The African Agricultural Technology Foundation Approach to IP Management

RICHARD Y. BOADI, *Legal Counsel, African Agricultural Technology Foundation, Kenya*
MPOKO BOKANGA, *Executive Director, African Agricultural Technology Foundation, Kenya*

ABSTRACT

For smallholder farmers in Africa, yields of major staple crops (maize, sorghum, millet, cassava, cowpea, bananas/plantains) have remained stagnant or even declined in the past 40 years. Numerous biotic and abiotic stresses have contributed to this dire trend. Local research efforts to overcome these stresses have been hampered by declining support for agricultural research, limited access to elite genetic material and other technologies protected by IP rights, and the absence of commercial interest in these crops from private owners of agricultural technologies. The African Agricultural Technology Foundation (AATF) is a new initiative addressing the challenge of reversing the negative trend in agriculture by negotiating access to proprietary technologies and facilitating their delivery to smallholder farmers in Sub-Saharan Africa.

This chapter addresses the IP issues and partnership arrangements associated with the access, development, and deployment of agricultural technologies in Sub-Saharan Africa by AATF. The chapter explores the model developed by AATF, which incorporates the acquisition, development, and deployment of new technologies from private sector partners, to try to address the agricultural needs of resource-poor smallholder farmers in Sub-Saharan Africa.

1. INTRODUCTION

The agricultural sector in developing countries is the key source of food, incomes, employment, and often, foreign exchange. Put another way, agriculture is crucial for sustaining livelihoods and stimulating overall economic growth. Traditionally, agricultural progress has been dependent on on-farm experimentation and the selection and adaptation of crop landraces. More recently, progress has been accelerated through the development of new varieties of crops, mainly through crossing and selecting parent crops with desirable characteristics. In Africa, smallholder farmers constitute approximately 70% of the general population and 90% of the agricultural workforce. According to Omanya and colleagues,[1] despite the availability of agricultural technologies (such as improved seeds and farm inputs), crop productivity in Africa has remained low or stagnant. This is true mostly because improved crop varieties that are resistant to biotic and abiotic constraints are not being planted. High costs and the unavailability of technologies in times of need have made drought-tolerant or disease- and pest-resistant seeds inaccessible, particularly to smallholder farmers in developing countries. The problem is compounded by the complexities associated with the protection of IP rights. Patents and plant breeders' rights attempt to strike a balance between protecting the rights of an invention and providing a benefit to the society as a whole, but such protected materials also often raise the cost of accessing new plant varieties.

The decline in agricultural productivity and the rise of IP rights has created a new challenge: How can the development community stimulate the development of innovative technologies while providing mechanisms that support the

Boadi RY and M Bokanga. 2007. The African Agricultural Technology Foundation Approach to IP Management. In *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices* (eds. A Krattiger, RT Mahoney, L Nelsen, et al.). MIHR: Oxford, U.K., and PIPRA: Davis, U.S.A. Available online at www.ipHandbook.org.

© 2007. RY Boadi and M Bokanga. *Sharing the Art of IP Management:* Photocopying and distribution through the Internet for noncommercial purposes is permitted and encouraged.

smallholder farmers' access to these technologies? A balance must be achieved in order to reach the goal of improving the economic productivity, and therefore, the lives, of these farmers. Delmer and colleagues[2] have described several initiatives designed to meet this challenge. Besides AATF, two other groups are working toward these initiatives:

- the Public Intellectual Property Resource for Agriculture (PIPRA), a U.S.-based initiative with global reach that seeks to pool publicly owned and patented technologies for use by research institutions in developing countries
- the Centre for the Application of Molecular Biology to International Agriculture (CAMBIA), an Australia-based initiative, which aims to provide technical solutions that empower local innovators to develop new agricultural innovations

AATF focuses specifically on negotiating access to proprietary technologies and facilitating delivery of the technologies to smallholder farmers in Sub-Saharan Africa. The next section describes AATF in more detail and discusses in-depth AATF's policy on IP management. Finally, the chapter describes a few specific projects under development by AATF.

2. THE AATF MODEL

2.1 *Background*

Improving agricultural productivity in Africa is key to expanding the economy and reducing poverty. Since the 1970s, significant investment and new technologies have caused agricultural productivity to rise dramatically in Asia and Latin America. But investment and innovation have been limited in Africa and agricultural productivity suffered. Sub-Saharan Africa has the highest hunger and malnutrition rates and the least productive agriculture in the world: approximately one-third of the population lacks food security (defined by the Food and Agriculture Organization [FAO] as having enough food to lead healthy and productive lives), and one-half lives on less than US$1 per day. According to World Bank figures, the 25 countries with the highest death rates are in Africa, and 24 of the 25 countries with the lowest life expectancy are in Sub-Saharan Africa. Most of the region's population depends for their livelihood on agriculture, which accounts for only 30% of the region's gross domestic product (GDP). Farmers make up about 90% of those individuals earning less than US$1 per day. Between 1980 and 1995, Sub-Saharan Africa was the only region of the world where crop production actually decreased: yields fell by 8% compared to increases of 27% in Asia and 12% in Latin America.

Developments in agricultural science and technology, however, hold out hope for significant improvements in food security and poverty reduction in Sub-Saharan Africa. African Poverty Reduction Strategy Papers, documents from the New Partnership for Africa Development (NEPAD), and multilateral policies and plans all emphasize the need for Africa to access new, better agricultural technology from the international community. Some of these technologies can be readily adapted to the region's conditions and can be provided immediately to poor farmers.

The private and public sectors hold the key to accessing these technologies—but neither alone can exploit this potential. Private sector companies have significant technological resources but currently no commercial incentive to invest in the specific technologies, varieties, and traits suitable for the unique agricultural conditions of the relatively small Sub-Saharan Africa market. On the other hand, public sector organizations have vast experience working on regionally important crops but need improved access to the proprietary technologies held by the private sector and other public sector institutions. Further, the region's public sector research institutions could benefit from assistance in adapting technologies to the needs of resource-poor farmers in Sub-Saharan Africa. But issues related to the availability, complexity, high transaction costs, licensing, testing, safety, and potential liability associated with these agricultural technologies bar access to these technologies by the region's researchers, development specialists, and resource-poor farmers. To address these issues, we need new, innovative

approaches based on the support and collaboration of both the public and private sectors.

The fundamental rationale for the creation of AATF was to establish links between private sector and public sector institutions (that own technological innovations) in developed nations and African stakeholders in agricultural development, such as the National Agricultural Research and Development Organizations, farmers' associations, nongovernmental organizations, and national, private sector agribusinesses. The goal of AATF is to facilitate access to advanced scientific and technological resources and to promote their adaptation for use in specific projects intended to increase the productivity of smallholder farmers in Sub-Saharan Africa. AATF is an Africa-based, Africa-led entity, registered as a charity under the laws of England and Wales, with the specific objective of relieving poverty in Africa by facilitating public/private partnerships for the transfer and use of innovative agricultural technologies by smallholder farmers, particularly resource-poor farmers. AATF thus contributes to increased productivity, higher farm output, increased food security, and higher incomes. Headquartered in Nairobi, Kenya, AATF was officially launched there in June 2004.

2.2 *Operating principles and strategy*

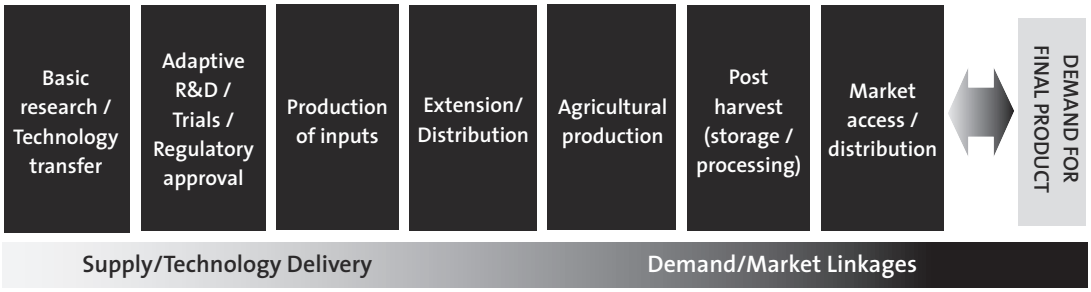
AATF's strategy for achieving its objectives is to act as the principal and "responsible party" in facilitating, on a case-by-case basis, public/private partnerships. AATF works closely with other African institutions, responding on a project-by-project basis to the expressed needs of African farmers. The foundation endeavors to assemble all the necessary components for each project, balancing concerns for expense, simplicity, and effectiveness. More specifically, AATF:

- consults with African stakeholders to identify priority crops and key constraints for resource-poor farmers
- consults with potential technology providers, in both the private and public sectors, to identify technologies that can address those constraints
- negotiates with potential partners to develop a project business plan that specifies the role of each partner institution and determines how and where the technology will be used
- enters into licensing agreements to access and hold proprietary technologies within paying royalties and to ensure *freedom to operate* (FTO) for all the components of the technologies
- sublicenses partner institutions:
  - to carry out research, as needed, to adapt the technologies to smallholder farming conditions
  - to test adapted technologies for regulatory compliance
  - to produce and distribute the technologies
- monitors compliance with the requirements of sublicenses to minimize the risk of technology failure
- facilitates the work of appropriate partner institutions to ensure that links in the value chain are connected, are effective, result in technology products that reach farmers, and allow farmers' surplus harvests to reach markets.
- creates partnerships within African countries and with external stakeholders to develop necessary indigenous capacities over time

As implied above and further illustrated in Figure 1, AATF operates along the entire product value chain, from the transfer and adaptation of technology to farmers' access to output markets, with each implementation step undertaken with the relevant partner organizations. The nature of AATF's involvement varies from project to project, depending on the specific requirements and issues that need addressing.

Depending on the needs of African farmers, AATF promotes the development and transfer of all types of technology. The choice of technologies reflects African priorities, is demand driven, and is guided by the potential to improve food security and reduce poverty. AATF gives preference to technologies that are simple, cost effective, and provide sustainable value to the farmer. So far, eight broad areas

Figure 1: Complete Product Value-Chain



Source: AATF [2]

have been identified as priorities for intervention by AATF:

- *Striga* control in cereals (*Striga* is a parasitic weed)
- improvement of cowpea productivity and utilization
- bananas/plantain productivity
- nutritional quality enhancement in maize and rice
- drought tolerance in cereals
- reduction/elimination of mycotoxins in food grains
- cassava productivity improvement
- insect resistance in maize

AATF's policy is based on the belief that developing countries in Sub-Saharan Africa must make their own decisions about whether or not to adapt and adopt particular agricultural technologies, including genetically modified (GM) organisms. AATF expects that these decisions will be based on appropriate national or regional assessments of the costs, benefits, and social acceptability of each technology. In the case of food biotechnologies, AATF will always require countries that license technologies to have the capacity to manage their safe development and use through appropriate, operational national biosafety regulations and other necessary instruments.

2.3 *Liability and other concerns*

A major concern of AATF's project collaborators, whether they are public entities or multinational companies, is liability exposure once proprietary technologies have been licensed to AATF and subsequently sublicensed to other parties for use in Sub-Saharan Africa.[4] A related concern is the possible misuse of the technology and associated confidential information. AATF has devised the following product stewardship mechanisms to address these concerns. For each project, AATF:

- develops a business plan, which outlines the specific uses of the technology, together with management and oversight protocols that will govern and monitor such use
- conducts risk analyses to aid in formulating and implementing risk mitigation plans

Liability issues can arise due to damage caused by the use of agricultural technologies to persons, property, or the environment, for example, damage that may result from the contamination of seed and organic crop purity. Due to the close proximity in Sub-Saharan Africa of smallholder farmers to one another, pollen from one holding can move easily to neighbouring holdings, contaminating seedlings, produce, and air. Complaints of allergies and health-related problems arising from pollen flow and food consumption have led to liability suits in some countries outside Africa. While this issue is yet to be tested in Sub-Saharan Africa, farmers and biotechnology companies have the responsibility to take steps to ensure, in so far as practicable, that techniques are developed and used to prevent such damage. AATF, through its product stewardship

role, helps farmers and companies carry out this responsibility.

AATF is proactive in its role of product stewardship. It ensures that smallholder farmers and research partners comply with all relevant licensing conditions, standards, guidelines, regulatory requirements, and any instructions regarding the use of GM crops. Scientific and technical safeguards are developed for all projects, and stakeholders are advised on the appropriate use of technologies and products.

AATF further protects technology donors from liability through *indemnification* provisions and warranty disclaimers in agreements and by conducting a comprehensive risk analysis for each project. Most not-for-profit organizations are typically averse to providing indemnification in the agreements they sign, but AATF is not a typical not-for-profit organization. On a case-by-case basis, AATF indemnifies technology donors. AATF also uses warranty disclaimers, allowing donors to disclaim guarantees that would otherwise arise by law. AATF's risk analysis procedures identify risks early and allow for the development of risk-mitigation strategies for each project, thus reducing exposure to possible liability claims.

3. MANAGEMENT OF IP

3.1 *Formulating an IP policy*

AATF firmly believes that effective and responsible management of IP starts with the formulation of an IP policy that:

- sets clear objectives and principles of conduct in obtaining access to and use of IP and protected technologies
- establishes guidelines as to how and when IP protection will be sought and exercised
- promotes basic principles concerning the use of IP and protected material by recipients to ensure that this use is consistent with furthering AATF's mission

AATF is formulating a policy to guide the management of IP by both AATF and its project collaborators. The policy seeks to ensure that any knowledge and products that result from AATF projects will be used for the maximum public benefit of resource-poor smallholder farmers in Sub-Saharan Africa.

Through a series of collaborative projects and technology transfers, activities coordinated by AATF are expected to contribute to the development of improved technologies used by resource-poor smallholder farmers. Partners in projects coordinated by AATF are required to commit to facilitating a sharing and transfer of technology and research products for both research and commercial use that will benefit resource-poor smallholder farmers.

Further, AATF's IP policy stresses the responsible, respectful use of other's IP rights. Additionally, in the acquisition and management of IP, AATF complies with all relevant international laws and treaties as well as the national laws of the countries in which it operates.

Finally, AATF is guided by its core values of accessibility, accountability, credibility, dedication, transparency, and trustworthiness. Our approach to IP management is best illustrated by the Cowpea Improvement Project that is currently being developed.

3.2 *Implementation and management: case study of the Cowpea Improvement Project*

3.2.1 *Obtaining access to and the right to use proprietary technology (freedom to operate)*

As a *responsible party*, AATF ensures that proprietary technology is properly acquired and used by AATF and its project collaborators in order to achieve the results needed to further AATF's mission. AATF and its partners always endeavor to develop and deploy products that are *free and clear* of restrictions imposed by third-party IP rights. AATF makes genuine efforts to disclose any outstanding restrictions that might apply to such technologies and, where possible, obtains any required permissions.

The Cowpea Improvement Project currently under development best illustrates this commitment (see also Box 1 for further details). AATF has negotiated with Monsanto and obtained a

Box 1: The Cowpea Improvement Project

"Cowpea is the most important food grain legume in the dry savannas of tropical Africa. The legume is consumed by nearly 200 million Africans, provides cash income to smallholder farmers, serves as nutritional fodder for livestock, and provides an ideal way to complement protein-deficient diets."

The overall goal of the AATF cowpea project is to facilitate the development, distribution and adoption of appropriate technologies that will substantially increase cowpea productivity and utilization in Sub-Saharan Africa. In order to achieve this goal, smallholder cowpea farmers in the region need higher-yielding varieties that can perform well under adverse conditions and, in particular, that are genetically resistant to major insect pests, such as the Maruca pod borer. Farmers need to learn and apply new cropping systems that can significantly increase cowpea productivity and profitability.

AATF's role in this project includes negotiating access to the cry1Ab gene, which confers resistance to the Maruca pod borer; providing liability protection to the technology provider; ensuring high-quality seed production and availability; licensing improved seed and technology distribution in Africa, and helping to develop relevant markets. The foundation has supported three consultative meetings with stakeholders that defined project activities, roles, and responsibilities to deliver expected outputs.

Partner Institutions

- African Agricultural Technology Foundation (AATF), Kenya
- Network for the Genetic Improvement of Cowpea for Africa (NGICA)
- Monsanto Company, U.S.A.
- The Kirkhouse Trust, U.K.
- National Agricultural Research Systems (NARS) in West Africa
- International Institute for Tropical Agriculture (IITA), Nigeria
- Commonwealth Scientific and Industrial Research Organization (CSIRO), Plant Industries, Australia.

royalty-free, nonexclusive license to Monsanto technology, a *Bacillus thuringiensis* (Bt) gene (cry-1Ab) for use in the development and deployment within Africa of cowpea (*Vigna unguiculata*) varieties with resistance to the cowpea pod borer (*Maruca vitrata*), in order to provide a sustainable crop for resource-poor farmers of Africa to grow for consumption and sale.

AATF coordinated a comprehensive *technology due diligence*, whose primary objective was to inform on FTO, vis-à-vis research, to produce improved cowpea cultivation, harvesting, and storage processes, and to improve use and consumption of the final product. Achieving this objective required taking an inventory of all technologies to be used in the project, completing a search and analysis of patent databases for filed or issued patents, and preparing a report analyzing the potential strengths, weaknesses, opportunities, and threats related to the project.

The FTO assessment helped to determine the ownership rights in the gene and other component technologies that promoters needed to develop the improved cowpea variety. In the future the assessment will serve as a guide to AATF and its project collaborators to ensure that the technologies used do not infringe the IP rights of the owners. Further, the assessment will serve as a basis for seeking all required permissions from the owners of the technologies, thus removing, or at least reducing, the potential for IP infringement should a product be exported from Sub-Saharan

Africa into a territory where third-party IP rights are in place.

In line with good IP management practice, AATF will keep the FTO up-to-date by utilizing existing "Watch Lists" to track applicable patent and litigation trends.

3.2.2 *Preserving the confidentiality of IP and related project information*

AATF considers it good IP management practice to preserve the integrity of confidential information contained in third-party IP, IP resulting from AATF-coordinated projects, and general project information. Therefore, AATF includes a confidentiality clause in all employment contracts and stresses compliance with this clause as a condition of continued employment for AATF personnel. Further, AATF advocates that its project collaborators require personnel involved in any AATF-coordinated project to sign confidentiality agreements. Finally, AATF routinely enters into nondisclosure agreements with its collaborators to facilitate the free exchange of information and materials, including IP, and to preserve the integrity of confidential information at the institutional level.

3.2.3 *Defining ownership rights*

Good IP management requires that all ownership rights are defined at the start of any engagement, taking into consideration any attendant responsibilities, including liability and risk management. The rights of AATF employees are defined in an employment contract, which stipulates that any rights (intellectual or tangible property) in research products, publications, and other works created or contributed to by AATF personnel in the course of their normal and assigned professional duties will be vested in AATF.

The ownership rights of AATF and technology providers are negotiated and determined on a project-by-project basis. For instance, in the Cowpea Improvement Project, Monsanto will retain its existing IP rights, while AATF will own all right, title, and interest associated with any improvement realized through the use of Monsanto's technology under the terms of the license agreement.

The ownership rights of AATF and of project collaborators are negotiated on a project-by-project basis with the goal of equitably sharing such rights. The goal is achieved by taking into consideration the following principal factors:

- the intellectual contribution of each partner to the particular project (foreground IP)
- the contribution of IP, materials, research effort, and preparatory work of each partner brought to the project (background IP)
- the facilities provided by each partner
- the financial contribution of each partner
- other considerations determined by the partners to be relevant

Any rights (intellectual or tangible property) in research products, publications, and other works commissioned by AATF will be assigned and vested in AATF. Any rights (intellectual or tangible property) in research products, publications, and other works jointly commissioned by AATF and the project collaborators will be assigned to and vested in AATF and the project collaborators as joint right holders.

3.2.4 *Execution of agreements*

AATF believes it is essential and indeed good IP management practice to finalize all contractual terms, set them out in writing, and have an agreement duly signed by the authorized representatives of the parties before commencement of any engagement. Therefore, AATF ensures that all arrangements with third parties associated with the access to or the creation, use, or exploitation of IP protected materials are appropriately documented. Documentation for the Cowpea Improvement Project, for example, will, in the end, involve several agreements between AATF and its collaborating partners. First, AATF obtained a license from Monsanto, and thereafter sublicensed the licensed Bt gene to CSIRO and IITA in order to introduce the Bt gene into the cowpea genome. The AATF, potentially, will sublicense the resulting successful transgenic events to African agricultural research institutions, which will introgress the Bt gene in cultivated cowpea varieties. These varieties would

then be licensed to commercial, nongovernment, humanitarian, or public institutions charged with disseminating the improved cowpea varieties in Africa.

3.2.5 *Identification of IP assets*

Maintaining IP asset inventories or a register of IP assets is essential for effectively managing those assets. AATF and its collaborating partners encourage the adoption of procedures and practices—such as DNA fingerprinting, the keeping of appropriate laboratory notebooks, and controls over the release of information—to properly identify, record, safeguard, and manage IP generated under projects coordinated by AATF.

3.2.6 *Publication of project research results*

AATF anticipates facilitating access to and use of improved germplasm and research products for the public benefit through publication and public disclosure. Therefore, to the extent determined appropriate and feasible by AATF and its project collaborators, research outputs and products from AATF projects will be placed in the public domain.

3.2.7 *Statutory protection of IP*

In certain cases, statutory IP protection may be necessary to ensure the continued availability of germplasm, inventions, publications, and databases to AATF and its partners. Such protection may also be needed to provide AATF with the necessary leverage to negotiate access to other proprietary rights and technologies required for product development. Therefore, in appropriate cases, AATF may seek IP protection for products (termed improvements) generated from projects for which the foundation has obtained ownership rights. For instance, as noted earlier, AATF will own all right to, title to, and interest in any improved cowpea varieties or other improvements developed using Monsanto's technology. In consultation with the project collaborators, AATF may seek to protect these improvements by obtaining IP protection through patents, plant breeders' rights, copyrights, trademarks, statutory invention registrations or their equivalent, and/or trade secrets.

In seeking IP rights,[5] AATF will be guided by its commitment to serve African resource-poor smallholder farmers—not by opportunities to obtain revenues. To the extent that IP licensing generates financial returns, they will be used by AATF and the project collaborators to achieve AATF's charitable objectives. AATF will ensure that all third-party licenses to the improvements make provisions for:

- ready access by others for humanitarian use
- avoidance of possible restrictions arising from "blocking" patents and ensuring the project collaborators' ability to pursue research without undue hindrance
- the transfer of technology, research products, and other benefits to African resource-poor smallholder farmers through public channels and, where appropriate, through the commercialization or utilization of research products.

With regard to the protection of cells, genes, molecular constructs, plants, varieties, and traits, AATF and its project collaborators will, to the extent permitted by applicable law, consider the effects that protection has on the distribution of, use of, and access to the protected product before proceeding with an application for statutory protection.

AATF and its project collaborators may allow third parties to take IP rights on research products or material derived from research products if it is determined that doing so would best serve the public good. In such cases, AATF and its collaborators will ensure that agreements granted to recipients to protect intellectual property do not in any way waive the rights of AATF and the collaborators to challenge excessive protection through administrative and/or court proceedings. AATF and its collaborators may also reserve the right to retain research products for use by AATF and its collaborators, and they may also enter into agreements to deploy research products in a targeted manner to certain partners and/or in certain markets.

3.2.8 *Publications, databases, reports, training material, public awareness material, artwork, audio-visual material*

AATF encourages the wide dissemination of publications (printed and electronic), including databases, reports, training materials, public awareness material, artwork, and audio-visual material to be used for maximum public benefit. For instance, AATF and its project collaborators have issued publicity materials, including press releases in English and three Kenyan local languages (Kiswahili, Dholuo and Luhya), to help publicize the deployment of Imidazolinone Resistant (IR) maize technology in the western part of Kenya. Named *Ua Kayongo* ("kill *Striga*" in English), it will help to control the parasitic weed *Striga.*

In creating such publicity materials, AATF and its project collaborators seek to use the copyright material of others only within "fair use" limitations, or with the consent of the copyright owner, and to properly attribute the source of the material.

AATF and the project collaborator publications (printed and electronic) will normally carry standard copyright notices that indicate AATF and/or project collaborators as the copyright owner(s) of the compilation (for the specific edition and year of publication).

AATF and the project collaborators will generally incorporate standard copyright notification statements in their publications:

- permitting, especially in the case of the National Agricultural Research Systems (NARS), the making of a reasonable number of copies of such copyrighted material for noncommercial purposes
- requiring attribution where such copyright material is reproduced in other publications
- prohibiting interference or tampering with the material without the express consent of AATF and/or the project collaborators
- addressing any other issues relevant to the best use being made of the material, such as procedures for the dissemination and recall of material subject to updating

AATF and its project collaborators may, to the extent available in national laws, enforce the copyrights in such publications (printed and electronic) and protect them from unfair competition in order to:

- respond to a breach of the above terms
- prevent misappropriation of such material for commercial purposes
- protect the integrity of such material

To the extent practicable, AATF will develop databases that assist the resource-poor and will make best efforts to keep these databases in the public domain.

3.2.9 *Trademarks*

AATF and the project collaborators may register as trademarks all distinctive marks associated with their initiatives, in order to protect the goodwill and reputation associated with the use of these marks by AATF and its collaborators.

4. CONCLUSIONS

Conventional methods for technology development and transfer have not always sufficiently supported sustainable food security and contributed to the alleviation of rural poverty in Sub-Saharan Africa. Although there have been numerous attempts in the past to promote public/private partnerships in the region, most have had little tangible or lasting effect. It has become increasingly obvious that new approaches are needed to mobilize new science for new applications in Africa. It is also increasingly obvious that developing these approaches will require the potential complementarities of public and private sector research and development efforts.

AATF represents an innovative approach based on forging collaborations between these sectors to identify and transfer proprietary technologies that would otherwise be unavailable for trying to address the problems of resource-poor smallholder farmers. AATF is surely not the only possible answer or a "silver bullet." And it may not be the only or even the best means to achieve the goal of easing access to important technologies for humanitarian purposes. But its African focus, leadership, and operational location promise a more comprehensive, realistic appreciation

of the constraints to technology transfer in Africa, which will allow for the design of more feasible solutions and closer follow-up and continuity in implementation. A wide range of stakeholders in the private and public sectors and in civil society have already pledged their commitment to making the AATF concept work, and AATF seeks to retain the confidence of these stakeholders through effective leadership and responsible IP management. ■

ACKNOWLEDGMENTS

We thank Dr. Hodeba Mignouna (Technical Operations Manager, AATF), Dr. Francis Nang'ayo (Regulatory Matters Specialist, AATF), Dr. Gospel Omanya (Projects Manager and Seed Systems Specialist, AATF) and Mrs. Nancy Muchiri (Communications and Partnerships Manager) for their critical input into preparing this chapter. Any errors or misrepresentations remain the authors'.

RICHARD Y. BOADI, *Legal Counsel, AATF, c/o ILRI, P. O. Box 30709, Nairobi 00100, Kenya. r.boadi@aatf-africa.org*

MPOKO BOKANGA, *Executive Director, AATF, c/o ILRI, P. O. Box 30709, Nairobi 00100, Kenya. m.bokanga@aatf-africa.org*

---

1 Omanya, G, R Boadi, F Nang'ayo, H Mignouna and M Bokanga. 2005. Intellectual Property Rights and Public/Private Partnerships for Agricultural Technology Development and Dissemination. Paper presented at the Kenya National Conference on Revitalizing the Agricultural Sector, 21–24 February 2005, Nairobi, Kenya.

2 Delmer, DP, C Nottenburg, GD Graff, and AB Bennet. 2003. Intellectual Property Resources for International Development. *Plant Physiology* 133:1666–70. www.pipra.org/docs/Plant Physiology - IP.pdf.

3 AATF.2002. *AATF Business Plan*. Cambridge Economic Policy Associates, Ltd.: Cambridge, U.K.

4 See, also in this *Handbook*, chapter 14.5 by RY Boadi.

5 Should the need arise, AATF could utilize the Patent Cooperation Treaty (PCT) process, administered by the World Intellectual Property Organization (WIPO), which offers inventors and industry an advantageous route for obtaining patent protection internationally. By filing one "international" patent application under the PCT, protection can be sought simultaneously in any of the 130 PCT member countries designated in the application.

AATF could also use African regional filing mechanisms such as the African Regional Intellectual Property Organization (ARIPO) and/or the African Intellectual Property Organization (OAPI), wherein one application could result in the grant of an IP right in multiple countries. ARIPO currently has 15 member states: Botswana, the Gambia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Applicants can file their applications with either their national offices or directly with the ARIPO office. Under this system, one application is effective in all member states designated in the application. OAPI is the central registration system for 16 French-speaking African countries: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of the Congo, Cote d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Togo. Under the OAPI system, the IP rights of an applicant are simultaneously protected in all member states through a single deposit, which is considered as a national deposit for each member state.

For countries such as Liberia, Madagascar, Seychelles, and South Africa, which operate the "national route only" system of registration, AATF may have to apply to the respective IP offices. The same would apply in the case of Sub-Saharan Africa countries that are non-WIPO members (Angola, Burundi, Cape Verde, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Mauritius, Nigeria, Rwanda, São Tomé e Príncipe, and Somalia).