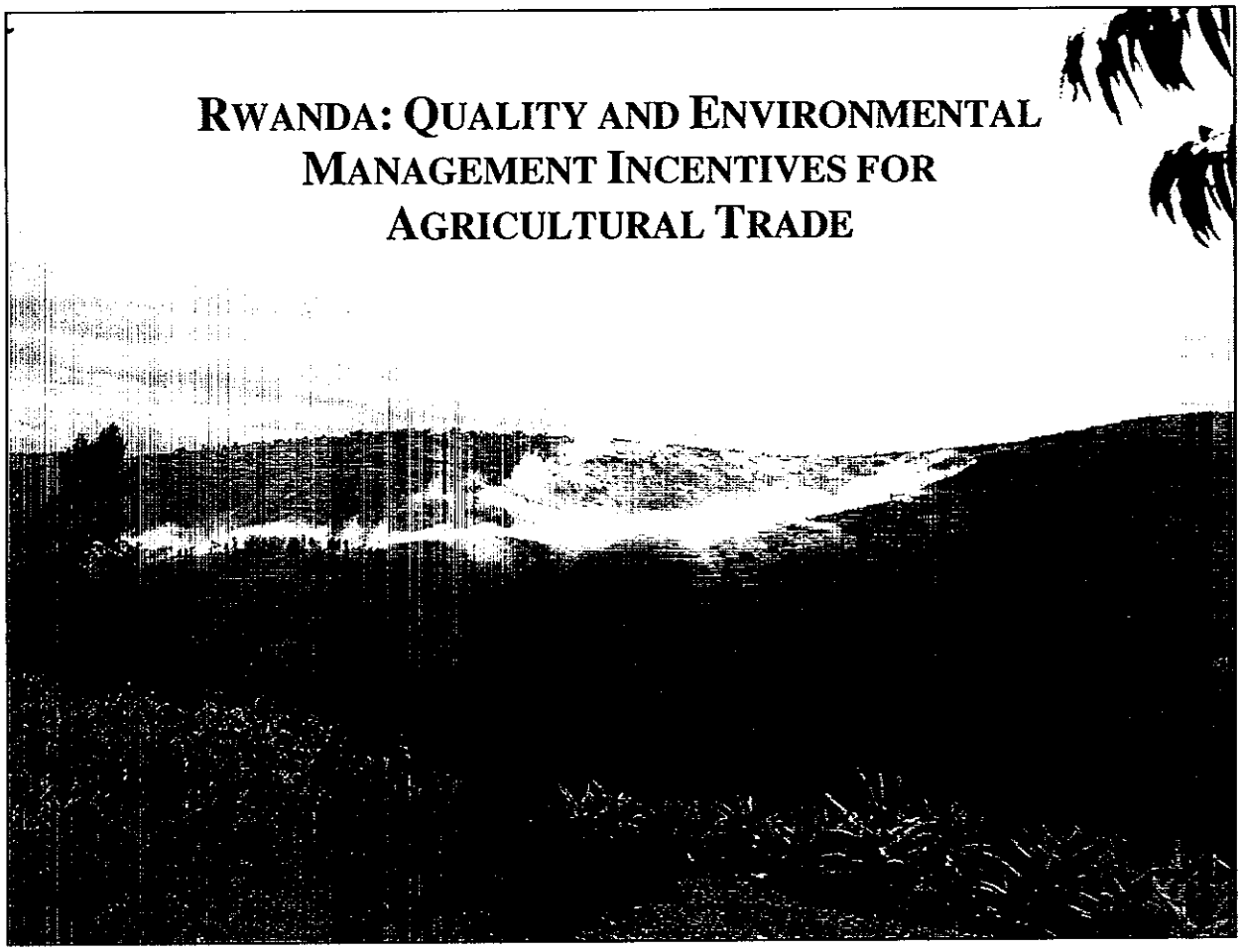
PN-ACT-992

RWANDA: QUALITY AND ENVIRONMENTAL MANAGEMENT INCENTIVES FOR AGRICULTURAL TRADE



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May 2002

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ACRONYMS

ADAR	Agribusiness Development Assistance in Rwanda
CFC	Chlorofluorocarbons
DRSA	Regional Agricultural Services Office
EMS	Environmental Management Systems
FLO	FairTrade Labeling Organization
Frw	Rwandan franc
HACCP	Hazard Analysis and Critical Control Point
ICRAF	International Center for Research in Agroforestry
IFOAM	International Federation of Organic Agriculture Movements
IPM	Integrated Pest Management
ISAR	Institut des Sciences Agronomiques du Rwanda
ISO	International Standard Organization
MINAGRI	Minister of Agriculture and Livestock
MINERENA	Ministry of Energy and Natural Resources
MINICOM	Minister of Commerce, Industry and Tourism
MINITERE	Ministry for Lands, Human Resettlement and Environmental Protection
MSDS	Material Safety Data Sheets
NPK	Generic term for fertilizer containing nitrogen (N), phosphorus (P), potassium (K)
QEMS	Quality and Environmental Management Systems
ORN	Rwanda Bureau of Standards
PEARL	USAID Partnership for Enhancing Agriculture in Rwanda through Linkages
PCBs	Polychlorinated biphenyls
RBS	Rwanda Bureau of Standards
REMA	Rwanda Environment Management Authority
SGS	Société Générale de Surveillance SA
SME	Small and Medium-Sized Enterprises
SOPYWRA	Société de Pyrethrum du Rwanda
UHT	Ultra-High Temperature

Executive Summary

Addressing food insecurity by diversifying agriculture-based income opportunities is a key feature of many donor programs in Rwanda. Accelerating income generation encourages investment in Rwandan agribusinesses and enables agricultural producers and processors to take advantage of global trade opportunities. High-value export markets, retailers, wholesalers, and brand name producers are requiring producers and processors to comply with increasingly rigorous standards for quality, the environment, health and safety. Supporting a more systemic integration of quality and environmental management will improve both competitiveness and environmental management in agriculture production, processing, and marketing in Rwanda.

A three-person team was fielded during a 10-day period to assist the Agribusiness Development Assistance in Rwanda (ADAR) project in identifying the operational aspects and potential environmental impacts of the agribusinesses it supports. The team sought to take a business-systems perspective to determine the extent to which these businesses are vulnerable to regulatory or market-based environmental pressures. The team looked at the applicability of both Rwandan and U.S. laws and regulations, as well as the significance of voluntary quality and environmental trade standards for specific commodities receiving ADAR support.

Rwandan agribusiness competitiveness in international markets is increasingly dependent on meeting rapidly evolving market standards. Beyond basic quality, many export commodity markets (including coffee, tea, organic horticulture, flowers, and pyrethrum) require conformance to independently audited certification standards, including International Standard Organization (ISO) 14001, Forestry Stewardship Council (FSC), International Federation of Organic Agriculture Movements (IFOAM) and FairTrade. Given that Rwanda has extremely weak environmental regulations, these market standards provide alternative means to achieve improved environmental management, as well as an opportunity to create economic incentives. However, most Rwandan exporters are poorly equipped to handle the supply chain's progressively more stringent third-party certification standards for product grades, processing, and handling requirements in quality, environment, and health and safety.

Higher-value agriculture export markets offer real opportunities to encourage better land-use management and sustainable agriculture practices through market incentives over wide expanses. Although a small fraction of Rwanda's farmers can compete in such markets, the broad geographic and economic reach of export *filières* can be harnessed for positive landscape-scale changes. The vast potential of out grower networks for coffee, tea, pyrethrum and organic produce offer exciting opportunities to extend sustainable husbandry practices across broad landscapes in a country that is unlikely to afford extension services.

Major Findings and Conclusions

1. ADAR agribusiness clients' abilities to enter and remain competitive in export markets are increasingly determined by their familiarity with and application of international standards for quality, health and safety, and environmental responsibility.

2. Specialty and high-value markets are particularly sensitive to consumer and business-to-business demands for products that are safe and healthy, and are produced in a socially and environmentally responsible manner.

3. Sales in rapidly growing, high-value markets provide the economic stability necessary for producers and processors to make needed investments in rational land use with a long-term view, in addition to imposing market-based environmental standards.

4. Most ADAR-assisted agribusinesses have weak management systems that hinder adaptation to market standards. These also hamper cost controls, identification of alternative production or processing procedures, and profitability.

5. ADAR clients with better management systems are more responsive, competitive, profitable, and efficient at meeting environmental standards, particularly those related to resource use and waste control. These clients and their processes prove more sustainable.

6. There is a shortage of basic enterprise consulting in Rwanda, as well as a complete dearth of quality and environmental management systems that respond to standards (e.g., ISO 9002/14001, FairTrade, and IFOAM). Dependency on expensive offshore auditors and implementation consultants will act as a serious cost barrier for ADAR clients.

7. Current environmental legislation and government capacity in Rwanda is inadequate to monitor the importation or use of agrochemicals in production or processing. The Bureau of Standards, Ministry of Agriculture and Livestock (MINAGRI), Ministry of Lands, Human Resettlement and Environmental Protection (MINITERE), Ministry of Commerce, Industry and Tourism (MINICOM), and other government testing facilities are currently unable to track the quality of agricultural inputs, and customs facilities are unable to control the importation of delisted or expired agrochemicals.

8. Several pieces of draft legislation, notably MINITERE's Framework Law on Environment and MINAGRI's regulations on Plant Protection and Pesticide Use, could eventually have direct bearing on and costly ramifications for ADAR-supported agribusinesses, which should be taken into consideration now.

9. The selection and use of agrochemicals in Rwanda is worrisome given the broad donor community's intent to use them to rapidly accelerate agriculture production. While current usage rates are very low (composite average of 3-4 kg per hectare per year), no safeguards are in place to discourage improper use of fertilizers and pesticides. Most, if not all, of ADAR's clients need to significantly improve their systematic application of guidelines for proper selection, storage, and application of agrochemicals.

General Recommendations

ADAR should help emerging Rwandan producers and processors meet the increasingly rigorous quality, health and safety, and environmental standards as a basic element of their competitiveness model. To improve profitable and sustainable agriculture and assure long-term economic growth, ADAR and USAID should carefully consider the following recommendations. More specific recommendations are offered within the report body:

1. ADAR should test the attached Quality and Environmental Management Systems (QEMS) as an element of its screening procedures for new applicants. Using such a tool can identify quality and environmental management issues it may be able to address.

2. ADAR's market information system should begin to routinely track and make available information on the standards regarding social responsibility that are likely to become increasingly important to exporters of high-value commodities.

3. ADAR and USAID should support a two-day practical awareness training in environment and quality management systems for agribusinesses, a five-day environmental management systems (EMS) certification training for line officers and consultants working for the Bureau of Standards and MINITERE, as well as a short evening seminar for key decision makers on the standards for social responsibility likely to affect Rwanda in the near term.

4. As a complementary but essential line of assistance, USAID and ADAR should support the development of local commercial capacity to implement and audit third-party certification to international market standards, including ISO 9002/14001, IFOAM, and FairTrade, by supporting local and regional consultants through networks and training.

5. USAID/Rwanda should consider the many ways in which landscape ecology can be more positively influenced by harnessing the power of agribusinesses and large numbers of producer associations and out growers. To meet USAID's natural resources management objective, the agency should consider protecting critical watershed elements; reducing soil erosion and fertility decline; assuring minimum operating distances from remaining natural forests and riparian zones; supporting cooperative management of forest plantations; encouraging policies that create incentives for forest-product out growers; and supporting regulatory reforms that better govern the use of agrochemicals and processing waste streams will all greatly help.

SECTION I

Introduction

Sustainability is a crosscutting theme spanning all Agribusiness Development Assistance in Rwanda (ADAR) operations. Given the fertile but finite and fragile natural-resource base in Rwanda, ADAR has determined to support the development and establishment of management systems that incorporate environmental values within supported agroindustries. Adding environmental aspects to production and marketing may provide a significant opportunity to enhance sustainability and help avoid future costs related to regulatory compliance and production factors. USAID and ADAR have determined that their contribution to agribusiness can be strengthened by facilitating improvements in its partners' ability to identify and respond to environmental cost-reduction opportunities, as well as track developments within the supply chains they feed. More systematic support for quality and environmental management systems (QEMS) can help ensure ADAR's clients continued access to export markets.

The objective of this work has been to help the ADAR project develop an internal management and documentation system that identifies the environmental aspects of client firms and develops a method by which ADAR can support the mitigation of potentially negative environmental consequences of the agroindustries it supports. The consultancy was designed to catalogue applicable regulations and current best practices (see Annex A: Scope of Work), which ADAR can easily and routinely support within current resource constraints.

The objectives of this assessment were to:

- Review current and prospective agroindustries receiving ADAR support to assess their operational aspects and the scope of these operations' potential environmental impacts and associated costs, as well as identify sources of mitigation support;

- Review current Rwandan environmental laws and meet with appropriate officials to identify and catalogue the regulations governing agroindustry environmental performance;

- Work closely with ADAR staff and the USAID Environment Officer to determine the nature and limitations of ADAR support services and the best way to leverage other projects that may be providing environmental services;

- Based on the above work with the ADAR team, design and develop an environmental decision support system that allows the project to identify and document its support to agroindustries that may have environmental consequences, as well as documenting cost savings that might accrue. Also, support mitigating measures, particularly by leveraging other projects' capacities and resources.

SECTION II

Approach and Findings

This section sketches the team's major findings and conclusions for each major commodity. The Quality and Environmental Management Systems (QEMS) team undertook a rapid analysis of the environmental situation and management capacity of select enterprises ADAR supports or may support during the field visits. The team developed and tested the Quality and Environmental Management System questionnaire to help guide interviews and site visits. The revised QEMS was refined and is included as Annex C: Quality and Environmental Management System Questionnaire. The team anticipates that this type of instrument will become a routine part of the ADAR screening program for new assistance requests. The QEMS team is developing this tool as an automated element of an environmental management decision support system that will help ADAR and similar projects elsewhere to more systematically review and document small and medium-sized enterprises (SMEs) and agribusinesses for environmental management needs at the time of application.

The team met with senior management and administrators, observed operations and environmental conditions at production and/or processing sites, conducted interviews with employees, and assessed institutional constraints and the regulatory and operations environment.

The enterprises reviewed have all received prior management and marketing support from ADAR. They can be categorized into traditional or non-traditional products, depending on the length of time they have been produced. For environmental management purposes, the distinction is unimportant, but to apply environment or quality trade standards, there is a significant difference between those commodities aimed at domestic consumers and those headed toward external markets.

A. Methodology

The Environmental Management Systems (EMS) team mission included a nine-day visit to Rwanda and the methodology adopted was calculated to take maximum advantage of the limited time available. The team spent approximately six days visiting nine agroindustrial enterprises in different parts of Rwanda. These included:

- A tea producer and processor;
- Two coffee association washing stations;
- A dairy producing *lait caillé* and yogurt;
- A fruit juice and preserves processor;
- A rose producer;
- A pyrethrum processor;
- A passion fruit producer, aggregator and processor; and
- An ornamental flower producer.

Except for the dairy and the fruit juice producer, all the enterprises were export-oriented with current and future ex-Africa buyers. While the team looked at operations and management capacity and did not discriminate between export enterprises and domestic market suppliers, the majority of ADAR clients are trying to sell into non-Rwandan markets and most of the team's attention was focused on those firms likely to export or attempting to export.

The team devoted approximately two days to meet with representatives of Rwandan government agencies and parastatals responsible for environmental regulations, as well as other standards and norms related to agroindustries. Rwandan government representatives included:

- The Ministry of Lands, Human Resettlement and Environmental Protection: Minister of State for Environmental Protection and Secretary General;
- The Ministry of Agriculture, Animal Resources, and Forestry: Minister of State and Senior Agriculture and Food Security Policy Advisor;
- The Rwanda Bureau of Standards: Director General;
- Institut des Sciences Agronomiques du Rwanda (ISAR): Director General;
- OCIR-Café: Director General; and
- Ministry of Commerce and Industry: Director of the Industrial Investments Division.

The team also met with the staff of several organizations that promote agribusinesses, including ADAR, ACDI/VOCA, and the PEARL Project. A complete list of contacts is included in Annex B.

B. Tea

Rwanda's eight tea estates are extremely important generators of foreign exchange and income, and employ tens of thousands on estate-managed tea processing plants. Multiples of these receive income from out grower areas. Most of the tea is from the uplands, but several operations produce "swamp" or irrigated tea. Both teas command relatively high world prices due to Rwanda's unique altitude, soils and microclimates. Some Rwandan tea producers are currently audited annually by FairTrade-accredited organizations for labor and producer pricing practices and other supply chain-driven systems looking at environment, health and safety concerns. There is every reason to believe the level of scrutiny with regard to social responsibility issues will become more exigent in the future, something also true for the use of independent auditors to meet *filière* requirements.

Dave Gibson

Lowland tea estate.

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B1. Agrochemical Management

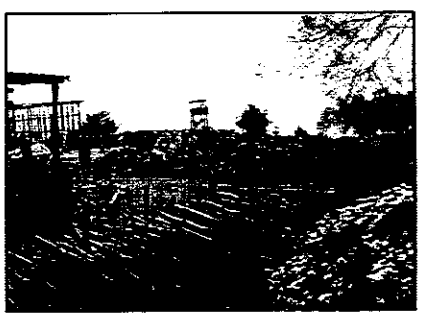
Tea is intensively managed on both estate and out grower areas and currently dependent on large quantities of composite fertilizers, fungicides, and pesticides that can total more than 1,000 kg per hectare per year. Of concern to both authorities and buyers is the use of this level of amendments on swamp tea, where over or improper application can result in rapid contamination of surface water. The adequacy of record keeping for the storage and distribution of pesticides on out grower parcels is very questionable, as is the level of training and supervision of both estate staff and out growers in the proper applications of all agrochemicals. ADAR should consider providing technical assistance to tea producers in the establishment and maintenance of pesticide training records and materials. Included in such training system establishment would be more systematic attention to the use and control of appropriate safety equipment for pesticide and fungicide handlers.

B2. Worker Health and Safety

Additional health and safety concerns spill over into the conduct of the drying and processing facility, where the team observed that cleaning, maintenance, and production staffs were working without proper foot and eye protection. Although the firm visited had access to medical personnel and evidently had a system to manage health and safety records, there was no indication that these records translated into training, improved signage, or other preventative actions. Safety signage is poor throughout Rwanda and no better or worse in the tea factories. But the workaround high-pressure drying facilities and the use of caustic cleaning agents require redoubled attention to protective equipment. ADAR and USAID could improve the situation by working with OCIR-Thé in the development and rollout of clustered training courses for tea estate agronomists and safety personnel.

B3. Fuelwood and Energy

Tea drying is done through boilers fired with fuel wood grown on private or state-owned plantations. Medium- and large-sized drying facilities require approximately one hectare of mature forest for each day of operation. Tea estates, which now compete with the construction boom needs for bricks and pole wood, are facing fuel wood shortages and increasing energy costs. Given the importance of drying in quality tea production, there are no realistic alternatives to fuel wood and estates must immediately help plan future forests. They must also pay attention to more thoroughly drying their fuel wood and identifying increased efficiencies in boiler operations. Tea plantations have the opportunity to stimulate many more jobs in the establishment and management of forest plantations; increasing prices may eventually stimulate private growers to shift some agriculture production to forestry. ADAR and other donors could work with tea estates in the establishment of model forests that could stimulate additional employment while improving overall watershed management. USAID may wish to



Dave Gibson

Fuelwood used in drying tea, the amount available from cutting one hectare of mature forest.

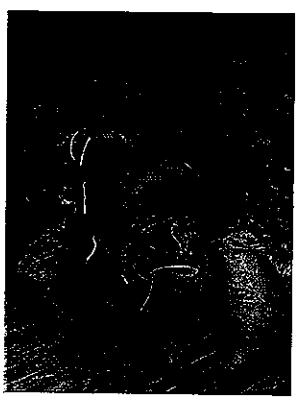
consider this collateral industrial forestry within the evolving strategic planning of natural resources management.

B4. Landscape Concerns

Tealeaf production, particularly swamp tea, is very vulnerable to upstream land-use decisions that accelerate runoff and cause flooding. Deforestation, expansion of agriculture into critical gallery forests and ravines, lack of terracing or mulching on subsistence crops, and hillside water retention are all directly responsible for the increased flooding that irrigated tea producers now face. Silting of plantations and the dramatic shifting of the peat "plates" that underline most swamp tea are reducing the area under cultivation. Plantations now face costly water retention and drainage investments to control water during the rainy season while assuring minimum water requirements during the dry season. Working more closely with local government in the delimitation of critical watershed areas and the establishment of commercial fuel wood plantations could have significant and positive impacts.

C. Coffee

In Rwanda, coffee is cultivated on small parcels, often on lower side slopes close to the homestead. Household production is, on average, some 20-50 plants per household. There are few large coffee estates and production can be described as very decentralized with very low input. High variability in cherry quality, lack of everything other than artesian washing and drying, and poor roasting characteristics have relegated Rwandan producers to the low end of the bulk Arabica coffee market. Falling coffee prices in this market segment have cut production to half of its 1980s level, and in many parts of the country, farmers have begun removing areas from production.


Dave Gibson

Coffee bean storage.

Similar to all agriculture commodities, the environmental aspect and potential impacts around coffee are the production of the primary product – coffee beans or "cherries" – and the processing they undergo on the way from a farmer's field to the ultimate market. USAID partners are concentrating their management support on either the organizers of coffee bean production (associations) or the elements of the commercialization chain (*filière*) by sorting, washing, drying, and transporting the intermediate product or "parchment coffee" to roasters and exporters to add value to bean production. The current strategy in Rwanda and elsewhere is to make producers more able to enter and stay in the specialty market.

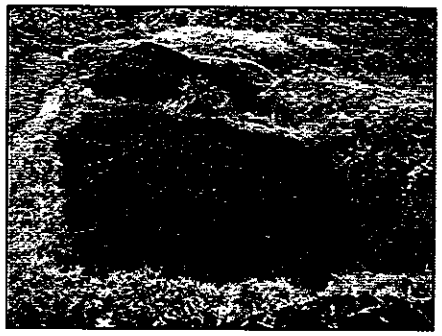
Although specialty markets offer the potential of premium prices and Rwanda's agroecology lends itself to excellent quality beans, it is not easy to enter or stay in these markets. Coffee specialty markets are governed by very high-quality and flavor (cupping) requirements. In addition, these markets are increasingly applying independently audited standards for production elements beyond quality. Quality aside, several emerging standards, such as FairTrade and Starbuck's Preferred Supplier programs (see Annex D), include attention to adequate producer prices, natural resources management concerns, and worker health and safety issues.

C1. Coffee Bean Production

Because of its historic value in the Rwandan landscape and the pre-genocide agronomic support system, coffee has traditionally been well managed. Most farmers use nothing more than very limited quantities of fungicide to control rust and use manure for nitrogen needs. Indeed, much of the coffee production would meet most organic criteria due to the limited use of inorganic amendments. Nursery production of plants and out planting using mulching, terracing, and largely organic amendments has made coffee an ecofriendly crop. Although shade coffee remains an elusive element of Rwanda's coffee production, despite 15 years of experimental research by ICRAF and ISAR into shade-tree species and planting configurations, coffee production has a positive watershed influence. If prices can be stabilized and gradually increased, coffee may have a long future in Rwanda.

C2. Washing Station Location and Management

It is often said that you only subtract value from good coffee beans: everything that is done after the bean is produced can only harm the quality of the cupping if done incorrectly. Depulping or washing coffee thus becomes a critical feature to maintain quality through the final drying and roasting phases. For this reason, USAID and its partners, including ADAR, have emphasized the establishment and management of stations. With the recent inauguration of the Maraba station outside Butare, there are now only two operational washing stations in Rwanda. Neighboring Burundi and Kenya have about 130 and 2000, respectively. Traditionally, coffee in Rwanda has been washed and dried at the household level, which limits competitiveness in more-than-basic coffee markets.


Dave Gibson

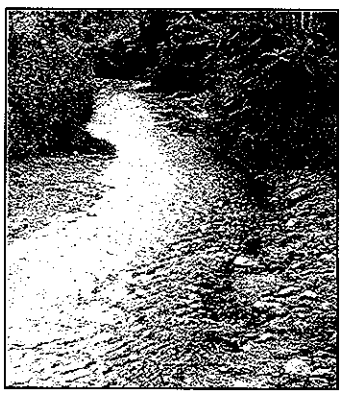
Pulp waste at coffee washing station greatly exceeds onsite storage.

Virtually all of the most serious environmental aspects and impacts of coffee production occur at the washing site. The average washing station in the region is capable of depulping 100 tons of wet fruit, and thus can increase environmental problems. High-water requirements for the mechanics of washing, generation of substantial quantities of pulp waste, and discharge of washing and fermentation water are all accentuated when production is concentrated at washing stations.

Water needs often dictate that stations be located close to water sources and oftentimes in river valleys. Not only do washing stations require high volumes of clean water (50-100 m3 per ton of wet fruit), which must be disposed of after washing, but the fermentation process of the depulped beans requires a smaller quantity of water that generates an effluent much higher in simple carbohydrates and organic matter. Although they are not toxic to humans, both waste streams can quickly reduce available oxygen in receiving waters and have impact on downstream fishponds, fragile swamps (*marais*) crucial to water management, and drinking water supplies. Both washing and fermentation water should be recycled and perked in settling ponds, respectively, before reaching surface waters. Unfortunately, recycling wash water adds another management dimension that is rarely considered unless the station is actually purchasing water from local authorities.

The large quantities of pulp that are concentrated at washing stations can provide a good source of organic matter if composted for six months to a year. But stations elsewhere have also proven to be unsightly sources of air pollution, rodent infestations, and soil contamination. In other countries, stations have not counted on the amounts of waste generated (a ton of parchment coffee produces nearly five tons of pulp) and are faced with the cost of transporting that waste elsewhere or storing it, often inappropriately. The ergonomics of an ideally sited washing station reduce such handling, provide adequate composting area, provide for the recycling of wash water, and allow for the proper perking of fermentation waste.

ADAR has been working with ACDI/VOCA and the PEARL project to develop design specifications for future washing station construction. The QEMS consultants consider that the parameters for the siting and management of future stations should be carefully reviewed with support from civil or environmental engineers familiar with the operations of such washing stations. Siting should also be consistent with the new environmental framework law currently moving through Parliament, which will, on a broad scale, prohibit discharging virtually any waste into wetlands or rivers (Article 72, 73, 74 and 75). This would eventually require filtering and recycling of wash water and mandatory perking of fermentation water.



Dave Gibson

Coffee washing station waste water (darker water on right) can have significant downstream impacts.

C3. Recommended Follow-Up Options

Operating stations should now be doing everything possible to screen pulp that is not recycled from entering receiving waters. Stations should accelerate the mixing of washing and receiving waters, and establish simple, cascading rock weirs during the dry season to enhance oxygenation. Perking fields for fermentation water should be established on permeable and well-drained soils outside of floodplains, if possible. The use of reconstructed wetlands for rapid uptake of nutrients and carbohydrates is an option that USAID should investigate within the context of its forthcoming natural resources strategic objective. The manual that ADAR consultants are developing for coffee station installation and management should have a chapter dedicated to identifying and mitigating these situations. The USAID Mission or the Regional Economic Development Services Office for East and Southern Africa (REDSO) Environmental Officer should review future construction.

D. Fresh-Cut Flowers

The export of fresh-cut flowers from countries in East and Southern Africa gained momentum over the past decade as northern country land and labor prices made production uncompetitive. Uganda, Kenya, and Zimbabwe have held prominent positions in the fresh-flowers market over recent years. Rwanda has occasionally been a player in flowers over the past decade, but civil war and genocide eliminated much of the human capacity, investment climate, and airlift necessary to stay in this highly competitive market. With African Development Bank support, a new entrant has reinvigorated interest in harnessing Rwanda's agroecological potential for flower production. Currently only one enterprise exports flowers – 10 varieties of long stem,

medium, and sweetheart roses – from Rwanda to Europe and competes directly with the estimated 23 producers in Uganda. The operational aspects of flower production and the most significant environmental impacts occur in three areas of production: water and groundwater management, agrochemical use, and worker safety.

D1. Water Requirements and Groundwater Pollution

Fresh flowers require large quantities of clean water for drip irrigation schemes and are close to water sources. Because of the high volume of water and large quantities of agrochemicals used, the most significant aspect and potential environmental impact of the fresh flowers are on surface and groundwater contamination. Rwandan producers are no exception, and the past and current flower exporters the team visited are located on reclaimed swamp land that sits approximately one meter above ground and surface water. Both producers visited are directly upstream from Rwanda's large rice and sugar producing areas. This same *marais* is situated directly above Kigali, on the primary water source upon which a significant and rapidly growing informal sector depends.

Dave Gibson

Irrigation/chemical treatment in rose green house.

There is a high degree of certainty that excess agrochemicals of all types are leaching into the immediate watershed. While some nearby sugar and rice producers may actually be benefiting from this seepage, the obvious nutrient loading that is taking place is disrupting downstream ecology with algae blooms, eutrophication, and reduced oxygen levels. The ability of aquatic grasses and papyrus to cleanse the water and maintain the hydrology of these swamps is reduced, and downstream aquaculture is being challenged.

D2. Agrochemical Use

The Rwandan rose exporter uses a sophisticated drip system that pumps approximately 130 m3 per day of double-filtered water through an elaborate system that places water and nutrients at the base of the plants. The fertilizer injection system allows a high degree of control in each of the five one-hectare sheds currently producing. Soil samples are taken routinely to determine the needs and the blend of amendments and apparently there is a simple management system that tracks fertilizer use. All pesticides and fungicides are applied aerially through either another centralized system or mobile spraying units where chemicals are mixed for individual application.

While the technology is adequate to minimize costly over application of chemicals, the overall management systems governing their procurement, handling, and application are inadequate. Blackboards in each shed prescribe agrochemical "cocktails" applied, but the operation lacked a log of historic use that allowed any sort of trend analysis. While the application rates of fertilizers were reasonably well managed, there was no routine maintenance of the use, inventories, or procurement of pesticides, nor was there any indication of training for application staff. The suppliers of agrochemicals evidently source products from many locations, and dating

and concentration information was most often labeled in languages neither spoken nor understood in Rwanda.

D3. Worker Safety

The systematic training in and use of protective equipment requires attention in most emerging market agribusinesses. The situation in Rwanda is not different. Protective gear and application equipment was poorly stored and lacked maintenance records. Breaches of normal protocols concerning pesticide handling, disposal of empty containers, and management of mixing vessels were evident, as well as indications that standard conventions describing minimum intervals between pesticide application and worker exposure were neither well understood nor applied. Lastly, the ventilation, lighting, and general management of pesticide storage areas were very inadequate and inventories of stocks were unavailable. Material data or specification sheets (MSDS) for any agrochemicals, instructions for extinguishing stocks in the event of fire or treating accidental poisoning, and records of accidents, illnesses, or safety violations were not available.

While the team identified important operational issues that had both cost and environmental management implications, most problems could be addressed through better housekeeping, including stepped-up training, improved documentation, and inventory management. Any improvements in general management systems that ADAR currently supports are likely to also identify the costs and opportunities in improved environmental management. Rapidly evolving standards for importation of fresh flowers into Europe (International Flower Coordination Association, among others) will likely require these management changes in any case. Major producers in the Americas (e.g., Dole/Ameriflor) have already begun certifying plantations to ISO 14001 and SA 8000, which would preclude these practices. By incorporating specific attention to agrochemical management, ADAR could assist flower producers to become more compliant with standards and improve their bottom lines.

Dave Gibson

Inappropriate storage/disposal of pesticide containers.

D4. Recommended Follow-Up Options

ADAR could encourage more progressive agrochemical management through several actions. Increasing senior management awareness about cost considerations, health and safety issues, and market implications through a walk-through audit would be a good start. Improvements in agrochemical inventory, procurement methods, and application management must be systematically developed through hands-on training. Clustering industries with a high use of agrochemicals (e.g., tea, flowers, and pyrethrum) into a tailored training course to which each commodity team takes plans to be reviewed and products that define the system would be a way that could reduce costs and justify repeat consultants. An extremely valuable follow-up exercise would be to team the international consultants up with some proven local consultants, and involve the Rwandan Bureau of Standards (ORN) and the new Environmental Protection Unit.

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E. Organic Horticulture

International markets for organic fruits and vegetables offer another potential opportunity for intensification in Rwanda. ADAR is working with several producers currently exporting into regional and European markets for certified organic products. Good growing conditions and counter-season growing capabilities afford Rwandan producers some important advantages. Producing quality products without the loss of soil fertility is the most significant challenge to sustainability. ADAR is supporting producers in the development of market information and contacts, training in business administration, and producing quality products that can compete in European markets.

Two aspects of agronomic practices govern organic production on the steep slopes of Rwanda: those practices that are permissible by international certifying bodies and those that are actually sustainable on the steep slopes and fragile soils of Rwandan agriculture.

E1. Organic Certification

Until quite recently, most organic certifications were fundamentally based on a prohibition of the use of inorganic fertilizers and pesticides during the previous three years. There were not specific principles or criteria that required that third-party auditors or certified producers take into account biodiversity and forestry, attention to soil conservation and water management, recycling, and development of planning that incorporated landscape-level considerations. While many of the standards in place in the United States still do not address such elements, the European market where Rwanda sells is quickly incorporating measurable criteria. Standards for organic produce are evolving as quickly as other social responsibility standards for other commodities described thus far.

Dave Gibson

Barren soil in steeply sloped passion fruit field.

The report by ADAR consultant Dr. Anne Turner (March 2002) discusses a dozen organizations of interest to Rwandan producers that were encountered at the BIOFACH International Organic Trade Fair in Nuremburg, Germany. Perhaps the most important is IFOAM, which is an umbrella organization to which many, if not most, individual organic products organizations belong. The IFOAM Basic Standards for Organic Production and Processing (2nd Draft 2002, 69 pages) begin with a chapter on Organic Ecosystems, which includes subsections on:

- Ecosystem management and landscape development
- Biodiversity and nature conservation
- Genetic engineering
- Soil conservation
- Water management
- Wild harvested products and common/public land management
- Use of abiotic resources (encouraging use of renewable resources)

Of particular relevance to ADAR producers, the ecosystem management and landscape development section of IFOAM's recent draft standard requires that the operator shall:

- "Develop an ecosystem management plan of the whole farm, including semi-natural and natural habitats, and manage to ensure their protection";
- "Take appropriate measures to prevent erosion and ensure livestock numbers do not degrade land";
- "Not excessively exploit or deplete water resources and ensure livestock do not pollute water resources"; and
- "Return nutrients and other resources removed through harvesting by the recycling and addition of organic matter."

A partial draft of the IFOAM standard is appended in Annex E. The IFOAM standard is used as the primary audit tool for most agencies selling certified produce in Europe. Auditors from the German certifying company, Control and Certification Organization (ECOCERT), have already performed audits on ADAR partners. Although numerous companies such as Société Générale de Surveillance SA (SGS) and KPMG consult and audit to these standards, the language and specific auditing criteria remain vague.

E2. Production Agronomy and Soil Management

The team visited several organizations attempting to sell to organic markets. While their attention toward developing export-level fruit quality was progressing and they knew something about the agrochemical constraints of being organic, they were most often unaware of agronomic best-management practices that would keep them in business more than one or two seasons. Cultivation on steep slopes, often in excess of 30 degrees, without attention to soil erosion prevention threatens sustainable production. The team observed many organic sites with conditions comparable to test sites where the measured top-soil loss exceeded 100 tons per hectare per year without terracing, mulching, or cover cropping. They were clearly unsustainable and will eventually require abandonment or use of inorganic fertilizers to recapture fertility.

ADAR has been supporting agronomic assistance for fruit production and has the capacity to add attention to fertility and erosion management through targeted extension materials. With the high degree of commitment exporters tend to show, these farms could become model farms where use of manure, cover and intercropping, and terracing could be effectively demonstrated. Development of short and translated best practices technical sheets or manuals could reinforce these practices over wider parts of the organic landscape. Many of these materials were produced in the 1980s within the GTZ/Nyabisindu project. However, enquiries to GTZ suggest that much, if not all of those extension materials, have been lost.

E3. Recommended Follow-Up Options

Improving the availability of information on emerging organic standards should be perceived as part of ADAR's overall mission. The market information system widely used by agribusinesses could be tailored to provide targeted updates on standards and case studies. A quarterly review on the subject would help fledgling producers, as would attendance at trade shows. With the

emphasis emerging on landscape and ecoregional planning, organic enterprises will need to build skills though targeted consulting to identify likely conservation issues (e.g., soil erosion, proximity to forest, water conservation, and solid waste management) and mitigation strategies, and to develop credible plans that *filières* will respect. Identifying and working with key stakeholders, including local MINAGRI agronomists and local consultants, will be important to reduce the costs of these environmental production factors.

F. Pyrethrum

Another export crop that is grown by an estimated 15,000 smallholders in the Rhuengeri and Gisenyi Prefectures is pyrethrum. This composite flower, a member of the chrysanthemum family, has been cultivated on small parcels adjacent to food crops since the 1980s, when a factory was installed to distill the pyrethrums. Pyrethrums have a low order of toxicity to warm-blooded animals and may be used with safety as contact or fogging applications in food plants, homes, and around animals in cases in which more hazardous materials cannot be used. Pyrethrum has a long history of use around mammals and birds, is quickly biodegradable, and resists the toxic build-up association with more persistent organic compounds.

The *filière* for pyrethrum is quite short and very sensitive to world pyrethrum prices that have been buffeted in recent years by synthetics and competition from other African and Australian producers. Virtually all pyrethrum flower production in Rwanda is small holder and the wet flowers sold by weight (Frw50 per kg) to drying agents and brokers who collect on behalf of the sole processor of pyrethrum, SOPYRWA, which was recently privatized.

Agronomically, pyrethrum is an ecofriendly crop grown on the region's rich volcanic and well-drained soils that requires only small amounts of fertilizer, normally manure. The most significant environmental aspects of pyrethrum occur during the drying process and at the distillation factory. The team was fortunate enough to tour the facility with the SOPYRWA director of personnel management. The recently privatized plant is still going through its "shake down" season and finding its own operating systems after a multiple-year production hiatus.

F1. Energy Production Factors

Nearly 25 percent of the factor-gate price of dried flowers is fuel wood purchases for drying the flowers: it takes nearly a stacked cubic meter of wood to dry 100 kg of flowers at large and inefficient wood-fired drying stations. With the influx of refugees into the area, the loss of the extensive Gishwati forest during the civil strife, and the boom in post-genocide housing, fuel wood prices throughout Rwanda have begun to increase. Several drying operations have attempted to use peat for drying, with mixed results (and collateral environmental costs at the mining sites) and some experimentation with crude solar dryers for use on farm is taking shape. However, the dryers are rather expensive and farmers are likely to resort to drying flowers on the ground. This would likely result in significant foreign matter in the flowers, and substantial wear and reduced longevity of the

Dave Gibson

Inefficient wood-fired dryers at pyrethrum drying station.

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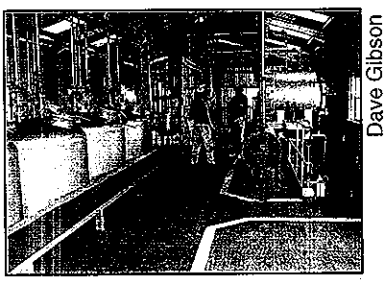
machinery. Since it was privatized, SOPYRWA is increasingly feeling the effects of competing in escalating fuel wood markets, which may partially explain the currently low producer prices. In addition to exploring on-farm solar drying, SOPYRWA should explore the potential of facilitating fuel wood production by participating farmers to ensure an adequate and reasonably priced supply of fuel wood for drying activities.

F2. Health and Safety

The processing plant in Ruengheri involves the movement, milling, and storage of large volumes of dried flowers in preparation for the distillation process. Open conveyor belts, open milling areas, and bagging all occur within one closed and poorly ventilated warehouse unit. Workers were observed without protective respirators or with the wrong type of respirator. Safety signage was absent throughout the plant and the lighting was poor in maintenance facilities, handling, milling areas, and around landings and ladders. Poorly maintained safety railings standing oil in several places indicated neglect of safety procedures, if they existed. Fire extinguishers throughout the plant had not been checked or recharged during the past five years. New management had not yet established procedures for health and safety training and still lacking was a system to record accidents or assign responsibility for corrective action.


Dave Gibson

In pyrethrum distillation, use of highly flammable and potentially toxic hexane may impact workers' safety.

F3. Hazardous Material Management

Distillation of pyrethrum requires a simple but dangerous blending of the ground dry flowers and the solvent hexane into a slurry that is filtered under pressure. Hexane is highly flammable and must be carefully recycled after dissolving the pyrethrums that are recovered through a simple refrigerated fractionating process. Hexane is a mobile and potent neurotoxin that is metabolized in the liver. Long-term exposure through inhalation, ingestion, or skin contact can lead to permanent disabilities. The use of hexane is being discouraged in many counties due to legal actions tied to worker exposure. SOPYRWA maintains significant but poorly documented stocks of hexane in both aboveground and underground storage tanks. Numerous leaks within the aboveground system were fire hazards and there were no records available on the quantity of hexane stored in the underground vessels.

The refrigeration system used to separate the pyrethrums from the hexane solvent currently uses chlorodifluoromethane (freon 22), a chlorofluorocarbon (CFC) scheduled to be phased out under the Kyoto Protocol and the Climate Change Convention, which Rwanda has ratified. More than 1,500 lbs of this expensive and ozone-depleting chemical were poorly stored in a variety of flammable stores. There were no inventory records describing the quantities, purchase dates, or disposition.

SOPYRWA generates much of its own power requirements and maintains multiple aboveground storage tanks with several grades of diesel and gasoline fuel. The team observed numerous leaks

and maintenance problems, and noticed that there were no containment vessels to guard against spills into local groundwater. All tanks were located adjacent to evacuation systems that discharged directly into surface waters. No oil or grease traps to reduce accidental damage from small spills, regular wear and tear, or maintenance operations were visible. No safety signage was observed around the tanks nor was there any indication as to the type of fuel stored.

F4. Supply Chain Considerations

Given SOPYRWA's recent acquisition and the tough task of bringing the plant back on-line after a two-year production hiatus, there are very understandable investment priorities. Previously SOPYRWA's largest buyer, if not the exclusive one, was Valent Bioscience Inc., which was recently purchased by Sumitomo Chemical Company of Japan. Sumitomo, a member of the Responsible Care® Initiative of Chemical manufacturers, has pledged to require its primary suppliers to achieve ISO 9002 and ISO 14001 certification. It also has a stated policy to revise its product planning to eliminate specific CFCs, including chlorodifluoromethane. To meet ISO 14001 standards, SOPYRWA will need to modify its production practices, particularly the use of CFCs and safe handling of hexane, and improve housekeeping and management systems. ADAR and SOPYRWA should explore Sumitomo's willingness to help fund changes necessary to meet the standards it is imposing on its suppliers.

F5. Recommended Follow-Up Options

The distillation process requires management systems that could be improved to handle environmental considerations, predominantly through housekeeping improvements (safety signage, maintenance logs, and hazardous material inventory) and training. SOPYRWA management needs to better understand the market and the demands of their current buyer if they wish to retain both. It would also help if they attended the suggested awareness seminar and have a designated environment or pollution control officer attend the proposed five-day ISO 14001 auditor course. The suggested "cluster" training for heavy chemical users and hands-on development of the essential elements of the ISO 14001 standard would help SOPYRWA at least begin to visualize the required changes. The team also recommends that ADAR work to identify one or more plants in Kenya that may have faced similar issues in a stronger regulatory environment. ADAR should consider identifying a consultant to work directly with the plant to improve its conformance with international norms for hexane storage and use to minimize risks to the plant's densely surrounding neighborhood. Any further ADAR and USAID assistance to the firm should be contingent on their willingness to undertake some fundamental improvements in health and safety management and attention to better documentation and control of toxics chemicals on-site.

G. Fruit Preserves and Juice Processing

Several Rwanda enterprises have developed substantial capacity in the processing of horticulture products to produce preserves and juice for domestic consumption and would like to develop export markets. The processing provides employment and value added for Rwandan horticultural products and the potential to expand their markets. European markets for horticulture products such as passion fruit require unblemished produce. The attempt to produce unblemished fruit entails additional labor and input costs, and still results in a substantial portion of blemished fruit

that cannot be exported profitably. Processing provides an alternative market for produce that does not meet the very high-quality requirements of the European markets, as well as a means to expand the market for fresh produce. Most juice and preserves are sold to institutional clients, such as the university, other schools, hotels, and restaurants, but with some sales to supermarkets. The artisan-scale processing facility visited by the QEMS team processes roughly 10 tons of fruit per month. Most of this fruit is produced with little chemical input and, therefore, would qualify as organic produce. The facility would like to expand production and export juice and preserves to developed country markets. To export to Europe or the United States, it needs certification that it conforms to the Codex Alimentarius or Hazard Analysis and Critical Control Point (HACCP) food safety standards, respectively.

G1. Food Safety Standards

International food safety principles and basic standards are being codified in the Codex Alimentarius, a joint standard of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO), but developed in collaboration with developed countries' governments. The standards include a Recommended International Code of Practice, General Principles of Food Hygiene, as well as perhaps 300 or more specific standards for specified types of food products. While the Codex specifies Principles for the Establishment and Application of Microbiological Criteria for Foods, it also indicates that microbiological criteria are no longer the preferred way to test and control food safety. Instead, it has adopted the principles of HACCP, also the name and process applied in the joint standard on food safety of the U.S. Food and Drug Administration and the Center for Food Safety and Applied Nutrition. HACCP involves seven principles:

- *Analyze hazards.* Identify potential hazards associated with food and measures to control those hazards. The hazard could be biological, such as a microbe; chemical, such as a toxin; or physical, such as ground glass or metal fragments.

- *Identify critical control points.* These are the points in the production of a certain food — from its raw state through processing and shipping, to consumption by the consumer — at which the potential hazard can be controlled or eliminated. Examples are cooking, cooling, packaging, and metal detection.

- *Establish preventive measures with critical limits for each control point.* For a cooked food, for example, this might include setting the minimum cooking temperature and time required to ensure the elimination of any harmful microbes.

- *Establish procedures to monitor the critical control points.* Such procedures might include determining how to monitor cooking time and temperature and who should do it.

- *Establish corrective actions when monitoring shows that a critical limit has not been met* — for example, reprocessing or disposing of food if the minimum cooking temperature is not met.

- *Establish procedures to verify that the system* is working properly — for example, testing time-and-temperature recording devices to verify that a cooking unit is working properly.

- *Establish effective record keeping to document the HACCP system.* This would include records of hazards and their control methods, the monitoring of safety requirements, and the actions taken to correct potential problems. Each of these principles must be backed by sound scientific knowledge, such as published microbiological studies on time and temperature factors for controlling foodborne pathogens.

For juices, the Codex Alimentarius General Norm for Juice and Fruits details standards with regard to sugar, ethanol, contaminants, labeling, containers, use of concentrates and additives, and sampling procedures and analysis for testing. The U.S. Food and Drug Administration Juice HACCP standard, following several incidents of illnesses attributed to pathogens in fresh juice, specifies a 100,000-fold reduction in target pathogens, typically *E. coli*. While this will not necessarily eliminate the marketing of fresh juice, the obvious methods to achieve such pathogen reduction include pasteurization or ultraviolet irradiation. Fresh apple juice producers have found that achieving such pathogen reduction without pasteurization requires increased care, starting in the field. While dipping fruit in chlorine solutions or ozone treatments provide perhaps a 100- or 1,000-fold reduction in pathogens, it still is insufficient. Fruit with broken skin that might harbor pathogens must be eliminated, and fruit must be produced and handled in a manner that it is largely free of dirt and contaminants when it arrives at the processing plant, and then physically washed and sanitized. Another important step has been to ensure that field staff has clean restrooms and wash their hands before returning to working with the fruit.

It is difficult to find a clear standard for jams, jellies, and preserves, at least in part because they have not been controversial. While it is no longer universally accepted that molds on fruit preserves are safe to human health, they rarely compromise human health. Commercially prepared jams, jellies, and preserves are typically cooked sufficiently to destroy most pathogen and hermetically sealed to avoid spoilage. The high (usually 45 percent) sugar content also helps to prevent spoilage. The U. S. industry norm is that fruit preserves are classified as non-perishable and have a shelf life of 24 months. The HACCP norms are that the fruit should be processed under practically sterile conditions with little if any exposure of the fruit to possible sources of contamination between the time it is cooked and placed in hermetically sealed jars.

John Lichte

Use of open wood-heated kettle to bleach/cook preserves may not meet hygiene and food safety standards.

G2. Hygiene and Food Safety

The fruit-processing enterprise the QEMS team visited will require some improvements to achieve commercial hygiene and food safety standards. Fruit was received and partially prepared for processing in the same room where peat was stored for use in the cooking kettle. Wastewater drained across the floor in areas where workers had to walk. Peels and waste fruit material was stored in open containers in the room. Thermal treatment was conducted in a commercial soup-type kettle heated with wood or peat. The enterprise had tried an electric kettle but found it too expensive to operate. Temperature

control seemed questionable and temperatures did not appear to be regularly recorded. The lid was open to allow stirring and provided the opportunity for contamination by smoke and ash from the fire and insects. The rooms were not well ventilated, even with doors left open to provide some air. Fruit was manually moved between stages of processing in open buckets, which potentially allowed contamination following cooking. The process might be comparable to what would happen in a home kitchen, but on a larger scale. However, in the United States and some European countries, homemade preserves can no longer be sold commercially. The enterprise would likely have difficulty achieving certification for hygiene and food safety, given the present production process, even if the products are cooked and/or pasteurized. The enterprise would also need to use improved pest control and to eliminate the reuse of plastic containers for juice.

G3. Worker Health and Safety

The wood-heated kettle was not properly vented and released smoke and ash into the room where workers were doing final preparations, cooking, and processing the fruit. While workers appeared to have gloves to protect their hands from constant exposure to water and acid from the fruit, the team had some questions whether they were regularly used or were only in evidence because of our presence. The counter height where fruit was washed, peeled, and cut was nearly four feet high and much too high for most of the workers to use comfortably. On our first visit, workers were standing on stools while using knives to cut up fruit. When the team returned a few minutes later, they were sitting on stools in the reception area and dropping peelings and other waste on the floor underfoot.

John Lichte

High counter is safety hazard for workers.

G4. Recommended Follow-Up Options

Rwanda fruit juice processors do not have control over field conditions and fruit quality, and also face the problem that transportation to Europe or other developed markets will require substantial time and potentially exceed the stable shelf life of some fresh products. Although it would provide a significant improvement in present food safety procedures, it is not clear that the addition of a chlorine or ozone-based fruit sanitization process will be sufficient to meet developed-country food safety requirements for juice.

To meet these food safety requirements and extend the shelf life of juice products, Rwandan juice processors should explore the possibility of producing pasteurized juice for export to developed countries. Although the use of a thermal treatment process (cooking) might have been sufficient to gain access to developed country markets for jams, jellies, and fruit preserves in the past, the new insistence on HACCP principles would appear to require adoption of best sanitary practices to gain certification in the present climate. This also is likely to require a more industrial process that eliminates fruit exposure to potential contamination throughout the process after cooking.

SECTION III

Institutional and Policy Framework

After the 1994 war, the Rwandan government adopted a policy of agricultural intensification to respond to the rising food security needs. The principal themes of this policy are: rehabilitation of production support infrastructure; protection of soil against erosion and the management of soil fertility; promotion of the use of agricultural inputs; reform of the production and marketing channels for export crops (tea and coffee); promotion of improved varieties that are more productive and better adapted to local circumstances; and rehabilitation of coffee and tea field plantings.

In Rwanda, managing and protecting the environment is the responsibility of the Ministry for Lands, Human Resettlement and Environmental Protection (MINITERE) and coordinated by the Direction of Environmental Protection. However, since the war and genocide of 1994, the ministry has lacked human and material resources. To improve environmental management, MINITERE has proposed the creation of L'Office Rwandais de l'Environnement (ORE)/Rwanda Environment Management Authority (REMA), which would be responsible for coordinating environmental management in its broader context. Without approval and the additional implementing legislation that will give teeth to MINITERE and REMA, the Ministry for Agriculture remains in effective control of the environmental sector (see more details on Institutional and Policy Framework in Rwanda in Annex F).

A. Applicable Conventions

After the 1992 earth summit in Rio, programs on sustainable development were established in accordance with the requirements of Agenda 21. The Rio summit led to the signing and ratification of several international conventions on protection and the conservation of the environment, including: The Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES (1980), the African Convention on the Conservation of Nature and Natural Resources (1980), the Convention on Bio-Diversity (CBD, 1995), the UN Framework Convention on Climatic Changes (UNFCCC, 1995), and the UN Convention to Combat Desertification (UNCCD, 1999). All these conventions helped piece together Rwanda's environmental policy. The ratification of these international instruments made it possible for Rwanda to obtain financing (GEF and UNEP) to implement its national environmental strategies. For this reason, Rwanda worked out its national environmental strategy and environmental action plan (SNER, 1996) and its national strategy for biodiversity (2000).

These conventions and the support from their various secretariats and the Agenda 21 coordinating groups require that the Rwandan government monitor and show the country's progress toward implementing them. There are several aspects of these commitments made at Rio that will be reemphasized at the World Summit on Sustainable Development event in Johannesburg this summer that affect several ADAR and USAID actions, including: 1) use of CFC-based refrigerants for distillation and storing; 2) protection of remaining natural forests and

biodiversity threatened by agriculture expansion; 3) international transportation of hazardous materials, including delisted pesticides.

B. Current Institutions

Management of water resources is the responsibility of several ministries, depending on how the resource is used. These include: the Ministry of Water, Ministry of Energy and Natural Resources (MINERENA) (hydroelectricity, food, and potable water), Ministry of Agriculture and Livestock (MINAGRI) (irrigation and drainage for the agriculture, aquaculture, and fishing) and the Ministry of Land, Resettlement, and Environmental Protection (MINITERE) (environmental management). No law regulates water resources management, except one from January 7, 1974 on pollution and the contamination of springs, lakes, and rivers. This ordinance requires territorial authority to determine the zones of protection of lakes, rivers, or parts of rivers that are used or have the potential to be used as a potable water source. MINERENA is currently preparing a new law.

In response to private sector demands to promote agriculture trade nationally and internationally through the use of appropriate grades and standards, the Rwandan government has just created the Rwanda Bureau of Standards (RBS)/Office Rwandais de Normalisation (ORN). This bureau still lacks the human and technical resources to be fully functional. It also faces the daunting task of preparing standards or identifying standards that can be adapted to Rwanda's needs in almost every technical area. It will likely require considerable capacity building to meet its institutional responsibilities. With limited resources and an unclear mandate from the highest levels of the Rwandan government, ORN will be obliged to undertake strategic planning that will help it identify the elements be best undertaken by other ministries or left to the private sector. The laboratory capacity of MINAGRI and the Ministry of Commerce and Industry must be harnessed and duplication of efforts must be avoided if ORN is to use its resources wisely for long-term effectiveness.

Before it was privatized, OCIR-Café controlled the entire coffee sub-sector (*filière*). Currently, the responsibility for the sale, processing, and marketing of coffee have passed to the private sector. OCIR-Café retains responsibility for promoting coffee quality and the distribution of pesticides to producers. However, the responsibility for more general extension services has devolved to the Regional Agricultural Services Office/Direction Régionale des Services Agricoles (DRSA).

OCIR-Thé coordinates administration of the tea sub-sector. However, as with the coffee sub-sector, it no longer retains control of tea from production to export or sale. The tea plantations and factories have been privatized and are largely independent of OCIR-Thé. The tea factory visited responds to quality requirements imposed by the export market, rather than by OCIR-Thé.

OCIR-Thé and OCIR-Café appear to be struggling to identify and develop new institutional roles relevant to this new era of market liberalization. One important contribution might well be market and product promotion, and the creation of a positive image for Rwandan products, somewhat in the manner that Juan Valdez promotions have done in the United States for Colombian coffee.

C. Existing Rwandan Standards and Norms

The Rwandan Bureau of Standards has begun operating over the past six months. The director general concedes that, as yet, it has only minimal staff, no laboratory facilities and no established standards and norms. However, the director general cited a recent case of food poisoning in which it was necessary to send samples to a lab in Europe to try and determine the cause. No system tests fertilizers, pesticides, and other agricultural inputs to determine if labeling is accurate. Some laboratory facilities conduct rudimentary chemical analyses at the University of Butare, and in other government agencies. At ISAR, the team was told that the Ministry of Agriculture uses the list of tolerated pesticides published annually by FAO. Although several interviewees insisted that there is a recognized list of acceptable pesticides, no one was able to produce it.

There are no formal national standards at the Bureau of Standards level concerning the characteristics of exported commodities. Agencies such as OCIR-Café and OCIR-Thé work to improve the quality of the commodities for which they are responsible and do have norms that they help propagate. However, there is no Rwandan certification process for even these principal exports. Also, no nationally established minimum quality standards ensure that Rwandan exports maintain a good reputation in international commodity markets.

The disposition of solid and liquid waste is governed by the broad "Code d'Assainissement," which was passed in 1956. Although evidently an extensive set of implementing rules were developed under a special project completed in 1996, Rwanda's laws governing waste management are nearly a half-century old. There are no primary wastewater treatment plants in Rwanda and, although the largest urban areas have officially designated landfills, virtually all human effluent and industrial waste for the entire country is discharged untreated and unsorted into receiving waters and shallow landfills. Moreover, the country lacks industrial hygiene standards governing exposure levels in manufacturing or processing and facilities for the controlled storage, discharge, or incineration of hazardous or toxic materials. Medical wastes are treated in the same way as industrial wastes. No standards, measuring norms, nor regulatory bodies govern air emissions from factories.

D. Application of USAID Regulation 216

USAID's appropriations from the U.S. Congress are subject to the environmental procedures stipulated in 22 CFR 216. These procedures harmonize many of USAID's operations with the United States framework law for the environment; the National Environmental Protection Act, which became law in the United States in 1976. Additional language that directs USAID Missions to pay close attention to the management of the natural resource base, and specifically, the forests and their attendant biodiversity, takes the form of an amendment to the Foreign Assistance Act (Sections 117, 118 and 119), which authorizes the existence of USAID.

Regulation 216 is largely a screening procedure that USAID has historically used during the design of projects. It was originally directed to the review of infrastructure projects in which construction, road building, water impoundments, and earth moving had likely significant and negative environmental consequences. These policies directed USAID environment officers to

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undertake initial environmental examinations, identify possible impacts, and undertake more thorough environmental analysis that would mitigate the most significant environmental impacts during project design. Implementation of businesses plans and activities that occur after construction or during USAID's follow-on support through technical assistance are most often categorically excluded from further review, which limits USAID's opportunities to make such enterprises truly sustainable. Thus, Regulation 216 is not particularly useful at managing the context within which projects like ADAR and other USAID/Rwanda partners operate where resources are most often used for technical assistance to support already established businesses that may or may not have received prior USAID support.

Within the context of Rwanda's evolving support from agriculture intensification with emphasis on high-value export crops, there are significant opportunities to help businesses build management systems that respond to external market forces, as well as evolving domestic environmental regulations. Moreover, the true costs of doing business should increasingly reflect the societal costs associated with the procurement of raw materials and the disposition of waste. International standards and norms are accelerating both the breadth and depth of their interests in sustainability in ways that will fundamentally affect Rwandan producers. The QEMS survey instrument and the evolving decision support system take into account Regulation 216 requirements, and the system will help tease out the most salient environmental aspects of ADAR operators and help train resources on their mitigation. This survey will better document the type of support ADAR will provide clients and the determination of how ADAR can address these enterprises' quality and environmental management system needs.

E. Application of International Trade Standards and Norms

Although a dearth of official national standards and norms exists, international standards, norms, and certifications affecting Rwandan agribusinesses proliferate. These international standards run the gamut from those developed by international organizations – such as the International Standards Organization (ISO), FAO, WHO, and others – to the standards of trade and commodity organizations, and individual retail organizations.

E1. ISO 9001/2 Quality Management Standards

The ISO standards are recognized as the basic world business-to-business standards for quality management systems enhancing business practices. The ISO 9000 series (now up to date with the 2001: 9002 series), is the original ISO quality standard and its elements remain at the core of the other ISO series. More than 350,000 companies are certified to the ISO 9001/2 standard and its backbone is the basis for a vast auditing industry built to provide independent, third-party certification to supply chains worldwide.

E2. ISO 14001 Environmental Management System Standard

Based on the same system principles as ISO 9001/2, the ISO 14000 series remains the basic world standard for environmental management systems. Many more specific standards, for example, those from individual production or retail organizations, are based on the principles of more generic standards, to the extent that they frequently adopt the same language. Since the lack of appropriate management systems is perhaps the most common deficiency among

agroindustries, the principles of ISO 9000 and 14000 provide significant potential to improve the operations of the firms, product quality, and export potential, while at the same time move toward improved environmental responsibility and compliance. The environmental aspect is also important to meet the requirements of international markets and marketing organizations. The type of verification required for various certifications, such as "FairTrade" and "Organic" certification, appear to be inspired by these standards.

E3. Food Safety and Occupational Safety and Health Standards

- Standards regarding working conditions, use of protective gear, exposure to chemicals, noise, or other conditions that might compromise workers health:
  - *International Labor Organization Occupational Safety and Health (OSH).* Guidelines provide both general guidance and Codes of Practice that address both specific sectors (open mines, construction forestry), and specific issues, including chainsaws, escalators, noise, and vibration and radiation.
  - *The U.S. Occupational Safety and Health Administration (OSHA)* has an even longer list of specific sectors and topics on which it has standards that serve as industry regulations in the US.

- Standards related to hygiene and handling of food products, purity, additives, among others:
  - *Hazard Analysis and Critical Control Point (HACCP).* The joint standard on food safety of the U.S. Food and Drug Administration and the Center for Food Safety and Applied Nutrition.
  - *Codex Alimentarius*. The joint standard of FAO and WHO on food safety. Among the Codex Alimentarius are chapters devoted to different types of food products. For example, the General Norm for Juice and Fruits details standards with regard to sugar, ethanol, contaminants, labeling, containers, use of concentrates and additives, and sampling and analysis.

E4. Social Accountability Standards

Standards related to social responsibility of businesses, particularly with regard to child labor, health and safety of employees, the right of employees to organize, among others, is Social Accountability (SA) 8000. Others, such as AccountAbility 1000 and several manufacturing-specific standards (textiles, garments, and mining) enter into play. Most of these standards are organized around the ISO 9000/14000 series and require similar systems and document controls, policies, management review, and public disclosure elements. Some, such as the Rainforest Alliances "BetterBanana" certification, are hybrids that apply both social and environmental norms.

The *FairTrade Labeling Organization (FLO)* provides a standard focused on labor conditions and other aspects of social responsibility to benefit small farmers (producer associations) and wage workers. Reference to environmental management is minimal, but "producers are expected to protect the natural environment and to make environmental management part of farm management." Like many others, the FairTrade standard requires that producers implement

integrated pest management (IPM) to minimize the use of pesticides and it encourages producers to work towards organic certification.

Commodity/Retailer Specific Standards. The team has encountered a number of standards from specific retailers, such as the British retailers, Fyffes and Premier Beverages, and the U.S. retailer, Starbucks. European supermarket chains now handle a majority of the fresh produce imported, and compliance with their standards is a necessity for anyone wanting to enter this significant marketing channel. Starbucks is one of the major coffee retailers in the world, and has recently established new standards for their preferred suppliers (Starbucks Green Coffee Purchasing Program: Pilot Program for Preferred Suppliers, November 12, 2001).

E5. Pesticide Management Practices Standards

Tolerated/accepted pesticides for different type of applications (fungicides, herbicides, fumigants, insecticides): FAO/UNEP, WHO, the European Union and the Environmental Protection Agency provide lists of accepted or tolerated pesticides, appropriate uses and potential consequences. The United States and European Union have very strict standards on maximum residuals of tolerated pesticides in food products. Food items with any detectable residual of non-accepted pesticides are prohibited and any import that tests positive for such residues will not be allowed entrance. The detection of delisted pesticides on table grapes and deciduous fruit from Chile caused that market to lose entry into the United States for nearly three years and is an excellent reminder of how quickly a country can fall out of favor due to chemical use.

SECTION IV

Discussion and Analysis: Issues for Agroindustries

Not surprisingly, there is a very strong correlation between environmental and business management issues in Rwandan agriculture. Many of the operational issues and constraints of the enterprises are related to the availability or cost of natural resources, such as land, water, and energy, particularly fuel wood. Many are or have been dependent on no-cost or low-cost access to one or more natural resources, without which profitability is jeopardized.

A. The Dilemma of Specialty Coffee

Coffee quality is dependent on being fully washed with good quality water. But washing coffee requires large amounts of water – as much as 90 m3 of water per ton of parchment coffee produced. If washing stations have to pay for their water or market standards require that they provide a drainage field adequate for the quantity of wastewater released, it will significantly impact their costs, and perhaps change their mode of operation. While water can be recycled to limit the amount of water used and wastewater released when producing standard coffee, it is not clear if recycling is compatible with production of gourmet-quality coffee. The team was unable to sort through the strongly held opinions about wash-water recycling (on both sides by acknowledged experts); therefore, further investigation into the economics of recycling is needed. Clearly though, the best way to encourage recycling and water conservation is to have to pay for water.

B. Energy Requirements Increasingly Prominent in Tea and Pyrethrum

The drying process for tea and pyrethrum production uses very large quantities of energy, and in the cases observed, this meant fuel wood. The tea factory the team visited uses 80 steres (stacked cubic meter) of fuel wood, which is approximately the amount of wood that can be harvested from 1 hectare of mature forest – each day of operation. The current shortage and cost of fuel wood potentially threatens the viability of the tea plantation and factory, yet the chief executive officer estimates that switching to diesel fuel would cost approximately five times what they are paying for fuel wood. The pyrethrum factory has attempted to burn peat to dry the chrysanthemum flowers from which pyrethrum is produced, but has found peat to be of such poor quality that it is not cost-effective. It is now experimenting with simple solar dryers that the farmers could use on the farm to reduce both the volume and cost of transportation and the cost of drying. If farmers dry the flowers themselves, it seems likely they will return to the traditional practice of spreading products on the ground to dry, especially since the solar dryer is rather expensive. This will likely result in considerable foreign matter in the flowers and potentially compromise product quality, as well as increase the cost of factory equipment maintenance and decrease the longevity of the equipment. It is not clear that the pyrethrum factory has calculated these additional equipment costs or determined whether the quality of pyrethrum that they can produce under such conditions will still be competitive and acceptable to the buyer, Sumitomo.

C. Organics: Trellising without Terraces

Organic passion fruit producers are making a substantial investment in trellising. Several are discussing replacing the wood trellises with posts and wire so that it would last longer and be less expensive in the long run. However, these same producers are growing passion fruit on steep slopes without any terracing, running the rows up and down the slope, and they are not using any mulching or other organic soil amendments. Studies in the same area indicate that, under such conditions, fields lose 80-100 tons of topsoil per hectare per year. With such soil losses, and without the possibility of using fertilizer, these fields will become infertile after about 3-4 years and will no longer be capable of producing exportable-quality fruit. Their system at present is not sustainable and will not support the investment in wire trellises they are considering to further reduce long-term costs. It also remains to be seen whether their phytosanitary precautions are adequate to maintain a healthy environment for passion fruit production over an extended period on the same plot of land.

D. Lack of Management Systems

The most common shortcoming of the agroenterprises the QEMS team visited is the lack of strong management systems. With only a few exceptions, this applies to enterprise/business management as well as environmental management. Many producers do not appear to have robust business plans that adequately consider the risks of changes over a period of time and their consequences for the business. In many cases, their management systems do not provide adequate information to characterize the problem caused by these changes and to identify potential solutions. While good management systems would not solve all of the business or environmental problems, they would significantly reduce many inadvertent business and environmental issues. The ISO 9000 Quality Management Systems standard was the first standard to be adopted large-scale worldwide precisely because it helped assure consistent quality and customer satisfaction, which positively impacted business profits. Organic certification and many of the other market standards require that firms have the records to verify many detailed aspects of their production system, based on management systems similar to those proposed by ISO 9000. Without a management system that produces such records, firms are not likely to achieve and maintain the desired certification.

E. Quality of Commodities Processed

Another problem common to many of the processors of agricultural products is that they do not control the production and quality of the commodity on which their business is dependent. This is true of any production association or firm using out grower schemes, including those involved in milk, tea, coffee, pyrethrum, fruit juice and preserves, and passion fruit. Firms should recognize that this is the same problem that marketing firms and retailers in destination markets are trying to control by imposing standards on Rwanda's agricultural producing and processing enterprises. These firms need to develop their own standards, quality control systems, and incentives, and be prepared to adjust them as changes occur in their destination markets. While all of these firms have at least informal standards, they need to be transparent and communicated to producers in a manner that allows the producers to plan on and prepare for changes, since changes in consumer tastes and competition increase quality requirements. This adaptation will be greatly facilitated by strong internal management systems.

F. Land Resources

Access to adequate and appropriate land resources is often a constraint for agroenterprises. The constraint is sometimes fairly intense, given Rwanda's high population density. Some of the firms are located on uplands where they compete directly with farms and human habitation. Several of the enterprises are located on swamplands, and either drain or manage the swamp to implement their production activities. The rose operation drained a portion of swamp for its approximately 10-ha installation (five hectares of greenhouse facilities). The tea plantation the QEMS team visited consists of 260 hectares of swampland and its out grower operation occupies nearly another 1,000 hectares of swampland, in addition to the upland location of the factory and facilities. In their natural state, these *marais* or swamplands have historically helped regulate the flow of surface water, as well as provide a source of infiltration to replenish groundwater. They also provide significant environmental services in terms of water filtration and purification. Where clearing the swamp for agricultural production has disturbed these functions, availability of potable water has often been compromised or the cost of treating that water to meet health standards has increased significantly. Unfortunately, the use of large quantities of agricultural chemicals in swamplands, which are subject to flooding and are very close to the groundwater table, will almost inevitably affect the quality of both the surface and groundwater. This is the case of both the tea plantation and the rose enterprise.

Steep hillsides are likely to be subject to erosion anytime protective vegetative covering is removed or the surface is disturbed. Therefore hillsides typically suffer the least erosion in their natural state as forests or grassland. Regularly disturbing the soil and leaving large portions of it without protective covering, as when used to produce agricultural row crops, promotes erosion. Studies support by USAID in the 1980s (Rhengeri Resource Analysis and Mapping Project) indicated that under such conditions, hillsides lose as much as 80-100 m3 of soil per hectare per year, which makes the field infertile and unproductive after only three or four years.

Terracing and other protective measures can significantly reduce erosion if implemented well and maintained. Production of perennial crops, such as tea and coffee, which provide significant vegetative cover and do not require the soil to be disturbed regularly, can also reduce soil erosion. Given the large amount of steep hillside land in coffee production in Rwanda, one strong rationale for supporting the coffee sub-sector is to maintain coffee acreage as a form of hillside protection. One fears that if agricultural row crops replace much of the coffee in Rwanda, then Rwanda would shortly begin to look like Haiti.

G. Water Resources

A number of the firms visited use large quantities of water: the dairy uses 15-20 m3 per day, the coffee washing stations 30-90 m3 per ton of parchment coffee, and the rose operation 100-300 m3 per day. The dairy pays for its water, is aware of wastewater issues, and has a system in place for wastewater management. The rose operation uses drip irrigation and calibrates the quantity of water provided to different blocks according to measurements of soil humidity at 15- and 40-cm depths.

One of the two coffee washing stations pays for its water and recycles water in the operation, which reduces water use to less than one-half of the water used in the other station. While it is not clear if it will be adequate, it also has a septic system to handle at least the most polluting portion of the wastewater. The second coffee station, which does not pay for water, has no waste water system and dumps all of its untreated wastewater directly back into the stream. This second station targets a gourmet coffee market, and will obviously require additional investments for its coffee to be accepted in the high-end coffee market, which increasingly requires that products be produced in a sustainable production and processing system.

H. Energy/Forest Resources

A number of the agroenterprises visited are significant energy consumers. The dairy uses approximately 700,000 Frw of electricity per month, the rose production facility 400,000 Frw per month. For many of the firms, the primary source of energy used is fuel wood. The fruit juice and preserves processing firm originally used an electrical pot for blanching fruit, but found it too expensive and changed to a wood-fired pot instead. The tea processing facility burns 80 steres of wood per day. Tea plantations are supposed to produce two hectares of fuel wood for every hectare of tea. This tea plantation was provided swampland in an area where the highlands were already heavily populated. It then expanded production by nearly 300 percent, using out growers who also produce swamp tea. Even if they originally had adequate forest resources, the two-to-one ratio would not have accommodated the fuel wood requirements of the additional out grower scheme. While it was thought that there would be sufficient forest resources in the area, population increases, additional tea operations nearby, the emergency resettlement of immigrants, and reconstruction following the 1994 crisis have all contributed to the scarcity of fuel wood in the area. Although the tea enterprise recently purchased and planted 250 hectares of eucalyptus, that still will not meet their energy needs and the firm's viability may be threatened by inadequate fuel wood sources.

I. Transportation

In a land-locked country, transportation is a significant constraint and cost for any firm attempting to export products. The availability of air transport has declined sharply in the last several years (although it may improve somewhat with the planned resumption of Sabena/SN Brussels flights). Air transport is always so expensive that any fresh products that do not meet the highest quality standards are likely to produce insufficient revenue to even pay for the cost of the flight. The ornamental horticulture producer exported plants by air for a number of years, but has stopped due to the decreased availability and increased cost of air transport. The rose producer is dependent on air transport for marketing most of its product and therefore, most of its revenue. It cannot afford to ship roses to Europe during the summer months when local production in Europe reduces the prices the market will pay for its produce. Although it is still a significant cost, commodities such as coffee and tea that can rely on ground transportation face something less of a constraint with regard to transportation.

J. Solid and Liquid Waste

Many of the firms have significant waste streams for which existing treatment and disposal methods are inadequate. Among the most important are streams of wastewater mentioned above.

The rose producer has large quantities of plant cuttings, which are improperly composted within a few meters of the facility and on the banks of the stream. The fruit juice and preserve processing facility has quantities of water that flow directly into the city gutters and local stream, and solid fruit waste that is taken to the city dump, and also ends up in the local stream when it rains. The coffee beans constitute only about 20 percent of the volume of cherry coffee received by the washing stations. Coffee husks constitute about 80 percent of the total. Once composted, the husks provide a good organic soil amendment, one that farmers are happy to have. However, the washing stations tend to lack sufficient land for adequate composting and typically do not provide vehicle access to sites where husks accumulate. They must be moved by head-load, which makes them expensive for either the washing station or the farmers to evacuate.

K. Pesticides and Agro-Chemicals

Several of the firms use significant quantities of pesticides and agrochemicals. The tea plantation uses 1,000 kg of NPK fertilizer and several kilograms of pesticides per hectare over large areas of swampland, exposing surface and ground water to potential contamination.

Coffee farmers following OCIR-Café recommendations use 150 kg of NPK (fertilizer containing nitrogen, phosphorus, and potassium) per hectare, and may use pesticides, particularly to control wood boring insects. The rose operation regularly adds quantities of seven fertilizer compounds to the irrigation water. It also uses large and poorly documented quantities of fungicides and significant quantities of insecticides.

L. Human Health and Safety

The flower operation and the tea plantation, in particular, regularly use and must frequently store significant quantities of fertilizer and pesticides with potential human health and safety risks. While protective gear was in evidence in both cases, it was unclear whether the gear is adequate or regularly used. A worker filling sulfur boxes in the flower operation was not wearing protective gear, although rubber suits and masks were hanging in the pesticide control facility. The pesticide treatment lines at the flower operation appear to be drained on open ground only a few yards from the local stream. The facility that controls the fixed placement pesticide spray system (a mobile system is also used) has no containment structure and water on the ground outside the facility appeared to contain significant pesticide residual.

While some firms seem to have protective equipment, the QEMS team is skeptical whether supplies are adequate and regularly used. Many workers cleaning the tea factory were shoeless and wearing no protective gear. Women working among the roses had smocks, but not necessarily gloves or shoes. Workers at the fruit juice and preserve-processing firm were wearing gloves and many had sandals. They were, however, trying to cut up fruit while standing on the cross-rails of stools in order to work at a counter that was approximately 4-feet high. When the team returned to the fruit reception area, workers had abandoned the counter and were sitting on chairs and taking fruit from plastic buckets while letting refuse accumulate on the floor. The processing room was full of smoke from the wood-burning kettle in which the fruit was blanched or cooked. The pot lid was open and exposed to the smoke and other elements. A significant number of cockroaches was evident. Partially processed fruit was moved from one machine to another in open plastic containers. Much of the processed fruit and juice was placed in reused

20-liter plastic containers (with small mouths, which must be difficult to clean and sterilize). The storeroom contained used plastic bottles, which the team was told were to be washed and refilled with juice.

SECTION V

Conclusions and Recommendations

A. Management Systems

ADAR should consider facilitating capacity building in enterprise and environmental management systems for its clients. In many cases, this will contribute as much or more than anything else ADAR can do to improve competitiveness and long-term enterprise viability. Efforts to improve management systems should be done with a view to the management-related requirements of whatever market standard is, or may soon be, applicable to the commodity. Many market standards, particularly organic certification, require extremely complete records on inputs, processes, production volumes, prices, and handling to verify that the produce has not come in contact with any non-conform product (e.g., agrochemicals) and that no produce from non-certified producers is included in the certification.

For all practical purposes, compliance with the verification requirements of these standards will require a management system similar to that promoted under ISO 9000. While each commodity or sub-sector will likely end up with some unique management requirements, ADAR can build capacity that meets 90 percent of the requirements by basing its activities on the ISO 9000 standard, or better yet, on the ISO 14000 standard to add the environmental aspect. While most organic certification programs reviewed are still very weak on the environmental aspects, the new (2002) Basic Standards of the IFOAM now include a strong focus on environmental criteria and it is only a matter of time before these begin to influence the organic certification programs.

B. Quality of Commodities Processed

Most of ADAR's client enterprises are heavily involved in processing agricultural products and purchase most of the product from members of their producer association, affiliated out growers, or fully independent producers. In all these cases, someone other than the processing entity makes the direct production decisions, and the client does not fully control the production process and the quality of the product delivered to the processing facility. This situation is closely analogous to that of retailers, wholesalers, and brand name producers leading the charge to impose standards in international markets. The corresponding solution appears to be to implement standards of their own so that their producers have financial incentives to meet standards and work toward continual improvement. Improving the standard so that the product may compete in the highest-quality international market segments may in some cases have to be done in a series of steps over a period of time. However, the process should be transparent and producers should be aware of the plan and be encouraged to adopt an attitude that targets continual improvement and improved competitiveness of their product.

C. Health and Safety

Many of the processing facilities visited by the QEMS team do not demonstrate a commitment to worker health and safety. In many cases, some rather simple and low cost housekeeping activities could significantly improve the health and safety of the work force:

- Human traffic areas, particularly steps and narrow walkways, need to be kept clean of oil, grease, fruit waste, and other contaminants that could cause someone to slip and fall;
- Potentially dangerous materials should be controlled and handled carefully, avoiding pooling on the ground where they might contaminate workers or enter surface or ground water;
- Where fire extinguishers are provided, they should be inspected and refilled on a regular schedule and maintained in proper operating condition;
- Where particulate matter is a problem, such as in the warehouse storing dried chrysanthemum flowers, appropriate masks should be provided and used;
- If a work counter is provided, it should be at a level that is comfortable and convenient for most workers to use;
- Agricultural chemicals should be stored in areas that are protected, ventilated, and dry. Deskwork related to inventories should be performed outside the storeroom in an area that is well ventilated and does not require workers to be exposed to chemicals any longer than necessary; and
- Where exposure to potentially dangerous materials is likely, such as among workers at the rose greenhouse facility, appropriate safety gear should be provided.

ADAR should support building client capacity to address health and safety issues and use health and safety criteria among others to screen for clients that ADAR will support.

D. Land Resources

ADAR needs to consider different land-use regimes among its screening criteria for clients that it will support. For environmental purposes, it should give priority to supporting activities that promote perennial and woody crops, and where that is not possible, activities that provide proper terracing and erosion control on steep hillsides. ADAR should be aware that draining or managing water in swamps and peat bogs for agricultural production is a high-risk activity that often fails and also destroys the swamp's capacity to provide environmental services, such as water filtration, regulation of water flows, and infiltration into the groundwater table. An enterprise's impact on land resources and the preservation of the resources and their functions have important implications for the sustainability of the enterprise. This should be integrated into ADAR's screening tool for selecting enterprises that it will consider supporting.

E. Water Resources

Enterprises using agrochemicals or hydrocarbons and established in swamps, wetlands, or near streams or lakes are likely to contaminate that local water resource unless fairly complex precautions are taken. This may or may not affect the enterprise itself, but will likely have a negative impact on people and entities downstream, which are dependent on local groundwater. The drainage and/or conversion of wetlands or swamps to agricultural production, is a high-risk activity that often has significant negative impacts on water regimes, including surface water flow and filtration and the infiltration of water to supplement groundwater resources. ADAR should support enterprises in such areas to take steps to reduce their impact on water resources. The fact the wetlands and swamps are environmentally important and fragile areas should be reflected in ADAR's screening tool for the selection of clients. Current and pending legislation may soon require more attention to the discharging of solid or liquid wastes and the time to develop alternatives to untreated and improper waste disposal is now.

F. Energy/Forest Resources

Several of ADAR's client enterprises require large quantities of energy for their production process. For the most part, they use fuel wood as the primary source of energy because it has been locally available and relatively cheap. Lately, fuel wood appears to be less readily available at least in some areas and enterprises complain of price increases. One CEO suggested that conversion to diesel fuel was not practical since it would be five times more expensive than the fuel wood. In some cases, solar energy may be a possibility, but its use by individual farmers to dry products may reduce uniformity and overall quality of the product. At least one of the enterprises has experimented with burning peat, but the quality of the peat was so poor that it was not cost-effective. It seems likely that peat mining would have significant negative impacts on the land and water resources where the mining is taking place. ADAR should support building the management capacity of enterprises to ensure they have a plan in place to provide the energy they need at a reasonable cost. This may involve experimentation with alternative energy sources, but may equally well focus on assuring the provision of fuel wood at an acceptable cost. The availability and cost of energy should be integrated into ADAR's screening tool for selecting clients.

G. Standards

International standards appear to provide an opportunity to accomplish several things in Rwanda. First, they tell Rwandan producers and processors what they need to do to ensure that their products are of acceptable quality and become or remain competitive in the international market. Rwandan producers and processors would like to target high-quality, high-return markets, and these international standards provide a roadmap on what must be done to become competitive in these markets. Quality management systems are at the heart of most proliferating international standards and management systems are typically weak among ADAR client enterprises. Support for development of the standards and quality management systems are self-reinforcing and potentially, both are greatly beneficial to ADAR's clients. In the absence of strong environmental regulations, the international standards increasingly indicate what Rwandan producers and processors must do to ensure that their activities are environmentally sustainable. If they have not done so, Rwandan enterprises need to ensure that they will have adequate access

to land, water and energy resources, and to include the cost of these resources in their cost and profit calculations. This benefits both the environment of Rwanda and the long-term prospects of the enterprise.

ADAR appears to have an important opportunity to help enterprises and entire commodity sub-sectors (*filières*) to achieve or maintain competitiveness by helping them build the capacity to address and comply with the appropriate international standards. This will be necessary to expand, or in many sub-sectors, to even maintain Rwanda's present exports.

Concretely, ADAR should consider presenting a series of workshops to familiarize various groups with the importance and content of major relevant standards. This might consist of:

- A half-day workshop targeting high-level decision makers (ministers, directors general);
- A two-day workshop targeting important players in target sub-sectors; and
- A week-long ISO 14000 auditing course for a small group responsible for implementation of quality and environmental management systems in ADAR client enterprises or support institutions.

H. Summary Conclusions and Recommendations

The heavy-handed approach of previous governments to reduce soil erosion and fertility decline within subsistence farming had serious limitations. Higher-value export *filières* offer real opportunities to "upstream" better land-use management and agronomic practices with market incentives than can improve productivity and the environment over wide expanses. In fact, there is probably no more efficient way to extend better agronomic practices than through a *filière*-based approach in which producer association members understand the role of organic protocols and better land husbandry from the production and marketing aspects. Not all farmers will accept this approach, but those who are leaders are likely to help extend technologies and improve watershed practices.

H1. Summary Conclusions

1. ADAR agribusiness clients' abilities to enter and remain competitive in export markets are increasingly determined by their familiarity with and application of international standards for quality, health and safety, and environmental responsibility.

2. Specialty and high-value markets are particularly sensitive to consumer and business-to-business demands for products that are safe and healthy, and are produced in a socially and environmentally responsible manner.

3. Sales in rapidly growing, high-value markets provide the economic stability necessary for producers and processors to make needed investments in rational land use with a long-term view, in addition to imposing market-based environmental standards.

4. Most ADAR-assisted agribusinesses have weak management systems that hinder anticipation of and adaptation to market standards. These also hamper cost controls and identification of alternative production or processing procedures and profitability.

5. ADAR clients with better management systems are more responsive, competitive, profitable, and more efficient meeting environmental standards, particularly those related to resource use and waste control. These clients and the processes they employ are more sustainable.

6. There is a shortage of basic enterprise consulting in Rwanda, as well as a complete dearth of quality and environmental management systems that respond to the various standards (e.g., ISO 9002/14001, FairTrade, and IFOAM). Dependency on expensive offshore auditors and implementation consultants will act as a serious cost barrier for ADAR clients.

7. Current environmental legislation and government capacity in Rwanda is inadequate to monitor the importation or use of agrochemicals in production or processing. The Bureau of Standards, MINAGRI, MININTERE, MINICOM and other government testing facilities are currently unable to track the quality of agricultural inputs, and customs facilities are unable to control the importation of delisted or expired agrochemicals.

8. Several pieces of draft legislation, notably MINITERE's Framework Law on Environment and MINAGRI's regulations on plant protection and pesticide use, could eventually have direct bearing on and costly ramifications for ADAR-supported agribusinesses, which should be taken into consideration now.

9. The selection and use of agrochemicals in Rwanda is worrisome given the broad donor community's intent to use them to rapidly accelerate agriculture production. While current use rates are very low (composite average of 3-4 kg per hectare per year), no safeguards are in place to discourage the improper use of fertilizers and pesticides. Most, if not all, of ADAR's clients need to significantly improve their systematic application of guidelines for the proper selection, storage and application of agrochemicals.

H2. General Recommendations

ADAR should help emerging Rwandan producers and processors meet the increasingly rigorous quality, health and safety, and environmental standards as a basic element of their competitiveness model. In order to improve profitable and sustainable agriculture and assure long-term economic growth, ADAR and USAID should carefully consider the following recommendations. More specific recommendations are offered within the report body:

1. ADAR should test the attached Quality and Environmental Management Systems (QEMS) as an element of its screening procedures for new applicants. Using such a tool can identify quality and environmental management issues that it may be able to address.

2. ADAR's market information system should begin to routinely track and make available information on social responsibility standards that are likely to become increasingly important to exporters of high-value commodities.

3. ADAR and USAID should support a two-day practical awareness training in environment and quality management systems for agribusinesses, a five-day EMS certification training for line officers and consultants working for the Bureau of Standards and MINITERE, as well as a short evening seminar for key decision makers on social responsibility standards likely to affect Rwanda in the near term.

4. As a complementary but essential line of assistance, USAID and ADAR should support the development of local commercial capacity to implement and audit third-party certification to international market standards including ISO 9002/14001, IFOAM, and FairTrade, by supporting local and regional consultants through networks and training.

H3. USAID Recommendations

The vast potential of out grower networks for coffee, tea, pyrethrum and organic produce offer exciting opportunities to extend sustainable husbandry practices across broad landscapes in a country unlikely to be able to afford extension services. USAID/Rwanda should consider the many ways in which landscape ecology can be more positively influenced by harnessing the power of agribusinesses joined with producer associations and out growers. Actions that would be of great help include: protecting critical watershed elements; reducing soil erosion and fertility decline; assuring minimum operating distances from remaining natural forests and riparian zones; supporting cooperative management of forest plantations; encouraging policies that create incentives for forest product out growers; and supporting regulatory reforms that better govern the use of agrochemicals and processing waste streams.

1. ADAR and USAID should consider ways to support the rolling out of an applications policy once the Framework Law on the Environment is passed. Unless there is multilateral support for pushing this law to implementation, there are real reasons to be fearful for Rwanda's crumbling environment, particularly surface water contamination, deforestation, and the loss of remaining biodiversity.

2. ADAR should assist *filières* to identify and apply best landscape-management practices for soil, water, and forests as one of the important aspects of achieving global expectations for environment and social responsibility.

3. ADAR, USAID and all of the partners should review and consider the forthcoming applications on the sighting and design layout for an idealized or prototype coffee washing station. It is recommended that qualified civil engineers familiar with the environmental and ergonomic impacts of stations, be engaged during the installation of future stations. Determination as to the costs and benefits of water recycling and water treatment on quality and the environment should be fully explored.

4. USAID should work with the Government of Rwanda and private partners to develop and install guidelines to assure that both ground and surface water resources are carefully considered in all agriculture activities.

Scope of Work
Environmental Management Specialists

I. Background

USAID/Rwanda's Strategic Objective Number Three (SO3) seeks to increase the ability of rural families involved in producing targeted commodities to improve household food security by positioning agribusiness operators and their entire commodity sectors on sustainable and expandable growth.

To facilitate the agribusiness private sector revitalization in Rwanda, the USAID mission has, under a RAISE IQC, designated Chemonics International Inc., a Washington D.C.-based consulting firm with agribusiness experience in more than 100 countries, to implement the mission's Agribusiness Development Assistance in Rwanda (ADAR) project. The ADAR project seeks to:

- ***Add value*** to key commodities targeted ***for export***
- ***Build efficiency*** and expand employment within ***commodity chains***
- ***Upgrade managerial and technical capability*** in agribusiness enterprises
- ***Improve product quality and expand access to markets***
- ***Develop financing options*** to support agribusiness growth

Special features and benefits in the ADAR program include the following:

- **Agribusiness Centre (ABC)** to serve as the "information central" for Rwanda's agribusiness community offering current market information, expanded commercial contacts, and technical assistance, all to keep motivated agribusiness operators informed;

- **Special initiatives** to break through operational, market, technical and financing obstacles which may confront enterprises seeking to accelerate sales and export;

- **Training** through carefully prepared modules to sharpen production, marketing, planning and financial management skills, and to improve client enterprise performance through less formal workshops and seminars, conducted on a continuing basis;

- **Financial access** to individual enterprises and associations that need to apply for credit through a program of orientation and training for bankers and other professionals offering agribusiness support services

Sustainability is integrated throughout all ADAR operations. Given the finite natural resources base in Rwanda, ADAR has determined that supporting environmental management systems within agro-industries may provide a significant opportunity to enhance sustainability and help avoid future costs for regulatory compliance and production factors. ADAR's contribution to agribusiness can be strengthened by facilitating improvements in its partner's ability to identify and respond to environmental cost reduction opportunities.

II. Objective and Nature of Service Required

The objective of this task order is to help the ADAR project develop an internal management and documentation system that identifies and mitigates the potential environmental impacts of ADAR-supported agro-industries. The consultancy will also catalogue applicable regulations and current best practices, which ADAR can easily and routinely support within current resource constraints.

III. Specific Tasks to Be Performed

The objective of this assessment is to:

1) Review current and prospective agro-industries receiving ADAR support in order to assess their operational aspects, the scope of these operation's potential environmental impacts and associated costs, and to identify sources of mitigation support;
2) Review current Rwandan environmental law and meet with appropriate officials to identify and catalogue the regulations governing agro-industry environmental performance;
3) Identify and compile information on current best management practices that mitigate the environmental impacts or associated production costs of ADAR-supported agro-industries, and projects that have the capacity to support these practices;
4) Work closely with ADAR staff and the USAID Environment Officer to determine the nature and limitations of ADAR support services and how best to leverage other projects that may be providing environmental services;
5) Based on the above work with the ADAR team, to design and develop an environmental decision support system that allows the project to identify and document its support to agro-industries that may have environmental consequences as well as documenting cost savings that might accrue. Also to support mitigative measures, particularly by leveraging other project capacities and resources.

IV. Personnel and Qualifications

Environment and Natural Resources Management Specialist. Demonstrated background in functional environmental management, familiarity with natural resources management issues and small holder production systems, and proven ability to work within USAID's Reg. 216 process as well as familiarity with international EH&S and agriculture product auditing protocols (e.g., ISO 14001, FSC, SA 8000, FairTrade). Familiarity with Central African agriculture production systems and best environmental management practices. French-speaking expert with background in resource conservation practices.

Agriculture Production Specialist. Proven appreciation of agriculture production and farming systems with knowledge of agronomic practices, processing of small holder crops for regional and international markets, and familiarity with grades and standards issues related to trade-based certification systems. Background in production and environmental economics and USAID's Reg. 216. French-speaking expert familiar with Central African production systems and resource conservation issues.

V. Level of Effort

Two-person team, two weeks each, flight time inclusive, six-day work week requested plus two days preparatory time in Washington and two days report writing (36 days total).

VI. Deliverables

1) Inventory and written review of applicable environmental laws governing agriculture production, processing and transport;
2) Annotated inventory, of best environmental management practices and projects with the capacity to support these practices, including compilation of ready-to-use extension support materials and potential human resources for training;
3) ADAR internal environmental management system which allows the project to identify, scope and propose mitigative actions for potential environment, health and safety impacts within agribusinesses supported by project resources;
4) Final report detailing findings and recommended actions

VII. Roles and Responsibilities

The international facilitator will report to the ADAR deputy chief of party or to his designee while in Rwanda.

Contacts

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ADAR Agriculture Business Center
Quality and Environment Management Review

Scope

Sustainability is a cross-cutting theme spanning all Agribusiness Development Assistance in Rwanda (ADAR) operations. Sustainable development in Rwanda is dependent on how well farmers and agribusinesses collectively manage the country's natural resources base. With few advantages in anything other than agriculture, Rwanda's soils, water and forests will singularly determine its economic future. To successfully enter high-value and export-led markets and remain competitive requires incorporation of social and environmental responsibility. ADAR has determined that the establishment of environmental management systems within supported agro-industries may provide significant opportunity to enhance competitiveness and reduce future risks that accompany evolving regulatory compliance and production factors. ADAR's contribution to agribusiness can be strengthened by facilitating continual improvements in its partners' ability to identify and respond to environmental cost reduction opportunities

Purpose

The ADAR Quality and Environment Management Review (QEMR) is designed to help the project evaluate the environmental sustainability of prospective agribusiness client operations. The QEMR will supplement other ADAR application requirements and will serve to identify quality, environment, health and safety challenges that might limit the enterprises' competitiveness and production by:

1. Appraising overall management conditions required to systematically identify and incorporate environmental, health and safety costs into management decisions;
2. Gauging the client's conformance with applicable international standards in quality management, environmental/social responsibility and identify corrective actions;
3. Benchmarking the firms knowledge and application of local laws and regulations;
4. Identifying applicable U.S. laws governing the use of USAID funds.

The QEMR provides the basis for the identification, mitigation and continual improvement of activities that may have negative environmental consequences throughout the period of ADAR's substantial support.

Instructions

The ADAR QEMR is for use in review of all ADAR-supported activities to assist enterprises, cooperatives and associations. ADAR's deputy chief of party or his designee will be responsible for its timely application, obtaining required approvals and follow-up information, for monitoring the subsequent performance of ADAR clients, and for assuring the proper documentation of the ADAR QEMR system.

The QEMR interview questionnaire is designed to be conducted with the ADAR client general manager or production manager.

1. ADAR Contact Information
2. General Enterprise Information
3. Quality Management System Assessment
4. Environmental Characterization of ADAR Support
5. Occupational Health and Safety Assessment
6. Walk Through Inspection
7. ADAR Resource Allocation Strategy

Agribusiness Development Assistance in Rwanda (ADAR)
Environment and Quality Management Review (QEMR)

Note: This questionnaire is confidential and the responses will not be released to any party outside ADAR. See instruction sheet for additional information.

Date: _____ ADAR staff member (s) conducting QEMR: _____

A. ADAR Contact Information:

1. Name:_____
2. Title:_____
3. Name of organization:_____
4. Address:_____
5. Telephone number:_____
6. Fax:_____
7. Email:_____

B. General Enterprise Information:

Type of enterprise (select one):

1. ☐ Private Enterprise ☐ Association ☐ Cooperative
   ☐ Non-Governmental Organization

2. If private, please provide following information:

3. Owner's name: _____Parent organization if applicable: _____

4. Domestically owned? ☐JVC ☐ JV Partner(s) _____

5. Year established: _____

6. Products: _____

7. Export countries: _____

8. Number of employees at plant: _____

9. Active association, cooperative or out grower members: _____

10. Enterprise size: ☐ small (<50) ☐ medium (50-300) ☐large (>300)

11. Individual out grower area dedicated to crop:
    ☐ < 0.1 ha ☐ 0.1 – 0.25 ha ☐ 0.25 – 0.5 ha ☐ 0.5 – 1.0 ha

12. Depiction of out grower association development:
    ☐ nascent ☐ no management ☐production and regular meetings
    ☐ functioning board ☐ revenue distribution ☐ adding members

C. Quality Control System Review

1. How does the company manage quality control in produce sourcing, processing or final product?

    ☐ Inspection, during production or before dispatch of individual products
    ☐ Quality control including product/service inspection, statistical sampling
    ☐ Recognized quality assurance system implemented to the ISO 9001/2/3
    ☐ Don't know
    Does the firm or buyer conduct quality audits? (ask for audit results)
    ☐ Yes ☐ No ☐ Don't know

2. Does the firm have written statements related to quality, health and safety, and the environment?

    ☐ Quality
    ☐ Environmental
    ☐ Occupational Health and Safety
    ☐ None

3. Is the organization certified to any of the following standards by a recognized third-party provider?

    ☐ ISO 9001/2
    ☐ ISO 14001
    ☐ FairTrade
    ☐ IFOAM
    ☐ Other (specify)
    ☐ Don't know

D. Environmental Characterization of ADAR Support[1]

Identify those activities that ADAR is likely to support or intends to:

☐ Technical studies and analyses and other information generation activities not involving intrusive sampling of endangered species or critical habitats

☐ Support for intermediate credit organizations including banks, other microfinance lenders, or NGOs? If so,

[1] Information requirements derived from the *Rwanda SO3 Initial Environmental Evaluation (amended)* conducted by Charlotte Bingham, REDSO/ESA/REA on 09/12/98 and amended based on *Environmental Guidelines for Small-Scale activities in Africa* (2nd draft). Tellus Institute.

Do credit institutions have environmental guidelines for lending in use?
☐ Yes ☐ No
Does ADAR anticipate supporting environmental guidelines or capacity?
☐ Yes ☐ No

☐ Controlled experimentation for the purpose of research and field evaluation confined to small areas? If yes, size of experiments will be: ☐ < 4 ha ☐ > 4 ha in total area

☐ Water system development for ADAR client commercial requirements? If so, will these include:

☐ Structures such as dams, dikes and other impoundments
☐ Approximate size of any water impoundment
☐ < 0.1 ha ☐ 0.1 – 0.5 ha ☐ > 0.5 ha

☐ Irrigation systems development and deployment.

Type of irrigation: ☐ open canal ☐ piped using gravity
☐ piped using pump ☐ drip
a. Anticipated surface area to be irrigated:
☐ < 0.1 ha ☐ 0.1 – 0.5 ha ☐ > 0.5 ha
b. What is the length of the water distribution system?
☐ < 100 m ☐ 100 m – 1 km ☐ > 1 km

☐ Construction or repair of agribusiness or partner facilities.
If yes, total surface area to be disturbed will be: ☐ < 1000 m2 ☐> 1000m2

☐ Includes land clearing or leveling for new agriculture production?

☐ If so, is it currently farmed? ☐ Has it been previously farmed?
☐ It's never been under production
☐ Type of leveling anticipated: ☐ individual producers ☐ processing site
☐ storage facility
☐ Erosion precautions during leveling:
☐ gabions ☐ earthen terracing ☐vegetative strips
☐ Conversion if never under production:
☐ from forest production ☐ from cattle production

☐ Rehabilitation of water points for domestic household use, shallow, hand-dug wells or small water storage devices. If so,

☐ Will water points be adjacent to:
☐ marais ☐ national parks ☐ Forets Classes

- ☐ Does the activity plan to test water quality for:
  - ☐ arsenic ☐ nitrates/nitrites ☐ coliform?
- ☐ Minor construction or rehabilitation of rural roads less than 10 km?
- ☐ If so, are alignment changes anticipated?
- ☐ If so, will such changes take the new alignment within 5 kilometers of any national park or remaining natural forests? ☐ Yes ☐ No

☐ Purchase or importation of agrochemicals ? If so, which are likely?

- ☐ Compound or simple fertilizers. Anticipated quantities: _____ kg
- ☐ Pesticides. Anticipated quantities: _____ kg
- ☐ Fungicides. Anticipated quantities: _____ kg
- ☐ How will the project assure that only approved chemicals will be used? Check those that apply:
  - ☐ Check bills of lading, purchase orders and invoices.
  - ☐ Regularly update ADAR client on approved USEPA and Rwandan regulations.
  - ☐ Monitor the client's proper storage, handling and use during site visits

☐ Is there any anticipation of support for forest industries, including:

- ☐ Procurement or use of timber harvesting equipment?
- ☐ Commercial extraction of timber or non-timber products from anything other than plantations?
- ☐ Construction, upgrading or maintenance of roads that pass through natural forest?

☐ Out grower production sites are best described as:

- ☐ steep upper side slopes ☐ gentle lower slopes ☐ in bottomlands or marais
- ☐ near streams, lake or running water ☐ on reclaimed or severely degraded land

E. Processing Site Description (*n.b. these questions pertain only to processing facility only*)

1. Processing facility proximity to: Closest town: ___ km Town name: _____

2. Facility proximity to nearest stream, river, lake:
   ☐ < 100 m ☐ 100– 00 m ☐ 500–1,000 m ☐ >1 km

3. Facility location (check all that apply):
   ☐ marais/basfonds ☐ hillside ☐ steep slopes ☐ urban

4. Approximate surface area of facility:
   ☐ < 0.5 ha ☐ 0.5-1.0 ha ☐ 1.0 – 5.0 ha ☐ 5.0 ha

5. Does the product cycle require drying or heating? ☐ Yes ☐ No.

6. If yes, What type of energy is used for drying? ☐ fuelwood ☐ peat ☐ electric ☐ other _____

   Approximately what % of product cycle costs can be ascribed to energy needs? _____%

7. What processes are operated at the facility?

☐ Irrigation	☐ Cold pressing	☐ Pressing
☐ Bleaching	☐ Fermentation	☐ Pulping
☐ Bottling	☐ Food Processing	☐ Forestry
☐ Canning	☐ Forging	☐ Pickling
☐ Milling	☐ Fuel Storage	☐ Stripping
☐ Dairy production	☐ Grading	☐ Polishing
☐ Dyeing	☐ Mining	☐ Welding
☐ Drying	☐ Packaging	☐ Wood Preserving
☐ Extruding	☐ Painting	☐ Power Generation
☐ Degreasing	☐ Refining	☐ Tanning
☐ Farming	☐ Washing	☐ Sandblasting

8. List hazardous chemicals or materials (e.g., "pops" chemicals) used at facility: (indicate annual usage as follows:
   ☐ 1 – 10kg; ☐ 10 – 100 kg; ☐ 100 kg – 1,000 kg; ☐ > 1,000 kg)

☐ Aldrin	☐ Dioxins
☐ Chlordane	☐ Solvents (Hexane, Tolulene, etc.)
☐ DDT	☐ Toxaphene
☐ Dieldrin	☐ CFCs/Refrigerants
☐ Endrin	☐ Fungicides (Mancozeb, Dithane, etc.)
☐ Furans	☐ Rodenticides
☐ Heptachlor	☐ Other:

9. How do you track the quantities of agrochemicals chemicals used at your facility?

   ☐ Inventory records
   ☐ Shop floor estimates
   ☐ Purchase records
   ☐ Don't track

10. What are the major wastes generated at the facility?

Solids

Byproduct: ☐ pulp ☐ hulls/husks ☐ peelings ☐ grading loss
☐ fermented residues

Energy: ☐ cinders/ash ☐ sawdust ☐ sidecuts ☐ unusable briquettes
☐ stable bedding

Packaging: ☐ product packaging ☐ transportation containers
☐ shipping pallets

Collateral refuse: ☐ plastic wrapping ☐ fertilizer/pesticide containers
☐ worker refuse

Liquids

Wastewater: ☐ depulping ☐ cleansing ☐ fermentation sludge
☐ irrigation runoff

Tanning/textiles: ☐ tannins ☐ colorants ☐ surfactants/emulsifiers
☐ paints, dyes, latex, resins

Equipment: ☐ discarded solvents ☐ spent oils, greases ☐ refrigerants
☐ animal wastes ☐ machine shop residues

Air releases: ☐ boiler smoke ☐ fuelwood burning ☐ waste incineration
☐ other

Does the firm have emergency response procedures or plan in place?
☐ Yes ☐ No

Does the firm monitor or measure environmental performance, including regulatory compliance?
☐ Wholly ☐ Partially ☐ Not at all ☐ Don't know

Do you conduct environmental audits to determine the effectiveness of the controls in place?
☐ Yes ☐ No

Has the firm ever been served a notice of violation or cease and desist order by the Government of Rwanda?
☐ Yes ☐ No

Have you encountered any community pressure or public relations problems related to the environmental operations of your company? ☐ Yes ☐ No

11. Occupational health and safety assessment:

Has the firm identified the health and safety hazards to personnel at either the production or processing sites? ☐ Yes ☐ No ☐ Don't know

Has relevant legislation and regulations on the firm's health and safety risks been identified?
☐ Wholly ☐ Partially ☐ Don't know

Do you maintain records your occupational health and safety performance?
☐Yes ☐ No ☐ Don't Know

F. Walk-Through Inspection

Please walk through the facility and observe the following conditions:

Observation	Note specifics
☐ Product quality deficiencies	
☐ General housekeeping problems	
☐ Evidence of chemical releases	
☐ Inadequate or incorrect product or hazardous chemical labeling	
☐ Lack of safety warning signs	
☐ Improper segregation or storage of hazardous material and/or waste	
☐ Leaking valves, lines and containers	
☐ Inadequate or incorrect PPE	
☐ Inadequate machine guarding	
☐ Uncovered chemical/waste containers	
☐ Inadequate/incorrect emergency equipment	
☐ Improper lighting/ventilation	
☐ Absence of MSDS information	
☐ Inadequate or ineffective maintenance	
☐ Presence of uncontrolled physical, chemical and biological hazards	
☐ Other observations:	

G. ADAR Resource Allocation Strategy

Are the firms' environmental, health and safety, and natural resources impacts readily identifiable?
☐ Yes ☐ No

Does the organization already have a quality, environmental or health and safety system in place?
☐ Quality ☐ Environmental ☐ OSH

In your opinion, does the organization have the managerial commitment to improve management performance with ADAR support? ☐ Yes ☐ No

Would the following be of interest to you regarding the ADAR project?
☐ customer requirement ☐ potential cost savings ☐ regulatory compliance
☐ public image ☐ no interest in participating ☐ other:_____

What is the most appropriate assistance that ADAR can provide for this organization with regard to QEMR? ☐ QMS first ☐ EMS only

What are the prospects for certification to an international standard in timeframe of ADAR assistance? ☐ Small ☐ Medium ☐ Large

Recommended strategy/next steps?
☐ management training ☐ quality systems support
☐ environmental management training
☐ additional environmental review

ANNEX D

Starbucks Preferred Supplier Program

Starbucks Coffee Company
PO Box 34067
Seattle, WA 98124-1067
206/447-1575

November 12, 2001

Dear Friends,

As you know, Starbucks is dedicated to sourcing the highest quality coffees available throughout the world. To that end, we are committed to encouraging and expanding the production of high quality, sustainably grown coffee. We believe that the sustainable model is the key to a healthier future for our industry. Starbucks defines sustainability as an economically viable model that addresses the social and environmental needs of all the participants in the coffee supply chain from producer to consumer.

For some time, Starbucks has been in the process of defining a new purchasing philosophy. Although we are committed to addressing social and environmental concerns, we also think that there are compelling business reasons to effect change in the worldwide coffee market. Through enlisting the support of coffee suppliers who are like minded, sustainability advocates, we hope to create a network of industry leaders who will join us in finding a way to create positive changes within our global coffee community. We do not underestimate the difficulty of such an endeavor. However, in evaluating the long-term future of the coffee world we conclude that our collective choices are quite clear. The coffee industry must undergo internal change to ensure a solid future.

We have sought the help of many outside sources to help us develop a set of guidelines which will not only protect our high quality standards but will also promote the long term viability of the high quality coffee market. We are focusing on quality, economics, environment, and people. It is our intention to provide financial incentives along the supply chain that will promote a healthier industry.

Our objective is not to replace existing supplier relationships, but rather to enlist our current suppliers and others as partners in developing truly sustainable sources for the world's best coffees.

Enclosed you will find the following:

- A description of our pilot program for preferred suppliers
- Starbucks green coffee purchasing guidelines
- Starbucks coffee quality letter
- An outline of a system for independent verification
- A list of organizations with verification expertise
- A supplier information profile

We are planning to conduct a two-year pilot of this newly defined purchasing policy. We will use feedback from suppliers and our own experience to make adjustments to the program during the pilot phase. We will publish an update at the end of the first year and an evaluation of the pilot at the end of the second year. We believe that building this program will take time, patience and flexibility. We encourage you to participate with us.

Sincerely,

Mary Williams
svp, Coffee

Marc Schonland
vp, Green Coffee

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Starbucks Green Coffee Purchasing Program
Pilot Program for Preferred Suppliers

As part of Starbucks Coffee Company's ongoing commitment to the values we embrace in our mission statement, we have developed a Preferred Supplier Program to encourage continuous improvement in sustainable coffee production. Our ultimate goal is to create a fully sustainable coffee production supply chain.

We are introducing this as a pilot program. It is a flexible point system that rewards performance in five sustainability categories and enables vendors to evaluate their capability to qualify as a Starbucks Preferred Supplier. The coffee offered by Preferred Suppliers will be given purchase priority over all other coffee offers received during that particular Starbucks purchasing cycle. Every lot of a vendor's coffee will be subject to these same sustainability criteria.

Starbucks realizes that this program will require a process of change for many of our vendors. We want to support like-minded sustainable coffee advocates as they make these changes toward sustainability by providing a market for high quality coffee. All coffee purchased during the pilot program will receive a premium based on sustainability points earned. At the end of a two-year pilot phase, the program will be reevaluated based on progress made and work still to be done with individual vendors. The ultimate goal would be to have all sustainability factors included in the cost of production, and therefore, covered through our outright pricing program

Point System
Preferred supplier status will be awarded to vendors who have achieved a score of 100 points. However, in order to reward improvement, contracts will be awarded to those vendors who are engaged in the process of achieving preferred supplier status based on compliance with the following point system. The more points earned the higher level of purchasing preference will be awarded, until Preferred Supplier status is reached. During the pilot phase, whenever Starbucks is in the market, the vendors with the highest sustainability ratings will be given preference over other vendors.

Quality

Prerequisite for participation. (See attached letter regarding quality.)

Verification

Prerequisite for participation. (See attached Outline of a System for Independent Verification.)

Environmental Impacts: 50 points

Soil management	5 points
Water reduction	5 points
Clean water	5 points
Water buffer zone	5 points
Forest and biodiversity conservation	5 points
Use of shade	5 points
Energy use	5 points
Pest management	5 points
Accepted agrochemical	5 points
Waste management	5 points

Please note: Organic certified coffee will be awarded the current industry standard of 15 cents per pound. Consequently, an organic category does not appear here.

Social Conditions: 30 points

Wages and benefits	10 points
Health and safety	10 points
Living conditions	10 points

Economic Issues: 20 points

Transparency from supplier to farm level	20 points

Price Incentives

Starbucks believes that all of the criteria described in the point system are crucial to creating a truly sustainable coffee production system. We want to encourage the transition to such a system by supporting the costs associated in making the transition. We will therefore provide an interim financial incentive program to assist vendors in becoming sustainable producers and suppliers. Starbucks will provide up to ten cents per pound premium based on the above point system. This equals roughly one cent per pound for each 10 points earned. This premium can be included on the invoice for the coffee under a category called "sustainability bonus," provided suitable verification is attached.

For those vendors who have already negotiated contracts with Starbucks for crop year 01/02 and beyond, we encourage you to participate in this pilot program now. It is our hope that during the two-year pilot program, you will provide Starbucks with sustainable coffees against these contracts. The point system and sustainable bonus program are offered to you as an incentive to achieve Preferred Supplier status while fulfilling your existing contracts with us. (You will receive "sustainability bonuses" in addition to the contract price currently agreed upon based on verification of meeting the criteria.)

Starbucks is clearly committed to establishing long term alliances with sustainable producers and suppliers. We know that a lot of unexpected issues will arise during the pilot phase of our preferred supplier program. Our goal is to work with vendors individually on programs that meet their needs, attain our mutual objectives and create a path toward sustainability for our industry.

Acknowledgements

The coffee sourcing guidelines are part of a long-term partnership between Starbucks and Conservation International to promote methods of coffee production that help conserve global biodiversity. The criteria for the sourcing guidelines are based on the *Conservation Principle for Coffee Production*, which were developed jointly by Consumers Choice Council, Conservation International, the Rainforest Alliance, and the Smithsonian Migratory Bird Center. Starbucks and other industry leaders played an advisory role in the creation of these principles.

Starbucks Green Coffee Purchasing Guidelines

Quality Criteria: Prerequisite	
Every coffee offered must meet Starbucks quality standards in order to be considered for purchase. High quality is an integral component of sustainability at all levels of the coffee supply chain.	
Qualifying varieties	Only arabica varieties of coffee will be purchased.
Flavor characteristics	Starbucks cup quality standards are based on specific descriptions for each coffee purchased. Every coffee is expected to represent the flavor character unique to the country or region of origin. All coffees are expected to provide a perfectly clean cup, with medium to heavy body, and excellent aroma. All washed coffees must be of Good Hardbean or better density and have good acidity.
Defect-free beans	Starbucks requires zero defects in grade, good even color, and consistent bean size.

Environmental Impacts: 50 points		
Coffee growing and processing systems should contribute to conservation of soil, water and biological diversity; employ efficient and renewable energy technologies; minimize or eliminate agrochemical inputs; and manage waste materials consistent with the principles of reduction, reuse and recycling.		
Soil management	Farm management practices should effectively control erosion and enhance soil structure and fertility, relying as much as possible on means such as organic fertilizers, cover crops, mulch and compost.	5 points
Water reduction	Coffee should be processed using methods that reduce water consumption.	5 points
Clean water	Coffee should be processed using methods that prevent pollution of surface water and ground water.	5 points
Water buffer zone	Vegetative buffer zones should be in place adjacent to all water sources. No alteration should be made to the courses or hydrology of streams or other surface water bodies.	5 points
Forest and biodiversity conservation	Coffee production systems should maintain and enhance biological diversity on farms and surrounding areas without disturbance of natural forests.	5 points
Use of shade	Existing coffee farms in forest regions should maintain or enhance shade canopy cover with diverse tree species that conserve local and endemic biodiversity.	5 points
Energy use	Coffee growing, processing and drying should use energy efficiently, employ renewable sources wherever possible, and not rely on firewood obtained from forest clearing. For example, patio drying should be used as much as practical and solar coffee drying technology employed where feasible.	5 points
Pest management	Integrated pest management systems are employed, limiting pesticide application to extreme cases when necessary to avert severe crop loss and substantial economic failure.	5 points
Accepted agrochemical	Coffee production systems should minimize and wherever possible eliminate inputs of agrochemicals such as chemical pesticides and synthetic fertilizers. Farms are certified organic, use organic management techniques or are otherwise demonstrating significant reductions in the quantity of synthetic agrochemicals being applied. No agrochemicals that are banned for agricultural use in their country of use, country of origin or by international agreement are stored or used on the farm.	5 points
Waste management	Waste and coffee by-products are managed to minimize environmental impacts by applying the principles of reduction, reuse and recycling, for example, composting or recycling of coffee pulp and parchment.	5 points

Social Conditions: 30 points		
Coffee production systems should ensure protection from workplace hazards and conform to local laws, as well as to applicable international conventions related to employee wages and benefits, occupational health and safety, and labor and human rights.		
Wages and benefits	Coffee farms that employ workers should conform to local laws and applicable international conventions related to workers' rights and benefits and are in a process of continual improvement over time. Wages and benefits should meet or exceed the minimum required under local and national laws. Workers' rights to organize and negotiate freely with their employers are guaranteed in accordance with local laws and international obligations.	10 points
Health and safety	Working conditions should meet or exceed applicable laws and regulations related to health and safety of workers. Effective measures should be taken to ensure the health and safety of farm workers who may handle or be exposed to agrochemicals.	10 points
Living conditions	Workers and their families, including seasonal workers, are provided with access to potable water, sanitary facilities, adequate housing, education and training, transportation, and health services.	10 points

Economic Issues: 20 points		
Coffee production systems and commercialization should benefit rural communities by boosting producer incomes, expanding employment and educational opportunities, and enhancing local infrastructure and public services. In order for coffee production to be sustainable, it must be economically viable at all levels of the supply chain, from seed to cup.		
Long-term relationships	Starbucks seeks to develop long-term trading relationships with preferred suppliers.	
Incentives	Through its purchasing and pricing policies, Starbucks seeks to provide incentives and support for sustainable coffee production, processing and shipping methods.	
Economic transparency	In order to ensure that the entire supply chain – farmer, miller, exporter, and importer – benefit from the Starbucks preferred supplier program, vendors are expected to provide reliable documentation regarding prices paid to their suppliers.	20 points

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Starbucks Coffee Company
2401 Utah Avenue South
S-CF1-Coffee Department
Seattle, WA 98134
(206) 318-7270 trading line

Starbucks Coffee Company

Dear Starbucks Supplier,

As we continue to expand Starbucks' green coffee needs, we believe it is important to reiterate the expectations we have for coffees we purchase. As you know, Starbucks has extremely high quality standards for both cup and grade. We have built our reputation on our commitment to the best quality coffee available. We view our vendors as strategic partners in the procurement the world's best coffees. It is our intention to ensure clarity and contract compliance for both you and for Starbucks. With this in mind, please note the following expectations for green preparation and cup quality.

GREEN PREPARATION-all contracts specifying "Starbucks Preparation", "European Preparation" or "E.P." are expected to contain the following: screen size 15mm and above, consistent bean size, uniform, good green color. The following defects will be considered out of specification for Starbucks Preparation, European Preparation, and E.P. : Black or partial black beans, brown beans, moldy beans, sours, insect damaged beans, white beans or quakers, pods, broken beans, more than 5% peaberries, uneven green color or faded beans, presence of sticks, stones or other non-coffee foreign matter. All other contracts will rely on established grades as per origin or established types. Deviation from the above standards will result in rejections.

CUP QUALITY- All coffees will be purchased on a very specific description. Each coffee is expected to represent the flavor character unique to the country or region of origin. Starbucks will establish approved types with all vendors for each quality purchased. Coffees purchased are expected to arrive fully equal to established type. All contracts are subject to the approval of both preshipment and arrival samples. Preshipment samples are not to represent more than 1000 bags and must weigh over 300 grams per sample. The following defects are considered out of contract compliance and will result in rejections: ferment, excessively fruity, oniony, phenolic, rioy, hard, medicinal, chemically tainted, baggy, oily, musty, moldy, peanutty, dirty.

This letter is not intended to be an assessment of past performance but rather it is a guideline for all existing and forward contracted business. Further, it is Starbucks goal to either approve or reject all coffees thus eliminating the need for most quality claims. Thank you for your continued participation as a green coffee supplier to Starbucks. We appreciate all your support.

Best Regards,

Green Coffee Buyer

Starbucks Green Coffee Purchasing Program
Outline of a System for Independent Verification

Starbucks recognizes that the effectiveness and credibility of the new purchasing guidelines and preferred supplier program will hinge upon regular monitoring and independent verification. Participating suppliers will be expected to furnish Starbucks with reliable third-party documentation regarding their progress in meeting Starbucks guidelines. In addition, Starbucks will assess the degree to which the overall goals of the program are being achieved, and will work with vendors to set targets for increased participation and continuous improvement. Starbucks envisions having progress toward meeting these measurable targets subject to independent audits. Such audits will likely be based upon representative samples of the results reported by individual participating suppliers. Starbucks will report annually on the progress and outcomes of the program.

As an integral part of the first phase of program implementation, the detailed design of the verification system will be developed during the coming year in consultation with growers, vendors and other stakeholders. Plans will be established jointly with each vendor, and different options will be tested, to ensure that verification is tailored to fit individual circumstances. Development of the system will take into account existing experience with applicable monitoring and verification tools employed by various industries.

Among other basic features, the verification system must be:

- **Affordable**, without adding significantly to production costs, and drawing to the greatest extent possible on existing relevant documentation.
- **Flexible**, to encourage innovation and diversity in best practices and methods of documentation.
- **Accessible**, with procedures that are transparent and understandable to all participants throughout the supply chain.

It will be necessary for participating suppliers to enlist the services of institutions qualified to conduct independent verification of activities and outcomes related to the Starbucks guidelines. Such institutions might include:

- Private sector accounting firms, certification organizations, or consulting businesses.
- Non-profit NGOs, academic institutions, or research organizations.
- Government agencies with divisions, departments or programs relevant to and compatible with the Starbucks guidelines.

It will be essential for qualified organizations to have sufficient expertise and capacity on matters relating to coffee production and supply chains. An additional prerequisite in all cases will be avoiding conflicts of interest. Individuals performing verification activities should have:

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Relevant professional experience and training.

- Ability to communicate in the local language of coffee origin locations where supplier practices are undergoing verification.
- Capability of making field visits.
- Skills required to prepare concise, coherent reports on verification findings.

Participating coffee vendors will have ample discretion in choosing verification organizations. A sample list of organizations with verification expertise is attached. Starbucks may engage the services of one or more established organizations to assist in the design, testing and refinement of the verification system. Hence, suppliers may be asked to cooperate in an audit of this program initiated by Starbucks.

Implementation of the purchasing guidelines is intended to complement Starbucks commitment to increased transparency along the coffee supply chain. Although the verification system for the Starbucks purchasing guidelines will have some elements in common with third-party certification, it is not our intention to create a new certification and labeling program within the coffee industry. The key distinction is that the purchasing guidelines will provide a basis for long-term relationships with our suppliers to encourage improved environmental and social performance. The guidelines program is not a substitute for chain-of-custody tracking and labeling of particular certified coffee products, which Starbucks will continue to offer in increasing quantities.

Starbucks Green Coffee Purchasing Program
Organizations with Verification Expertise

- Conservation International
- Rainforest Alliance
- ECO-OK
- OCIA
- International Labor Organization, Washington,DC
- Scientific Certification Systems
- QAI
- EcoLogica
- Icafe, Costa Rica
- Cicafe, Costa Rica
- Anacafe, Guatemala
- Colombian Coffee Federation
- Cenicafe, Colombia

Starbucks Green Coffee Purchasing Program
Supplier Information Profile

This form seeks general background on Starbucks vendors who may be interested in participating in a pilot implementation of Starbucks new green coffee purchasing guidelines. The form is for informational purposes and does not obligate respondents to any particular commitments.

Responses to this questionnaire are not intended for public dissemination. During the course of monitoring and reporting on the pilot implementation phase, however, Starbucks may make information available on the suppliers chosen to participate in the program. Proprietary business information will be kept confidential in all circumstances.

Please respond to the following questions to give us an idea of your current and planned activities that may be relevant to the guidelines program.

Part 1: General information

Name of organization and contact	
Address, telephone, fax, and e-mail, if applicable	
Type of business (*e.g.*, small farmer co-op, estate farm, importer, export company)	
Coffees grown or traded (varieties, origin countries, certified products, etc.)	

Part 2: Activities Related to Starbucks Green Coffee Purchasing Guidelines
Please indicate which standards you are currently meeting and the documentation you will submit as verification of your current practices. Also, indicate which standards you propose to meet and by what date. Use additional paper if necessary.

Standard	Are you currently meeting this standard (yes/no)	Verification If yes, describe documentation you will submit.	If no, do you intend to meet this standard? Please describe your plans.	By what date?	Points
Environmental Impacts: 50 points					
Soil management					5 points
Water reduction					5 points
Clean water					5 points

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Standard	Are you currently meeting this standard (yes/no)	Verification If yes, describe documentation you will submit.	If no, do you intend to meet this standard? Please describe your plans.	By what date?	Points
Environmental Impacts continued: 50 points					
Water buffer zone					5 points
Forest and biodiversity conservation					5 points
Use of shade					5 points
Energy use					5 points
Pest management					5 points
Accepted agrochemical					5 points
Waste management					
Social Conditions: 30 points					
Wages and benefits					10 points
Health and safety					10 points
Living conditions					10 points
Economic Issues: 20 points					
Economic transparency					20 points

ANNEX E

IFOAM Basic Standards for Organic Production and Processing

INTERNATIONAL FEDERATION OF
ORGANIC AGRICULTURE MOVEMENTS

FINAL DRAFT 2002

Basic Standards for Organic Production and Processing

TO BE VOTED ON AT THE GENERAL ASSEMBLY

Victoria, August 26-28, 2002

The deadline for motions is May 25, 2002!

Send your motions to the IFOAM Head Office:
Email: headoffice@ifoam.org
Fax: +49-6853-919899

International Federation of
Organic Agriculture
Movements

Introduction to the final draft of the IFOAM Basic Standards 2002

IFOAM continuously revises the IFOAM Basic Standards (IBS), taking into account the views of its members and other interested parties. In order to facilitate comment, the IFOAM Standards Committee (SC) circulates several drafts of the IBS. This is the third and final draft circulated in this round of revisions. It is based upon comments received by the SC to the previous drafts. The next General Assembly of IFOAM in Victoria, Canada, August 2002, will consider the final draft and adopt a text that will become the next version of the IBS (IBS 2002).

Motions to the general Assembly

Motions to the General Assembly may be proposed by 10 Members of IFOAM jointly or by a regional group. Motions addressing standards issues including the new version of the IBS must be **submitted to the IFOAM Head Office by May 25, 2002.**

Homepage

You can also view the draft proposal on the IFOAM homepage *www.ifoam.org* .The home page contains a version of the current draft with all changes highlighted and for ease of reading, a plain text version of the proposed new IBS. Both versions are available as Word files or PDF. The home page also contains a commentary form the SC that summarises the main issues raised by commentators and some of the reasoning of the SC concerning acceptance or rejection of proposals.

Structure of the presentation

The proposed language is presented in correction mode as shown here:
This text is a new proposal
~~This is old language now excluded from the proposed text~~
This is a comment from the IFOAM Standards committee

Text that is moved to a new location within the document but not changed is not marked as new text.

Comments to the drafts

Your comments have been very important to this revision process. In the two rounds of consultation, 50 commentators made a total of 1,302 comments. The SC thanks everyone providing comments to the drafts. All comments are welcome and no comment is too simple or too complex. The SC regrets that not all comments have been used in the final draft. Some reasons for this are:

1. Some proposed changes attract conflicting (i.e. favourable and negative) comments. These must be weighed by the SC and sometimes controversial sections of the IBS must be left unchanged until consensus is reached.
2. It is the policy of IFOAM that major changes to the IBS must be sent out for public comment at least twice. It follows therefore new comments to the second draft may not be suitable for use in the third draft. The SC would like to assure all commentators that many useful comments will be retained and used in the next revision of the IBS.

Comments from the IFOAM Standards Committee

The revisions achieved in this round address the content, structure and consistency of the standards. It includes changes to the standards and to draft standards and major changes to the organisation of the document. Many changes have been made in this round of revisions. The SC would like to draw your attention to the following:

There is a new structure to the document. It is now written mainly in the active voice. The active voice makes it much more clear which party is responsible for each action. The chapters have been reorganised into a new, and more logical order. The organization now follows this sequence:

Section A: General Principles

Section B: Standards, beginning with general principles and then ecosystem management, plant production and animal husbandry

Section C: Appendices. Includes inputs to organic agriculture, food additives and processing aids plus criteria for adding new inputs and additives.

Section D: Draft standards/appendix. Includes plant breeding and multiplication, aquaculture, cleaning, disinfecting and sanitizing, processing of textiles and forest management.

Some parts of the text have been removed because they relate more to criteria for accreditation than to standards. Some parts of the document have been restructured into a chapter on ecosystem management.

The SC has tried to gather all references to GMOs into one chapter (ecosystem management). The intention is to make the policy toward GMOs consistent and comprehensive, and to avoid the problems of contradictory or uneven treatment by mentioning them in some sections but not in others. The section on Beekeeping has been extensively revised.

The Chapter on Social Justice has been rewritten. The SC strongly encourages consideration of the issues and discussion concerning this chapter to see if the new proposal can be better received at the next General Assembly.

The SC regrets that it has not had time to further develop the Chapters on aquaculture, textiles and forestry. We invite further discussion on these Chapters in the next round of revision, and propose that these sections of the IBS will receive substantial further development in a future revision.

The chapter on processed product has been restructured and revised to clarify what is required of organic processed products. This version of the IBS includes a proposal for a Chapter called Plant Breeding and Propagation, and a corresponding Appendix. The new standards are proposed as draft standards only, at this stage. The SC seeks to initiate a wide discussion on this topic and considers that this section of the standards still requires further improvement.

In Appendix 1, 2 and 4 some of the materials have been explicitly restricted and others not. The restrictions that apply within the Standards are now identified in the Introduction to the Appendices. Additional restrictions in the input (materials) lists are provided where there is need to bring attention to specific concerns about the use of that material. The SC has proposed additional restrictions for a few materials.

The SC has considered many further changes to the biodiversity section of Chapter 2, and the appendices, especially criteria for inclusion of materials. This work has not been presented in this version in order to consult further and to ensure that biodiversity content of the IBS is commonly agreed, relevant to the worldwide context and capable of inspection. The SC has particularly identified this area for development in next revision.

Final remark

The IFOAM Basic Standards are a work in progress. The IBS covers organic production for the whole world. There are sometimes large historical, cultural, climatic, ecological and other differences in the operating environment in how organic production is performed. It is the intention of the SC and the IFOAM standard-setting process to:

1. Define the Basic Standards that unite organic production around the world and safeguard the organic consumer

2. Encourage producers, processors and marketers to strive for continual improvement and to adopt recommended practices

3. Promote the fundamental principles that underlay sustainable organic farming systems, food handling and food policy

4. The process also strives to facilitate and develop the organic production in all the diverse regions of the world.

The SC looks forward to meeting commentators and other interested parties at the General Assembly in Canada. The associated conference includes a workshop on standards issues, where everyone will be welcome.

With our sincere thanks, on behalf of the IFOAM Standards Committee,

Eva Mattsson
Chair of the IFOAM Standards Committee

Tim Marshall
IFOAM Organic Guarantee
System Coordinator

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Section A General

Scope of the IFOAM Basic Standards

Organic agriculture is a whole system approach based upon a set of processes resulting in a sustainable ecosystem, safe food, good nutrition, animal welfare and social justice. Organic production therefore is more than a system of production that includes or excludes certain inputs. The IFOAM Basic Standards provide a framework for certification bodies and standard-setting organizations worldwide to develop their own certification standards and cannot be used for certification on their own. Certification standards should take into account specific local conditions and provide more specific requirements than the IFOAM Basic Standards. Producers and processors that sell organic products are expected to be certified by certification bodies, using standards that meet or exceed the requirements of the IBS. This requires a system of regular inspection and certification designed to ensure the credibility of organically certified products and build consumer trust. The IBS reflect the current state of organic production and processing methods. These Standards should not be seen as a final statement, but rather as a work in progress to contribute to the continued development and adoption of organic practices throughout the world.

Relevance to accreditation and international reference

The IBS and the IFOAM Accreditation Criteria are used by the International Organic Accreditation Service (IOAS) in the accreditation process for certification bodies and standards setting organisations. The IOAS compares the standards (used by the certifier) against the IBS and certifier performance against the IFOAM Accreditation Criteria. All the requirements of the IBS relevant to the farming or processing operations certified must be implemented by IFOAM Accredited Certification Bodies. IFOAM Basic Standards are also used by non accredited certification and standard-setting organizations as a reference for setting their standards.

Structure

The IFOAM Basic Standards are presented as **General Principles, Recommendations, Basic Standards** and **Derogations.**

General Principles are the intended goals of organic production and processing. The principles are written as positive statements, using words such as "is" or "are". For example "Organic livestock husbandry is based on the harmonious relationship between land, plants, and livestock; respect for the physiological and behavioural needs of livestock and feeding of good-quality organically grown feedstuffs".

Recommendations are practical suggestions for operators to implement in organic farm, food, and fibre systems. IFOAM promotes the recommendations as desirable practices, but does not require operators to use them. They are written with the word "should". For

example "Handlers and processors should identify and avoid pollution and potential contamination sources."

Basic Standards are the minimum requirements that an operation must meet to be certified organic. All of the Standards applicable to the particular farm and enterprise must be met before the operation may be certified as organic. Basic Standards use "shall". For example "All ruminants shall have daily access to roughage".

Derogations are the exceptions made to specific sections of the Basic Standards that may only be applied under clearly defined conditions. Derogations are presented in *italic* text. Technical terms are explained in the section on definitions below. **Note:** Certification bodies sometimes set their own standards, or they may adopt standards set by other organizations. For convenience throughout the text, we have written standard-setting organization, where we mean both the standard-setting organization and the certification body.

Revision of the IFOAM Basic Standards

The IFOAM Basic Standards (IBS) are developed by the IFOAM Standards Committee (SC) in close cooperation and consultation with IFOAM member organizations and other interested parties. The General Assembly in Basel, September 2000, decided to install a new *Procedure for revision of standards*, confirmed the procedure regarding the presentation of *standards related motions* and approved the *Procedure for urgent standards revision.*

Statement from the IFOAM Standards Committee: Procedures decided by the General Assembly will be included in the text of the final version for printing. They are not included here as they are not part of the revision process. Refer to the Basel version (IBS 2000) for the full text.

Draft standards

New standards previously not covered by the IBS shall be called Draft Standards, to enable standard-setting organizations to develop ways of adapting them to local conditions before final adoption. Certification bodies are not obliged to follow Draft Standards, however they are encouraged to use them to guide the development of their own standards. Revision of Draft standards follows the Procedure for revision of standards.

You can view the draft standards on the homepage at IFOAM - International Federation of Organic Agriculture Movements.

Institutional and Policy Framework Governing Environment and Agribusinesses

In Rwanda, managing and protecting the environment is the responsibility of the Ministry for Lands, Human Resettlement and Environmental Protection (MINITERE), and coordinated by the Direction of Environmental Protection. However, since the genocidal war in 1994, the ministry lacks human and material resources. In order to improve environmental management, MINITERE has proposed the creation of L'Office Rwandais de l'Environnement (ORE)/Rwanda Environment Management Authority (REMA) which would be responsible for coordinating environmental management in its broader context.

In response to private sector demands to promote trade both nationally and internationally through the use of appropriate grades and standards, the Rwandan Government has just created the Rwanda Bureau of Standards (RBS)/Office Rwandais de Normalisation (ORN). This bureau still lacks the human and technical resources to become fully functional; it also faces the daunting task of either preparing standards or identifying standards that can be adapted to Rwanda's needs in almost every technical area. It will likely require considerable capacity building to meet its institutional responsibilities.

Prior to privatization, OCIR-Café controlled the entire coffee sub-sector *(filière)*. Currently, responsibility for the sale, processing and marketing of coffee have all passed to the private sector. OCIR-Café retains responsibility for promoting coffee quality and the distribution of pesticides to producers. However, the responsibility for more general extension services has devolved to the Regional Agricultural Services Office/Direction Régionale des Services Agricoles (DRSA).

Administration of the tea sub-sector is coordinated by OCIR-Thé, however, as with the coffee sub-sector, it no longer retains control of tea from production to export or sale. The tea plantations and factories have been privatized and are largely independent of OCIR-Thé. In the case of the tea factory that the team visited, it responds to quality requirements imposed by the export market rather than by OCIR-Thé.

OCIR-Thé and OCIR-Café appear to be struggling to identify and develop new institutional roles that are relevant to this new era of market liberalization. It would appear that one important contribution might well be market and product promotion and creating a positive image for Rwandan products, something like what the Juan Valdez promotions have done in the United States for Colombian coffee.

1. Regulatory Framework Governing Environmental Considerations in Agriculture

2.1. The National Environmental Policy

In Rwanda, as in many other African countries, the Ministry for Agriculture remained in control of the environmental sector. It was only after the earth summit in Rio 1992 that specific

programs related to sustainable development were established in accordance with the requirements of Agenda 21. Rio led to the signing and ratification of several international conventions on the protection and the conservation of the environment, including: the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES (1980), the African Convention on the Conservation of Nature and Natural Resources (1980), the Convention on Bio-Diversity (CBD, 1995), the UN Framework Convention on Climatic Changes (UNFCCC, 1995), the UN Convention to Combat Desertification (UNCCD, 1999) all helped piece together Rwanda's environmental policy. The ratification of these international instruments made it possible for Rwanda to obtain financing (GEF and UNEP) to implement their national environmental strategies. For this reason, Rwanda worked out its national environmental strategy and environmental action plan (SNER, 1996) and its national strategy for biodiversity (2000). These strategies demonstrated that the environmental problems of Rwanda articulate around questions such as:

- Water and soil management, the consequences of bad management being erosion;
- Waste management in general (solid waste, used water, industrial toxic waste). This is more difficult due to a lack national norms and standards and suitable management systems;
- Land management and the organization of rural and urban areas.

After the war of 1994, Rwanda, adopted a policy of agricultural intensification to respond to the food needs of its population. The principle threads of this policy are: rehabilitation of production support infrastructure; protecting soil against erosion and the management of soil fertility; promoting the use of agricultural inputs; reforming the production and marketing channels for export crops (tea and coffee); the promotion of improved varieties, which are more productive and better adapted to local circumstances, and the rehabilitation of existing coffee and tea fields plantings.

2.2. Current Environmental Legislation Affecting Agriculture in Rwanda

Due to environmental issues' recent entrance into the political landscape of Rwanda, few environmental laws exist. Nevertheless, there are long-standing laws that regulate natural resources and their use, including:

1.1. The Forest Code

Law N° 47/1988 was announced on December 5, 1988 and was officially published on February 1, 1989. This law includes provisions for soil protection, conservation and restoration that could all play an important role in watershed protection, particularly in cases where reforestation is required. Article.4.2 specifies the contents of communal forest plans and requires an inventory of communal lands threatened by erosion or degradation, which may require reforestation as the means to achieve conservation and restoration. Actually, this inventory has never been implemented and, consequently, this provision does not play the role envisioned to help protect the watersheds.

Article 28 stipulates that national parks, the banks of lakes and streams, and marshes with woody vegetation belong to the national forest estate. Unfortunately, this law does not have any implementing regulations to identify how it might be applied.

1.2. Laws on Fishing and Aquiculture

On the legislative level, the laws that exist are from the colonial period and concern mainly the regulation of fishing (ORU N° 52/60 of June 2, 1955), the introduction of new species of fish (Ordinance N°325/Agri of October 16, 1947) and the ban on the importation of water hyacinth (Ordinance N°51/162 of May 4, 1955). A law on fishing and aquiculture has been drafted and awaits adoption by the appropriate authorities.

1.3. Land Tenure Legislation

Land tenure law is a result of the dual traditions of common law, particularly the claiming of land by families or lineages (and the Mwami right of eminent property), and the written tenure law that was instituted during colonial rule according to Ordinance N° 8 of March 1927. This allowed foreigners to obtain land. After independence, the land tenure system did not change from that which was established during colonial times. Indeed, more than 90 percent of the agricultural land is still controlled by common law. The written land tenure law is exercised mainly in urban and commercial environments.

In 1976, a law regulating the process of purchasing and selling traditional land rights, the N°99/76 Decree of March 4, 1976 was proclaimed. This juridical instrument was to remove dualism between written land tenure law and the common law. The land regulation was even more complicated after the war of 1994, and the only legal tool available was the agreement of Arusha between the Government of Rwanda and the Patriotic Rwandan Front concerning the repatriation of the refugees. Article 2 of this agreement, stipulates that each Rwandan who returns to Rwanda is free to settle in any place of his/her choice inside the country in so far as it does not encroach upon the rights of others. In order to respond to this lack of legislation regarding the good management of national land resources and adapted to the present day context, the Government developed a draft law, "Portant Régime Foncier du Rwanda." This law has not been officially proclaimed because the government judged that the law must be supported by a land tenure policy that has not yet been developed.

1.4. Water Resource Management Legislation

Management of water resources is the responsibility of several ministries, depending on how the resource is used. This includes: the Ministry of Water, Ministry of Energy and Natural Resources (MINERENA) (hydroelectricity, food, and potable water), Ministry of Agriculture and Livestock (MINAGRI) (irrigation and drainage for the agriculture, aquaculture, and fishing) and the Ministry of Land, Resettlement and Environmental Protection (MINITERE), which is responsible for environmental management. There is no law that regulates the management of water resources except one dating from January 7, 1974, regarding pollution and the contamination of springs, lakes, and rivers. This ordinance requires territorial authority to determine the zones of protection of lakes, rivers or parts of rivers used as, or having the

potential to be used as, a potable water source. A new law is currently being prepared by MINERENA.

2.3. Pending Legislation Likely to Affect ADAR Clients

2.3.1. Draft Environmental Legal Framework

The environmental bill has just been prepared with the assistance of the United Nations Environment Program (UNEP). This law outlines the major principles of management and protection inspired by international conventions Rwanda has signed. Thus according to the Article7, the protection and the rational management of the environment and natural resources are based upon the following principles:

- Principle of precaution: precautionary or preventive steps result from an environmental evaluation of programs, projects or socio-economic activities and allow the avoidance of useless financial expenditures and environmental degradation often significant and irreversible;
- Principle of lasting and fair allocation between generations;
- Principle of polluter pays;
- Principle of public participation;
- Principle of cooperation.

Certain aspects of this draft legal framework may impact enterprises supported by ADAR. These include:

- Article11 regulates the management and use of agricultural land;
- Article 14 regulates the importation and exportation of any animal or vegetable products;
- Article 19 addresses the control of substances contributing to air pollution;
- Article 24 and 25 establish standards for the management of waste (sewerage, hospital and dangerous waste)
- Article 36, 37, and 38 establish the obligation to perform environmental impact assessments and indicate how they must be organized. These articles specify that the expense of the EIA will be born by the project promoter.
- Article 45 stipulates standards for environmental protection and for imported products. However the document does not specify if these standards exist today or how they will be defined. These standards do not apply to export products.
- Article 72,73,74and 75 prohibit all types of waste in the wetlands and river.

The legal framework authorizes criminal prosecution for violators, however, the bill does not cover the following aspects:

- The question of bio-safety and genetic transfer;
- Environmental standards for industry and other commercial activities;
- Pesticide management and its environmental impact;
- Quarry management and environmental norms for mining operations.

In order for this new legal framework to take effect, implementing rules will have to be developed and also passed into law. Experience shows that this last stage may be very long.

2.3.2. Draft Legislation on Plant Protection and the Use of Pesticides

This bill, prepared by MINAGRI, is of great interest to several enterprises receiving support from ADAR and involves the following:

- National phytosanitary monitoring and control;
- Phytosanitary inspection at the borders;
- Regulation of pesticides;
- Enforcement structures and their authorities;
- Criminal penalties for offenders.

MINAGRI annexed a presidential decree to the draft bill that specifies the make up of the Pesticide Commission. The members are high-level representatives of the ministries implicated in plant protection, the trade of imported plant products, environmental and human health, the Bureau of Standards, as well as importers and users of the pesticides. This decree will facilitate implementation of the law. The relevant provisions concerning the regulation of the pesticides include:

- The approval process and authorization of products (Article 15, 16, 17, 19);
- Packaging and labeling (Article18);
- Prohibitions and exemptions (Article.21, 22 and 23).

This bill gives all regulatory control of pesticides to the Ministry responsible for agriculture and does not refer to the Bureau of Standards. In addition, the bill does not indicate that phytosanitary certificates will be required, even though the Ministry of Agriculture presently requires and authorizes such certificates.