



AFRICAN AGRICULTURAL TECHNOLOGY FOUNDATION
FONDATION AFRICAINE POUR LES TECHNOLOGIES AGRICOLES

**Bridging the gap
to new technologies for smallholder
farmers in Africa**

AATF Strategy (2007-2015)

Revised Draft, November 2006

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Executive Summary

The African Agricultural Technology Foundation (AATF) facilitates the transfer of appropriate proprietary technology, held by private and public organisations in the North and South, for use by smallholder African farmers. AATF serves as an honest broker in negotiating the royalty-free transfer of technologies held by public and private organisations in industrialised and developing countries to smallholder farmers in SSA. AATF does this by establishing partnerships along the product value chain, from basic research through adaptive research and development, and product deployment. It provides expertise and know-how that facilitates access to, and development, delivery and utilisation of proprietary agricultural technologies.

AATF's Strategic Direction

After three years of experience with initiating and managing projects, AATF decided to develop a document that would outline its strategic direction for the next ten years. This document is based on the lessons learned during the first three years of AATF's activities and presents priorities and strategies to guide the Foundation in the coming decade. The document describes AATF's vision, mission, values and guiding principles; presents AATF's three strategic thrusts and outlines the challenges, strategies and measures of success for each one; explains how these thrusts are implemented; and discusses the organisation's structure, governance and resources.

Vision, Mission, Values and Principles

AATF's vision is: "Prosperous farmers and a food secure Africa, enabled through AATF's catalytic role in bringing innovative technologies to smallholder farmers." Its mission and core values (integrity, dedication, and accessibility) follow from this vision.

Its guiding principles recognise the urgency of helping agriculture play a stronger part in Africa's economic development, supporting an increasing role for the private sector whilst reinvigorating the contribution of the public sector in African agriculture, developing the role of proprietary technology, mitigating the risks associated with the adoption of new technology, and facilitating productive partnerships that strengthen Africa's agriculture.

Strategic Thrusts

AATF bases its activities on three strategic thrusts, each associated with a set of challenges, strategies, and criteria for success.

1. Negotiating access to proprietary technologies that enhance the productivity of agriculture in Africa. AATF engages in technology scoping, interaction with technology developers, and negotiation. It keeps abreast of the latest information about agricultural production constraints and priorities in Africa and is familiar with major national, regional and Africa-wide policies on agricultural development. AATF devotes the majority of its attention to proven technologies, rather than those that are in the concept stage.

2. Managing partnerships for project formulation, product development and deployment to introduce innovative agricultural technologies to African farming systems. AATF identifies and develops partnerships with the most appropriate organisations for product development. These may be public or private organisations at the national or international level. AATF's attention to product delivery includes working with partners to strengthen retail distributorships or access complementary inputs at a reasonable price. AATF may also pursue access to funds for limited and targeted subsidies or output-based contracts. Partnerships may also include investments for information provision (such as farm-level demonstrations). AATF ensures that intellectual

property management is addressed and assists its partners to comply with the relevant regulatory and biosafety regimes. It ensures that its partners are investing the required resources in product stewardship and develops workable liability arrangements.

3. Managing knowledge and information to support technology identification and development, and the policy environment. AATF develops access to information on production constraints in African agriculture, the technical characteristics of candidate technologies, and relevant regulatory, biosafety and IPR requirements. AATF also develops its own knowledge base about issues related to the enabling environment for agricultural technology. Much of AATF's information provision is related to its specific products. AATF presents information to stakeholders on the performance and potential of its products and engages in issues training with its partners. AATF also ensures that it is providing information about the potential and performance of its products to those who are concerned with biotechnology and with broader agricultural technology development.

Implementation

AATF pursues its long term objectives following a phased approach. AATF continuously undertakes intelligence gathering on technological breakthroughs locally and internationally with a view to generating ideas that can be nurtured into projects for addressing constraints to crop productivity in Sub-Saharan Africa (Phase 0). Promising ideas are discussed and screened for feasibility through consultations with stakeholders, leading to the formulation of Project Business Plans (Phase 1). For each project, the Business Plan serves as a key document for guiding project implementation and the interactive mechanisms for collaborating partners during research, testing and adaptation of products as well as technologies in target areas (Phase 2) and for guiding activities critical for product deployment to reach smallholder farmers and other end users (Phase 3). The entire process of identification, formulation and implementation of AATF projects does not follow a top-down, linear approach but adopts a flexible and iterative scheme involving periodic wide-ranging stakeholder consultations with built-in triggers for 'go or no-go' decisions.

Structure, Governance and Resources

AATF is a not-for-profit, limited liability entity. Its governance structure creates a clear separation between the responsibility for setting and monitoring strategy and the management of operations. The management of AATF includes an executive director, technical operations manager, a regulatory matters specialist, legal counsel, project portfolio manager, business development manager, communication and partnerships manager, and administration and finance manager. AATF's mandate requires a small but highly qualified staff and AATF's core of technical, legal, business, communication and regulatory expertise will necessarily remain small.

AATF is supported by donor commitments for the first five years of the Foundation's life. AATF plans to use its initial funding to leverage additional contributions from other donors and from the private sector. The precise composition of AATF's financial resources will depend to a large extent on the nature of the technologies it pursues and the pace of growth in Africa's commercial, legal and regulatory institutions.

Acronyms

AATF	African Agricultural Technology Foundation
BOT	Board of Trustees
BP	Business Plan
CBO	Community based organisation
CIMMYT	International Maize and Wheat Improvement Center
FARA	Forum for Agricultural Research in Africa
FTO	Freedom to Operate
GMOs	Genetically Modified Organisms
HRD	Human resource development
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
IP	Intellectual Property
IPR	Intellectual Property Rights
KARI	Kenya Agricultural Research Institute
M&E	Monitoring and Evaluation
NEPAD	New Partnership for Africa's Development
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
PIIPA	Public Interest Intellectual Property Associates
PIPRA	Public Intellectual Property Resource for Agriculture
R&D	Research and Development
SSA	Sub-Saharan Africa
SWOT	Strengths, Weaknesses, Opportunities and Threats
UK/DFID	United Kingdom Department for International Development
USAID	United States Agency for International Development

1.0 Introduction

Ensuring food security is one of the greatest challenges facing the world community. The challenge is most critical in low-income, food-deficit countries of Sub-Saharan Africa (SSA) where an estimated 70% of the population comprises of resource-poor farmers living on small family gardens where soils have over the years become impoverished, in environments that are prone to drought, soil erosion and epidemics of pests and diseases. Addressing these constraints to crop productivity is a monumental challenge that warrants, among other things, technological interventions requiring use of new intensive production technologies to increase yields and reduce losses including adoption of genetically modified crops. National and regional institutions in Africa in collaboration with their international partners are responding to these challenges and establishing innovative approaches to addressing Africa's agricultural malaise.

One such innovation is the African Agricultural Technology Foundation (AATF). AATF is a private, not-for-profit foundation established to help resource-poor farmers in Sub-Saharan Africa gain access to proprietary technology. It is an African-led and -managed organisation, focused on African priorities and interests in technology transfer and agribusiness development.

Although agricultural growth in Africa demands attention to various economic, environmental and policy challenges, it is recognised that new technology is an indispensable part of the solution. Such technologies can help provide better harvests to improve household nutrition and well-being, reduce households' susceptibility to risks of pests, diseases and climate, provide additional cash income, contribute to a diversifying rural economy, contribute to overall economic growth and address problems of environmental degradation.

Until recently, Africa, and indeed much of the rest of the world, depended on public organisations to develop and deliver agricultural technology. In the past few decades the private sector has begun to play an increasingly important role in technology development worldwide, complementing public research efforts. This evolution in research direction, combined with the fact that the private sector is usually more efficient at producing and delivering technologies, helps explain the growing importance of proprietary technology, developed by both the private and public sectors. In most industrialised countries the development and delivery of proprietary technology is facilitated by a number of commercial and legal institutions. Africa's experience in these areas is not yet well established, and private agribusiness and input delivery have relatively less experience. But there are many proprietary technologies developed elsewhere that can make significant contributions to increasing Africa's agricultural productivity and improving rural livelihoods. In many cases, the owners of such technologies are willing to contribute them for agricultural development in Africa. The challenge is to access these proprietary technologies and manage their deployment until they reach smallholder farmers, and this is where AATF plays its key role.

AATF serves as an honest broker in negotiating the royalty-free transfer of technologies held by public and private organisations in industrialised and developing countries to smallholder farmers in SSA. AATF does this by establishing partnerships along the product value chain, from basic research through adaptive research and development, and product deployment. It provides expertise and know-how that facilitates access to, and development, delivery and utilisation of proprietary agricultural technologies.

AATF's current priorities are for technologies that promote greater productivity of Africa's basic food crops, which actually contribute to both food security and household cash income. In the future it may find justification for including some non-food crops, livestock or other enterprises that make significant contributions to the livelihoods of resource-poor farmers.

There is a wide range of proprietary technologies that are eligible for AATF's attention. Many of the possibilities are biological, including access to germplasm for conventional plant breeding, genes and tools for the development of transgenic varieties, micro-organisms used to control pests or diseases, and techniques such as tissue culture or marker assisted breeding that enhance the ability to identify and deliver new technology. Other possibilities include mechanical innovations (e.g. for post-harvest operations or high throughput laboratory assays), chemicals (e.g. for crop protection) and processes (e.g. information management systems for plant breeding).

AATF's creation can be traced to discussions among stakeholders in industry, research and public policy organised by the Rockefeller Foundation in 2000 to examine ways in which agricultural science could make a greater impact on African livelihoods. One of the principal findings was that although the owners of many proprietary technologies were willing to make these available to African farmers there were significant roadblocks to such transfers. This stimulated a series of consultations that led to the establishment of a design advisory committee for AATF in 2002, the appointment of an implementing director, and the identification of donor funding. AATF started operations in 2003 with the support of three investors: the UK Department for International Development (DFID), the Rockefeller Foundation and the US Agency for International Development (USAID); it was officially launched in June 2004 with the appointment of an executive director. AATF is incorporated in Kenya and in the UK, registered as a charity under the laws of England and Wales, has a tax exemption status in the USA, and has signed a host country status agreement with the Government of Kenya.

This Strategy Document

In 2006, after three years of experience with initiating and managing projects, AATF decided to develop a document that would outline its strategic direction for the next ten years. This document is based on the lessons learned during the first three years of AATF's activities and presents priorities and strategies to guide the Foundation in the coming decade. The document has two audiences. The first is the wide range of stakeholders that are affected by AATF's activities; the document is consistent with AATF's business plan but focuses on AATF's strategies in a way that can inform the general reader. The second audience is AATF itself: the document will serve as a reference point and a guide in choosing priorities and selecting strategies when planning the Foundation's activities. It will be used to ensure that AATF's activities are consistent with the priorities, strategies and principles presented herein.

The strategy document was developed in several stages. In early 2006, AATF organised a series of internal brainstorming meetings where staff reviewed past achievements and challenges, discussed and debated strategies and objectives, and conducted an analysis of strengths, weaknesses, opportunities and threats (SWOT). In June 2006, AATF organised a three-day workshop in Nairobi whose participants included representatives from research, regulatory, intellectual property, technology acceptance, agricultural industry, African seed systems and communication fields in both the private and public sector. The workshop

featured small-group discussions around current trends, key challenges, strategic goals, organisation, and resources. A small steering group met every evening to review the issues raised during the day and give guidance for the next days' discussions. At the end of the workshop, the steering group agreed on the main strategies recommendations emanating from the discussions. An initial draft of this strategy document was produced by a consultant who was asked to attend the workshop and capture the essence of the brainstorming workshop. The draft was complemented by information supplied by AATF staff. This overall strategy document was subdivided into six strategy components as follows:

1. **PROPRIETARY TECHNOLOGIES:** AATF will focus on accessing proprietary technologies and not on technologies in the public domain.
2. **STEWARDSHIP AND VALUE CHAIN MANAGEMENT:** AATF will support the adoption of new technologies by (a) guiding the identification of the right technologies to match priority needs, (b) advising on the creation of a conducive legal environment that protects the interests of all parties, (c) identifying and convening suitable partners, (d) promoting regulatory compliance (e) intervening to mitigate risks where possible, and (f) facilitating the access, development, deployment and use of the new technologies.
3. **KNOWLEDGE AND INFORMATION FOR PRODUCT DEVELOPMENT:** AATF will develop and share knowledge and information (a) related to the development and deployment of specific products and (b) in seeking to engage the private sector to play a much more important role in technology development and in seeking to re-invigorate the public sector's role in African agriculture.
4. **KNOWLEDGE AND INFORMATION FOR AN ENABLING ENVIRONMENT:** AATF will engage in knowledge and information sharing to support knowledge-based advocacy that will contribute to public understanding and to the establishment of a supportive, enabling environment for agricultural technology development in Africa.
5. **PROJECTS PORTFOLIO:** AATF will select projects following a demand-driven consultative process depending on availability of technological solutions, needs of smallholders, particularly resource-poor farmers, and on the projects' potential to reduce poverty in Sub-Saharan Africa.
6. **SUSTAINABLE PARTNERSHIPS:** AATF will establish effective partnerships for product development, product deployment and marketing of farmers' surpluses.

These strategy components were described in less than 500 words each and were sent to over 200 stakeholders who were asked to indicate their level of agreement or disagreement with each strategy component, to stress arguments for or against each component and to indicate what they perceived as risks of each component. A select group of these stakeholders, including the donors group, were invited to a workshop in Nairobi, Kenya in September 2006 to review these strategy components and to discuss the strategic positioning of AATF. Opinions of these stakeholders and responses to the questionnaire were analysed by AATF management and incorporated in this strategy document.

This document has six sections starting with an introduction. Section 2 presents AATF's vision, mission, values and guiding principles. Section 3 presents AATF's three strategic thrusts and outlines the challenges, strategies and measures of success for each one. Section 4 explains how these thrusts are implemented, and Section 5 discusses the organisation's structure, governance and resources. The final section provides a brief summary.

2.0 Vision, Mission, Core Values and Principles

Recognising its unique role and niche in fostering African agricultural development, AATF is motivated by the vision, mission, core values and principles as outlined below:

Vision

Prosperous farmers and a food secure Africa, enabled through AATF's catalytic role in bringing innovative technologies to smallholder farmers.

Mission

To access and deliver affordable agricultural technologies for sustainable use by smallholders, and in particular resource-poor farmers, in Sub-Saharan Africa through innovative partnerships and effective technology/product stewardship along the entire food value chain.

Core Values

As pioneers to brokering innovative agricultural technologies to farmers, and in particular to resource-poor smallholder farmers, in Sub-Saharan Africa, AATF staff uphold the following core values: **integrity, dedication and accessibility**

Integrity: We uphold integrity, we keep our word and do what we say we will do by when/how. We adhere to moral principles in dealing with ourselves and partners. We seek to be honest, transparent and accountable. In recognition of our facilitative role, we provide accurate information to our partners while respecting confidences. We also base our actions on facts and present accurate reports of our progress, thus showing credibility and thriving to become the partner of choice for stakeholders in the agricultural sector.

Dedication: We are responsible partners, committed to ensuring our intended beneficiaries are well served. We seek to maintain good relations with our partners, investors, staff and other stakeholders to ensure we maximise their potential for delivering public goods. We undertake to seek required resources to ensure the success of accessing and delivering required technologies

Accessibility: We are available and approachable to discuss and/or provide information that will support technology transfer in Sub-Saharan Africa. AATF has specialised expertise to address niche issues related to technology transfer such as technology stewardship, partnership management, regulatory compliance and intellectual property management. In recognition of the capabilities and contribution of the various entities involved in overall agricultural revival for SSA, AATF will avail its knowledge and provide necessary information in discussions and in requests for information to support best decisions and inform opinion on the issues at hand. We respect our stakeholders' opinion and seek to learn from their experiences.

Guiding Principles

1. AATF responds to a growing sense of urgency demanding that agriculture plays a stronger role in Africa's economic development. The response includes the recognition that new approaches to technology development and delivery are required.
2. AATF believes that if African agriculture is to provide secure livelihoods for farm households and contribute to economic growth then the private sector must play a much more important role in technology development for and delivery to smallholder farmers.
3. This strong belief in the potential of the private sector is combined with a commitment to re-invigorate public sector roles in African agriculture, ensuring that public institutions support both markets and policies for equitable development.
4. AATF focuses its attention on proprietary/innovative technologies because much of it is currently unavailable to African farmers. Because such technologies encourage commercial activity it can bring new energy to African agriculture; its importance lies in the incentives it provides for the delivery of a product.
5. AATF is committed to the adoption of new technologies and to facilitating the adoption process by intervening to mitigate risks and ensure that the new technologies are deployed and used appropriately.
6. AATF is committed to fostering partnerships that are based on real incentives, including the desire of emerging African enterprises to grow and prosper; the interest of farmers in acquiring the most productive technologies to improve their food security and incomes; and the commitment of donors and governments to see that those farm households with insufficient resources are helped to build their assets and experience in order to prosper.

AATF's Role and Niche

AATF addresses the inadequate institutional resources for efficient access to, and utilisation of, proprietary technologies in African agriculture. Although AATF can be seen as part of wider efforts to support 'public-private partnerships' for African development, its role should be understood in much more specific terms. It does not develop technology itself, nor does it produce or market agricultural innovations. Instead, it provides partner institutions with contacts, information, advice, legal instruments, and incentives that facilitate the development and utilisation of proprietary technologies.

AATF was created because of several problems that affect agricultural development in Africa:

1. The current size of Africa's markets is often insufficient to attract the commercial interests of most multinational corporations that offer useful proprietary technologies.
2. Although many of those firms are interested in donating some of their technologies for poverty alleviation, they are not prepared to invest in establishing the necessary

contacts or follow through the required legal and regulatory procedures, or face liabilities that may arise from the donated technologies.

3. Similarly, many public research institutions (in the North and South) are willing to provide their technologies for African farmers, but are not capable of engaging in the required downstream partnerships and procedures.
4. Public research organisations in Africa have little experience in delivering proprietary/innovative technologies to the private sector for production and deployment and require advice and access to best practices.
5. Neither public nor private organisations in Africa currently have sufficient experience in promoting proprietary agricultural technology targeting resource-poor smallholder farmers.
6. African agribusiness firms will be unwilling to invest in producing, promoting and delivering products from new technologies to resource-poor farmers unless they have some assurance of widespread acceptance of such products enabling a reasonable return on investment; they may also require advice and facilitation on legal and regulatory matters and, in some cases, initial, targeted support to ensure widespread uptake of the new products may be necessary.

AATF's principal beneficiaries are African farmers and consumers. In the course of carrying out its mission, AATF's actions will also strengthen African public and private research organisations; promote the establishment of more responsive legal, commercial and regulatory institutions in Africa; contribute to the development of African agribusiness; and help private and public organisations outside of Africa fulfill their aspirations of sharing expertise and technology to create a strong foundation for African agriculture. But AATF does not actively promote or sponsor changes in these various organisations, nor does it advocate particular policies or types of technology. Instead, AATF acts as a trustworthy partner capable of entering into contracts with both public and private sector organisations to facilitate technology access, development and deployment, and serves as a 'responsible party' in ensuring that technologies are used appropriately, consistent with the principles of good stewardship and in a manner that brings value to African smallholder farmers.

3.0 AATF’s Strategic Path and Thrusts

Strategic Path

The activities that will be conducted during formulation and implementation of AATF projects occur within a strategic path bordered by management of strategic partnerships and technology stewardship. The activities are illustrated in Figure 1 below. A third dimension of the AATF strategic path is information and knowledge management to support the selection of technologies best suited to smallholder farmers’ conditions, building partnerships for product development and deployment, ensuring appropriate stewardship, and supporting a favourable policy environment.

AATF Strategic Path	Managing Strategic Partnerships	<ul style="list-style-type: none"> • Technology scouting • FTO assessment • License negotiations • IP management • Project formulation • Resource mobilisation • HRD 	<ul style="list-style-type: none"> • Product development • FTO assessment • Technology licensing • IP management • Information and knowledge management • Project M&E • Resource mobilisation/allocation • HRD 	<ul style="list-style-type: none"> • Stakeholder management • FTO assessment • Commercialisation • Marketing • Project M&E • Resource mobilisation/allocation • HRD • Exit strategy implementation
	Technology Stewardship	<ul style="list-style-type: none"> • Biosafety audit • Regulatory review • Liability protection • Project M&E • Resource mobilisation 	<ul style="list-style-type: none"> • Risk assessment • Risk mitigation plan • Public acceptance • Risk communication • Project M&E • Resource mobilisation/allocation • HRD 	<ul style="list-style-type: none"> • Regulatory compliance monitoring • Risk management • Product performance monitoring • Public acceptance • Assessing impact • Project M&E • Resource mobilisation/allocation • Exit strategy implementation • HRD
		Project Formulation	Product Development	Product Deployment
		AATF Projects Phases		

Figure 1: AATF’s Generic Activity Matrix

Strategic Thrusts

Consistent with its chosen strategic path, AATF will anchor its activities within three strategic thrusts, namely:

- Negotiating access to proprietary technologies that enhance the productivity of agriculture in Africa
- Managing partnerships for project formulation, product development and deployment to introduce innovative agricultural technologies to African farming systems
- Managing knowledge and information to support technology identification and development, and the policy environment.

The following discussion examines the challenges, strategies and criteria for success of each of these thrusts.

3.1 Negotiating access to proprietary technologies that enhance the productivity of African agriculture

3.1.1 Challenges

(a) Technology identification

AATF identifies and negotiates access to proprietary technology that can contribute to African agricultural development. Only a fraction of proprietary agricultural technology is relevant for African farming, and this implies two challenges for AATF. First, it must have access to good information on the extent and technical nature of major production constraints facing African agriculture. Second, it must have excellent contacts with a wide range of technology developers in order to assess the availability of promising interventions, and it must develop its reputation so that technology developers are encouraged to positively respond to AATF request for accessing their technologies and come to AATF when they have innovations relevant for African agriculture.

There are several potential sources for promising technology. The most prominent example is the private ‘life science’ industry in industrialised countries. Although much has been written about the concept of public-private partnerships there are still relatively few examples in agriculture. Many private firms are interested and willing to donate specific technologies as part of their corporate responsibility, but they are usually unwilling to invest significant resources in identifying and working with potential recipients. They also want to ensure that their technology will be used only where appropriate and that it will not compete with their commercial interests. More importantly, they require to know that potential liabilities emanating from their technology donation are adequately attended to. Therefore these firms require an institution that acts as the responsible party in technology transfer and that facilitates collaboration and partnership, and that can provide liability protection. AATF has been established to fulfill these roles.

(b) Managing access to and delivery of intellectual property

The private industry is not the only source of relevant technology. AATF also negotiates with public research institutions for access to selected proprietary technologies. Public institutions often license their technologies to private industry, but there is growing concern that the complexities of intellectual property management are hampering the delivery of public technology for development purposes. Institutions such as the Public Intellectual Property Resource for Agriculture (PIPRA), an initiative by universities, foundations and non-profit research institutions to make agricultural technologies more easily available for development and distribution of subsistence crops for humanitarian purposes in the developing world, have been established to help address this problem. AATF will take advantage of such initiatives and facilitate access to appropriate publicly developed technologies for input into African agriculture.

AATF’s scope is not confined to North-South technology transfer. There is significant agricultural research capacity in developing countries’ public and private sectors, and countries such as India, China and Brazil are the sources of many relevant innovations. A large proportion of these technologies is relevant to African farming conditions and AATF

will scan the output of developing country research institutes and commercial firms for appropriate innovations.

Once a candidate technology has been identified, AATF faces an additional set of challenges. It must enter into preliminary discussions regarding availability and potential application. As negotiations proceed, AATF will need to conduct (or have access to) a ‘freedom to operate’ assessment for the technology (in order to understand the ownership structure of the various components and the implications for its eventual application in Africa). AATF will also discuss the nature of the potential license. It is assumed in most cases that the license will be royalty free, but there will usually be various other conditions that will feature in the negotiation. In addition to the license to use the technology, AATF is also interested in accessing the know-how and relevant information necessary for the proper utilisation of the technology. The negotiations will also discuss issues pertaining to the allocation of liability. In areas such as biotechnology, this is a primary concern of technology providers and may be the single most significant challenge to the transfer of technology.

(c) Managing an IP portfolio

Finally, AATF will develop its portfolio of technologies so that they include both those that offer relatively short-term delivery trajectories and those that will have a longer period of development. In addition, AATF must ensure that the portfolio addresses a range of agricultural environments and problems throughout Sub-Saharan Africa.

3.1.2 Strategies

(a) Access to relevant information

In order for AATF to access the most appropriate technology, it needs to keep abreast of the latest information about agricultural production constraints and priorities in Africa. For instance it is not sufficient to simply recognise that drought is a major problem; AATF staff need to have access to research on the subject in order to understand the variable character of the problem in different African environments so as to select technologies that will be most appropriate. In addition, AATF will be familiar with major national, regional and Africa-wide policies on agricultural development, in order to understand what priorities are assigned (and alternative solutions are considered) for a problem such as drought. AATF’s technical expertise also extends to an understanding of the complementary conditions and technologies that are required for a specific innovation to have an impact. AATF’s choice of candidate technologies will be based on an assessment of accessibility, impact on resource-poor farmers, and deliverability.

(b) Access to sources of technology

AATF must have excellent access to sources of technology in the North and South. Such access will be developed through both formal meetings and informal contacts. AATF will interact frequently with these sources, as well as scanning the literature on the latest innovations. It is important that AATF has access not only to information on those technologies that have already achieved application, but also on technologies that may not have gone into product development in industrialised countries but that have potential applications in Africa. Although the large multinational corporations that are an important source of relevant technology are fierce rivals of each other, it will be recognised that AATF must be able to ‘shop around’ and enter into frank discussions with various competing firms. As AATF’s reputation grows there will be an increasing number of contacts initiated from

technology developers, but AATF will apply the same criteria regarding the selection of the highest priority technologies.

AATF must be prepared for many discussions and explorations that do not finally result in licensed technology. Finding the right technologies to address specific challenges will be a complex process. Because of the many uncertainties involved, AATF will devote the majority of its attention to proven technologies, rather than those that are in the concept stage. For technologies that require extensive regulatory approval (such as transgenes), emphasis will be given to instances where a regulatory dossier has already been developed.

(c) Negotiation skills

The licensing of a technology may be a multi-stage process. In some cases AATF will want to negotiate a license that simply allows for testing the technology under African conditions, with an option to license for commercial application if the initial testing is successful. At the same time AATF will need the capacity to carry out (or commission) a freedom to operate analysis to ensure that the technology, once acquired, can be utilised without infringing the rights of the owners of associated technologies. If the license for commercial use includes market segmentation AATF will need to research the potential uses and markets for the product and ensure that segmentation agreements can be enforced. In addition, AATF must address liability management, which will often be one of the determining conditions for a license (see section 3.2).

From the earliest stages of negotiation for licenses for the technology, AATF will need to begin an assessment of product delivery strategies (see section 3.2). The identification of such strategies will determine the nature and feasibility of any technology access licenses that may be negotiated. Even at these early stages, AATF will conduct frequent assessments of progress and will be prepared to terminate projects when it judges that successful delivery is unlikely.

Criteria for Success

(a) Balanced technology and project portfolio

The primary criterion for success in this area of AATF's mission is the development of a strong and balanced portfolio of new technologies that are available for sub-licensing for product development. The portfolio will emphasise technologies that promise adaptation in products that can be delivered to African farmers in a short time span, but it will be balanced with some technologies of high potential (and often higher risk) that involve a longer product development trajectory.

(b) Appropriate skills set and experience

Additional criteria for success include the establishment of skills and knowledge within AATF that make it (a) an important source of expertise on the technological challenges and opportunities for African agriculture, (b) a centre of competence in the analysis and negotiation for access to proprietary technology, and (c) an authority on the regulatory, legal and IPR challenges that determine agricultural technology transfer in Africa.

3.2 Managing partnerships for product development and deployment to introduce innovative agricultural technologies to African farming systems

3.2.1 Challenges

(a) Establishing effective partnerships

AATF will only negotiate access to a proprietary technology after it has investigated the feasibility of establishing effective partnerships that can carry the technology forward, resulting in the development and deployment of a useful product for African farmers. In addition to establishing such partnerships, AATF ensures that product development is only pursued where there is an adequate enabling environment of laws, policies and regulations. This means that AATF must be familiar with the requirements and concerns of many different stakeholders. The negotiation of access to a proprietary technology does not guarantee that farmers can benefit from it. The technology must be incorporated into a product that can be utilised by farmers, and AATF's principal responsibility is to establish effective partnerships for product development and delivery.

Partners and Stakeholders

AATF works with, and responds to, the interests of an exceptionally wide range of private firms, public organisations, civil society and smallholder farmers. These all may be seen as its *stakeholders*. In addition, AATF establishes well-defined relationships with particular organisations, which become AATF's *partners*. These partnerships are usually mediated by different agreements that define expectations for both parties and imply shared risks. One example is the relationship between the technology provider and AATF, which will usually include a license for a specific technology. However, most of AATF's partners are involved in the development and/or deployment of specific products. For example, AATF may sub-license a technology to a public research organisation to develop new crop varieties or sub-license a seed company to produce and sell the new variety. AATF may also contract a non-governmental organisation, farmers' association, community-based organisation or government's agricultural extension service to conduct technology testing in farmers' fields. In some cases, AATF may reach an agreement with private or public institutions to extend their supply or purchasing networks to reach farmers targeted by AATF projects. In the majority of these partnerships, AATF acts as the principal and responsible party in targeting technologies, ensuring regulatory and legal compliance, and promoting good stewardship.

(b) Translating technologies into products

The new technology must be converted into products that will perform in smallholder farming systems farmers. For instance, in the case of a mechanical technology AATF must establish a partnership with an appropriate manufacturer or research organisation that is able to develop and test prototype machinery. If it is a crop genetic technology, the partner of choice will be a public or private entity that has access to appropriate germplasm and plant breeding skills in order to develop and test new varieties.

The organisation that incorporates the new technology into an appropriate product may or may not be equipped to produce and market the product. In the case of a new type of

machinery, the company producing the prototype may have the experience and resources to proceed with manufacture and marketing. In the case of the genetic technology, a public research organisation that develops a new variety will not be able to produce and market seed, and appropriate commercial partners (seed companies) must be identified.

Although an AATF partner may have the capacity to produce and market a product, there will be cases where the partner's uncertainty about commercial demand will make it reluctant to proceed. In such cases, AATF will need to design strategies that help promote the product or that provide some initial subsidies that allow resource-poor farmers easier access to the innovation.

Technologies and Products

AATF makes a distinction between technologies and products. Technologies are specific innovations that may find practical application. AATF focuses on proprietary technologies that can contribute to improving the productivity of African agriculture but that are not readily available to smallholder farmers. The particular *technology* may require to be incorporated in a *product* that can be delivered to farmers. For instance, the STRIGAWAY[®] maize product being promoted by AATF to control *Striga* in maize fields is based on maize germplasm containing a herbicide resistance gene, a proprietary technology of BASF; the gene has been bred into varieties adapted to African agroecological zones by CIMMYT, IITA and national agricultural research institutes, such as KARI; seeds of the herbicide-resistant varieties need to be coated with the Imazapyr herbicide by seed companies such as Western Seed Company of Kenya to become products that smallholder farmers can use to control *Striga* in their maize fields.

In addition to AATF's direct participation in product development through appropriate partnerships, it must pay careful attention to the enabling environment. An initial feasibility study will have provided AATF with enough confidence to proceed with supporting product development in a particular country, but constant monitoring and support for partners is also important. The most important elements of the enabling environment include IPR regimes, regulations for input markets (particularly seed and chemicals), and biosafety regulations (in the case of transgenic crops).

AATF will assess the relevant national IPR regimes to ensure that any benefit sharing agreements can be enforced, appropriate incentives for product deployment are in place, and stewardship can be managed. Mechanical (and some biological) innovations may be protected by patents but national patent regimes may not provide for protection of gene-based technology, and other mechanisms that allow appropriate control will need to be identified. In most African countries some type of plant variety protection will be available and AATF will need to ensure that this is applied in a way that ensures resource-poor farmers the broadest access to the product.

(c) Regulatory and biosafety compliance

Regulatory approval will also be required for many of the products that AATF helps develop and disseminate. In the case of new plant varieties, national regulatory authorities will require examination and testing for variety registration and release. The seed of the new varieties will often be subject to seed certification. Novel chemicals or biological agents used for pest

control will have to face similar regulatory examination; in many African countries these procedures are less well established than those for crop variety regulation. AATF will need to ensure that its partners are well informed about regulatory requirements and that they provide all of the data required to facilitate approval.

In the case of transgenic crops, product development, from its earliest stages, must conform to national biosafety regulations. This is a challenging area partly because of its technical complexity and partly because it is so highly politicised. Although few African countries have full biosafety laws in place, existing regulatory agencies can draft specific guidelines or regulations that govern initial assessment of a technology. The public or private organisations involved in developing the transgenic variety will have to work closely with local biosafety authorities and AATF will have to work with its partners to ensure access to the appropriate data, compliance to all national regulatory requirements and internationally accepted standard operating procedures.

AATF's development of partnerships for product development and deployment and its interactions with legal and regulatory bodies are all part of a strategy to promote effective product stewardship. To fulfill its role as the responsible party in technology transfer, AATF must ensure that the companies, manufacturers, retailers and government agencies that are involved in the development and delivery of the product are aware of their stewardship roles and are able to invest the required resources in ensuring the safe and effective use of the innovation.

Stewardship

Stewardship is a concept that addresses the concern that a product must be used safely and effectively throughout its life cycle. It takes account of the environmental and public health consequences of potential misuse of a product and provides strategies to reduce or eliminate such outcomes. Stewardship also entails monitoring and evaluation of product performance, obtaining feedback and addressing of challenges that may be identified during product deployment. Although much of the responsibility for stewardship rests with the producer of the product, stewardship is also a concern for distributors, government agencies, and consumers.

(d) Managing liabilities

A major challenge for AATF in accessing and deploying technological innovations is liability management. One of the primary concerns of potential technology donors is their exposure to lawsuits resulting from the misuse of a product incorporating their technology or 'nuisance cases' initiated by opponents of the technology in order to slow its deployment. An effective stewardship strategy will help liability management, but this will often not be sufficient. The liability issue represents a particularly difficult challenge for AATF because there are as yet no mechanisms (e.g. special types of insurance) that have been developed and deployed anywhere in the world.

3.2.2. Strategies

The challenges of product development and deployment imply a range of strategies for AATF.

(a) Identification of competent partner institutions

AATF will identify and work with the most appropriate entities for product development. These may be public or private organisations at the national or international level. While supporting the development of local capacities, AATF also recognises that efficiency and experience are important factors and it seeks the most effective partners in each case. For new crop varieties this may be a national research organisation with access to locally adapted germplasm, an international organisation with broader resources and expertise, or a private company (for instance, the technology owner itself might be contracted to backcross its gene into suitable germplasm). Product development will include adequate adaptive research in order to ensure that the product meets expectations under farmers' conditions. AATF must be familiar with the capacities and resources of the relevant organisations to ensure that they provide competent performance testing.

In many instances the initial incorporation of the technology into a product will be done by a public organisation. In these cases, AATF will seek additional partners for technology deployment. This implies that AATF must be very familiar with the performance and capacities of local agricultural input industries.

(b) Finding efficient product delivery systems

Most of AATF's products will be delivered in form of improved seed. Other products may include machinery or biological control innovations. To impact farmers' livelihoods, it will thus be critical that the delivery mechanisms are efficient for products to reach farmers efficiently. Africa has the lowest levels of improved seed utilisation of any region of the world, mostly because seeds are not physically or financially available to the majority of farmers. AATF will facilitate access to improved seeds and other inputs by smallholder farmers. This implies brokering of agreements between the national public research institutes, who develop seeds and other products, and the private sector, who take the products for commercialisation, in a mutually beneficial way. This will entail a stakeholders' consultative process with a view to building consensus around issues that can guarantee sharing of benefits accruing from seed development and commercialisation.

(c) Facilitating farmers' access to markets

Input marketing is a particular challenge in much of Africa and AATF's strategies need to include imaginative ways of providing support and incentives for the retailing of new products. This may involve working with partners to facilitate advice on strengthening distributorships or accessing complementary inputs at a reasonable price. In cases where there are insufficient commercial incentives to market the product, AATF may include in its partnership agreements access to funds for limited and targeted subsidies or output-based contracts. Financial support for such efforts would be provided by donors or governments. Extra investments for information provision (such as farm-level demonstrations) could be channeled in collaboration with appropriate NGOs or public agencies.

Although some of the demand risk faced by producers or distributors may be mitigated by targeted subsidies, AATF would ensure that there are still strong incentives for product delivery. In addition, AATF would generally expect its partners to be responsible for other risks, such as production delays or higher than expected production and marketing costs.

(d) Intellectual property protection and risk management

AATF's license from the technology provider should include, to the extent possible, a clear definition of the intellectual property involved and the limitations that this imposes. AATF will work within this license to establish understanding with its partners (e.g. agreements on exclusive versus non-exclusive access). The license may also include requirements related to information disclosure, product labelling, or other issues which AATF will have to monitor.

AATF will assess the relevant national IPR regimes to identify how any infringement can be addressed, to ensure that the sub-license is defensible. In some cases, AATF will assist its partners in establishing appropriate royalty agreements (e.g. between a national research institute that develops a variety and a seed company that markets it).

(e) Facilitating regulatory compliance

AATF will be familiar with the procedures and requirements of national regulatory agencies (such as seed certification agencies and pesticide registration authorities). It will assist its partners in acquiring information and contacts that allow compliance with these regulatory regimes, assess any bottlenecks in the process, and help draw attention to possible solutions. In some cases (such as pesticide registration) the international private sector may have much more experience in developing the required data, and AATF could establish a specific partnership for this purpose. As part of its strategy, AATF will maintain close contact with other organisations that advocate regulatory reform and transparency in Africa (e.g. FARA, NEPAD, regional economic communities, etc.).

AATF's strategies for biosafety compliance must ensure that its partners are meeting the regulatory requirements. These usually include the provision of considerable amounts of data on environmental impact, food safety, and other areas. In many cases the technology provider will have already developed a comprehensive regulatory dossier (to gain approval in industrialised countries) and this can be accessed for the local biosafety review (and may indeed be required by the technology provider). Developing data to meet biosafety requirements will make exceptionally high demands on skilled personnel and resources. It is unlikely that AATF or its current partners can meet this demand, and hence they must support the development of effective biosafety laws and capacity development (perhaps within some Africa-wide entity).

AATF's strategies for partnerships and regulatory compliance will include stewardship as an integrating concept. It will ensure that its partners are investing the required resources in product stewardship and will help identify sources of advice and technical assistance when concerns in stewardship management arise.

The liability issue requires particular attention from AATF. The Foundation can try to specify indemnification in its license and sub-license agreements and insist on high performance standards from its sub-licensees (for instance, in training in product stewardship). AATF will also monitor trading patterns and understand the implications of its products entering into international commerce. AATF will keep its partners and other stakeholders abreast of the latest developments in this field in order to offer effective advice; one way of doing this is to monitor the liability and redress negotiations that are part of the ongoing negotiations of the Cartagena Protocol on Biosafety.

Finally, as AATF manages and monitors its partnerships for product development and deployment it will subject the process to continuous monitoring and evaluation. This will allow AATF to identify additional resources or inputs when needed or, on the other hand, to terminate projects when the assessment indicates that initial projections do not correspond to current realities. It is vitally important that AATF conduct this type of continual assessment to ensure that its resources are effectively invested.

3.2.3 Criteria for success

The most important criterion for the success of AATF's strategies at product development will be the widespread use of new technologies by African farmers. Progress towards this goal will be measured by the growth of effective partnerships involving AATF, on the one hand, and African research organisations and commercial firms, on the other. The partnerships should increasingly be established on a purely commercial basis, although in the early years, and for specific products, donor or government support or subsidy to ensure access by all farmers (and particularly the resource poor) may be necessary.

AATF's success will also be judged by the breadth and confidence of its contacts with the research organisations and commercial firms who are potential partners for product delivery. AATF will be expected to have a very good understanding of all the relevant players in Africa's agricultural technology development sector.

AATF will also be judged on the extent to which it is a reliable and knowledgeable source of information and advice on the enabling environment for African agricultural technology, including regulatory regimes, biosafety, intellectual property management and technology/product stewardship. The effectiveness of this expertise will be judged by the extent to which AATF's partners are able to use its advice to manage regulatory and legal requirements and stewardship for the delivery of new products.

Finally, AATF's success will depend on whether it is able to provide adequate guidance on product stewardship and liability management, to satisfy the requirements of technology providers and to ensure that innovative new products make their full contribution to raising the productivity of African smallholder farmers.

3.3 Managing knowledge and information to support technology transfer, to inform policy processes

3.3.1 Challenges

AATF's involvement in the development of advanced technologies for African farmers requires a significant investment in information and knowledge management. The challenges include two broad areas: knowledge related to AATF's core mandate of accessing technologies and deploying specific products; and information to promote AATF's strategic interests in ensuring public understanding and the establishment of a supportive and enabling environment for agricultural technology development in Africa.

(a) Information for product development and deployment

Many of the products that are developed from technologies accessed through the intervention of AATF will be novel, at times complex, and require the provision of adequate information for producers and users. For instance, a manufacturer who is considering investing in the production of a new biopesticide, based on technology provided through AATF, will require accurate, detailed information on the nature of the technology, its performance under a range of conditions, and methods for incorporating it in an acceptable product. Once that product is developed, farmers will need reliable information on how to use it in their fields. Although AATF is not responsible for the development of such information, it must know how to identify it and how to help its partners access it and use it in the most effective way.

Some of this information will be used by companies to inform their product development process, and once prototypes are available the companies may need additional information to meet relevant regulatory requirements. As the product comes to market, the companies will need to design an information delivery strategy that helps farmers make the best use of the new product. Other parties, such as NGOs and extension agencies, will also require accurate information about the product to support their own training and education efforts. In all of these cases, AATF plays a key role in helping access and utilise the best information available on the particular technology and products. Those involved in the production, promotion and delivery of the new product also require this type of information to help them develop and manage an efficient stewardship program.

(b) Information for technology adoption

As products are developed and delivered to farmers, AATF will also have to establish partnerships with organisations that can measure and assess the impact of the new technologies. Such impact studies imply the provision of information for various sets of stakeholders. A donor may be interested in information that illustrates how agricultural technology addresses rural poverty; a company will want to see patterns of product uptake, to help it refine its strategies; and stakeholders in other countries will be anxious to understand the process of technology delivery to help design their own strategies.

(c) Information to support an enabling policy environment

In addition to providing technology-specific information to support product development, AATF also needs to contribute information that helps build a more supportive enabling environment for new agricultural technology. This implies attention to public opinion as well as policy development. To meet this challenge, AATF will have to make sure that accurate information is available to a range of stakeholders, while at the same time ensuring that it

does not cross the line separating engagement from advocacy. That is, although AATF needs to ensure it develops and delivers high quality information that promotes public understanding and policy support for its products, its resources cannot be spent on its own advocacy initiatives (e.g. promoting biotechnology or urging reform of specific policies or regulations).

3.3.2 Strategies

(a) Access or generate information

As AATF investigates the feasibility of candidate technologies it will need to have access to (or contract the development of) excellent information on specific production constraints. For instance, if a technology addresses a particular plant disease, AATF will need good information on the extent and seriousness of the yield losses caused by the disease in order to assess whether it warrants interest and negotiation. This implies establishing good access to research that documents constraints, practices and opportunities in African agriculture.

Once AATF has entered into a partnership for the acquisition of a technology it will need to access all of the relevant technical and regulatory information available for that technology so that this can be used by other partners who are developing a product, preparing it for regulatory approval and designing a marketing strategy.

Regulatory approval will often require that AATF have access not only to information about a particular technology but also about national regulatory requirements. AATF must be familiar with the relevant crop variety release procedures, seed certification requirements and pesticide registration protocols. If the new product is a transgenic crop, AATF will need to have excellent information about biosafety procedures and requirements to help guide the actions of its partners.

Similarly, AATF must have close familiarity with national procedures for intellectual property protection, including patents and plant variety protection.

(b) Develop a knowledge base

In order to pursue these strategic objectives AATF needs to develop its own knowledge base about the issues related to the enabling environment for agricultural technology. This will involve monitoring various sources and expressions of public opinion related to agricultural technology in Africa and following national, regional and international efforts to support African agricultural development. It will also involve building AATF's knowledge about input regulation, biosafety laws, intellectual property rights in agriculture, liability management, and the progress of international agreements such as the Cartagena Protocol. This knowledge will inform AATF's choice of priority technologies and will also be used for advising its partners and other stakeholders.

(c) Interactions with relevant institutions

There are several strategies for AATF to develop the requisite knowledge base on regulatory and IPR issues. One strategy is to ensure that the relevant AATF staff have opportunities to interact with national regulatory and IPR authorities at technical conferences and regional forums. Similarly, AATF should interact with agricultural input industries (e.g. seed producer associations) in their meetings, in order to understand their point of view. In addition, AATF staff should participate in regional meetings that consider regulatory reform or the

harmonisation of regulations or IPR requirements. Attendance at international conferences or observer status at negotiations of international protocols will also be useful. AATF's participation in these various types of meetings will serve to develop its knowledge base as well as providing opportunities to present the status of AATF products (and to explain how they are affected by particular policies and regulations). But such presentations should always be seen as contributing relevant information to a discussion rather than active advocacy for general policy change.

AATF can also acquire technical knowledge in areas such as regulatory compliance or IPR through opportunities for its staff to serve as interns with private companies, working with the relevant regulatory and IPR personnel.

(d) Periodic review of trends in key areas

Another strategy for building AATF's knowledge base is to organise reviews of relevant policy or regulatory areas in African agriculture. Possible candidates might include a review and analysis of current biosafety regulations, seed certification requirements, plant variety protection systems or patenting of relevant agricultural technology in Africa. The reviews would appear as published reports, summarising the current status and developments in the respective fields. Because these are rapidly changing areas, the reports could be updated every few years. The reports would not simply contain a description of the regulatory or legal structure in each country, but also provide some analysis of implementation, as well as contact information for key personnel in relevant government agencies.

Such reports would require significant staff time when they are initially assembled and published, but if they are initiated during AATF's early years, while most products are in preliminary stages of development, staff should have the time to devote to this exercise. Such reports would serve two important purposes. First, they would help raise AATF's profile as a source of objective expertise on important policy issues related to the promotion of agricultural technology. Second, the development of these reports would serve to acquaint AATF with the details and issues in these important aspects of the enabling environment. The reports would reflect AATF's strategy of providing information rather than leading advocacy regarding agricultural technology issues.

(e) Training of stakeholders

Much of AATF's information provision will be related to its specific products. Not only will AATF present information to stakeholders on the performance and potential of its products, but it will also engage in issues training with its partners. This training will provide a clear set of messages regarding a particular AATF product and its relation to important regulatory concerns, consumer issues and policy debates. Such training will help develop a consistent presentation and understanding of AATF's products. Again, while AATF can provide product-specific information it must turn to other, better-placed organisations to play a more general advocacy role. AATF will also develop a strategy for crisis management that will provide means of addressing any inappropriate use of its products.

(f) Provision of information for evidence-based advocacy

Finally, although AATF will not be directly involved in advocacy activities, it will ensure that it is providing information about the potential and performance of its products to those who are concerned with biotechnology (such as the High-Level Panel on Modern Biotechnology of the African Union) and with broader agricultural technology development

(such as NEPAD's Comprehensive African Agricultural Development Program). AATF will also monitor the Press and public opinion and be proactive in providing product-specific information that addresses concerns regarding issues such as genetic engineering or intellectual property protection. AATF will identify a range of opinion leaders who will receive information about its products and their impact on African agricultural development.

3.3.3 Criteria for success

One of the principal measures of the success of AATF's information and knowledge management strategy will be the extent to which partners are able to access appropriate information and advice on technologies and their requirements that can be used in successful product development.

AATF's ability to manage information on production constraints, technology performance, regulatory and biosafety requirements, and intellectual property management will depend on several strategies. Success will be measured by the organisation's access to, and management of formal sources of information (publications, websites, etc.); the extent and quality of its informal contacts with research, industry, regulatory and policy bodies; and in some cases by the establishment of formal relations such as internships that help build AATF's expertise in commercial technology development.

AATF's knowledge about regulatory, biosafety, and intellectual property issues in Africa will not only be measured by its ability to offer effective advice to partners but also by its development and publication of reviews and updates of these areas that provide useful information to the wider public and enhance AATF's knowledge and reputation in these areas.

The success of AATF's information strategies will also be measured by its ability to offer information about its products to the general public that address the genuine concerns that people have about new technology and the role of technology in African agriculture. AATF's strategy will be judged successful if the organisation is seen as a source of objective and consistent information, rather than as an advocate for particular policies or industries.

4.0 Strategy Implementation

4.1 Overview

AATF will pursue its long term objectives following a phased approach as detailed in Table 1. AATF will continuously undertake intelligence gathering on technological breakthroughs locally and internationally with a view to generating ideas that can be nurtured into projects for addressing constraints to crop productivity in Sub-Saharan Africa (Phase 0). Promising ideas will then be discussed and screened for feasibility through consultations with stakeholders leading to the formulation of Project Business Plans (Phase 1). For each project, the Business Plan will serve as a key document for guiding project implementation and the interactive mechanisms for collaborating partners during research, testing and adaptation of products as well as technologies in target areas (Phase 2) and for guiding activities critical for product deployment to reach smallholder farmers and other end users (Phase 3). Typically, this approach will encompass implementation of all planned activities, including triggers for project sign-off, also called ‘exit strategy’ (Table 1). It is worth pointing out that the entire process of identification, formulation and implementation of AATF projects shall not rigidly follow a top-down, linear approach as outlined in Table 1 but is intended to portray a flexible and iterative scheme involving periodic wide-ranging stakeholder consultations with built-in triggers for ‘go or no-go’ decisions. As a matter of fact these steps may even be overlapping for specific projects (see Figure 2).

Table 1. Phases and steps in AATF Project Life Cycle

Phase	Phase Name	Step	Step Description	Expected output and paper trail
0	Intelligence Gathering	0	Agricultural Problem/Solution Intelligence Gathering	Product Idea report
1	Business Plan Development	1	Product Concept Identification	Product Concept report
		2	Product Concept Note Development	Product Concept Note
		3	Scientific/Technical/Legal Review	Reviewed Concept Note
		4	Feasibility Assessment	Feasibility Report
		5	Project Business Plan Development	Business Plan
		6	Board Recommendation	BOT endorsed business plan
2	Product Development	7	Product Development	Product ready to deploy
		8	Risk Management Strategy	Risk Mitigation Plan
		9	Communication Strategy Development	Communication Plan
		10	Baseline Study for Impact Assessment	Baseline data
3	Product Deployment	11	Product Deployment in Pilot Locations	Product used in pilot locations
		12	Impact Assessment	Measure of impact
		13	Planning for Cross-Border Expansion	Cross-Border Expansion Plan
		14	Wide Scale Product Deployment	Sustained product use
		15	Exit strategy	Monitoring reports

4.2 Selection of AATF Projects

AATF will select projects following a demand-driven process, based on the needs of smallholders, including resource-poor farmers, and the projects’ potential to reduce poverty

in Sub-Saharan Africa. Thus, the selection of initial projects will aim to demonstrate a range of technologies that can be adapted for use under African farming conditions and those that are valued by smallholders. This way, AATF and its partners will be able to test and refine project selection criteria and processes as may be deemed appropriate. Over time, AATF will develop a portfolio of projects to generate a flow of results beneficial to smallholder farmers.

4.2.1 Projects Portfolio

The project portfolio will be selected to:

- Combine projects with different overall size, expenditure profiles and risk. The aim is to create a balanced portfolio in terms of risk and expected outcomes.
- Develop synergies (technical or institutional) between projects.
- Promote AATF and subsequent resource mobilisation, e.g. by including projects that are relatively easy to manage and are expected to deliver ‘quick wins’, and/or by including high profile projects that attract public attention and interest.
- To achieve a geographic balance that ensures benefits to farmers in central, eastern, southern and western Africa subregions.

4.2.2 Project Selection Criteria

The criteria for project selection reflect AATF’s overall principles:

- Projects must address high priority constraints hindering access to and use of technologies that would otherwise not be available (particularly those held or used by the private sector). Emphasis will be on food security and poverty reduction for both smallholders in general and resource-poor farmers in particular, with the recognition that the large majority of resource-poor farmers are women. In particular, projects selected will need to demonstrate the contribution of the technology to AATF objectives, the value addition of the proposed intervention, and deliverability within reasonable time frames and reasonable costs.
- The constraints to be tackled must involve potential end users in problem definition, selection of technology interventions, project planning, implementation, monitoring and evaluation.
- Consideration will be given to enabling environment issues (including national/regional consumer acceptance of the technology; efficient national/regional biosafety regulatory systems; mechanisms for compliance with intellectual property rights (IPR) protection; adequate capacity in seed production; seed input markets; and effective demand for the product). Projects will only be planned for countries/regions where enabling environment constraints to sustainable and profitable use by smallholders are either being tackled or where AATF can facilitate the process of putting favourable conditions in place within a reasonable time frame and at a reasonable cost.

4.3 Project Life Cycle

AATF has elaborated steps that are followed during project formulation and implementation as illustrated in Figure 2. The process has three interactive phases as indicated below and also described in section 4.1.

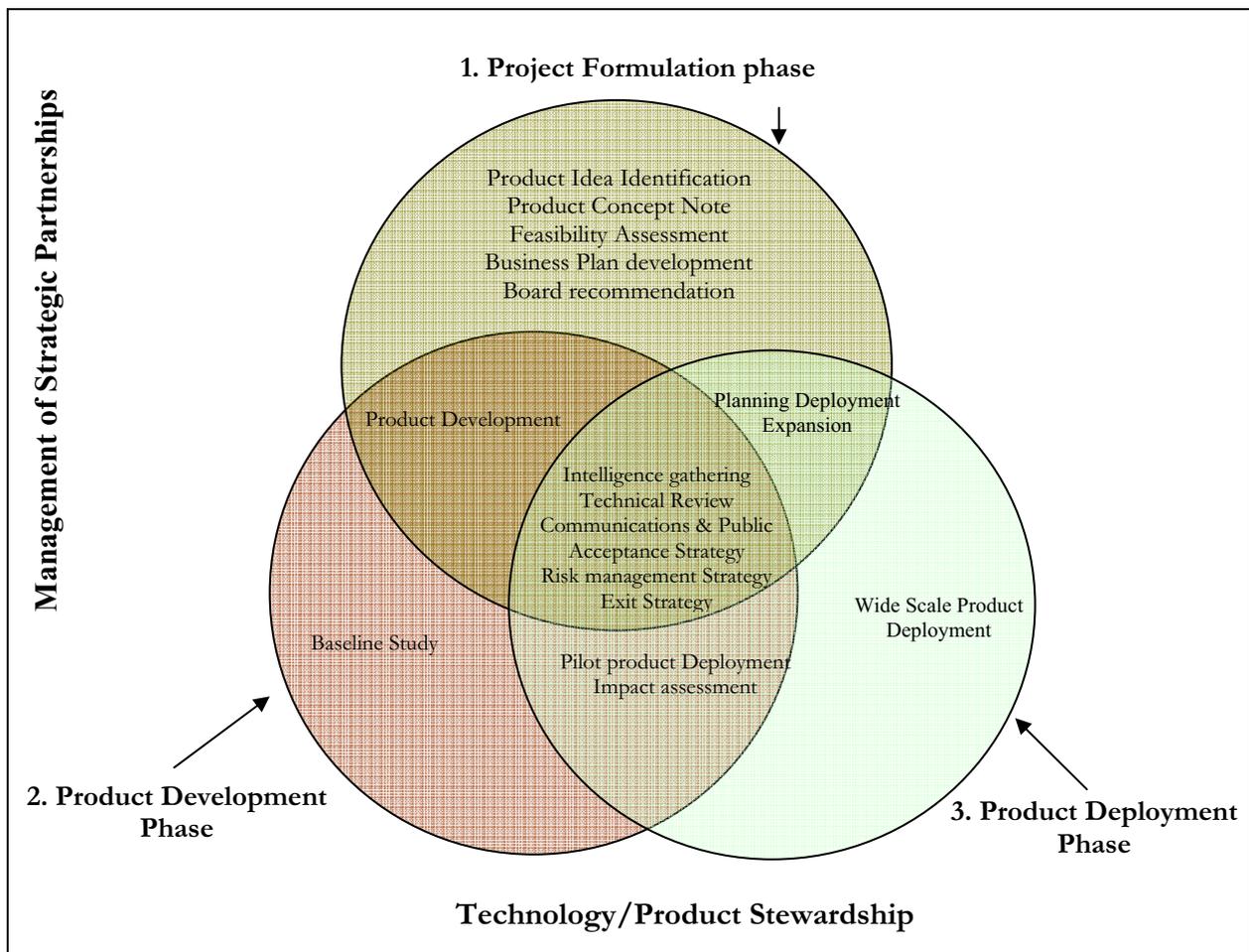


Figure 2. Interactions of phases and steps of the AATF Project Life Cycle

4.3.1 Business Plan Preparation (Project Formulation Phase)

AATF Management continuously gathers intelligence on available proprietary technologies with a view to identifying technologies that may address African smallholder farmers’ constraints. Once such a technology is found, the patent holder is approached and, if there is a good indication that the patent holder is willing to give access to the technology on humanitarian grounds, a rigorous process is initiated to evaluate this opportunity and to formulate a project that will use the technology to convert it into products to be used by smallholder farmers. This process goes through the formulation of a product concept note, a technical review of the concept, a feasibility study and ultimately a project business plan.

During the project formulation phase, an inventory is made of all the technology components required and a technology due diligence is conducted to ascertain the ownership of all components. Negotiations are held with the owners of all the technology components to obtain the rights (usually in the form of licenses) to use their intellectual property with full freedom-to-operate (FTO). Typically, AATF will then grant sub-licenses to partner

institutions for further research, as needed, to adapt the technologies to smallholder farming conditions, to test the adapted technologies, and for commercial production and distribution.

Product concept notes are developed in close consultation with key stakeholders. The concept will cover the key commercial (including demand), technical, financial and regulatory issues associated with the product. Table 2 describes the expected contents of a product concept note. Interaction with stakeholders will be project specific. Product concept notes are subjected to an external scientific/technical peer review by experts in the field of interest. A feasibility study is commissioned to explore the various possible approaches of producing and deploying the product, examine their advantages and the risks associated with them. At each one of these steps, there is a possibility of terminating the project if the analysis reveals a low probability of success of the project. The reviewed product concept note and the feasibility study are then used to develop a project business plan which is submitted to the Programme/Product Development Committee of the AATF Board for approval. Once approved, the project business plan becomes the project’s reference document that is used to draw annual work plans and to guide the implementation of project activities.

Table 2. Typical content of a Product Concept Note

Area	Content
Product description	Details of the product and the territory.
Demand (effective or otherwise)	Evidence from consultations/experts/participatory methods. To include description of expected markets/value chain.
Impact on food security/incomes	<i>Ex ante</i> assessment of expected usage/impact on crop losses and incomes.
Technical feasibility/key stages	Technology requirements (covering process, products and technical information).
Risk management approach	Description of critical sensitivities, environmental hazards and performance milestones (which will form the basis for project monitoring).
Preliminary forecast costing	Early estimates of the project related costs, including the costs of developing the full project plan.
Funding/technology sources	Indication of initial potential funders/technology licensors. Details of potential revenue generation (if any). Funding strategy, including potential for matched funding.
Partner requirements	Expected partnering arrangements for adaptive research, regulatory approval, production, distribution and market development. Initial indication of commercial basis of licensing.
Key AATF actions	Summary implementation timetable.

4.3.2 Product Development Phase

In this phase, AATF is involved in packaging the technology into a product or adapting the technology/product for use in target areas of Sub-Saharan Africa. This may entail some adaptive research and testing on-station and on-farm. It also calls for the development of risk management, communications strategies and baseline studies to take account of potential scenarios on the ground. Issues of public acceptance of the product become critical from this stage. With a product in sight, it is important to identify strong partnerships that will support

the dissemination of information to various critical targets that will have an impact on the final release and use of the product. Other activities in this phase include the identification of partners for product development, setting up structures to service the partnership, gathering information that will assist regulatory compliance, and monitoring public opinion.

4.3.3 Product Deployment Phase

At this stage, a product has been developed, tested and found to provide a satisfactory solution to the targeted farmers' constraints. Relevant institutions, whether public or private, will have been identified to mass produce and distribute the product. Deployment of the product will start in pilot locations. Preliminary adoption studies and farmer perception studies of the technology/product shall be conducted in this phase. Lessons learned in the pilot location will be used to scale out the technology to other locations. Wide-scale deployment activities shall be conducted to reach as many farmers as possible. During this phase, AATF will identify and establish strategies that will support the long term availability of the products. Such strategies shall include the private sector entity commercialising the product, extension services, NGOs and CBOs. An exit strategy will be designed (often during the project formulation phase) to ensure that the product will continue to be accessible to farmer after AATF has disengaged from the project.

4.4 Project management

4.4.1. Project Portfolio Management

Project portfolio management needs to recognise both the urgency of establishing some early successes and the realities of the inevitable delays inherent in product development, testing, regulatory approval and commercialisation. In its early years of implementing its mission, AATF will emphasise access to proven technologies but will balance its portfolio so that its individual products come on stream in a relatively balanced fashion, allowing the required attention at each step of the development process. While emphasising relatively low-risk and short- to medium-term product development trajectories, AATF project portfolio will also include a selected number of riskier, but potentially high payoff opportunities; these will be carefully monitored and evaluated in order to justify continued investment.

In addition, there will be a number of cases where the successful implementation of a project in a particular country will lead to demand for similar work in a number of other countries. In the early years, such expansion (e.g. to a second country) may require almost as many financial and human resources as the original project, as new partnerships are formed with the relevant organisations and contacts are established with additional national legal and regulatory systems. Such demands may lead to at least temporary expansion in AATF's project management investment, through project coordinators inbuilt within each project. In later years, as national commercial and regulatory institutions develop, and as AATF gains more experience, the replication of individual projects should occupy a smaller proportion of AATF time.

There is also a need to balance project portfolio management with investment in staff development. The slower pace of project activities at the outset allows some space for relatively heavier investment in staff development in the earlier years.

4.4.2 Partnership Management

AATF takes a proactive role in facilitating the creation of partnership alliances that strive to unite a wide variety of public and private sector organisations around shared agricultural research and development goals for the ‘public good’. The Foundation views these partnerships as constituting its primary means of bringing advanced proprietary R&D technologies and information to bear on the problems faced by resource-poor smallholder farmers in Sub-Saharan Africa. Partnership is at the core of AATF strategy and is recognised as the means by which the Foundation will deliver on its mandate of accessing technologies from providers, and stewarding the technologies it accesses and products therefrom until they reach the smallholder farmers. Partnership development and management is therefore a mission critical function.

The Foundation’s objective of entering into partnerships is to seek opportunities for mutually beneficial relationships that will support the achievement of the Foundation’s mandate. This will be guided by two main elements: the Foundation’s vision of having “*prosperous farmers and a food secure Africa, enabled through AATF’s catalytic role in bringing innovative technologies to smallholder farmers*”; and its promise to various stakeholders and partners to be an honest broker and responsible party in accessing and delivering proprietary technologies.

The stakeholders include smallholder resource-poor farmers, African scientists and technology providers and investors. AATF will work closely with smallholder resource-poor farmers to identify their needs and match them with technologies suitable for adaptation to African ecologies and farming systems, and to address constraints to access and use of appropriate agricultural technologies. To African scientists, AATF will serve as the bridge that allows them access the ‘tools’ they need to get the final product into the hands of the farmers and contribute to capacity development within SSA institutions. To technology providers and investors, AATF will address their needs and ensure appropriate use of the technologies combining the best practices from the public and private realms, balancing concerns for expense, simplicity and effectiveness for sustainable adoption of the technologies by the smallholder farmers.

The Foundation’s strategy for achieving its objectives is to facilitate collaboration and partnerships among competent institutions in Africa and elsewhere, responding on a project-by-project basis to the expressed needs of African farmers.

The nature of AATF’s collaborations and partnerships will vary depending on the specific requirements of each project. AATF will initiate and put in place mechanisms and partnerships to ensure production, distribution and use of the technologies by African farmers. In all of its activities, AATF will act as a facilitator, with delivery and implementation carried out by public, private and NGO partners.

Management of partnerships will be guided by the different partnership models that will be defined by each relationship. For each partnership entered into, AATF will seek to have clearly defined agreements that will guide expectations by the partners. AATF will invest in understanding what it takes to make such partnerships effective. It will also seek to identify areas of common interest shared by different entities in order to benefit all involved.

4.4.3 Stewardship

Ultimate responsibility for product stewardship rests with the producer of a product, as well as with distributors, regulators and consumers. However, AATF shall ensure that a comprehensive stewardship program is put into place. In many cases this will be an important topic of initial negotiations with technology providers who will seek assurances that their innovations will be used responsibly. As the responsible party, AATF will include stewardship concerns in all of its partnerships. Stewardship management by AATF is particularly important at the product testing and delivery phases. Stewardship will also be an important element in AATF's information management strategies, ensuring that all stakeholders have access to appropriate information to promote good stewardship.

4.4.4 Risk Management Strategies

The risks to AATF have been assessed under four headings: project selection risks; project implementation risks; operational risks and donor risks. This assessment will inform AATF management and donors in the development and monitoring of AATF's activities. Table 3 outlines the perceived risks, together with mitigation strategies.

Table 3. Risk analysis and mitigation strategy

Risks	Mitigation Strategy
Project selection risks	
1. Technology is not the most cost-effective means for addressing an identified constraint	Projects will be designed in conjunction with key stakeholders and end users; relevance and cost-effectiveness of technologies developed and promoted will be reviewed at milestones throughout the project.
2. The solution is not pro-poor (e.g. due to incorrect analysis/assumptions on affordability, relevance or 'taste')	AATF's focus is on resource-poor smallholder farmers. Projects undertaken will need to demonstrate <i>ex ante</i> a high pro-poor impact and substantial cost-benefit ratios.
3. The project has unidentified economic, social or environmental side effects	The design of projects will give explicit consideration to enabling environment issues. A robust project formulation process including peer-review of concept note, feasibility study and business plan development reduces the probability of unidentified side effects.
Project implementation risks	
1. AATF's inability to manage disparate partners in a project within time and budget	AATF will recruit individuals with appropriate skills and track record in project management.
2. Changes in the political, economic and regulatory environment within a target country	Changes in the enabling environment and projects will be reviewed at major milestones throughout the project's life.
3. AATF fails to mobilise funding for projects.	In principle, funding availability should be confirmed before product development and deployment can proceed.
4. Failure or cost overruns associated with R&D	Contracts with project implementation partners should be designed to minimise the risk of cost overruns. Cost will be reviewed at each milestone.
5. Failure to contracts in target countries	Country specific arrangements will be agreed upon and put in place at the onset of the project. AATF shall design and implement a robust monitoring programme.
6. Failure to ensure that IP rights obtained by AATF are not infringed.	AATF will stress to partner institutions and other users the importance of respecting the IP rights of third parties. In addition, AATF will design and implement a robust monitoring programme
Operational risks	
1. The inability of AATF recruiting and retaining staff with the appropriate skills at reasonable cost	As a knowledge-based organisation, AATF staff are its most valuable asset. The recruitment strategy will be designed to attract high quality staff with a competitive remuneration package to retain them.
2. Conflicts of interest at Board or partner level	Board members will be appointed in their personal capacity and not as representative of their institution. AATF Management shall periodically conduct partnership analysis and take appropriate action when cases of conflict of interest are identified.
3. Failure of the governance structure to provide effective, strategic management of AATF	The governance arrangements are in line with the best practice in public and private sector: the separation of responsibilities between the Board and the Management, internal and external audits performed by world class management consulting firms, and donors' scrutiny during Annual Donors Meetings and periodical external reviews are robust safeguards against ineffective management.
Donor/political risks	
1. Hostile Press coverage in relation to AATF involvement with multinationals and/or GMOs	AATF will implement a proactive communication strategy and will follow clearly-defined policies on technology choices and in the interest of African smallholder farmers.
2. High transaction costs associated with donor monitoring/information requirements	AATF donors should agree to a common reporting schedule and to holding Annual Donors Meetings at minimal cost to AATF; they should agree to hold joint external reviews.
3. Conflicts with (potentially) competing institutions.	The Executive Director and the Board Chair will actively coordinate AATF's activities with existing institutions. As a facilitator, AATF should yield when a competent organisation is committed to undertaking an activity that it would otherwise undertake.
Post-deployment risks	
1. Technology failure	AATF and partners will implement a technology/product stewardship programs including pest resistance management plans.

Table 4. Roles and responsibilities in the technology value chain

Steps in the Value Chain	Technology Identification	Product Identification	Research and Development	Input Production	Input Marketing	Agricultural Production	Surplus Marketing
AATF Roles							
Planning, Monitoring and Project Decisions	Concept note and technical reviews Review by AATF → Go/No Go	Feasibility study, Business Plan, Board review → Go/No Go	Contracts with R&D institutions, Review progress, IP, regulatory → Go/No Go	Contracts with input producers, Review progress, Assess any new information	Contracts with marketing and promotions organisations, Monitor progress	Contracts or links with NGOs and extension services, Review progress	Contracts or links with output marketing organisations, Review progress
IP Management	Negotiate access to IP, Examine possible licensing arrangements	FTO analysis, Develop liability management plan	Develop licensing agreements for commercial use	Ensure licensing agreements are followed	Verify IPR enforcement	Review licensing requirements for expansion to other areas	Verify IPR enforcement
Fostering Regulatory Compliance	Assess regulatory requirements of the technology	Assess regulatory processes are in place and their costs	Ensure regulatory data are developed to meet requirements	Ensure that regulatory procedures are followed	Assess adequacy of point-of-sale regulation, farmer protection	Review regulatory requirements for expansion to other areas	Evaluate regulatory compliance of product on the market
Product R&D Management	Review performance with this type of technology elsewhere	Assess technical feasibility, identify partners, mobilise resources	Review research progress, assess additional research needs	Assess initial performance of product in pilot areas	Monitor product performance	Assess needs for additional research for product in new areas	Assess product performance in the market
Monitoring and Facilitating Production and Delivery	Assess possible mechanisms for production and delivery	Identify production and delivery strategies, costs, needs (e.g. segmentation)	Identify producers, distributors (seek support if required)	Monitor production, ensure promotion and marketing strategies in place	Monitor marketing, assess needs for adjustments to strategies	Review expansion opportunities to other areas	Assess repeated use of product
Communication	Familiarisation with the technology, assess potential challenges	Develop a communication strategy	Update strategy, contribute to promotion strategies	Facilitate marketing strategy, create public awareness	Implement communication strategy	Review communication needs for extension to other areas	Monitor public acceptance
Stewardship	Identify potential risks	Develop a stewardship plan	Review potential risks and update stewardship plan	Evaluate adequacy of stewardship plan	Continue monitoring stewardship plan	Review stewardship requirements for expansion to other areas	Monitor stewardship plan performance
Impact Assessment	Get data on target areas, assess ex-ante impact on food security, income	Assess alternative and complementary technologies	Review evidence on potential impact, commission baseline study		Commission technology perception study	Commission technology adoption study	Commission impact assessment study

5.0 AATF’s Governance, Management and Resources

5.1 Governance

5.1.1 Governance of the Foundation

AATF is a not-for-profit, limited liability entity. Its governance structure creates a clear separation between the responsibility for setting and monitoring strategy and the management of operations. A Board of Trustees is appointed to run the Foundation and has overall fiduciary responsibility for its activities. It also approves the work plan, budget and business processes; appoints and monitors the Executive Director; and sets delegated authorities for the Executive Director and AATF management. The Trustees (a total of 7–12 persons) are drawn from a range of backgrounds and institutions and serve in their personal capacities. They are elected for terms of no more than three years and are eligible for re-election to a second term. Terms of office are staggered in order to ensure continuity on the Board. The Chair of the Board is elected for a three-year term. There is an Executive Sub-Committee and additional sub-committees responsible for program and product development, nominations, and audit.

There is also a Board Advisory Committee, comprising representatives of various stakeholder organisations in Africa, technology providers and donors that provides guidance to the Board. This committee meets approximately every two years and their members are consulted by the Board on an ad hoc basis.

5.1.2 Project Governance

The project development process is managed by AATF in consultation with its partners. Once approved and funded, product development and deployment activities typically are managed by a Project Coordinator recruited by AATF or seconded by a partner institution. The Project Coordinator is under the supervision of a Project Steering Committee made up of stakeholder representatives. A host of experts in various disciplines relevant for project implementation, referred to as Technical Advisors, are selected to provide, on a voluntary basis, technical advice to the Project Coordinator. The Project Steering Committee and the Technical Advisors meet once a year to review project’s progress and approve the work plan for the following year. The Project Coordinator reports to AATF through the AATF Project Portfolio Manager.

5.2 Management structure.

The management of AATF during this planning period is composed of the following:

- **Executive Director**, with overall responsibility for the operations of AATF, including strategic guidance, resource mobilisation and utilisation as well as managing partner and donor relations

- **Technical Operations Manager**, responsible for identifying opportunities for agricultural technology interventions, assessing the feasibility and probability of success of project concepts, identifying sources of appropriate technologies, negotiating their access and deployment, and providing overall leadership in the implementation of AATF's project portfolio
- **Regulatory Matters Specialist**, responsible for the development and management of components critical for the regulatory approval process for deployment of agricultural technologies, including ensuring compliance with regulatory requirements of target countries, and assessing and mitigating risks for AATF projects
- **Legal Counsel**, responsible for AATF's management of intellectual property, including licensing and contract arrangements, assessing and mitigating liabilities, and for ensuring the corporate integrity of the Foundation
- **Project Portfolio Manager**, responsible for monitoring the day-to-day implementation of AATF's projects portfolio, including consultations with stakeholders for priority setting, monitoring and technical supervision of project implementation across the technology delivery value chain. The Project Portfolio Manager doubles as the Seed Systems Specialist for advising on germplasm development and improvement, and seed production and distribution elements of product concepts and project plans
- **Business Development Manager**, responsible for evaluating commercial viability and financial feasibility of all AATF's projects, for formulating project business plans, and for providing to AATF and its partners the agribusiness perspective in technology selection, product development and deployment
- **Communications and Partnerships Manager**, responsible for managing the Foundation's public relations, managing strategic partnerships within AATF projects, designing and implementing its communication strategies
- **Administration and Finance Manager**, responsible for managing the administrative, human and financial resource functions of AATF.

In addition, AATF management will need support staff comprising of a special assistant to the Executive Director, an information and knowledge management specialist, one accounting officer, three administrative assistants, one publications and website officer, and one research and documentation officer. The structure of AATF should ensure strong technical support for proper understanding of technologies and for project implementation, but is intended to be lean and small; the Foundation will therefore rely on input from consultants and on temporary technical programme assistants on a need basis. For legal expertise, AATF has established linkages with various institutions such as PIIPA (Public Interest Intellectual Property Associates) and PIPRA (Public Intellectual Property Resources for Agriculture) that may provide legal assistance on a pro bono basis. The AATF Legal Counsel coordinates the Foundation's access to legal expertise, including to paid services.

5.3 Resources

5.3.1 Human resource development

AATF's mandate requires a small but highly qualified staff. AATF may expand with project staff (e.g. Project Coordinator) recruited for the duration of a project, either seconded by a partner organisation or fully paid up from project resources. AATF's core of technical, legal, business, communication and regulatory expertise will necessarily remain small.

These core responsibilities present a particular challenge because they involve the conduct of activities that have rarely been performed in Africa by public institutions: the negotiation for accessing proprietary technology and managing its development into products that will be delivered to resource-poor farmers, in an environment where commercial, regulatory, and legal institutions are relatively untested. It is therefore inevitable that AATF staff will have to grow with their jobs and, in the process, develop unique sets of expertise.

An important challenge for AATF is devising opportunities to help its staff obtain such expertise. One way is to provide access to venues for professional interaction (industry or professional conferences and international negotiations). More intensive experience can be gained during limited internships with relevant industry or regulatory bodies, and AATF will need to develop such opportunities.

In addition, AATF recognises that it needs to build staff experience with the demands and processes of agribusiness. Any staffing expansion will place high priority on attracting personnel with significant hands-on experience in agribusiness.

Some of the issues that AATF will be called upon to address are so complex and specialised that it is unreasonable to believe that the organisation can develop in-house capacity. AATF will therefore need to expand its network of external professional advice. There will be occasions when AATF will need to contract outside expertise, but much of the provision of such advice should be available from appropriate industry or research sources on a pro bono basis, and AATF will need to ensure that its mission is widely understood and that private industry sees the provision of such expertise as an important part of corporate social responsibility.

The fact that most of AATF's projects involve significant lead times before actual products are being tested and marketed provides an opportunity to build staff experience and contacts in the relevant professional areas. One way to take advantage of this opportunity is to devote a portion of staff time in AATF's first years to documenting and analysing the status and performance of key regulatory and legal areas in Africa. Once such reporting and monitoring procedures are established, they will require a smaller proportion of staff time in future years, when actual project management responsibilities will expand.

5.3.2 Financial resources

AATF is supported by donor commitments for the first five years of the Foundation's life. This type of grant funding is consistent with the 'public good' nature of AATF's work that facilitates access to technologies that would not otherwise reach resource-poor farmers.

AATF plans to use its initial funding to leverage additional contributions from other donors and from the private sector. The current model assumes that the private sector will contribute its technologies and AATF will pursue possibilities for gaining access to the time of private sector specialists (in areas such as product development, technology acceptance or regulatory compliance) as well as opportunities for internships for AATF staff in private or public institutions with significant expertise in areas of interest to AATF's work.

AATF will also pursue the possibility of donor funding for individual projects. This would provide possibilities of closer interaction and collaboration with donors that have interests in particular types of technology, but it runs the risk of increasing the burden on reporting procedures (if each project has a separate donor) and, in the extreme, could detract from AATF's ability to provide a consistent and coordinated service.

Various types of endowment fund that would provide AATF with a secure income to manage its core functions are another possibility.

In the longer term AATF will seek opportunities to generate revenues to cover the costs of some of its operating activities. AATF is currently prohibited from charging royalties on its products, although as markets develop it may be advisable to seek approval to levy modest royalties on selected products to help recover costs.

The precise composition of AATF's financial resources will depend to a large extent on the nature of the technologies it pursues and the pace of growth in Africa's commercial, legal and regulatory institutions. In its early years of operation virtually all of its projects will represent the delivery of technology that would otherwise remain inaccessible to resource-poor farmers and the public good nature of the task justifies donor and government support. As commercial incentives become more widespread in African agriculture, a certain proportion of AATF's projects should begin to attract more direct investment from the relevant industries, and farmers themselves will be able to pay a larger proportion of the costs.

6.0 Conclusion

The precarious state of Africa's food security, the extent of the continent's rural poverty, and the failure of many conventional programs and projects to bring about meaningful progress argue for the need to think creatively about African agriculture in the 21st century.

AATF is a unique and innovative approach to supporting Africa's farm households. It provides mechanisms to gain access to new proprietary technologies from around the world on a royalty-free basis; promotes the development and deployment of useful products by local research organisations and commercial firms; supports the growth of responsive and responsible regulatory, legal and commercial institutions; and helps build African agribusiness. It recognises the essential role that new technology must play in Africa's economic development. It draws on the widest possible range of scientific innovation, including, but certainly not limited to, biotechnology. Its support for the essential role of technical advances in agriculture is balanced by the recognition of public concerns about the possible inappropriate use of technology, and therefore insists on product stewardship in its own projects and encourages the growth of appropriate national regulatory and policy institutions.

The establishment of a mechanism to perform these unique and critical tasks requires time, expertise and patience. AATF needs to establish working relationships with an exceptionally wide range of stakeholders, manage partnerships for and ensure stewardship in the development and deployment of specific products, and build a knowledge base on the enabling environments for agricultural technology in various African countries.

We should thus expect significant evolution in AATF over its first decade. Its initial focus is technologies for food crops of importance to resource-poor farmers. Over time, this focus may expand to non-food and export crops or other agricultural enterprises that can also contribute to eliminating rural poverty in Africa. At the same time, we should expect the environment in which AATF operates to evolve. Commercial enterprises that serve African farmers (such as seed companies and engineering firms) should grow in number and strength, providing more demand and a wider range of partnerships for AATF. Public research institutions should develop closer links with those who can deliver their innovations in the market. At the same time, Africa's legal and regulatory institutions should become stronger and more experienced, making the facilitation of product development and deployment easier.

This evolution implies that the sources of support for AATF's activities will also shift, as commercial agricultural products become more widely used in Africa. Technology suppliers will see more opportunities for promoting their innovations and local commercial enterprises will be expected to make their own investments in product development and deployment.

The first decade of AATF's life will be a period of significant growth and learning for the organisation, fuelled by the emergence of new technologies, institutions and practices that see Africa's farm households becoming prosperous and playing a leading role in the development of robust, food-secure national economies.