suministro mundial de alimentos planteadas por el cambio climático: nuevas zonas de sequía o inundaciones, plagas y enfermedades que extienden su campo de acción o su intensidad, cambios en el contenido de la materia orgánica de los suelos, y muchos otros efectos sutiles. Si bien es evidente que a largo plazo el objetivo tiene que ser dar marcha atrás al cambio climático, a corto plazo la adaptación cobra una importancia primordial. Se sabe que el fitomejoramiento puede incorporar una serie extraordinaria de características en nuestros alimentos y cultivos de fibras, y se pedirá cada vez más a los científicos que determinen y desplieguen las características que contrarrestan los efectos del cambio climático. En los primeros tiempos de la revolución verde, era común decir que una mayor productividad agrícola ofrecía al mundo un respiro mientras la humanidad encontraba soluciones para contener el crecimiento demográfico. En el mismo tono y en un paradigma nuevo, el fitomejoramiento se puede considerar que ofrece un respiro para contener el cambio climático.

Los organismos y organizaciones internacionales han establecido gradualmente un marco para la gestión de los recursos genéticos de los cultivos como bien público y legado colectivo en beneficio de las generaciones futuras. Aquí se mencionan algunos de estos recursos. El sistema del Centro Internacional de Investigación Agrícola, inaugurado en el decenio de 1960, fue una importante iniciativa de recolección, conservación y mejoramiento de muchos de los cultivos más importantes del mundo. El Convenio sobre la diversidad biológica (1992) y el Plan de acción mundial para la conservación y la utilización sostenible de los recursos fitogenéticos para la alimentación y la agricultura (1996) fueron pasos importantes en el reconocimiento de la necesidad de conservar la diversidad de los cultivos. El Tratado internacional sobre los recursos fitogenéticos para la alimentación y la agricultura, que entró en vigor en 2004, tiene una óptica amplia que consiste en asegurar la conservación, el acceso y la distribución equitativa de los beneficios, así como el uso sostenible de los recursos. El Fondo Mundial para la Diversidad de Cultivos, establecido en 2004, se creó como mecanismo de apoyo a las obligaciones adquiridas por los países a través del Tratado internacional para la seguridad de la conservación. Si bien es indispensable la conservación, quedaba una laguna de apoyo mundial al uso sostenible de los recursos. La creación del Tratado Internacional y el Fondo Mundial crean las condiciones de una oportunidad importante y tempestiva para completar la cadena: partir desde esta nueva base a fin de reunir todos los elementos necesarios para incrementar al máximo los beneficios mundiales de la conservación a través de una nueva iniciativa para el uso de los recursos genéticos de los cultivos.



Éste es, en pocas palabras, el panorama general que condujo a nuevas reflexiones sobre cómo *aprovechar los recursos fitogenéticos para el desarrollo*. Por iniciativa de la FAO, una amplia red mundial de científicos, autoridades normativas y administradores de investigación reconocieron la urgencia de renovar el apoyo a la creación de capacidad en fitomejoramiento. Es una forma eficaz de capitalizar los beneficios de obtener un equilibrio entre la conservación de los recursos fitogenéticos y su uso para mejorar los cultivos a fin de contribuir al bienestar humano y ambiental. Así se estableció la Iniciativa de colaboración mundial para el refuerzo de la capacidad en materia de fitomejoramiento, en Madrid en 2006, como alianza internacional de organizaciones y particulares del público, el sector privado y la sociedad civil. El objetivo es catalizar y dar apoyo a la intervención nacional, regional y mundial complementaria destinada a sistemas completos para la creación y adopción de variedades mejores de los cultivos.

Este documento esboza un plan sistemático para ejecutar los objetivos de la GIPB de 2009 a 2013. Se trata de un plan basado en un proceso amplio de consulta con las partes interesadas, concebido para formular el marco estratégico, de organización y ejecución para la iniciativa. Los beneficiarios de ésta son las poblaciones de los países que emprenden el fortalecimiento de los sistemas de fitomejoramiento.

El programa de la GIPB gira en torno a cinco objetivos:

- (1) **Apoyo para la elaboración de políticas** de fitomejoramiento y una estrategia afín de creación de capacidad, para ayudar a asignar recursos encaminados a fortalecer y sustentar la capacidad de los países en desarrollo de utilizar los recursos fitogenéticos para la alimentación y la agricultura.
- (2) **Apoyo para formación y capacitación** en fitomejoramiento y capacidades científicas afines, pertinentes a la utilización de los recursos fitogenéticos.
- (3) **Facilitar el acceso a las tecnologías** a través de instrumentos, metodologías, conocimientos técnicos y servicios para encontrar soluciones genéticas a las limitaciones de los cultivos.
- (4) **Facilitar el intercambio**, de programas públicos y privados de mejoramiento, de recursos fitogenéticos que puedan mejorar la base genética y la capacidad de adaptación de cultivares mejorados en los países en desarrollo.
- (5) **Compartir información y conocimientos** para la creación de capacidad fitomejoradora a fin de suministrar los conocimientos nuevos disponibles a las autoridades normativas nacionales y a los mejoradores de los programas de los países en desarrollo.

La consulta para la elaboración del plan de trabajo expuso de cuatro a siete actividades prioritarias para cada objetivo, y en cada uno de ellos, varios productos (Apéndice 1). El plan es ambicioso pero realista. Entre sus muchas actividades previstas están:

- Elaborar materiales de promoción para las autoridades normativas
- Determinar oportunidades de formación y capacitación
- Difundir información y oportunidades de comunicación mediante un Centro de recursos de conocimientos en Internet
- Movilizar el apoyo de los donantes para las actividades de promoción, capacitación e investigación
- Dar apoyo a la definición de centros regionales de excelencia
- Facilitar la caracterización e intercambio de germoplasma

- Promover que los laboratorios avanzados y los programas de los países en desarrollo compartan tecnología
- Facilitar alianzas entre los sectores público y privado

Para que la GIPB funcione con eficacia como plataforma a largo plazo necesita una estructura y financiación adecuadas. Su estructura y supervisión están concebidas para promover la transparencia. Se propone que esta estructura conste de un *Comité Directivo*, designado por la FAO, responsable de la supervisión general de la estrategia del programa, procedimientos operativos y asuntos que conciernan en general a la GIPB. El *Grupo consultivo*, designado por la FAO en consulta con el Comité Directivo y las partes interesadas de la GIPB, tiene a su cargo el suministro de orientación estratégica y asesoramiento. La *Secretaría*, ubicada en la FAO, es una base de recursos de facilitación y técnicos para la ejecución de los objetivos específicos de la GIPB. La estructura prevista de la Iniciativa está concebida para aprovechar al máximo la capacidad de operación y la participación de las partes interesadas. Esto se logrará mejor mediante una matriz de *temas por regiones*. Los temas corresponden a los cinco objetivos de la GIPB, y las regiones geográficas se determinarán teniendo en cuenta la subdivisión lógica basada en instituciones, cultivos, idiomas e intereses de los donantes.

La financiación durante el primer ciclo del plan de trabajo de la GIPB comprenderá: 1) habilitar la ejecución de los cinco objetivos de la GIPB; 2) desarrollar y administrar del Centro de recursos de conocimientos (sitio web); 3) dar apoyo a las actividades de formulación de proyectos nacionales y regionales; 4) organizar y realizar talleres regionales e internacionales y grupos de acción; 5) dar seguimiento y evaluación; y 6) facilitar las funciones de supervisión, asesoramiento y secretaría de la GIPB. Se prevé que las necesidades de financiación serán de un orden de 25 millones de USD.

Los elementos de la capacidad de afrontar los desafíos del mañana en materia de seguridad alimentaria y desarrollo mundial general ya existen. Instalar un sistema que optimice las interconexiones y las complementariedades de esos elementos del mejoramiento genético de los cultivos establecerá las condiciones para un futuro más brillante para la humanidad.



PREFACE

Unstable food and energy prices, changes in climatic conditions and increased production costs are bringing new challenges to agriculture, and expansion of crops for bio-energy generation is conveying new opportunities as well as challenges to the agricultural sector. This new scenario being faced by today's world calls for increased attention from plant breeding, an area of applied science whose contributions in the developing world have been far below potential due to under-investment in recent decades.

Plant breeding efforts run in relatively long cycles from the time a problem is identified to the time of varietal deployment at the farm and commercial levels. A lack of long-term policy and institutional support for national breeding strategies may result in disastrous discontinuities, especially under the prospect of dramatic changes in commodity and input prices and climate. The limitations of trained scientific and technical personnel, institutional weaknesses, inefficiencies in facilities and information services, and inadequate links with genetic resource and seed systems, are key causes of the currently sub-optimal national and international plant breeding capacity.

Prior to the current initiative, there was no comprehensive and multi-component global partnership initiative in plant breeding capacity building in place to facilitate the necessary training and provide the essential career and resource support to trainees to ensure the development and sustainability of plant breeding capacity at the national and international levels. There is a need for a capacity building initiative that is large enough in scale to generate and support a critical mass of plant breeders and technicians who can network effectively and exchange material and know-how as part of a global system.

In light of the above, a unique Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) was launched in Madrid in June 2006 at the time of the First Governing Body Meeting of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). The GIPB is an International Partnership Platform (IPP) of public, private and civil society sectors working in a concerted and systematic manner to enhance professional and institutional plant breeding capacity in support to crop production intensification, food security and sustainable development.

As a partnership of stakeholders from the public, private and civil society sectors, the Initiative is aimed at catalyzing and supporting complementary national, regional and global action among relevant international organizations, foundations, universities and research institutes, corporate and business sector, civil society associations, and national and regional bodies. FAO's role is that of a host convener to facilitate concrete partnership action at national and international levels.

This Business Plan provides a road map for the implementation of GIPB for the next five years. It highlights the increasing importance of improved crops as a powerful tool for achieving multiple goals: food security, economic development, environmental protection and adaptation to climate change. Plant breeding is an essential component of the agricultural innovation system, capable of impacting the knowledge base for food and agriculture development and promoting sustainable production intensification in response to current and emerging global challenges. This Plan is based on a comprehensive stakeholder consultation process designed to formulate the strategic, organizational and implementation framework for the Initiative. It presents an agenda of priority activities to be accomplished over the period 2009-2013, and indications on how to organize resources and capacities to meet the planned goals – all conducive to the objectives of crop production intensification, food security and sustainable development, through improved plant breeding capacity.



STATEMENT OF PURPOSE

This Business Plan was developed with the purpose of defining and directing the activities of the Global Partnership Initiative for Plant Breeding Capacity Building for the next five years (2009-2013).

Whilst it is necessary for GIPB to have a reference plan and road map as it moves forward into the future, it is equally necessary that the Initiative remains responsive to changing needs and circumstances. Therefore, this Business Plan is considered to be a “living document” so that as projects develop, as opportunities arise, and as more resources are mobilised, the plan can be revised and amended, always taking as reference the results of consultations and major directions recommended by the GIPB stakeholders.

SIGNIFICANT OPPORTUNITIES AND CHALLENGES

Food and agriculture are back on the agendas of international aid agencies and development organizations. The World Bank Development Report 2008 is on Agriculture for Development, and there has been the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) completed in 2008. The European commission and other multilateral as well as bilateral donor agencies, and international and national development finance institutions, have begun to give agriculture a higher profile in their development strategies and resource allocation decision-making. Further, for achieving the Millennium Development Goals (MDGs), the role of food and agriculture development internationally is clearly recognised in all the goals but particularly in goals 1, 3, 7 and 8. Thus, the recognition of the value of the important multi-dimensional role played by food and agriculture sectors in national and international development, global food security, sustaining livelihoods and ecosystem services is now increasing, particularly in the face of new challenges such as global warming and climate change, increasing negative environmental externalities from intensive unsustainable industrial farming, degradation of ecosystems services and biodiversity, and overcrowded cities.

At the same time new scientific discoveries, technology development and knowledge integration is continuing to strengthen the technical base for food and agriculture development at an unprecedented rate, offering improved paradigms for sustainable production intensification and agro-ecosystems management. Effective international plant breeding capacity for genetic resource enhancement and generating better adapted crop cultivars is an essential part of this process in association with improved production systems to help tackle most of the new and emerging challenges to agricultural systems, as was done in the past for triggering the so called “green revolution”.

However, national capacities in plant breeding and crop improvement, using conventional and modern methods, in most developing countries, are neither sufficient nor properly integrated to fully capture the benefits of the wealth of plant genetic variability available in the germplasm banks around the world. Success in plant breeding requires continued long-term commitment, in order to sustain a flow of new technologies. Unfortunately, the role of plant breeding in agricultural



development was taken for granted by governments and donors over the past three decades or so, leading to a sharp decline in many developing countries in the national capacity to develop new adapted varieties for sustainable crop intensification.

If the policy and science communities are not brought together to face the challenge of strengthening plant breeding capacity for the future, the ability of agricultural systems to contribute to global food security and development will certainly become limited. Growing scientific evidence indicates that traditional and new cropping systems will have to incorporate greater plasticity and dynamics in response to climatic and production management changes. Extensive genetic manipulation and enhancement through plant breeding will be required to make such adjustments possible.

Other current and emerging opportunities and challenges will also be better tackled by strengthening plant breeding capacity - the need to improve human health and nutrition; pressures to improve crop efficiency and productivity; the need of reconciling agriculture with environment, promoting multi-functionality of crop production systems and ecosystem services; responding to the demand for development of sustainable bioenergy crop systems; emphasis on biological security through cleaner, genetic and biological strategies to face invasive and devastating crop diseases and insect pests; the need to promote the use of local, traditional knowledge and the cultural heritage represented in the biological diversity of traditional adapted genetic resources, among many others.

THE NEED FOR AN INTERNATIONAL INITIATIVE IN BUILDING PLANT BREEDING CAPACITY

The downward trend in national capacities to utilize Plant Genetic Resources for Food and Agriculture (PGRFA) underscores the need for an international initiative in building plant breeding capacity. The results of the international FAO survey assessment of plant breeding and related biotechnology capacity in National Agricultural Research Systems (NARS) in the developing regions (<http://km.fao.org/gjpb/pbbc/>) provide strong indications that capacity building in plant breeding and biotechnology is the key to strengthening the possibility for developing countries to promote and benefit from sustainable agricultural development (Guimarães *et al.*, 2006a, 2006b and 2007). The limitations in trained scientific and technical personnel and institutional weaknesses and inefficiencies in facilities and information services within the plant breeding sector and in its links with genetic resources and seed delivery systems are key challenges that prevent the potential contribution of plant breeding to sustainable development to materialize more widely.

The ITPGRFA establishes the legal conditions for building and sustaining an effective and efficient system for the utilization of plant genetic resources by plant breeders for sustainable agriculture and food security. It follows as an assumption that countries, both developing and developed, will now increasingly realise the need to make commitment to plant breeding and associated biotechnology capacity building, including forging effective linkages between public and private sector, and sharing germplasm and breeding technologies, if the utilization of genetic resources for agricultural productivity growth and development in the 21st century is to become a reality.

Building and sustaining the capacity of plant breeding at the national and regional levels requires the training of more plant breeders and the development of an integrated set of capabilities and support systems. At the same time, the resulting increase in crop productivity and in supply, processing and distribution of agricultural commodities can make an important contribution to further improving food and nutrition security and livelihoods of small scale producers, providing a source of increased production diversification, income and employment opportunity in the entire food chain. These facts need to be taken into account by governments and development organizations in formulating and financing development strategies.

There is widespread consensus that the substantial limitations in plant breeding capacity and in ability to sustainably access and use PGRFA in developing countries must be addressed through a global alliance of stakeholders. This will help to develop and maintain sufficient plant breeding and crop improvement capacity in developing countries as part of a global crop improvement system, backed up by effective policy and institutional arrangements and resource support.

There is no comprehensive and multi-component global partnership initiative in plant breeding capacity building currently in place that can facilitate the necessary training and also provide the essential career support to trainees to ensure sustainability. Further, there is a need for a capacity building initiative that is large enough to generate a critical mass of plant breeders and related professionals who can network and enhance sustainability. In fact, the different institutional service providers and donors internationally have never come together in partnership at the scale now called for to address the future strategic needs of plant breeding.

LAUNCHING THE GLOBAL PARTNERSHIP INITIATIVE FOR PLANT BREEDING CAPACITY BUILDING

The GIPB initiative was launched in Madrid in June 2006 at the time of the First Governing Body Meeting of the ITPGRFA. GIPB was formulated by FAO and its partners based on the results of the national assessment combined with information exchange and the discussions performed during the national and regional workshops. The Mission of GIPB is to enhance the capacity of developing countries to improve crops for food security and sustainable development through better plant breeding and delivery systems.

Together with governments and stakeholders, such as the Consultative Group on International Agricultural Research (CGIAR) and national and regional centres of excellence, the GIPB will foster linkages with the donor community and the public and private sectors to identify and address needs in the area of plant breeding and related biotechnologies. An internationally facilitated partnership forms the basis for achieving the goal of the initiative by catalyzing and supporting national, regional, and global action among relevant international organizations, foundations, universities and research institutes, the private sector, civil societies, and national and regional bodies. In particular, the international partnership role of GIPB is aimed at strengthening national plant breeding policies and strategies and national institutional capacity for coordinated action on training plant breeders, accessing technologies and developing skills for crop improvement, exchanging and accessing diverse genetic resources, as well as sharing information and knowledge.



The GIPB was proposed as a multiparty initiative of “knowledge institutions” around the world and agencies that have a track record in supporting agricultural research for development, working with country programs committed to developing stronger plant breeding programs. It will support a partnership of public and private sector parties from both the North and South, working together to enhance the capacity of developing countries to improve their agricultural productivity through sustainable use of PGRFA. However, it will be by no means a “closed shop” and partners will encourage broad multi-stakeholder engagement.

COMPLEMENTING THE INTERNATIONAL TREATY ON PGRFA AND THE GLOBAL CROP DIVERSITY TRUST

Over the last 10 years, significant progress has been made in addressing the needs and modalities to improve the conservation of PGRFA among governments and global partners. While conservation is vital, it is not enough. Strengthening the capacity at the national and regional level to identify and use new and more useful sources of variation for traits important to them now, while enhancing their capacity to easily identify useful germplasm material for the future is equally needed. The ITPGRFA came into existence in 2001 to ensure the continued availability of the plant genetic resources that countries will need for their future in harmony with the Convention on Biological Diversity (CBD). The Governing Body of the ITPGRFA, which had its first session in June 2006 in Madrid, supports both conservation and sustainable use of PGRFA and the fair and equitable sharing of the benefits arising out of their use.

The Global Crop Diversity Trust (GCDT) established in 2004 as an independent institution and hosted by FAO is considered to ensure that one of the key objectives of the ITPGRFA – the safe conservation of crop diversity – becomes a reality. The GCDT provides a robust mechanism to support the global efforts needed for effective and safe conservation of international plant genetic resources. There is, therefore, an important and timely opportunity to improve the balance between support to the conservation of PGRFA and their effective use to meet producer and consumer needs, address food security and livelihood concerns and contribute to the MDGs.

The GIPB partners, working closely alongside with the GCDT, will also contribute to a more comprehensive implementation of: (a) the International Treaty on PGRFA; and (b) the rolling Global Plan of Action for the Conservation and Sustainable Utilization of PGRFA (GPA). The emphasis would be on effective utilization of PGRFA and on measures for capacity building and international cooperation that strengthen national plant breeding strategies and crop improvement programs, particularly in developing countries. The GIPB partners will also benefit from international and national policy support and resources mobilized through the ITPGRFA and the GPA.

GIPB CONSULTATIONS AND PLANNING PROCESS

The GIPB is envisioned as a 20 to 25 year programme with four to five phases of five years each. The first five year phase (2009-2013) will focus *inter alia* on implementing the goal and objectives agreed at the stakeholder meeting in Madrid in June 2006 at the time of the First Governing Body Meeting of the ITPGRFA. These goals and objective were reaffirmed in Mexico at a consultation held in conjunction with the International Symposium in Plant Breeding, CIMMYT.

In 2007 a stakeholder consultation process was defined with a mission of formulating the organizational and implementation framework for the GIPB. The Task Force 1 was initiated with a virtual consultation involving 66 participants from a wide range of stakeholder institutions, who discussed electronically, from 27 July to 12 September, 2007, propositions and recommendations for longer-term strategies, outputs, outcomes and priority activities to be pursued by the GIPB. The results of the electronic discussion were discussed in detail in a face-to-face Task Force 1 meeting, held at FAO Headquarters in Rome, on 24-25 September, 2007, with 33 participants of the electronic discussion.

The consolidated set of recommendations from Task Force 1 were used as the starting point for Task Force 2, a consultation organized to define the parameters and content of the organizational and implementation framework for the GIPB. Taking as reference the results of Task Force 1 and the recommendations of a February-April 2008 electronic consultation with 298 participants, a group of 30 Task Force 2 participants met at the FAO Headquarters in Rome, on 23-24 April, 2008, to discuss and present recommendations for: a) the implementation of the five GIPB objectives in the period 2009-2013, and b) the organization and management framework of GIPB, including implementation of the international partnership platform, governance model, secretariat services, monitoring and evaluation.

The recommendations of Task Forces 1 and 2 form the core elements of this Business Plan, which is intended as a strategic road map for operating GIPB in the next five years, and to measure progress along the way. This Business Plan defines the international, regional and national priorities and strategies of the Initiative and the associated expected outputs and outcomes, while specifying its overall strategy, including the operating and communication plans. Also, this Plan is an essential element in presenting the GIPB to donors and supporters, as well as to further mobilize stakeholders towards collective efforts to enhance the capacity of developing countries to improve crops for food security and sustainable development through better plant breeding and effective delivery systems.



GIPB's DEFINITION OF PLANT BREEDING CAPACITY BUILDING

Plant breeding capacity building is defined by GIPB in a broad sense as the process of developing and strengthening the skills, abilities, processes and resources that countries and organizations need to establish and maintain plant breeding programs capable of surviving, adapting, and thriving in a fast changing world (Figure 1).

For GIPB, capacity building at the professional level refers to activities that improve the plant breeder's ability to define his/her goals or to do his/her work in more effective ways. Professional level capacity building is targeted to improve technical abilities, leadership, advocacy skills, communication abilities, organizing skills, and other areas of personal and professional development.

At the institutional and organizational level, GIPB considers that capacity building must be targeted to improve governance, leadership, mission and strategy definition, programme development and implementation, partnerships and collaboration, advocacy and policy change, monitoring and evaluation, among other activities and functions that may enhance the organization capacity to develop or support successful breeding programs.

As a global platform dedicated to enhancing plant breeding capacity at country, regional and global levels, as well as in promoting interaction and synergy with other sectors and complementary functions, GIPB also considers capacity across regions, countries and organizations. GIPB activities will necessarily involve individuals and groups of individuals, organizations, groups of organizations and networks within the plant breeding and related fields, in different countries and regions.

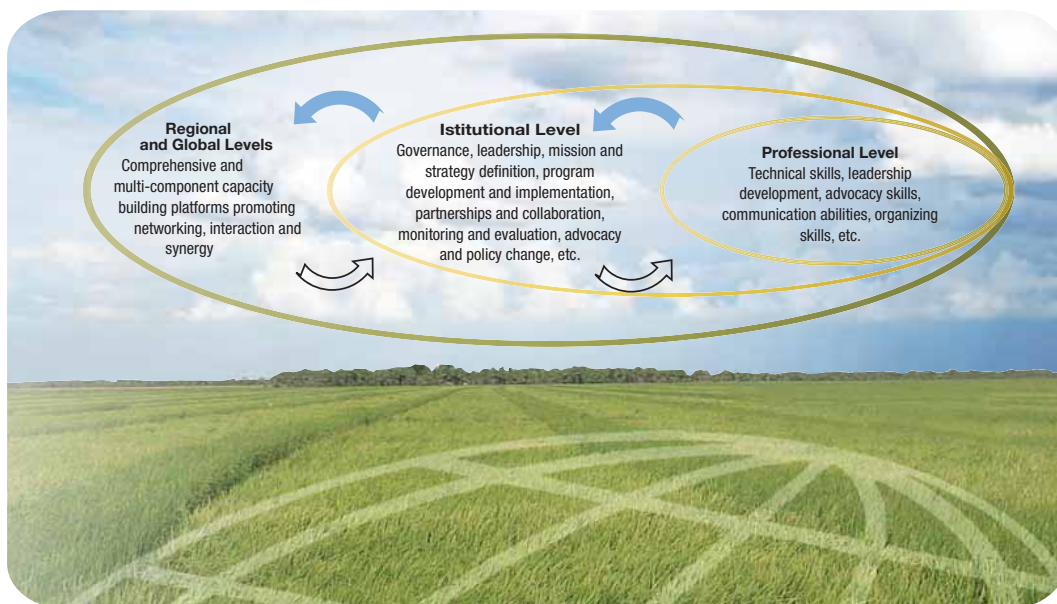


FIGURE 1

GIPB considers that different capacity providers and donors internationally must come together to implement a capacity building initiative that is large enough to generate a critical mass of plant breeders supported by solid institutional capacity, at a scale capable of addressing the future strategic needs of global food security and livelihoods.

STRATEGIC DIRECTIONS AND CHOICES - MISSION, VISION AND OBJECTIVES

Taken together, the several concluded steps of the GIPB stakeholder consultation process have defined the Mission, Vision and five longer-term specific objectives, aiming at the integrated enhancement of national plant breeding capacity building strategies for sustainable crop intensification and production system development:

MISSION

The mission of GIPB is to enhance the capacity of developing countries to improve crops for food security and sustainable development through better plant breeding and delivery systems.

VISION

The longer-term vision of success of the GIPB is the improvement in crop performance and food security based on the establishment of enhanced sustainable national plant breeding capacity. Improved cultivars will be produced and adopted in larger numbers and they will be better adapted to climate change and to protection of the environment and biophysical resource base through reduced use of pesticides and more efficient use of inorganic and organic fertilizer, water and energy. Improved stress tolerant cultivars will contribute to reduced consumer price, enhanced human health, and increased income and employment. In its broadest context, the GIPB is intended to impact the very essence of what constitutes the foundations of global food security.

FIVE OBJECTIVES

GIPB will function according to an operational model that prioritizes five objectives synergistically aligned towards consolidation of national plant breeding capacity in support to crop production intensification, food security and sustainable development.

- OBJECTIVE 1** Support for policy development on plant breeding and associated scientific capacity building strategy, to help allocate resources to strengthen and sustain developing countries' capacity to use plant genetic resources for food and agriculture;
- OBJECTIVE 2** Support to education and training in plant breeding and related scientific capacities relevant to utilization of plant genetic resources;
- OBJECTIVE 3** Facilitate access to technologies in the form of tools, methodologies, know how and facilities for finding genetic solutions to crop constraints;
- OBJECTIVE 4** Facilitate exchange of plant genetic resources, from public and private breeding programs, that can enhance the genetic and adaptability base of improved cultivars and production systems in developing countries;
- OBJECTIVE 5** Sharing of information focused on plant breeding capacity building to deliver newly available knowledge to national policy makers and breeders in developing country programs.



STRATEGIC DIRECTIONS AND CHOICES – OPERATIONAL MODEL

All five GIPB objectives are necessary to create the sufficient condition for sustainable and effective plant breeding capacity development at any level - national, regional and international. They are the core of an operational model that prioritizes the synergistic operation of the processes of “policy dialogue, coordination and implementation”, “education and training”, “access of technologies and know how” and “exchange of genetic resources”, and “sharing of new knowledge and information”. Figure 2 illustrates this operational strategy, in which the whole is bigger than the sum of the parts when the five components are working in a complementary and synergistic manner.

Objective 5 - “sharing new knowledge and information”, the component that allows GIPB to put life into its operational strategy, at all levels, keeping the ‘whole’ together.

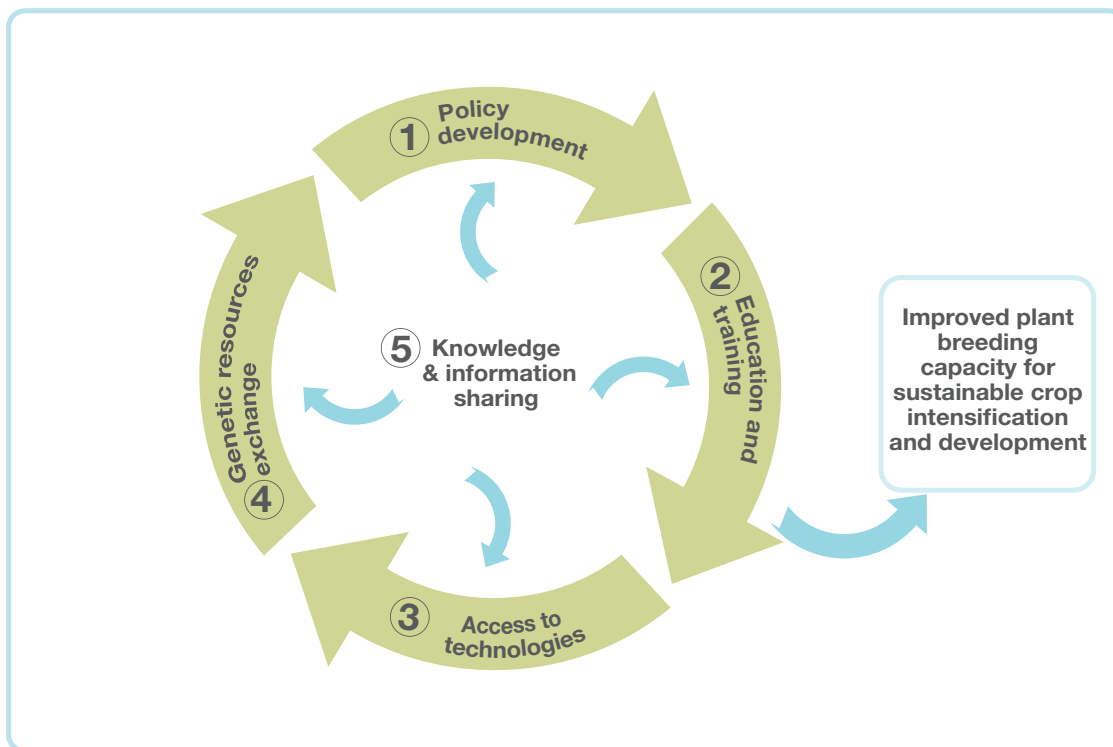


FIGURE 2

Operational model of GIPB, directed at implementing a comprehensive capacity building strategy, driven by new knowledge and information and aimed at consolidating and building national plant breeding capacity in support to crop production intensification, food security and sustainable development.

STRATEGIC DIRECTIONS AND CHOICES - OPERATIONAL PRIORITIES

The recent GIPB consultations (Task Forces 1 and 2) indicated the following longer term operational priorities, which guided the definition of the overall strategies, as presented in the next section, and the priority activities and intended outputs as presented in Appendix 1, to be pursued under each of the five GIPB objectives in the period 2009-2013:

OBJECTIVE 1 - POLICY DIALOGUE, COORDINATION AND IMPLEMENTATION

Policy planning and reform is a necessary dimension of sound national governance for food security and sustainable agricultural development. GIPB can play an important role of advocating at the policy maker level to help governments develop national genetic resources and plant breeding strategies compatible with user-driven country needs. Many national strategies and policies must be connected to the global policy landscape, which is quite complex and, in many cases, poorly known and/or poorly interpreted to regional/national contexts. Also, national decisions on genetic resources, plant breeding and associated fields (like biotechnology) involve a range of public institutions, agencies and civil society, all of which should work together to ensure effective country response. GIPB will, either directly or through partner organizations, establish an internationally credible platform to raise awareness and to support these organizations in the development of policies that allow national breeding programs and related innovation fields to benefit from global efforts and opportunities towards facilitated exchange and sustainable use of genetic resources for food and agriculture.

OBJECTIVE 2 - EDUCATION AND TRAINING

This GIPB objective responds to the worldwide declining or stagnating capacities in plant breeding for the utilization of plant genetic resources to ensure food security and sustainable development. There is now a need to develop capacity, including in pre-breeding and biotechnologies, for national programs to be able to take advantage of new scientific advances that increase the efficiency of crop improvement programs and enhance the genetic and adaptability base of improved cultivars. Also, there is a pressing need to build and improve capacity in support of institutional strengthening, better organization and management of breeding programs, farmer participatory breeding, and strengthened links with delivery systems and entrepreneurship. There is no global effort to build such capacities in a systematic and concerted manner over the medium- and longer-term and no way to address this deficiency. GIPB will, either directly or through partner organizations, develop an internationally credible platform to effectively promote training of new managers, scientists and technicians in all relevant aspects of the crop improvement process.



OBJECTIVE 3 - ACCESS TO TECHNOLOGIES AND KNOW-HOW

This objective responds to the technical opportunities that are becoming available to improve the effectiveness and efficiency of plant breeding programs. These opportunities are based on the advances in science, which provide tools and methodologies for addressing the need to strengthen the genetic base for biotic and abiotic stress tolerance, food quality and functionality. Valuable assistance to developing country programs in plant breeding and crop improvement can come from technology partnerships to provide methodologies, shared laboratory facilities, and guidance for finding solutions to constraints like environmental stresses, product quality, or human nutritional and health needs. There is no consistent or systematic effort to facilitate such technology partnership assistance at the global level, especially for under-served crops. GIPB can, either directly or through partner organizations, consolidate an internationally credible platform to effectively promote the flow of technologies and tools that are both location-appropriate and that enable attainment of plant breeding goals effectively and efficiently.

OBJECTIVE 4 - ACCESS TO PLANT GENETIC RESOURCES

Accessions in the international collections are expected to increasingly become characterized for their valuable adaptability, productivity and quality enhancing traits to improve utilization and incorporation into active collections and finished products. At the same time, in specific cases, private sector collections or even gene sequences may become more accessible. Genetic resource partnerships will support efforts by the ITPGRFA and the GCDT to strengthen germplasm conservation, characterization and utilization by developing country breeding programs. There is no global initiative to systematically facilitate effective exchange and use of genetic resources from private and public collections for incorporation in developing country breeding programs. GIPB can, either directly or through partner organizations, develop an international platform to effectively promote sharing and exchange of genetic resources relevant to increase the efficiency of crop improvement programs and to widen the genetic and adaptability base of improved cultivars in developing countries.

OBJECTIVE 5 - SHARING OF KNOWLEDGE AND INFORMATION

A mechanism for gathering, organizing, interpreting, and sharing information is required to deliver newly available knowledge and information in a format that meets the needs of policy and decision makers, managers and breeders, as well as national plant breeding capacity building efforts. A consolidated information and knowledge management gateway will positively impact information dissemination and sharing, training, and capacity building efforts, as well as contribute to increased efficiency and effectiveness of genetic resources management and crop improvement programs at the global level. Such gateway will connect and increase access to existing portals/websites of various breeding and education institutions, networks and initiatives aiming to sharing and exchanging information relevant to capacity building, institutional strengthening and more efficient operation of crop improvement programs, especially in developing countries.



STRATEGIC DIRECTIONS AND CHOICES - OVERALL STRATEGIES

The recent GIPB consultations (Task Forces 1 and 2) indicated the following overall strategies for the Initiative, which guided the definition of priority activities and outputs (Appendix 1) to be pursued under each of the five GIPB objectives during the period 2009-2013:

				
OBJECTIVE 1 Policy Dialogue, Coordination and Implementation	OBJECTIVE 2 Education and Training	OBJECTIVE 3 Access to Technologies and Know How	OBJECTIVE 4 Access to Plant Genetic Resources	OBJECTIVE 5 Sharing of Knowledge and Information
(a) Raise awareness of the need for coherent institutional policies and strategies in support of national PGRFA and plant breeding strategies	a) Develop a comprehensive capacity building strategy that recognizes training needs of scientists, managers, policy makers, farmers, and entrepreneurs	(a) Support centres of excellence with easily accessible facilities for training, research, and use of key sources of information	(a) Influence national leaders, decision-makers and donors to support adequate policies of access and use of genetic resources	(a) Implementation of Knowledge Resource Centre that makes available data, information, and tools relevant to building and improving capacity.
(b) Support development and dissemination of decision support tools for policy dialogue, coordination and implementation	(b) Support networking, mentorship, and complementary training and education programs both at the degree and non-degree levels	(b) Support public-private collaborations to accelerate access and application of new technologies and know how	(b) Improve skills to negotiate, access and promote use of genetic resources	(b) Organize and disseminate information to support policy dialogue, coordination and implementation
(c) Identify and publicize benefits from well-functioning plant breeding.	(c) Encourage lifelong learning and start up support for young professionals	(c) Support expanded networking to breeding and biotechnological research	(c) Create, support and enhance genetic resources partnerships	(c) Organize information to support education and training
d) Support countries in the preparation of their national PGRFA strategy, which includes conservation, use and delivery systems.	(d) Develop a Knowledge Resource Centre dedicated to support education and training	(d) Support application of science-based tools to improve neglected and underutilized crops	(d) Stimulate and support characterization of international germplasm collections	(d) Use IT tools to facilitate access and exchange of technologies and know how
	(e) Promote continuing education through linkages with extension, outreach and farmers	(e) Encourage and support multi-disciplinary linkages	(e) Support organization and dissemination of genetic resources information	(e) Use IT tools to support networking and communities of practice
	(f) Promote training of students in their jobs and support remotely-conferred degrees	(f) Promote knowledge sharing tools to enhance the flow of technologies and information useful to plant breeders		(f) Promote foresight analysis and access to information to support strategic planning



BENEFICIARIES AND STAKEHOLDERS

The primary direct beneficiaries will be the national populations of the selected countries along the food chain from production to consumption, and those who provide input, processing and marketing services. Consumers will benefit, through increased and affordable food intake, in terms of improved nutritional and health status. Producers will also benefit directly from improved socioeconomic status resulting from increased productivity and production and availability of food and other commodities. Because of the economic multipliers related to inputs, output handling and value added from processing, distribution and marketing services, economic benefits will accrue in terms of increased income and employment along the various supply chains.

The GIPB will foster a network of a large number of national and regional plant genetic resource conservation and utilization programs, seed systems and farmers, NGOs, United Nations and other international organizations, universities, extension services, national and regional research organizations and donors. The national plant breeding programs and seed systems in turn will connect to national agencies in the agriculture, health, education, trade and industry sectors, and to various linked service sectors for processing, distribution and marketing, farmer and producer organizations, and other civil society stakeholders.

An important group of beneficiaries will be the professionals and their respective scientific disciplines along the whole continuum from conservation of plant genetic resources to pre-breeding to breeding and crop improvement through to seed delivery systems. GIPB will facilitate the development and promotion of relevant and high quality science underpinning the various branches of modern genomics, plant breeding and biotechnology. The potential for scientific and professional benefits offered by GIPB cannot be underestimated, including the generation of strategic and applied scientific and technical knowledge along with the strengthening of its peer review processes.

MULTI-STAKEHOLDER INTERNATIONAL PARTNERSHIP PLATFORM

Due to its dynamic nature, the GIPB partnership should be seen as an evolving process, continuously fed by and coordinated through links and synergies with other ongoing initiatives, with special emphasis on national and regional plant breeding capacity building for utilization of plant genetic resources for enhancing crop productivity and quality. A multi-stakeholder IPP will champion the cause of GIPB, build consensus and political will, mobilize international and domestic resources and provide value-adding strategic and operational support to plant breeding capacity building initiatives. A major strategy of GIPB is to articulate and facilitate action of its diversified membership at the global, regional and national levels, in order to effectively address, in a coordinated and synergistic manner, the core objectives of the Initiative, described before.

GLOBAL LEVEL

To produce and disseminate GIPB-related analysis and information about plant breeding related training programs; availability of genetic resources of various types; molecular and non-molecular technologies, methods and know how, laboratory facilities, bioinformatics; and sources of purpose-specific knowledge needed by breeders, researchers, extension agents, farmers and policy makers, in order to sustain a global advocacy cooperation role. GIPB will serve as an information clearing house on which institutions or groups can offer particular services, thus enabling the matching of needs with service providers.

REGIONAL AND SUB-REGIONAL LEVEL

To promote the concrete application – with support of regional and national collaborators – of the above internationally facilitated opportunities for training, genetic material, technologies, facilities and information in order to assist in the concerted formulation of country strategies on plant breeding, and related biotechnology and seed systems; and support regional coordination.

NATIONAL LEVEL

To support the formulation and implementation of national strategies (including policy advice) on plant breeding capacity building, and related biotechnology and seed systems, for target crop sectors and priority national crop improvement programs.

Among the comparative advantages of the proposed approach, each partner at the global, regional and national level will find a full range of opportunities to establish new contacts and mechanisms for collaboration and exchange among diversified activity sectors, types of institutions and countries/regions.

STRUCTURE AND OVERSIGHT

GIPB's structure and oversight are designed to promote transparency, to facilitate collaboration with members and constant consultation with stakeholders, and to ensure well focused, relevant and effective action of the Initiative at global, regional and national levels. To fulfil its purpose of promoting the building of plant breeding and related capacities worldwide, GIPB operates with a flexible, non-bureaucratic lightweight administrative structure. This helps the Initiative to be responsive and free to move rapidly into new and emerging areas and opportunities, capable of responding to the needs of programs, countries and regions.



THE STEERING COMMITTEE

The GIPB Steering Committee is a group of individuals responsible for general oversight of the programme strategy, operating procedures, and related matters affecting GIPB as a whole. The Steering Committee generates, facilitates, supports and stimulates coherent action consistent with GIPB's mission and objectives to take GIPB forward in a consolidated manner, and maintains the relevance and quality of GIPB with the assistance of an Advisory Group. It guides the GIPB Secretariat on priorities and strategies, and on performance monitoring and evaluation. The Steering Committee consists of a non-limited number of members appointed by FAO in consultation with GIPB stakeholders. The Officer-in-Charge of the GIPB Secretariat will serve as the Secretary to the Steering Committee.

THE ADVISORY GROUP

The Advisory Group comprise a group of individuals responsible for providing strategic guidance and advice to the Steering Committee on specific scientific and technical issues of relevance to GIPB. Its role is to help the Steering Committee maintain the relevance, quality and impact of GIPB. The Group consists of a non-limited number of members, which are appointed by FAO in consultation with the Steering Committee and GIPB stakeholders.

THE SECRETARIAT

The Secretariat of the GIPB is hosted by FAO in its Plant Production and Protection Division. It is headed by an Officer-in-Charge and overseen by the Steering Committee. It serves as a catalytic facilitating and technical resource base for the implementation of the specific objectives of GIPB consistent with GIPB's operational plan. The Secretariat will assist the Steering Committee in its strategic and oversight functions, and in performance monitoring and evaluation. It will manage the GIPB Knowledge Resource Centre and technical communications with GIPB stakeholders; backstop national and regional project formulation activities; and organize regional and international workshops and taskforces. The Secretariat will ensure that its administrative and financial procedures comply with the administrative and financial regulations of the host institution.

The Secretariat staff and technical capacity comprises one full-time senior officer and a secretary/assistant, and supported by visiting staff from other network partner organizations. Thus, the Secretariat staffing and operational strength is subject to availability of direct funding and support in terms of visiting staff.

FAO is considered to be a suitable neutral host because of its long history of involvement in strengthening a range of scientific and technical aspects of sustainable development, including *inter alia* the conservation and utilization of plant genetic resources, and the promotion of the application of plant breeding and related biotechnologies as a basis for crop productivity improvement. FAO's position as an intergovernmental agency of the United Nations with no specific crop breeding programme enhances its role as an "honest broker".

A MATRIX OF THEMES BY REGIONS

To enhance its operational capacity and stakeholder engagement, GIPB will implement a matrix system of themes by geographic regions. The themes correspond to the five GIPB objectives (“policy dialogue, coordination and implementation”, “education and training”, “access to plant genetic resources”, “access to technologies and know how”, and “sharing of knowledge and information”). The geographic regions will be determined by examining what regional structures are already functioning; differences and similarities in major crops, languages, and donor interest; distances; and other factors. Each theme will have a global volunteer coordinator; and each region, a regional volunteer coordinator. All GIPB activities will be supported by at least one thematic and one regional coordinator. GIPB will look for dedicated individuals working in organizations for whose missions GIPB activities are relevant, and whose position descriptions already include elements of the GIPB matrix activities. As individuals and organizations are identified, they will be asked and supported to include GIPB activities in their work. In this way, the matrix would be built up gradually but sustainably, while broadening international ownership and integration. An advantage of starting to build the matrix based on voluntarism is that each matrix position, when occupied, is an opportunity to extend partnership and cooperation by getting greater numbers of people involved. The theme by region matrix manned by peer volunteers is a key management strategy to articulate cooperation, interaction and exchange within the IPP in a devolved and self-reliant manner while keeping overheads and administrative costs to a minimum necessary.

MONITORING AND EVALUATION

Monitoring and evaluation (M&E) are indispensable management functions to track GIPB’s progress against planned objectives and outcomes. The M&E strategy will be directed to identify whether the Initiative is heading in the right direction and whether it is using resources in the most cost-effective manner. To ensure that GIPB is delivering the desired outputs and outcomes, systematic monitoring of progress and periodic in-depth evaluation of the Initiative’s performance will be coordinated by the Secretariat and overseen by the Steering Committee, with guidance of the Advisory Group.

Each project derived from this Business Plan will necessarily define a process and routine of data gathering, analysis and reporting, aiming at providing the GIPB management team and stakeholders with information on progress being made towards achieving project/activity objectives; at increasing accountability with donors and other stakeholders; at enabling management to identify and reinforce positive results, strengths and successes; at alerting management of actual and potential weaknesses, problems and shortcomings. This process will allow timely adjustments and corrective actions to the work plan and implementation strategies, and provide input into the preparation of GIPB annual reports. Also, in light of its status as a global platform, GIPB considers it especially critical that monitoring and evaluation assist management to check whether the efforts are well balanced and relevant to the groups and/or geographical areas being targeted, and are of high quality and standard.



MOVING FORWARD - STATUS OF GIPB IMPLEMENTATION AND ACHIEVEMENTS

GIPB complements well the efforts through the International Treaty on PGRFA and the Global Plan on the conservation of plant genetic resources which is being implemented by the GCDT. For this reason FAO has been providing technical, administrative and financial support to GIPB since its creation. In 2007 the project proposal “Global Partnership Initiative for Plant Breeding Capacity Building” was prepared and submitted to the Bill and Melinda Gates Foundation through the GCDT and the UN Foundation. GIPB was awarded a start up grant to support formulation of its longer-term strategies and a business plan along with outputs, outcomes, and priority activities. These have been described in the preceding sections.

Since its launch in Madrid in June 2006, the GIPB partners in collaboration with the GCDT have been implementing several start-up activities, which include: pre-breeding training, policy support activities, the establishment of the Knowledge Resource Centre and a stakeholder consultation process to define recommendations for the formulation of the strategic, organizational and implementation framework for GIPB. Figure 3 illustrates the path of GIPB implementation and consolidation, indicating past, current and planned actions towards a fully operational, internationally facilitated partnership platform dedicated to enhancing the capacity of developing countries to improve crops for food security and sustainable development through better plant breeding and delivery systems.

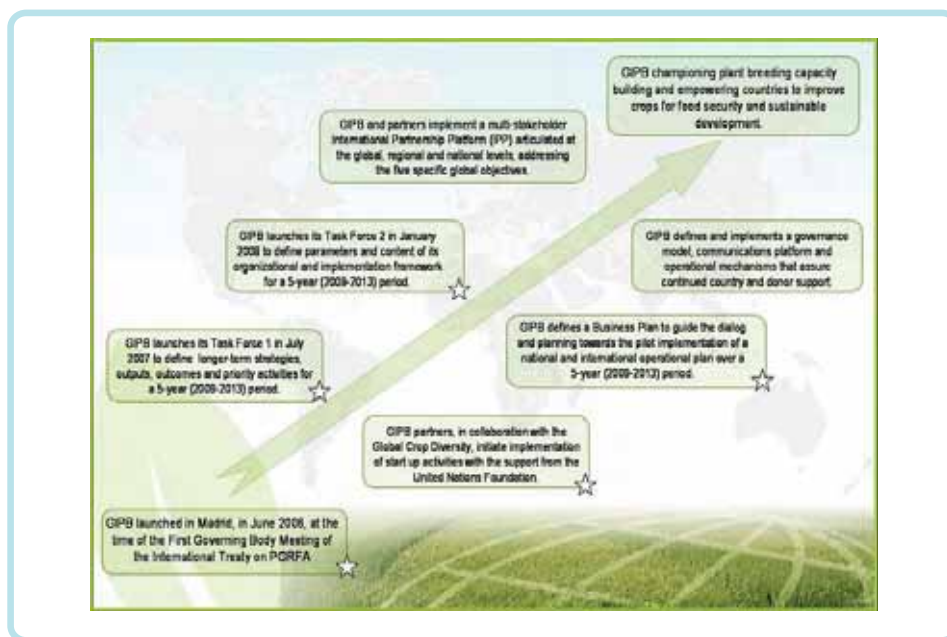


FIGURE 3

The pathway of implementation and consolidation of GIPB. Stars indicate steps already accomplished.



The key achievements during the current start up phase of GIPB are listed below, and summarised in Appendix 2.

- Worldwide assessment of plant breeding and biotechnology capacity
- Promoting awareness and supporting PGRFA policy development
- Definition of longer-term strategic priorities for plant breeding capacity building
- Establishment of the GIPB Knowledge Resource Centre (KRC)
- Implementation of a competitive grants system
- Call for studies and analysis
- Mobilizing a wide range of partners
- South-South and South-North plant breeding capacity building strategy
- Developing non-conventional tools to support plant breeding capacity building
- Support to PGRFA policy dialogue, coordination and decision
- Support to pre-breeding training and practice

ANTICIPATED FINANCIAL NEEDS - 2009-2013

GIPB has been conceived with a 20-25 year horizon and comprises 5-year phases. This Business Plan for 2009-2013 is the first full phase of GIPB offering a global agenda for plant breeding capacity building. The GIPB operational strategy, as sketched out in the Business Plan, will be implemented by the GIPB stakeholders as new partnerships and cooperation, forged around specific sets of priority activities at the national, regional and international levels.

The GIPB Business Plan is to serve as a common point of reference offering an operational framework for action formulated by over 300 stakeholders from diverse sectors as they engage themselves in various forms of partnerships to implement the priority activities. FAO will continue to provide some technical resources and administrative support from within its own core programme, but to implement the GIPB Business Plan 2009-2013, additional resources of some US \$ 5 million will be required for the following activities:

1. Enabling the implementation of the five GIPB objectives (e.g. through partnership building, policy support, running competitive grant schemes for education & training, facilitating access to tools and genetic resources, commissioning strategic analysis, etc);
2. Further develop and continue to manage the GIPB Knowledge Resource Centre;
3. Backstop national and regional project formulation activities;
4. Organize and implement regional and international workshops and taskforces;
5. Monitoring and evaluation;
6. Facilitate the oversight, advisory and secretariat functions of GIPB.



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USEFUL WEB LINKS

<http://km.fao.org/gipb>

<http://km.fao.org/gipb/pbbc/>

<http://www.fao.org/ag/magazine/0606sp1.htm>

www.fao.org/AG/Agp/agpc/doc/services/pbn/pbn-168.htm

www.fao.org/ag/magazine/pdf/0606-1.pdf



APPENDIX 1

PRIORITY ACTIVITIES AND INTENDED OUTPUTS UNDER THE FIVE GIPB OBJECTIVES

Due to its dynamic nature, the GIPB partnership should be seen as an evolving process, continuously fed by and coordinated through links and synergies with other ongoing initiatives, with special emphasis on national and regional plant breeding capacity building for utilization of plant genetic resources for enhancing crop productivity and quality. A multi-stakeholder IPP will champion the cause of GIBP, build consensus and political will, mobilize international and domestic resources and provide value-adding strategic and operational support to plant breeding capacity building.

PRIORITY ACTIVITIES FOR OBJECTIVE 1 - POLICY DIALOGUE, COORDINATION AND IMPLEMENTATION

Support for policy development on plant breeding and associated scientific capacity building strategy, to help allocate resources to strengthen and sustain developing countries' capacity to use plant genetic resources for food and agriculture.

Priority Activity 1:	Status
GIPB and its partner organizations will stimulate and support the preparation of multi-lingual advocacy materials and/or events for policy makers, donors, seed associations, urban society, the press, etc, explaining the value of plant breeding, its benefits to society, and the need for policy commitment for national plant breeding capacity building. <i>Intended Outputs</i>	Short Term
a) Multi-lingual awareness information based on the "Plant Breeding and related Biotechnology Capacity Assessments" developed by FAO.	Urgency 1
(b) Multi-lingual awareness information illustrating consequences of food shortage/famines and how improved varieties could divert those in the future, particularly by breeding for traits for adaptation to climate change and biotic and abiotic stress intensification.	Urgency 1
(c) Regional analysis, reports and issue papers (for example, country-specific human resources and capacity building situation, ITPGRFA-CBD policy coordination, changing paradigms in PGRFA access and use, etc.) to call attention to weaknesses, opportunities and areas for priority work.	Urgency 2
d) Basic analysis and information to help raise understanding of how policy systems work (linking agricultural policy objectives, food security issues, public sector role, private sector involvement, IP mechanisms, changing technological paradigms, regional/international cooperation, etc.).	Urgency 3



Priority Activity 2:

Status

GIPB and its partner organizations will create in the GIPB Knowledge Resource Centre a link for dissemination of information on PGRFA-related policy awareness and development.

Short Term

Intended Outputs

(a) A functioning Knowledge Resource Centre link publicizing the awareness goals of GIPB and providing access to information (survey data, policy studies, region/country-specific analysis, manuals, etc) and statements that can be useful to help raise awareness and mobilization towards adequate and coordinated policies in support to PGRFA access and use.

Urgency 1

Priority Activity 3:

Status

GIPB and its partner organizations will identify describe and disseminate illustrative examples or cases of countries that have been able to successfully put in place strategies of policy formulation and coordination, including institutional adaptation and human capacity development for adequate implementation.

Medium Term

Intended Outputs

(a) Reports and case studies, based on “data mining” the FAO survey and the literature, to be disseminated and discussed in a series of workshops directed to high level research administrators, leaders and policy makers, showing success cases and best practices in policy dialogue, coordination and implementation and stimulating discussion of country-specific policy needs and strategies.

Urgency 2

Priority Activity 4:

Status

GIPB and its partner organizations will develop decision support tools capable of enhancing understanding of the complex interfaces, interactions and multidimensional relationships involved in international and national PGRFA-related policy coordination, as well as of their implication to country-specific policy responsibilities and needs.

Medium Term

Intended Outputs

a) Decision support tools indicating implications, interfaces and inter-relations of PGRFA-related international policies on national and institutional policy development, and critical analysis and information for mapping the process of PGRFA-related policy dialogue, coordination and implementation in countries that have advanced most in policy implementation as means of illustrating and disseminating useful country-specific experiences.

Urgency 3

Priority Activity 5:

Status

GIPB and its partner organizations will create channels of interaction amongst scientists, farmers, consumers, decision and policy makers, publicizing well documented projects of high impact showing the benefits of well-functioning plant breeding programs. This activity should be directed to change the way agricultural research – and plant breeding as its essential component – fits into the countries agricultural policy decision making processes, including how it links to the food security, energy and the environment discussion.

Long Term

Intended Outputs

(a) Information resources tailored to inform donors - that can have the most effective voice when proposing projects to governments.

Urgency 2

(b) Well documented success cases - policymakers who are pushed by their constituents, or by their own sense of duty, to make real progress in climate change, energy costs, and/or food security issues will be open to hearing about the significant return on investment for plant breeding.

Urgency 3

(c) Channels of interaction (in the GIPB Knowledge Resource Centre) publicizing outputs (a) and (b). Policy-makers and donors may not access it directly, but this information will serve as a resource for scientists, leaders and research administrators to communicate and advocate with policy-makers and donors.

Urgency 3

(d) Workshops where policymakers should interact with the scientists, farmers and industrialists/consumers so that policy makers are fully convinced about the importance of plant breeding.

Urgency 3

PRIORITY ACTIVITIES FOR OBJECTIVE 2 – EDUCATION AND TRAINING

Provision of education and training in plant breeding and related scientific capacities relevant to utilization of plant genetic resources.

Priority Activity 1:

Status

GIPB and its partner organizations will develop studies and analysis to identify opportunities for education and training, as well as optimum plant breeding capacity targets, taking into account regional and country specific needs.

Short Term

Intended Outputs

(a) Comprehensive analysis of FAO’s Plant Breeding and related Biotechnology Capacity assessment (PBBC) identifying countries in the developing regions with highest priorities for plant breeding capacity building effort development.

Urgency 1



(b) Analysis and studies on capacity building targets to overcome regional and country-specific needs. This information must be tailored to help raise awareness and enhance willingness of policy makers to commit to long-term support to plant breeding education and training programs.

Urgency 2

(c) Analysis and studies indicating that well functioning breeding programs are dependent on systematic investments in high level education and continuous training – (emphasis on documenting cases that show the success of countries and organizations that dedicated substantial and systematic support to capacity building).

Urgency 2

(d) Studies and analysis addressing the needs of the institutions where future plant breeders will be trained.

Urgency 2

(e) Studies and analysis showing the impact of changing paradigms in plant biology in plant breeding capacity building and the need to incorporate multi- and trans-disciplinary approaches to the preparation of future professionals.

Urgency 3

(f) Analysis and studies on the importance of informing and educating the youth about the developments of basic science, with special emphasis to the impacts of advanced biology to plant sciences and plant breeding. This information must be tailored to promote the development of curricula for high school students addressing the needs of future plant breeders.

Urgency 3

Priority Activity 2:

Status

GIPB and its partner organizations will develop efforts to help adapt plant breeding curricula to a wider range of training needs, as well as to changing paradigms in science, technology and innovation.

Short Term

Intended Outputs

(a) Studies, proposals and active dialogue to support curricula alternatives that incorporate multi and trans-disciplinary approaches in the preparation of future plant breeding professionals. Emphasis on creative integration of conventional (quantitative genetics, statistics, etc) and advanced concepts and tools (functional genomics, molecular breeding, bioinformatics, etc).

Urgency 1

(b) Analysis and studies on capacity building targets to overcome regional and country-specific needs. This information must be tailored to help raise awareness and enhance willingness of policy makers to commit to long-term support to plant breeding education and training programs.

Urgency 1

(c) Studies, proposals and active dialogue in support to curricula alternatives that emphasize information technology for streamlining/expediting plant breeding work. The next generation of plant breeders will need to be proficient at using Information technology tools, thus, training in this area should be incorporated into degree/non-degree activities on plant breeding.

Urgency 1



(d) Web resources available at the GIPB Knowledge Resource Centre providing access to key information, resources and capacities to professionals in charge of curricula development.

Urgency 1

(e) Studies, proposals and active dialogue in support to reviewing curricula to include and value internships with senior practicing breeders as part of formal training - including certification of new practitioners, according to some universally agreed minimum standards.

Urgency 2

(f) Studies, proposals and active dialogue in support to high school curricula alternatives that place importance on basic science, with special emphasis to advanced biology and other disciplines that address the needs of future plant breeders.

Urgency 2

Priority Activity 3:

Status

GIPB and its partner organizations will survey institutions capable of providing capacity building at the technical level (degree and short-term non-degree courses) as well as at the leadership and managerial level, including development of abilities in institutional development, programme planning and integration with the market.

Short Term

Intended Outputs

(a) An international inventory of information on capacity building providers available at the GIPB Knowledge Resource Centre, including institutions from which national organizations and programs can access courses and expertise needed to advance their educational and training programs.

Urgency 1

Priority Activity 4:

Status

GIPB and its partner organizations will stimulate the development of a mentorship program to support and encourage young breeder's professional development.

Short Term

Intended Outputs

(a) A developed and functioning model of voluntary, requested mentor-mentee relationships for junior breeders wishing to grow through a defined mentorship relationship supported through the GIPB Knowledge Resource Centre.

Urgency 1

Priority Activity 5:

Status

GIPB and its partner organizations will take advantage of new strategies for gathering, organizing, interpreting, and sharing knowledge and information to consolidate the GIPB Knowledge Resource Centre as a gateway for data, information, and tools relevant to building and improving plant breeding capacity.

Short Term



Intended Outputs

- (a) A consolidated GIPB Knowledge Resource Centre gateway to existing portals/websites of various breeding and education institutions, networks and initiatives, aiming to sharing and exchanging information relevant to operation of crop improvement programs, especially in developing countries. **Urgency 1**
- (b) A “Plant Breeding Global Forum” designed to promote “communities of practice”, cooperation, interaction and exchange of information on plant breeding and related scientific fields. **Urgency 1**
- (c) A “Global Plant Breeding Clinic” organized as an electronically-based centre to provide plant breeders and other professionals a point of contact to obtain information and identify resources needed for crop genetic improvement. **Urgency 1**
- (d) A “Plant Breeding Questions & Answers” service to which breeders and other professionals submit questions to be answered through accessible electronic links. **Urgency 1**
- (e) “Plant Breeding Electronic Journal Clubs” organized as communities that meet electronically to critically evaluate plant breeding and related articles in the scientific literature. It will help young professionals and students become more familiar with the essential (classical) and current plant breeding literature. **Urgency 1**
- (f) Online courses available and adapted to the specific needs of national programs. **Urgency 2**
- (g) Information and support on accessing and utilizing tools for teaching and collaboration between countries and continents. **Urgency 2**
- (h) “Building together” tools (such as Wikis) to help bridge the barriers for collaboration at national, regional and global levels. **Urgency 2**

Priority Activity 6:

Status

GIPB and its partner organizations, including CGIAR Centres, advanced NARS, universities and the private sector in both the developed and developing world will develop pilot cases of networking to explore complementarities of capacity building programs, both at the degree and non-degree levels.

Medium Term

Intended Outputs

- (a) Implemented models of North-South ‘sister’ institutions partnerships towards continuity and consistency in capacity building (MSc and PhD), including in-depth training and ‘on the job’ training in developing countries. **Urgency 1**

(b) A developed and tested concept of South-South ‘sister’ institutions partnerships to increase access to providers of capacity building in the South, taking advantage of common characteristics of countries, such as language and educational system, common agricultural problems and similar needs.

Urgency 1

(c) A developed and tested concept of regional capacity building that would allow transferring skilled people from one country to another in a region to give or receive training. The ultimate objective would be to create a sense of shared responsibility so that by relying in each other, countries do not have to strive to have breeding programs and capacity building structures to cover all their needs.

Urgency 1

(d) A developed and tested concept of continuing education that stimulate linkages of extension, outreach and education for farmers, facilitating participatory plant breeding and supporting farmer-entrepreneurs capable of developing seed-related small businesses.

Urgency 2

(e) Training events on coordination and networking around the five GIPB objectives. These events could be coordinated with congresses that occur in each of the 5 macro-regions (North-America, LAC, Europe, Africa, and Asia-Pacific) and tailored for mid-career professionals, preferentially programs leaders. Attendants could act as multipliers of GIPB efforts in their respective countries.

Urgency 2

Priority Activity 7:

Status

GIPB and its partner organizations will mobilize donors to support implementation of a competitive grants program to enable newly trained breeders to jumpstart their careers and to practice their profession through initial infusion of research funds and other support (access to equipment and services, exchange of required germplasm, intellectual property, etc).

Long Term

Intended Outputs

(a) A developed and functioning training programme coordinated with a pilot competitive grant scheme to promote the application of trainees’ skills through plant-breeding contracts (with the breeders’ employer or sponsoring organization).

Urgency 3



PRIORITY ACTIVITIES FOR OBJECTIVE 3 – ACCESS TO TECHNOLOGIES AND KNOW-HOW

Facilitate access to technologies in the form of tools, methodologies, know how and facilities for finding genetic solutions to crop constraints.

Priority Activity 1:	Status
GIPB and its partner organizations will survey capabilities and facilitate dialogue, negotiation and support towards definition of regional centres of excellence with easily accessible facilities for training/research/information access, dedicated to internationally coordinated programs.	Short Term
<i>Intended Outputs</i>	
(a) Comprehensive analysis of FAO's PBBC identifying countries in the developing regions with highest potential to support development of regional centres of excellence for training/research/source of information.	Urgency 1
(b) Developed models and strategies of internationally-shared (as opposed to internationally-focused) labs and platforms and active dialogues with donors towards enhanced support to collective action and capacities in developing regions.	Urgency 2
(c) Development of criteria, terms and agreements to access space/equipment/time from internationally-shared labs and platforms, in compatibility with resources and needs of developing countries.	Urgency 2
(d) Tested models of phenotyping/genotyping platforms, taking advantage of complementarity and gains in infrastructure utilization, possibility of linking genotypic and phenotypic data, and shared improvement of experimental design, statistical and data analysis capacity.	Urgency 2
Priority Activity 2:	Status
GIPB and its partner organizations will survey capabilities and facilitate dialogue, negotiation and support towards definition of regional centres of excellence with easily accessible facilities for training/research/information access, dedicated to internationally coordinated programs.	Short Term
<i>Intended Outputs</i>	
(a) A functional Knowledge Resource Centre supporting knowledge sharing, enhanced networking and access to technologies in the form of tools, methodologies, know how and facilities relevant to developing country breeding programs.	Urgency 1
(b) A "Plant Breeding Global Forum" promoting "communities of practice", cooperation, interaction and exchange of information on new and evolving tools, methodologies, know how and facilities relevant to plant breeding.	Urgency 1



(c) A “Global Plant Breeding Clinic” organized as an electronically-based centre to provide plant breeders and other professionals a point of contact to obtain information on technological advances critical for crop genetic improvement. **Urgency 1**

(a) A functional Knowledge Resource Centre supporting knowledge sharing, enhanced networking and access to technologies in the form of tools, methodologies, know how and facilities relevant to developing country breeding programs. **Urgency 1**

(e) A GIPB Knowledge Resource Centre gateway to “Information and Resources” with links and connections to providers of a wide diversity of tools, resources and information on technological advances critical for crop genetic improvement. **Urgency 1**

(f) A regular series of e-conferences and forums to discuss and disseminate information and knowledge on conventional and evolving technologies applicable to crop improvement programs, especially in developing countries. **Urgency 2**

Priority Activity 3:

Status

GIPB and its partner organizations will stimulate and support the preparation of information directed to policy makers, donors, seed associations, private companies, etc, advocating the importance of technology partnerships and alliances to help developing countries benefit from breakthroughs and advances critical to crop improvement. **Medium Term**

Intended Outputs

(a) Awareness and advocacy materials/activities showing plant breeding as an integrative, multi-disciplinary science, highly dependent on linkages to allied disciplines and on access to advanced knowledge and innovative technological tools. **Urgency 1**

(b) Awareness and advocacy materials developed to stimulate discussion and decision, at the political/institutional levels, towards adequate technology partnerships and alliances to enable developing countries to benefit from breakthroughs and advances applicable to crop improvement. **Urgency 2**

(c) Studies and analysis to support identification and provision of science-based tools for breeding less visible or underutilized crops of actual and or potential importance to developing countries. **Urgency 2**

(d) Studies and analysis indicating suitable and accessible alternatives to proprietary technological tools, especially to developing countries’ breeding programs. **Urgency 3**



(e) Analysis, support information and active dialogue to increase understanding that plant breeding programs require a range of research tools and cannot function properly in an exceedingly protectionist environment.

Urgency 3

(f) Studies and support information showing that the public sector need to have access to platform and process R&D technologies critical to assure development of competitive public plant breeding programs, especially in developing countries.

Urgency 3

(g) Studies and analysis to support identification of flexibilities in IPR-related international laws and regulations that should be interpreted by national governments to suit their technological development requirements or their capacity to access key technological tools to enhance plant breeding capacity.

Urgency 3

Priority Activity 4:

Status

GIPB and its partner organizations will identify possibilities; facilitate dialogue and negotiation towards definition of Public-Private Partnerships (PPPs) to accelerate access and effective application of new technologies capable of increasing efficiency and efficacy of breeding programs in poor countries.

Medium Term

Intended Outputs

(a) Described/disseminated strategies and success cases of PPPs developed and implemented to accelerate access and effective application of new technologies capable of increasing efficiency of breeding programs and seed delivery systems in developing countries.

Urgency 2

(b) Development of criteria, terms and agreements compatible with the needs of PPPs, especially in developing country settings.

Urgency 2

PRIORITY ACTIVITIES FOR OBJECTIVE 4 – ACCESS TO PLANT GENETIC RESOURCES

Facilitate exchange of plant genetic resources, from public and private breeding programs, that can enhance the genetic and adaptability base of improved cultivars in developing countries.

Priority Activity 1:

Status

GIPB and its partner organizations will implement training and capacity building activities to improve decision maker and manager’s abilities to acquire and exchange genetic resources relevant to crop improvement programs.

Short Term



Intended Outputs

- (a) Capacity building guides and protocols to support development of best practices in access and exchange of plant genetic resources relevant to country's crop improvement programs. **Urgency 1**
- (b) Protocols, procedures and best practices in negotiation and promotion of exchange of better characterized (and thus more useful) materials from public and private sources for incorporation into breeding programs (concurrently assuring that locally-adapted germplasm and farmer-generated landraces are valued and used accordingly). **Urgency 1**
- (c) Documentation and dissemination of established ITPGRFA/Standard Material Transfer Agreement (SMTA) guidelines on germplasm transfers among contracting parties. **Urgency 1**
- (d) Documentation and dissemination of accepted, simplified approval procedures for germplasm transfers involving non-ITPGRFA countries. **Urgency 1**
- (e) Capacity building activities directed to remove the disconnect, at national, regional and international level among professionals dedicated to plant genetic resources conservation programs and the users - breeders, researchers, farmers and others. **Urgency 2**

Priority Activity 2:

Status

GIPB and its partner organizations will support collective action towards aggregation of value to germplasm by stimulating efforts of characterization and evaluation of national and international collections for their productivity/quality/sustainability enhancing traits.

Short Term

Intended Outputs

- (a) Development of best practices and procedures to help improve standardization of passport data in order to facilitate information sharing and exchange of useful germplasm. **Urgency 1**
- (b) Documentation and dissemination of success cases and best practices on combination of germplasm conservation and use-related activities, with special emphasis on success cases of national genebanks developing or closely collaborating with pre-breeding programs. **Urgency 1**
- (c) Development of models, procedures and practices to help build 'research-for-development' networks that include public-private and multilateral crop improvement partnerships, including germplasm developers, technology providers and on-the-ground evaluators around the world on collective generation of information and knowledge for multiple crops. **Urgency 2**



(d) Development of best practices, procedures and international standards for characterization of germplasm collections for their productivity, quality and sustainability enhancing traits.

Urgency 2

(e) Development of best practices and procedures directed to enhance characterization of local and locally adapted, neglected and underutilized species with potential to widen and enhance the genetic base, diversity and adaptability of cropping systems.

Urgency 2

Priority Activity 3:

Status

GIPB and its partner organizations will organize and implement a Knowledge Resource Centre gateway capable of surveying, organizing and disseminating information on characterized genetic resources available from public and private sources.

Short Term

Intended Outputs

(a) An information and communication process, aligned to a global accession-level information system, contributing to dissemination of knowledge on genetic resources which can benefit developing country breeding programs and seed systems.

Urgency 1

(b) Available databases of local and locally adapted crops, neglected and underutilized species with potential to widen and enhance the genetic base, diversity and adaptability of cropping systems.

Urgency 1

(c) Development of studies, best practices and procedures to support storage and access to rapidly growing genotype datasets, phenotype datasets (including gene expression analyses) and their interpretations, preferentially as one-stop-platform for all the information available worldwide for a given crop.

Urgency 2

Priority Activity 4:

Status

GIPB and its partner organizations will develop and implement strategies to support mobilization of better characterized, elite and semi-elite germplasm to benefit small and evolving developing country breeding programs.

Short Term

Intended Outputs

(a) Documented success cases of mechanisms and approaches to “mobilize” genetic resources, from both public and private sectors, for the benefit of the poor

Urgency 1

(b) Development of criteria, terms and agreements to facilitate developing country access to advanced germplasm from national and international sources.

Urgency 2



(c) Development of models, procedures and business practices to encourage private breeding programs to contribute semi-elite materials to small or evolving national programs, allowing programme consolidation through development of new varieties within shorter periods of time.

Urgency 2

Priority Activity 5:

Status

GIPB and its partner organizations should develop and disseminate information and decision support tools directed to support understanding, better interpretation and efficient country response to international norms, legislations and regulations that affect access, exchange and use of genetic resources.

Medium Term

Intended Outputs

(a) Studies, analysis and information tailored to raise awareness of national leaders, decision-makers and managers on the need to develop national genetic resources policies compatible with country needs and with requirements of international laws and regulations.

Urgency 3

(b) Case studies on PGRFA-related national policies developed in response to provisions of the CBD, the ITPGRFA, and PGRFA-related Intellectual Property Legislations.

Urgency 3

(c) Capacity building and decision support tools to help improve understanding and country response to international norms, legislations and regulations related to access, exchange and use of genetic resources.

Urgency 3

(d) Information and awareness materials on the importance of the SMTA and procedures for its implementation in ITPGRFA contracting party countries.

Urgency 3

PRIORITY ACTIVITIES FOR OBJECTIVE 5 – SHARING OF KNOWLEDGE AND INFORMATION

Information sharing focused on plant breeding capacity building to deliver newly available knowledge to national policy makers and breeders in developing country programs.

Priority Activity 1:

Status

GIPB and its partner organizations will organize and implement a Knowledge Resource Centre (KRC) as an internationally accessible gateway capable of gathering, organizing and sharing data, information, and knowledge tools relevant to building and improving plant breeding capacity.

Short Term



Intended Outputs

(a) A functional Knowledge Resource Centre (KRC) gateway providing access to newly available information in a format that meets the needs of decision and policy makers, managers, educators, breeders and technical support staff, especially in developing countries.

Urgency 1

(b) KRC agreements to connect and increase access to existing portals/websites of various breeding and education institutions, networks and initiatives aiming to increase sharing and exchanging of information relevant to capacity building, institutional strengthening and more efficient operation of crop improvement programs, especially in developing countries.

Urgency 1

(c) KRC agreements with education and capacity building institutions aiming to provide access to plant breeding related training at all levels (managers, breeders, field and laboratory support staff, etc).

Urgency 1

(d) An organized team of collaborators contributing to priority definition, management of content (gathering, organization and dissemination) and quality control of the overall KRC operating process.

Urgency 1

Priority Activity 2:**Status**

GIPB and its partner organizations will develop an information platform capable of providing access to germplasm, to documents and literature, to organizations and networks, to meetings and training events, to funding sources, etc, taking into account global, regional and national perspectives and needs.

Short Term

Intended Outputs

(a) A KRC gateway to support the development of a global germplasm accession-level information system (net of federated data banks), linking and expanding accessibility to existing PGR information networks.

Urgency 1

(b) A KRC gateway to accessible sources of SMTA and other germplasm exchange-related tools, protocols, guides and information.

Urgency 1

(c) An international inventory of providers of plant breeding capacity building institutions, from which national institutions and programs can access courses and expertise needed to advance their educational and training programs.

Urgency 1

(d) A KRC gateway to information resources, providing access to online literature, newsletter, videos, databases, research tools, supplies, HR directories, etc.

Urgency 1

(e) A KRC gateway to plant breeding related articles and news in the world media ("PB in the News"), as well as announcement of important events, current facts, trends and opportunities related to plant breeding and related fields.

Urgency 1



(f) A KRC gateway to “Organizations and Networks” with information on global, regional and national entities, networks and programs whose actions and priorities have direct and important connection with plant breeding.

Urgency 1

(g) A KRC gateway to “Associations and Events” with information on Plant Breeding Societies and Associations, important meetings and congresses, as well as training courses and events.

Urgency 1

(h) A KRC “Plant Breeding Memory” gateway with information and links on plant breeding historical facts, highlights of famous people that helped develop the field of plant breeding and genetics and contributions, views and opinions of professionals that impacted plant breeding and crop development worldwide.

Urgency 1

Priority Activity 3:

Status

GIPB and its partner organizations will develop an interactive web platform targeting problem solving, information and experience sharing, coordination and synergy, mentoring, discussion of alternatives and approaches to problems, joint formulation of projects, documentation of experiences to be shared, foresight analysis and forward thinking, mapping of knowledge and identification of gaps to the development of plant breeding, taking into account global, regional and national perspectives.

Short Term

Intended Outputs

(a) A KRC “Plant Breeding Global Forum” designed to promote “communities of practice”, cooperation, interaction and exchange of information on plant breeding and related scientific fields.

Urgency 1

(b) A KRC “Global Plant Breeding Clinic” organized as an electronically-based centre to provide plant breeders and other professionals a point of contact to obtain information and identify resources needed for crop genetic improvement.

Urgency 1

(c) A KRC “Plant Breeding Questions & Answers” service to which breeders and other professionals could submit questions to be answered through accessible electronic links.

Urgency 1

(d) KRC “Plant Breeding Electronic Journal Clubs” organized as communities that meet electronically to critically evaluate plant breeding and related articles in the scientific literature. It must be tailored to help young professionals and students to become more familiar with the essential (classical) and current plant breeding literature.

Urgency 1



(e) Available e-learning and information-sharing tools, provided in association with educational and capacity building organizations, and adapted to the specific global, regional and national training needs.

Urgency 2

(f) Web based mini courses designed to enhance high school student's access to information on biology and plant breeding.

Urgency 2

(g) Accessible and tested "building together" tools (such as Wikis) to help bridge the barriers for collaboration at national, regional and global levels.

Urgency 2

Priority Activity 4:

Status

GIPB and its partner organizations will develop an advocacy and awareness strategy to inform national leaders, decision makers and donors of the critical need to support adequate information and knowledge access and management strategies, so that developing country programs can benefit from advances in information technology relevant to genetic resources management and crop improvement programs.

Medium Term

Intended Outputs

(a) Information organized and disseminated among decision-makers and managers advocating for the importance of improving information and knowledge management strategies capable of increasing efficiency and effectiveness of genetic resources management and crop improvement programs.

Urgency 2

(b) Studies, analysis and information on accessible information management tools (software and web based resources) capable of enhancing developing country access to information, e-learning processes, germplasm exchange, methodologies and know how to improve capacity of crop improvement programs.

Urgency 3

(c) Studies and analysis on adequate technological solutions (infrastructure/hardware/software) and investments needed to allow developing country breeding programs to access and benefit from information and knowledge networks relevant to genetic resources management and crop improvement programs.

Urgency 3

Priority Activity 5:

Status

GIPB and its partner organizations will promote efforts to support strategic planning by accessing, organizing and disseminating foresight and scenario information relevant to guide future configuration of breeding programs, with special emphasis on efficient and timely response to current and emerging risks and opportunities.

Medium Term



Intended Outputs

(a) A GIPB Knowledge Resource Centre gateway to “Trends and Foresight” which would include documents, analysis and studies on future trends in science, technology and innovation as well as foresight analysis and strategic views that may impact the future of plant breeding.

Urgency 1

(b) A GIPB Knowledge Resource Centre gateway to “Plant Breeding Blogs” to encourage forward thinking and sharing of views and opinions on important subjects, especially those related to the future of plant breeding.

Urgency 1

(c) Accessible and tested tools to support electronic consultations through the GIPB Knowledge Resource Centre.

Urgency 2

(d) Accessible and tested tools to support e-conferences and forums through the GIPB Knowledge Resource Centre.

Urgency 2



APPENDIX 2

GIPB ACHIEVEMENTS DURING ITS START UP PHASE 2006-2008

The achievements of GIPB during its start up phase include the following:

WORLDWIDE ASSESSMENT OF PLANT BREEDING AND BIOTECHNOLOGY CAPACITY

FAO and partners have been assessing national plant breeding and related biotechnology capacity worldwide. The information gathered provides a foundation for designing comprehensive strategies by national governments, the research and development community, as well as for donor investments. This survey is concluded in 62 countries and is still ongoing for 27 others, through the support of both FAO and the GIPB. Surveys provide comprehensive and valuable information to support strategy design by national governments, the research and development community, as well as for donor investments. The survey database can be found at <http://km.fao.org/gipb/pbbc/>.

PROMOTING AWARENESS AND SUPPORTING PGRFA POLICY DEVELOPMENT

The information gathered by the GIPB surveys and the documents generated and disseminated are providing support to dialogue towards implementation of comprehensive national strategies to better crop breeding and delivery systems. The discussion of the information generated by the surveys in national and regional workshops has been a valuable opportunity to extend awareness and to further discuss appropriate strategies to strengthen capacity to use PGRFA. From these events, many country leaders, managers and decision makers concluded that issues such as capacity building, access to PGRFA, access to biotechnology tools, and awareness of plant breeding importance and its impact must receive major attention and support.

DEFINITION OF LONGER-TERM STRATEGIC PRIORITIES FOR PLANT BREEDING CAPACITY BUILDING

During the past year GIPB developed a consultation process, with unprecedented stakeholder engagement, that defined a longer-term strategic vision of global need to build and maintain sufficient national and international capacity in plant breeding and crop improvement. Two task forces have been organized to define a longer-term strategy and a 5-year (2009-2013) operational plan for the GIPB. Task Force 1 involved close to 70 stakeholders and Task Force 2, close to 300 stakeholders. GIPB has developed an innovative process of consultation, combining virtual discussions with a larger number of stakeholders, directed to information sharing, gathering of views and recommendations from a large number of sources. The results of the virtual consultation are discussed in a face-to-face planning meeting with a smaller group that consolidates the results and recommendations of the consultation that are finally validated with the larger group. This highly interactive process has allowed the definition of a longer-term strategic vision of global needs on plant breeding capacity building with substantial engagement of a large number of stakeholders.

ESTABLISHMENT OF THE GIPB KNOWLEDGE RESOURCE CENTRE (KRC)

Since July 2007 GIPB operates a web based Knowledge Resource Centre, established as an interactive web platform for gathering, organizing, interpreting, and sharing information in a format that meets the needs of policy and decision makers, managers and breeders, as well as national plant breeding capacity building efforts. Through this resource GIPB has been disseminating information on plant breeding and related scientific fields, with emphasis on methods and tools, access to germplasm and new technologies, access to Internet based resources, processes and methods, as well as methods of information sharing and communication, such as communities of practice to enhance cooperation, interaction and exchange (see <http://km.fao.org/gipb/>).

IMPLEMENTATION OF A COMPETITIVE GRANTS SYSTEM

GIPB has received support from the Bill and Melinda Gates Foundation, through the GCDT and the United Nations Foundation, to work in partnership with the GCDT in the project "Securing the Biological Basis of Agriculture and Promoting New and Fuller Use of Crop Genetic Resources". These resources help GIPB operate an awards programme to support plant breeders dedicated to widening the genetic and adaptability base of improved cultivars in developing countries. The first call under this Award Scheme is being made in coordination with complementary calls of the GCDT and the Generation Challenge Programme (GCP). The call from the Trust focuses on phenotyping, the GCP call on genotyping and the GIPB call on pre-breeding. Together, these coordinated and complementary calls widen the scope for applicants, by offering an all-round comprehensive programme to widen the genetic and adaptability base of improved cultivars in developing countries. More on the three calls can be seen at <http://km.fao.org/gipb/>.

CALL FOR STUDIES AND ANALYSIS

GIPB has launched in July 2008 an Award Scheme for studies and analysis aiming at expanding information on genetic resources of selected bioenergy crops. This call was developed in coordination with the International Bioenergy Platform, under a cross-sectoral collaboration program of the FAO Inter-Departmental Working Group on Bioenergy. The information will support the development of a guide on genetic resource assessment and use, which will help ongoing efforts directed at enhancing the potential of underutilized bioenergy crops for smallholder producers. These information resources will help bridge the knowledge gap and assist stakeholders to improve their ability to resolve constraints relating to genetic diversity characterisation and utilization. Also, it should assist in achieving the goal of productivity increase and sustainability of production systems of neglected and underutilized bioenergy crops.



MOBILIZING A WIDE RANGE OF PARTNERS

GIPB is a platform and partnership of public, private and civil society institutions. Enabling cooperation, interaction and exchange is top priority in its implementation strategy. During the past year interactions with partners have been intense in several fronts: a) two tasks forces have been organized under the stakeholder consultation process to define a longer-term strategy and a 5-year (2009-2013) operational plan for the GIPB. Task Force 1 involved close to 70 partners and Task Force 2, close to 300 partners of GIPB; b) the information gathering process in the framework of GIPB is a platform and partnership of public, private and civil society institutions. Enabling cooperation, interaction and exchange is top priority in its implementation strategy. During the past year interactions with partners have been intense in several fronts: a) two tasks forces have been organized under the stakeholder consultation process to define a longer-term strategy and a 5-year (2009-2013) operational plan for the GIPB. Task Force 1 involved close to 70 partners and Task Force 2, close to 300 partners of GIPB; b) the information gathering process in the framework of the Plant Breeding and associated biotechnology Capacity Survey also involved interaction with many professionals and collaborators in different parts of the world, from consultants, to Ministry representatives, NARSs, NGOs, private sector, etc.; c) GIPB has been interacting closely with FAO's Knowledge and Communication Department in the development of the GIPB Knowledge Resource Centre and, more recently, with the "Knowledge Network Management" teams, on development of "communities of practice" to initiate a "Plant Breeding Global Forum"; d) Many plant breeders and related professionals from around the world have collaborated with GIPB in the past year in several activities and many more will be engaged in the development of the concept of the "Plant Breeding Global Clinic", which is the interactive component of the GIPB platform that allows implementation of forums, plant breeding journal clubs, mentorship activities, blogs, etc. See <http://km.fao.org/gipb/>.

SOUTH-SOUTH AND SOUTH-NORTH PLANT BREEDING CAPACITY BUILDING STRATEGY

GIPB is stimulating organization and integration of efforts among universities and research institutes in developing and developed countries to obtain optimal use of limited resources, while ensuring complementarities of programs and comprehensiveness of the overall capacity building efforts, both at the degree and non-degree levels. Under the framework of the GIPB, and developing a model similar to the African Centre for Crop Improvement (ACCI) (<http://www.acci.org.za/>) and the West Africa Centre for Crop Improvement (WACCI) (<http://www.waccci.edu.gh/>), the Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ) (<http://www.esalq.usp.br/>), in Brazil, and the Kasetsart University (KU), in Kamphaeng Saen, Thailand (<http://www.ku.ac.th/aboutku/english/>), are ready to provide MSc and/or PhD education to plant breeders from Latin America and Asia. Ongoing dialogues with Universities in the South and in the North and private donors are aiming to further extend this programme to other areas in the developing world. In 2008 a support provided by USA to educate MSc students from Asia in Thailand marks the beginning of this process.

DEVELOPING NON-CONVENTIONAL TOOLS TO SUPPORT PLANT BREEDING CAPACITY BUILDING

Web based educational and interactive tools are being developed to support capacity building efforts, both at the degree and non-degree levels. The GIPB Knowledge Resource Centre initiated the Plant Breeding Electronic Journal Club, a web based platform directed to professionals and students interested in discussing relevant plant breeding themes and issues. Its major objectives are to help improve skills of understanding and debating current topics of interest to plant breeding, as well as to promote intellectually stimulating and professionally rewarding exchange with colleagues from around the world. Other examples of tools and resources in development are: an international inventory of institutions providing plant breeding educational and training programs; a 'plant breeding clinic', providing quick access, sharing and exchange of information and tools, a breeder2breeder contact including mentoring relevant to training of new managers, scientists and technicians in key aspects of the crop improvement process; e-learning tools and information-sharing capacity with emphasis on global, regional and national training needs.

SUPPORT TO PGRFA POLICY DIALOGUE, COORDINATION AND DECISION

GIPB will play an important role of advocating at the policy maker level to help governments develop national genetic resources and plant breeding strategies compatible with user-driven country needs. Many national strategies and policies must be connected to the global policy landscape, which is quite complex and, in many cases, poorly known and/or poorly interpreted to regional/national contexts. GIPB is developing comprehensive analysis and decision support tools (based on the concept of hyperbolic trees and relational maps) to facilitate dissemination of policy information, planning and implementation of policies coherent with the need to enhance plant breeding and sustainable use of PGRFA. A pilot model was developed and is under final stages of evaluation and validation to be released through the GIPB Knowledge Resource Centre.

SUPPORT TO PRE-BREEDING TRAINING AND PRACTICE

GIPB will support training programs to plant breeders dedicated to widening the genetic and adaptability base of improved cultivars in developing countries. Through these capacity building programs, trainees will be able to apply for post-training support for application of the acquired skills in their home countries programs. In 2007, forty eight scientists from 16 countries (Bhutan, China, DPR Korea, Ethiopia, Ghana, India, Indonesia, Mozambique, Myanmar, Philippines, South Korea, Spain, Tanzania, Thailand, Vietnam and the United States) were trained in pre-breeding at IRRI, Philippines and the Institute of Plant Biotechnology for Developing Countries in Belgium.



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