



**USAID**  
FROM THE AMERICAN PEOPLE

# MADAGASCAR AROMATIC AND MEDICINAL PLANT VALUE CHAIN ANALYSIS

COMBINING THE *VALUE CHAIN APPROACH* AND *NATURE, HEALTH, WEALTH AND POWER* FRAMEWORKS

microREPORT #70



**AUGUST 2006**

This publication was produced for review by the United States Agency for International Development. It was prepared by Criss Juliard (ACDI/VOCA), Charles Benjamin (IRG), Maziar Sassanpour (ACDI/VOCA) and Aro Ratovonomenjanahry and Pascal Ravohitrarivo with funding from the Accelerated Microenterprise Advancement Project Business Development Services (AMAP BDS) Knowledge and Practice Task Order and the FRAME Project.

# MADAGASCAR AROMATIC AND MEDICINAL PLANT VALUE CHAIN ANALYSIS

COMBINING THE *VALUE CHAIN APPROACH* AND *NATURE,  
HEALTH, WEALTH AND POWER* FRAMEWORKS

microREPORT #70

## **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# CONTENTS

<b>LIST OF ABBREVIATIONS</b>	<b>i</b>
<b>I. EXECUTIVE SUMMARY</b>	<b>1</b>
<b>II. BACKGROUND</b>	<b>9</b>
A. Introduction	9
B. Study Objectives	10
C. Analytical Framework and Approach	11
<b>III. VALUE CHAIN CHARACTERISTICS</b>	<b>14</b>
A. Overview	14
B. End Markets	15
C. Enabling Environment	21
D. Value Chain Actors	27
E. Relationships and Linkages Across Actors	37
F. Natural Resource Base and Sustainability Issues	41
<b>IV. STRENGTHENING THE AMP VALUE CHAIN</b>	<b>44</b>
A. Strategic Issues and Orientation	44
B. Constraints and Opportunities	44
C. Priority Actions	50
D. Stakeholder-led Action Plan	52
<b>V. CONCLUSION: LINKING VALUE CHAINS AND NATURE, HEALTH, WEALTH AND POWER</b>	<b>55</b>
<b>ANNEX 1: METHODS</b>	<b>58</b>
<b>ANNEX 2: EXPORT PRICE OF SELECT MALAGASY ESSENTIAL OILS (MARCH-APRIL 2006)</b>	<b>61</b>
<b>ANNEX 3: PHOTOGRAPHS</b>	<b>62</b>

# LIST OF ABBREVIATIONS

AMAP	Accelerated Microenterprise Advancement Program (USAID-funded Indefinite Quantity Contract)
AMP	Aromatic and medicinal plants
ANTP	<i>Association Nationale des Tradi-praticiens</i> (National Association of Traditional Healers)
BAMEX	Business & Market Expansion (USAID/Madagascar project)
BDS	Business development services
BfN	<i>Bundesamt für Naturschutz</i> (German Federal Agency for Nature Conservation)
CBD	Convention on Biological Diversity
CIE	<i>Conseil Interministériel de l'Environnement</i> (Inter-ministerial Environmental Council)
CIF	Cost, Insurance and Freight
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNE	<i>Conseil National de l'Environnement</i> (National Environmental Council)
CNRE	<i>Centre National de Recherches sur l'Environnement</i> (National Center for Research on the Environment)
CTD	<i>Collectivités Territoriales Décentralisées</i> (Decentralized Local Authorities)
EMEA	European Medicines Agency
ESSA	<i>Ecole Supérieure des Sciences Agronomiques</i> (Academy of Agronomic Sciences)
FOB	Free on Board
FOFIFA	<i>Centre National de la Recherche Appliquée au Développement Rural</i> (National Center for Applied Research in Rural Development)
FRAME	USAID project: Knowledge Sharing in the Natural Resource Community ( <a href="http://www.frameweb.org">www.frameweb.org</a> )
FTF	Fair Trade Federation
GACP	Good Agricultural and Collection Practices
GAP	Good Agricultural Practices
GELOSE/GCF	<i>Gestion Locale Sécurisée</i> (Secured Local Management)/ <i>Gestion Contractualisée des Forêts</i> (Contractual Forest Management)
GOM	Government of Madagascar
HMPC	Committee on Herbal Medicinal Products
ICBG	International Cooperative Biodiversity Group
IMRA	<i>Institut Malgache pour la Recherche Appliquée</i> (Malagasy Institute for Applied Research)
IRG	International Resources Group
ISSC-MAP	International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants
IUCN	International Union for Conservation of Nature
MEEF	<i>Ministère d'Environnement et des Eaux et Forêts</i> (Ministry of Environment, Water and Forests)
MSE	Micro and small enterprises
MT	Metric ton
NGO	Nongovernmental organization
NHWP	Nature, Health, Wealth and Power framework
NRM	Natural Resource Management
ONE	<i>Office National de l'Environnement</i> (National Environmental Office)
PNF	<i>Programme National Foncier</i> (National Land Program)
USAID	United States Agency for International Development
VCA	Value chain approach
WHO	World Health Organization
WWF	World Wildlife Federation

# I. EXECUTIVE SUMMARY

**Context of study.** This assessment of Madagascar's aromatic and medicinal plant (AMP) industry integrates the value chain approach (VCA) developed under USAID's Accelerating Microenterprise Advancement Project Business Development Services (AMAP BDS) Knowledge and Practice Task Order and the Nature, Health, Wealth and Power (NHWP) framework developed under USAID/FRAME and adapted by the USAID/Madagascar Mission.

The **NHWP** framework focuses on the nexus of natural resources, human health, economic concerns and governance as a driving force in rural development. It highlights the interlinked challenges of (a) facilitating sustainable utilization and improved management of natural resources, (b) improving standards of health and nutrition, (c) promoting economic growth and poverty alleviation, and (d) empowering rural producers and institutionalizing popular participation in public decision-making.

The **VCA** addresses the potential of small firms and the industries they dominate to compete in global markets. It focuses on (a) the role of benefits in creating incentives or disincentives for performance, (b) the effect of relative power among firms on inter-firm cooperation and coordination, and (c) the impact of learning and innovation on the competitiveness of micro and small enterprises (MSE).

The two frameworks share a concern with harnessing markets to reduce poverty and promote equity. VCA uses the industry sector as a starting point, and NHWP uses natural resource-dependent producers as a starting point. Combining the two analytical frameworks situates fundamental environmental and social issues within a broader context of competitiveness and long-term industry sustainability. One purpose of this study is to examine the potential advantages of a joint value chain–NHWP approach. Our analysis of Madagascar's AMP sector suggests that value chain analysis can be enhanced through full consideration of the role of natural resource management, health concerns and governance issues. It also suggests that value chain analysis can be an important tool for understanding the linkages between local-level NHWP dynamics and broader market systems.

**Aromatic and medicinal plants.** Madagascar's AMP value chain consists of plant products used in the perfume, cosmetics, food, wellness and pharmaceutical industries. AMP in Madagascar are either wildcrafted (collected from natural stands) or cultivated (in agroforestry systems or plantations). Common wildcrafted plants in the study area include radriaka (*Lantana camara*), talapetraka (*Centella asiatica*), and wild ginger (*Hedysarum coronarium*). Cultivated plants include ginger (*Zingiber officinalis*), cinnamon (*Cinnamomum verum*) and black pepper (*Piper nigrum*). Additionally, some endangered species, such as niaouli (*Melaleuca quinquenervia*) and katrafay (*Cedrelopsis grevei*) are increasingly cultivated on private plots. Plantation crops include cinnamon (*Cinnamomum verum*), eucalyptus (*Eucalyptus globulus* and *Eucalyptus citrodora*), cloves (*Eugenia caryophyllata*), and ravintsara (*Cinnamomum camphora*).

**End markets.** Madagascar has a robust and expanding domestic market and a modest share of the global AMP market. Madagascar has potential competitive advantage for some specific (e.g., endemic, scarce) plant products. The domestic market is on a growth trend because of combined government and civil society efforts to mainstream traditional and herbal medicine. Global markets in the aromatic, cosmetic and health sectors demand steady supplies of new and innovative scents and medicinal products. Increasingly, these products must also be certified organic, fair trade or sustainably produced. The market requires suppliers to adhere to broker terms (quantity, quality and timing of shipments), proper packaging and consistency on product, price and delivery.

Organic essential oil products for the export market and quality medicinal and herbal products for the domestic market have the greatest potential for growth now and into the future. To create competitive advantage, the value chain must become more flexible, innovative and efficient. Improving efficiency requires:

- better vertical and horizontal integration among actors in the value chain

- adoption of a clear regulatory framework and sets of product norms and standards
- building capacity for certification standards
- promoting sustainable natural resource and production practices

In addition, the AMP industry must establish effective channels of communication among value chain actors to allow them to respond quickly to shifting market demands.

**Value chain actors.** The AMP value chain involves five levels of actors:

- (1) **Producers.** Three groups comprise the “production” function: wildcrafters, cultivators and plantation operators. These groups include the largest number of individuals (almost all part-time) and MSEs. Producers are aware of biodiversity issues but have limited knowledge and incentives to apply conservation practices at the ground level.
- (2) **Collectors.** Collectors and sub-collectors (aggregators or middlemen) collect harvested plant material from wildcrafters and, to a lesser degree, from cultivators. This group is less sensitive to biodiversity conservation issues.
- (3) **Processors.** There are approximately 37 large processors and “hundreds” of small distilleries (formal and informal) that convert vegetative material into bulk or consumer grade products. The informal firms drag down product quality. A principal environmental concern at this level is fuel for the stills, which is primarily wood from neighboring forests.
- (4) **Wholesalers (domestic and export markets).** Twenty-six of the 37 large processing firms are also exporters. Formal exporters have learned that sustainable production practices are important to developing and expanding competitiveness with key European and U.S. importers.
- (5) **Domestic retailers.** They comprise three types of outlets: pharmacies, specialty wellness centers and spas, and informal vendors of medicinal plant products. All three categories are stakeholders of and understand the need for improving conservation measures.

The AMP value chain is characterized by the informal nature of its upstream base (producers, gatherers and collectors) and its better organized and more formally structured actors downstream (processors and wholesalers/retailers). Overall the value chain operates with little vertical integration and almost no horizontal collaboration. Producers and collectors have little access to end-market information, obtain fewer benefits relative to other actors, and are the least integrated in the value chain.

**Opportunities.** In the short to medium term, the focus should be on high-end aromatic and spice products for international markets and on medicinal plant products for the expanding domestic market. International AMP markets are expanding at a rate of 10 to 15 percent annually and there is a call for increasingly diversified products—particularly those that are new and exotic—as consumers become increasingly interested in alternative and natural medicine. Expansion of the domestic market is driven by the Government of Madagascar’s active promotion of traditional medicine and traditional practitioners as a health care option within the state health care system. The legitimization of traditional practitioners is a factor in upgrading quality control and increasing availability of healthcare to a large underserved market. Domestic and export markets complement each other, since improvements carry over from one market to the other. In the best of possible worlds, both markets should be aggressively pursued.

**Micro and small enterprises.** MSEs are favored in the AMP value chain. A growth trend in overseas markets puts Madagascar in a favorable position with its specialty brand as an “exotic island” and its natural product diversity. Spice, herb and medicinal plants sectors are dominated by agricultural MSEs. Producers (wildcrafters and cultivators),

collectors and small retailers represent the largest segments of value chain actors by number. They are predominately family and individual enterprises.

**Result of analysis: enhancing competitiveness and sustainability.** Strengthening Madagascar's AMP sector requires a focus on five key actions. A stakeholder's workshop held as part of this analysis (next section) produced complementary actions by category of actors in the chain:

- (1) ***Emphasize AMP in natural resource management and biodiversity conservation practices and training.*** The AMP sector's livelihood depends on sustainable management of specific plants. Biodiversity *per se* is an important resource in the search for new products, a repository of genetic material. Madagascar's rich biodiversity favors it as a source for innovation, yet unpredictable export markets can lead to over-harvesting and resource depletion in some cases. If accompanied by appropriate training, the promotion of AMP cultivation in ecologically complex forest gardens will contribute to sustainable management and biodiversity conservation.
- (2) ***Establish and diffuse AMP norms, standards and certification.*** End markets increasingly demand that AMP products conform to specific norms and standards, including health and sanitary, and certified organic, sustainable harvest and Fair Trade. To protect its competitive advantage, the AMP private sector (large, medium and MSE) in collaboration with concerned ministries (Commerce, Health, Agriculture, Forest) must accelerate the process already started by establishing equitable norms, standards and certification. Once formulated, these must be widely diffused among all segments of the value chain, and must include a mechanism that continually updates information to accommodate market shifts.
- (3) ***Support mainstreaming of traditional medicine.*** The Malagasy Ministry of Health and Family Planning, the Medical Association and the Traditional Healers' Association recently adopted a policy that recognizes traditional medicine and integrates AMP into the modern healthcare system. This initiative needs to be supported through advocacy and health policy projects. Mainstreaming traditional medicine will increase the accessibility of healthcare for the rural poor and further legitimize traditional and herbal medicine.
- (4) ***Mainstream "informal" processors, collectors, distributors.*** The general quality of AMP products remains low, especially by international standards, because of the "informal" nature of most participants. Improving quality requires upgrading skills and providing up-to-date equipment and technologies for actors (MSEs) at the margin of their profession. Skill upgrading is already provided by several large export firms through backward linkages. These can be reinforced through supplier contracts. Offering the opportunity to mainstream those who want upgrading will improve vertical and horizontal relations as it will reduce a major friction between formal and informal operators. It will open the way for a more dynamic and innovative value chain, facilitating the establishments of networks and overall integration of the sector.
- (5) ***Launch coordination and branding campaign.*** The AMP value chain links micro and small enterprises at the rural level, mid-size processing businesses in semi-urban or village regions, and international markets through larger exporter firms in the capital and urban centers. For the chain to function more effectively in the future it requires initially a coordinating hand or a neutral institution to synchronize various activities and events planned for the value chain that will make it more competitive and more environmentally focused. It also requires a rallying point, a simple vision or objective that will appeal to the local end-market and provide a recognized brand appeal to the international market.

**Stakeholder-led action plan.** The assessment team brought together a group of 51 stakeholders in Moramanga, Madagascar in late July, 2006 to discuss the results of the study, to review preliminary findings, and to develop an action plan for strengthening the AMP value chain. The participants represented all of the categories of value-chain

actors, including the public sector. Each level of actor developed an action plan specific to the group with short, medium, and long-term objectives representing their constraints and priorities. Participants made commitments to take responsibility for implementation. Key points in the stakeholder-led action plan include:

- **Wildcrafters and cultivators.** The main constraint of this group is its marginalization and general lack of information. Their proposed actions focused on the development of a communication program:
  - Establish a data bank of producers, with their relative strength and weakness
  - Form a producer's network
  - Establish communication links, using new information technology when possible
  - Put into place local natural resource management structures to preserve the environment and sustain production
- **Collectors.** The main constraint of this group is its inability to network within the group and with upstream and downstream actors. Their proposed actions focus on enhancing communication and the creation of a network:
  - Implement communication and network activities to build relationships among collectors
  - Identify reliable buyers
  - Conduct feasibility and profitability study of products collected
  - Search for technical and financing partners
  - Prepare a seasonal plan, including activities to undertake and a chronogram
- **Processors, Exporters and Wholesalers.** Their primary constraint is the lack of a regulatory framework. Their proposed actions revolved around the creation of clear norms and standards and an effective, low-cost certification system, as well as overall integration of the value chain.
  - Contact all other actors, including local and national administrations, to diffuse workshop results
  - Review and put into place uniform set of norms, standards and certification requirements
  - Revitalize professional associations, with expanded functions and membership
- **Public Sector actors** made a commitment to report back to their prospective ministries, to organize an inter-ministerial meeting of departments involved with AMP.
  - Establish a AMP working group within each ministry
  - Prepare an AMP support project within each ministry (Environment/Water & Forestry; Health, Commerce and Industry; Finance)
  - Implement, monitor, evaluate and adjust projects where needed
- USAID programs, **ERI** and **BAMEX**, sketched out the framework for an action plan to support the AMP value chain, focusing on communications, overall value chain support and promotion of techniques for environmental conservation.
  - Collect and diffuse information on AMP VC in specific locations (market, actors, technical aspects)
  - Seek financing sources and technical support to assist firm-level upgrading and technical training
  - Assist producers to prepare contracts, negotiation techniques, develop projects
  - Lobby public sector institutions and assist in establishing partnership with public sector
  - Organize and provide training according to needs
  - Support creation of locally based association and groups
  - Coordinate efforts to mobilize financial resources and technical support to support existing organizations

**Drawing lessons from the value chain–NHWP framework.** The analysis of the AMP value chain is enhanced through full consideration of the role of natural resource management, health concerns and governance issues. Value chain analysis is an important tool for understanding the linkages between local-level NHWP dynamics and broader market systems. Our observations from the field suggest that it is possible to increase value chain efficiency and

competitiveness but that these improvements alone will not necessarily improve the lives of the rural poor. Value chain strengthening is a potentially powerful tool for promoting NHWP-related development goals, but deliberate interventions are necessary to create opportunities for the rural poor. In this regard, some key points that emerge from analysis of the AMP value chain through a VCA/NHWP lens include:

(1) ***Nature***

- *Conservation incentives.* Economic opportunity does not necessarily translate into incentives to manage resources sustainable for all actors in the value chain. Deliberate, sustainable management of AMP (e.g., cinnamon, ginger, cloves) as plantation or agroforestry crops is associated with stable demand, which creates longer time horizons for decision-making.
- *Cultivation.* There is a trend toward plantation cultivation and vertical integration of some products by downstream firms, providing them a regular supply and greater control over quality. This trend strengthens the value chain, but it also risks taking the means of production out of the hands of the rural poor and limiting their participation in the value chain. Several firms have helped local people upgrade production techniques by promoting improved harvesting and cultivation in agroforestry or forest gardens. This upgrading improves supply of raw materials for downstream actors, while having positive effects for local producers and ecosystems.

(2) ***Health***

- *Quality of and access to medicine.* The majority of Malagasy, particularly in the rural areas where 70 percent of the population lives, continue to depend on plant-based, traditional medicines for cultural and financial reasons. The strengthening of norms and standards for medicines, as international markets demand, should lead to effective medicines being available and accessible on the local market.
- *Legitimization of traditional practitioners.* The Government of Madagascar is actively promoting the role of traditional medical practitioners and herbalists in order to increase the range of health care options. The legitimization of traditional practitioners is an important element in upgrading the quality and availability of healthcare, stimulating demand for high quality AMP products and strengthening the value chain overall.

(3) ***Wealth***

- *Poverty reduction.* The majority of producers are poor (and young and/or female). AMP are a source of cash income as well as means of diversifying household livelihoods. The amounts are small but not insignificant. There are opportunities to improve the position (and income) of the poor: by improving their power to negotiate prices (perhaps through a producer association), by providing stable markets for their products, or by creating opportunities for local level value-added processing (perhaps through community-level distilleries or incentives for quality control and traceability). Some producers feel that employment in plantations could increase income security, health standards and connectivity to more formal agricultural technology. A more detailed economic analysis is necessary to compare the relative advantages of production systems for smallholders.
- *Social relations between producers and collectors.* Collectors often deal in multiple products (many of which, such as rice, are more important than AMP) and provide additional services such as credit. Local producers have little power to influence prices in the face of effective local-level monopsony (single potential buyer), and they accrue limited direct benefits from participation in the value chain as a result. Efforts to improve the bargaining position of producers must address the multifaceted nature of this relationship. Integrating AMP producers into a broader, existing cooperative structure could improve their bargaining position. Providing services such as small credit or cereal banking through the cooperative could further strengthen the bargaining position by reducing dependence on collectors.

(4) *Power*

- *Producer organizations.* Producer associations are almost non-existent in AMP sector, in part because production is “part-time” for most gatherers and producers, and in part because of the immense distance between actors. Producer organizations will be difficult to form and time consuming. However, they are necessary to improve the position of producers, to enhance the efficiency and equity of the entire value chain, to promote participation in decision-making and to promote sustainable practices. At current levels, it is unlikely that producers will have incentive to self-organize. However, it may be possible to organize them under pre-existing groups, such as the federated *Koloharena* cooperatives.
- *Strengthening local government.* Receipts from taxes are a potential source of revenue for cash-strapped communal governments. However, few of governments have the capacity to monitor or enforce their own policies in this regard, so there is significant leakage. Strengthening this capacity, enabling communal governments to collect taxes could provide incentive and ability for them to monitor resource use. Revenue could be reinvested in natural resource management. But it can also foster accountability from constituents if it is seen as contributing financial resources of consequence.

**Table ES-1: Summary of Key Constraints and Opportunities**

Key Constraints	Key Opportunities	Stakeholders Perspective & Actions	Observations from NHWP Perspective
<b>Enabling Environment</b>			
<b>AMP sector lacks clear norms and standards</b>	Participation of all value chain levels and public sector in development of norms, standards	Full participation of all value chain actor levels	<b>POWER:</b> Strengthen local governments. Receipts from taxes are potential revenue. Few have capacity to monitor/enforce their own NRM policies. Revenue could be reinvested in NRM and foster accountability from constituents.
<b>Meeting certification standards is difficult, especially for MSE</b>	Decentralize certification bodies; train at local levels	Review and put into place set of norms and certification requirements	<b>HEALTH:</b> Strengthening standards for medicinal plants helps rural areas, which depends on plant-based traditional medicine.
<b>High value plant species are being depleted</b>	Establish an AMP overall sustainable framework involving all participants	Prepare an AMP support project (public sector)	<b>NATURE:</b> Responsible firms help local people to upgrade production techniques by promoting improved harvesting and cultivation in forest gardens.

Inter-Firm Cooperation (Vertical)			
<b>Distance, isolation and lack of trust impede cooperation</b>	BDS providers promote equitable contract models and agreements, provide training, help build linkages between levels	Network within the value chain	<b>NATURE:</b> Economic opportunity does not necessarily translate into incentives to manage resources sustainably. Incentives for sustainability are shaped by relations within value chain.
<b>Insufficient market information reaches producers</b>	Processing and export firms expand up stream education, information on production cycles	Contact all actors in the value chain, prepare seasonal plans, implement communication activities	<b>NATURE:</b> Trend toward plantation cultivation (for some products) by downstream firms strengthens vertical integration. Trend also risks taking means of agricultural production out of hands of rural poor.
Inter-Firm Cooperation (Horizontal)			
<b>Wildcrafters have little bargaining power</b>	Reinforce informal groupings around seasonal collection periods	Form a producers network; establish communication links using possible new information technology	<b>POWER:</b> Producers have limited leverage in face of local-level monopsony (single potential buyer). Train wildcrafters to improve their power to negotiate prices.
<b>Collectors are separated by great distance; information is scarce; supply source is uncertain</b>	Ignored by projects in the past now needs institutional follow-up to their Action Plan	Integrate collector network into value chain; search for technical and financial partners	
<b>Among processors, lack of trust between formal and informal distilleries</b>	Skill and knowledge upgrading of informal actors; increase their integration into value chain	Not addressed	
<b>Among exporters/wholesalers, inability of associations to adapt to markets</b>	Revive professional associations; institutional strengthening	Revitalize professional associations	

Firm-Level Upgrading			
<b><u>Wholesalers, retailers, and exporters</u> lack access to quality packaging and packing supplies</b>	Two levels: a) develop hand-crafted, natural-based packaging for niche markets; b) investment in cluster industries (glass, etc.) supporting AMP and other sectors	Apply at firm level conformity to standards, norms and certification	<b>WEALTH/HEALTH:</b> Some producers feel that employment in plantation could increase income security, health standards and access to more formal agricultural technology <b>HEALTH:</b> Government's promotion of traditional medicinal practitioners increases range of health care options. Training of practitioners improves health care delivery.
<b><u>Processors</u> have not updated distillery technology; informal distilleries produce inferior products</b>	Technical training by BDS providers, field-exchange visits; decentralized testing laboratories	None specified	
<b><u>Wildcrafters, cultivators, and collectors</u> are unable to upgrade operations; learning is not taking place at these levels</b>	Encourage wholesalers/exporters to strengthen backward linkage. Use firms like Label CBD, BIONEXX, Phael Flor as models.	Establish data bank of producers; establish communication links using IT when possible; put into place local NRM structures to preserve environment	<b>NATURE:</b> Upgrading improves supply of raw materials for downstream actors; positive effect for local producers and ecosystems.

# II. BACKGROUND

## A. INTRODUCTION

Madagascar is one of the world’s poorest countries economically and one of its richest in biodiversity. Madagascar is the world’s fourth largest island, covering an area of 592,000 km<sup>2</sup>. It contains at least 13,000 plant species, of which more than 80 percent are endemic and 3,500 are reported to have medicinal properties. With a per capita GDP of U.S. \$809, Madagascar ranks 146 of 177 countries on the Human Development Index.<sup>1</sup> Seventy-four percent of its population lives in rural areas, and 78 percent of the rural population lives in poverty.<sup>2</sup>

Agriculture accounts for the largest share of GDP (35 percent); economic growth has accelerated over past four years (5.2 percent in 2004), as the government shifted from socialist to private sector-led growth policies. Political strife associated with this transition set back the country, as key road infrastructure was destroyed. In spite of these challenges, the new government has shown a strong commitment to environmental programs. The most ambitious expression of this commitment was President Marc Ravalomanana’s 2003 pledge to increase Madagascar’s protected area from 1.7 million hectares to 6 million hectares—10 percent of the country’s surface area. This effort is known as the “Durban Vision.”

Madagascar’s rural economy is based upon subsistence-oriented agriculture. Much of this agriculture is slash-and-burn (*tavy*), which has been a principal cause of forest cover and biodiversity loss. The challenges of improving standards of living among the rural poor and conserving biodiversity are interlinked in Madagascar, and a key issue is how to increase rural incomes and reduce the need for *tavy*. USAID/Madagascar’s Environment and Natural Resource program has concentrated efforts to address the interlinked challenges of biodiversity conservation and rural poverty reduction by promoting alternatives to *tavy* along two of the country’s forest corridors: Zahamena-Mantadia and Ranamofana-Andringitra-Ivohibe.

Madagascar has a long-standing ethno-medical tradition of plant use for prevention and healing. With the introduction of Western medicine on the island, reliance on traditional remedies gave way to prescribed drugs from large

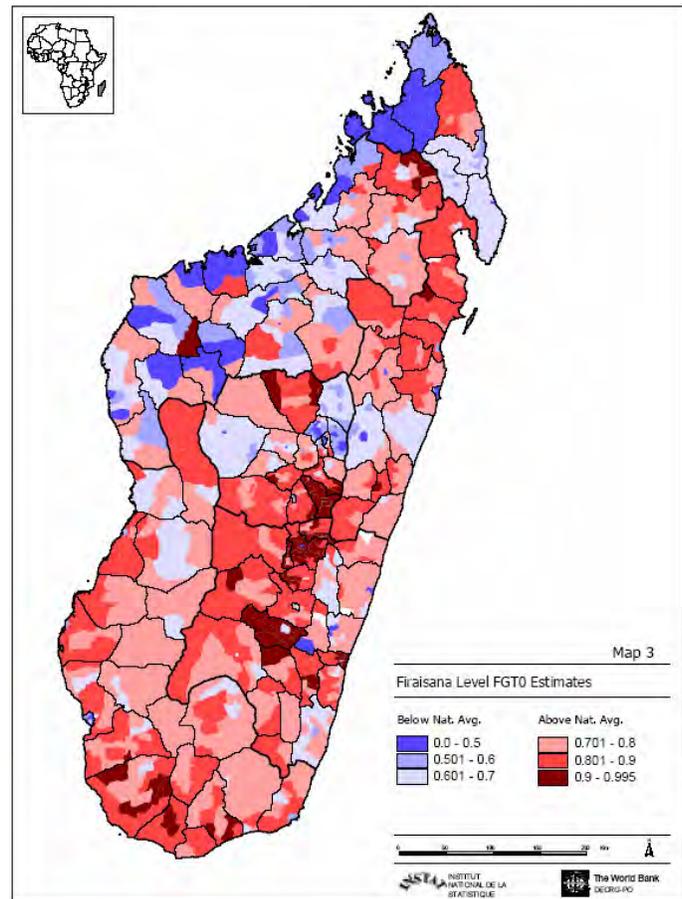


Figure 1: Geographic Distribution of Poverty

<sup>1</sup> Source: *Human Development Report 2005*; *World Development Indicators database*, April 2006

<sup>2</sup> Source: *The Wealth of the Poor* (World Resources Report 2005)

pharmaceutical companies. In recent decades, the rising cost of Western medicine and a growing recognition of traditional medicine have revived use of plant-based, locally-produced medicinal products. Research institutions have helped validate the active medicinal properties of traditional plants. During the same period, through self-directed exchange forums, events and campaigns, there has been a perceptible coming together of traditional healers, medical doctors and public authorities. This has been propelled by the World Health Organization's (WHO) recent mandate that African countries must increase traditional health practices to serve up to 30 percent of the health delivery services. All of these factors have increased the respectability and use of plant-based traditional medicine and practices.

International AMP markets are expanding at a rate of 10 to 15 percent annually and there is a call for increasingly diversified products— particularly those that are new and exotic—as consumers become increasingly interested in alternative and natural medicine.

Madagascar's ability to respond to the trends of these two end markets is founded on:

- its unique and varied plant base, 80 percent of which is endemic
- an experienced AMP processing sector, which realizes its need to upgrade
- an emerging awareness among actors of the inefficiency of the present organization of the AMP value chain
- increased awareness among actors in the value chain, the Malagasy government, certain importers, NGOs and development projects of the need to tie environmental sustainability to market demands, not only to expand the income generating base, but also to reduce *tany* cultivation practices

These factors also favor the AMP sector as an opportunity for addressing interlinked development and conservation challenges. As the present study reveals, however, development of the export-oriented AMP industry also presents the danger of negative environmental impacts, particularly through the over-exploitation of high-demand plants. Experience with AMP has shown that economic value does not automatically create incentives for sustainable management of the resource base. Linking AMP value chain development to biodiversity conservation, sustainable NRM and rural poverty reduction requires deliberate action. The export sector has applied pressure through importer requirements for environmental considerations in the harvesting and production of aromatic and medicinal products. Malagasy-led programs, institutions and interest groups are putting additional pressure to apply stricter regulations to safeguard the plant production base and promote sustainability at the processing level.

## B. STUDY OBJECTIVES

The goal of this analysis is to provide a diverse group of stakeholders with the information needed to make sound decisions and plan interventions focused on developing productive and globally competitive industries dependent upon the sustainable management of scarce natural resources that will benefit local people. A growing body of research has highlighted the interdependent and interlocking challenges of promoting sustainable management of scarce environmental resources, developing competitive industries, reducing poverty through integration of micro- and small enterprises (MSEs) into competitive industries, improving health and nutrition standards, and fostering the emergence of democratic governance.

The objective of this analysis is to provide a road map for businesses and facilitating NGOs from which stakeholders in the AMP value chain can develop an **industry competitiveness strategy** and a **stakeholder-driven action plan** to:

- increase the competitiveness and productivity of the natural resource-dependent industry
- ensure the sustainability of the AMP natural resource base in question

- reduce poverty through increased benefit flows to the rural poor through employment generation and the contributions of MSEs to overall industry competitiveness
- foster good governance within the value chain (private sector) and in the external institutional environment (public sector)

For donors and public policymakers, the results of this study will be used to:

- determine whether natural resource-based enterprise has the potential to provide the foundation for productive and globally competitive industries in the long-run with minimum adverse environmental impacts and maximum social and economic benefit for local people
- understand where and how the legal, regulatory and policy environment affects the growth potential and distributional equity of aromatic and medicinal plants and identify related opportunities for enhancing growth and equity

The research addresses the following key issues:

- What are the end market characteristics and trends, and what is Madagascar’s position in the global market?
- How do individuals enter the aromatic and medicinal plant trade, how is the trade coordinated and regulated, and how are benefits from the trade distributed among the actors?
- Under what enabling environment conditions can the AMP value chain be competitive while maintaining the sustainability of the resource base?
- How does the current structure of the value chain and natural product management systems influence natural wealth, market power, and information, learning, and benefit flows?
- What are the opportunities for upgrading in the value chain for increased efficiency, product differentiation and accessing new markets prioritized according to end market information on key competitiveness factors?
- What are the opportunities for enhancing health, biodiversity conservation and democratic governance via the value chain while maintaining competitiveness?
- What are the predicted positive and negative impacts—whether direct, indirect or unintended—of different proposed interventions?
- What are the potential win-win relationships, incentives and catalysts for pursuing opportunities?
- What short-term actions can be taken to pursue opportunities and address constraints?

## C. ANALYTICAL FRAMEWORK AND APPROACH

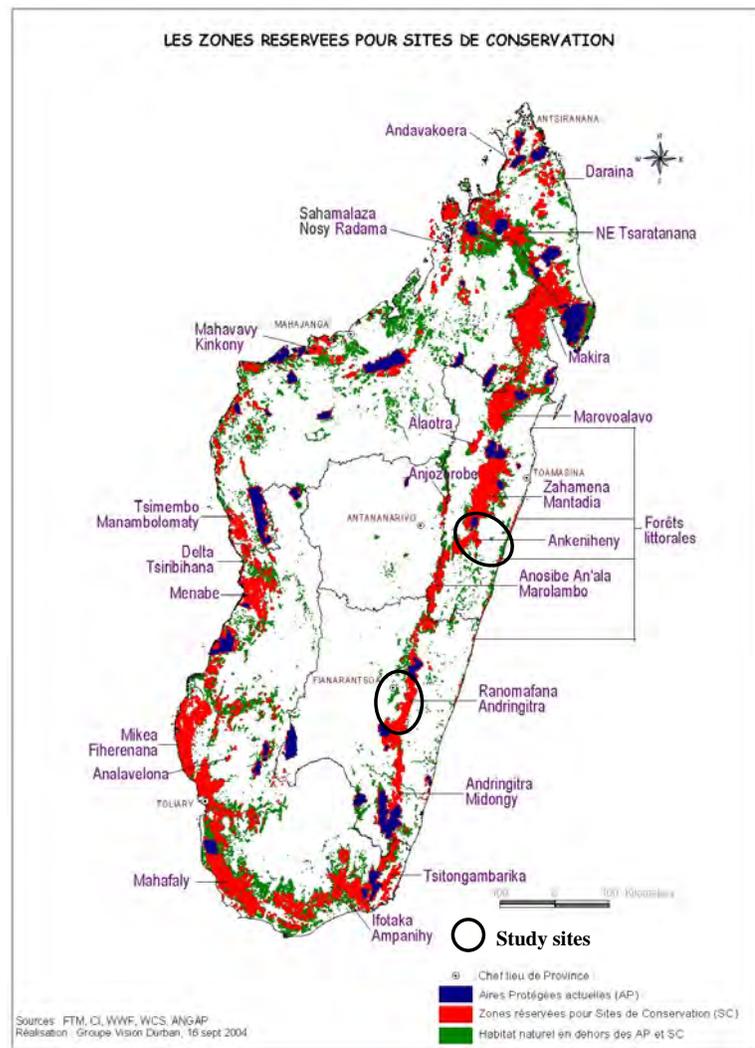
This assessment of Madagascar’s AMP industry integrates the value chain approach developed under USAID’s AMAP BDS Knowledge and Practice Task Order and the NHWP framework developed by USAID’s Africa Bureau and adapted by the USAID/Madagascar mission.

The NHWP lens sets out key questions including: how can we integrate nature (natural resource management), wealth (economic concerns) and power (good governance)? How is it possible to facilitate (a) sustainable utilization and improved management of natural resources, (b) improved standards of health and nutrition, (c) economic growth and poverty alleviation, (d) empowerment and enfranchisement? The value chain approach (VCA) addresses the question: can small firms and the industries they dominate compete in globalized markets, and, if so, how? How do benefits create incentives or disincentives for performance? How does the relative power among firms in a value chain affect inter-firm cooperation and coordination? How do learning and innovation promoted by both private and public actors affect the competitiveness of MSEs?

This value chain approach examines the key businesses in the AMP industry to analyze the relationships between them and the factors affecting the performance of the industry. The analysis identifies ways to achieve higher levels of competitiveness through a combination of three strategies: producing and delivering goods and services more efficiently; differentiating products or services through quality standards and branding; and exploiting new market demand. Factors include access to and the requirements of end markets; the global, national, regional and local business enabling environments; vertical linkages between actors that permit the flow of products and services, learning and benefits; horizontal linkages between like firms to create economies of scale and bargaining power; sector-specific, cross-cutting business and financial service markets; and opportunities for firm-level upgrading.

Combining these two analytical frameworks situates fundamental environmental and social issues within a broader context of competitiveness and long-term industry sustainability. From the VCA perspective, long-term industry competitiveness necessitates protection of the resource base on which it is founded, and social benefits to provide incentives to stakeholders (including communities where the plants are gathered, produced or processed) to support the industry. From the NHWP perspective, value chains are assessed for their potential to address multiple, interrelated development goals: increased resource productivity and biodiversity conservation (Nature), improved standards of health and nutrition (Health), economic growth through development of competitive industry (Wealth) and local empowerment and good governance (Power). FRAME and AMAP experiences highlight key relationships between producers and consumers, between public and private actors. These relationships can facilitate learning and information sharing that builds greater industry competitiveness, while removing barriers to sustainable use of natural resources and effective NRM. Emphasis is placed on identifying the conditions under which rural communities may be effectively integrated into the value chain, not merely passive suppliers of raw material but active participants who are motivated to manage their resources, reinvest and innovate.

A panel of USAID staff and partners selected the AMP sector for this study based upon NHWP- and VCA-related criteria. The aromatic and medicinal plants sector was considered as a single value chain encompassing diverse



**Figure 2: Forest Corridors and Study Sites**

products, many of which have relatively small markets individually but a large potential collectively. AMP initially appeared to involve a single set of actors who work simultaneously with numerous, diverse products in order to respond to changing demand. The value chain becomes somewhat differentiated at the producer level because of the geographic distribution of the plants, ecological impacts of harvesting behavior and gendered division of labor.

A joint AMAP-FRAME-USAID/Madagascar research team selected survey sites and participants by referral, starting with end market actors and working up the value chain. Through these downstream players and their network, the team was able to identify suppliers, intermediaries, collectors and producers as well as the plant-types gathered and cultivated. Staff of USAID/Madagascar's BAMEX project assisted in identifying end market actors among their clients. Using this approach, we identified two corridors that are both AMP production zones and USAID intervention areas for economic development and environmental protection. These include the Moramanga-Toamasina-Brickaville and nearby coastal zone, and the Fianarantsoa plateau to the Manakara-Manazara zone. Meetings with community groups living on the periphery of the Zahamena-Ankeniheny corridor, as well as with actors in Toamasina, led us to conclude that the majority of gathered or cultivated AMP in the region grew or were gathered in the periphery of the corridors, rather than in the protected forests themselves.

The team developed a set of survey instruments for a variety of value chain actors, including producers, intermediaries, processors, distributors/exporters and public sector actors. The pool of survey participants was selected to provide a broad and representative orientation to the AMP value chain. We did not use random sampling to select survey participants, as we did not intend to use the data for statistical analysis. If USAID/Madagascar pursues opportunities in the AMP sector, we recommend collecting quantitative baseline data for monitoring and evaluation purposes.

After fieldwork was completed, the FRAME, AMAP and USAID/Madagascar organized a workshop to discuss the results of the study, review preliminary findings, and identify strategies and implementation plans for strengthening the value chain. The 51 participants represented all functional groups in the value chain. The present report integrates the results, including a stakeholder-led action plan.

Methods and sequencing of activities are described in greater detail in Annex 1.

# III. VALUE CHAIN CHARACTERISTICS

## A. OVERVIEW

Madagascar's AMP value chain consists of plants and products derived from plants that are used in the perfume, food, wellness and pharmaceutical industries. From a geographical perspective, the value chain characteristics described in this report are representative of the east-central part of the island, which roughly stretches from coastal flatlands up through dense forest as well as denuded mountains, and ends in a plateau of rolling hills and flatlands at an altitude of around 1,400 meters. The climatic conditions range from tropical to semi-arid with the latter's rain-falls not exceeding 600 mm.

The value chain consists of five types of actors:

- Producers, made up of wildcrafters and cultivators
- Collectors, including up to three level of sub-collectors
- Processors, composed of formal and informal firms
- Wholesalers that service both the domestic and export markets
- Retailers that sell to both formal and informal domestic consumers

The largest groups in any region are the producers and collectors, whose numbers are difficult to estimate because of the part-time nature of their activity. It is rare for instance for individuals or groups to be engaged for more than a third of their time in gathering, cultivating or collecting aromatic and medicinal plants. These two sets of actors are at the lowest level with regards to accessing end-market information and obtaining benefits, and are the least integrated in the value chain.

We estimate that there are between 50 and 75 processing units in the region surveyed. They transform raw vegetative material into essential oils, teas, lotions, soaps or other forms of cosmetic or medical products. Exporters are smaller in number and are concentrated in the capital city and the seaport town of Toamasina.

The value chain operates within an enabling environment of loose regulations promulgated in large part for forestry products, even though only a small number of the AMPs in the region originate from the forest. There are sparse support services focusing on the sector, particularly with regards to financing. However, research institutions provide multiple services from analyses of the chemical properties of plants and verification of medicinal effects to the reproduction and multiplication of rare species and the marketing of locally produced aromatic and medicinal products.

Table 1 summarizes the principal plants in the study communities.

**Table 1: Common Aromatic & Medicinal Plants in Study Area**

Botanical Name	Common Name	Part Used	Botanical Name	Common Name	Part Used
<i>Centella asiatica</i>	Talapetraka	Leaf	<i>Melaleuca quinquenervia</i> var <i>viridiflora</i>	Niaouli	Leaf
<i>Cinnamomum camphora</i>	Ravintsara	Leaf	<i>Pelargonium graveolens</i>	Geranium	Leaf
<i>Cinnamomum verum</i>	Cinnamon	Bark	<i>Piper nigrum</i>	Black pepper	Seed
<i>Eucalyptus citrodora</i>	Eucalyptus	Leaf	<i>Prunus africana</i>	Pygieum; Kotofihy	Bark
<i>Eucalyptus globulus</i>	Eucalyptus	Leaf	<i>Psiadia altissima</i>	Dingadingana	Leaf
<i>Eugenia caryophyllata</i>	Clove	Clove, leaf	<i>Ravensara aromatica</i>	Ravensara	Leaf
<i>Hedychium coronarium</i>	Longoza; Wild ginger	Leaf	<i>Tagetes minuta</i>	Tagetas	Leaf
<i>Lantana camara</i>	Lantana; Radriaka	Flower	<i>Zingiber officinalis</i>	Ginger/Skamalaho	Root

The value chain map on the next page (Figure 3) summarizes the product flow from input supplier to end market buyers.

## B. END MARKETS

Madagascar has a robust and expanding domestic market and a modest share of the global market for AMP. The domestic market is on a growth trend because of combined government and civil society efforts to mainstream traditional and herbal medicine. With exports of \$4 million, Madagascar is not among the top ten exporting nations, but it follows very closely. However, these exports are not insignificant at the national level. Moreover, the global market is expanding by an estimated 10-15 percent per year, and Madagascar has potential competitive advantage for some specific (e.g., endemic, scarce) plant products.

Global markets in the aromatic, cosmetic and health care sectors demand steady supplies of new and innovative scents and medicinal products. For example, the perfume industry continually searches for “new” scents that can be introduced as new seasonal lines. Increasingly, these products must also be certified organic, fair trade or sustainably produced.

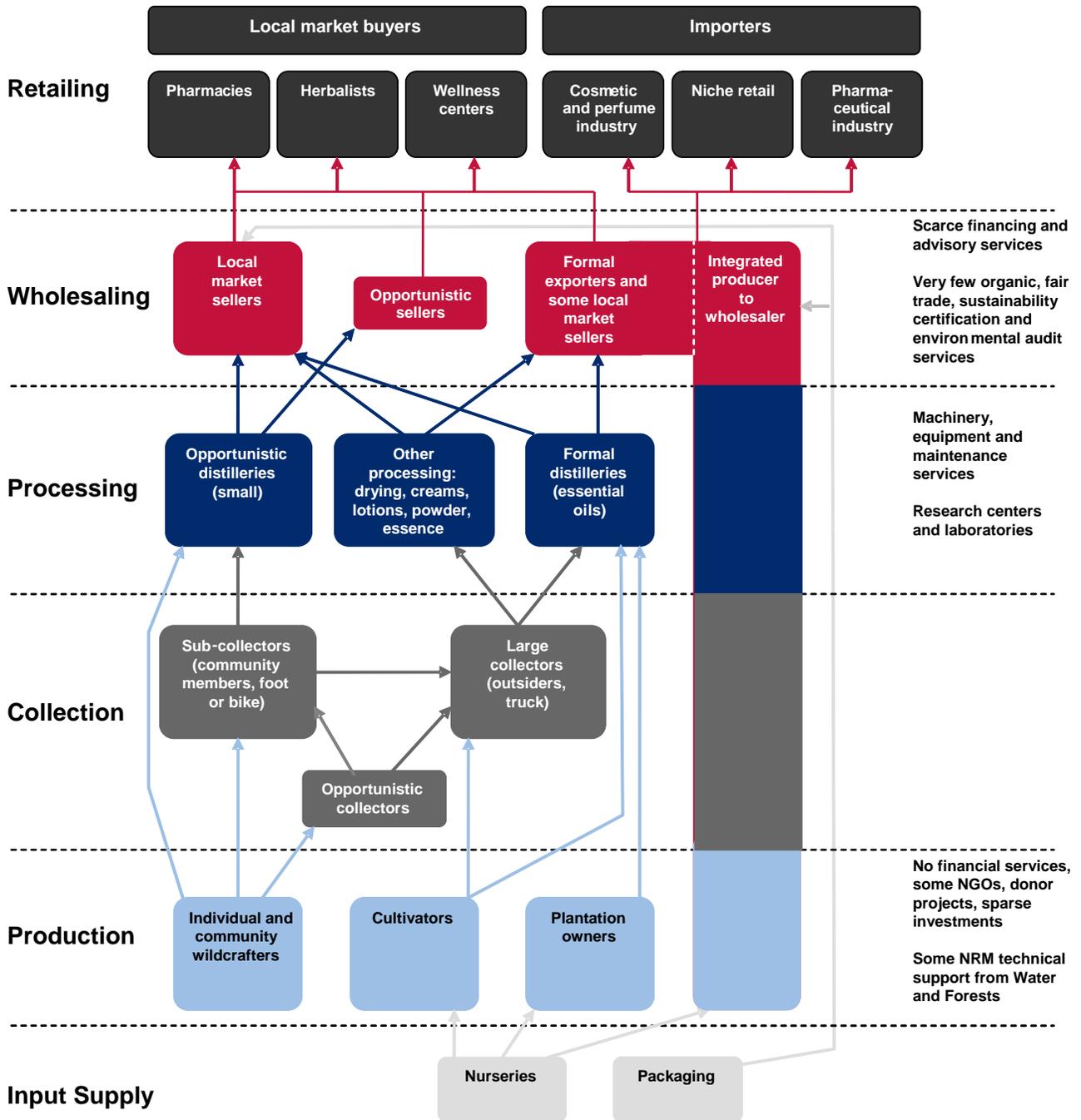
Madagascar presently exports five key AMP products. Three are relatively scarce essential oils: ylang ylang, niaouli, and ravintsara. The other two are spices: cinnamon (some bark is also distilled into essential oil) and clove (used mostly in Indonesia in cigarettes). The potential for growth lies in organic aromatic essential oils—not only ylang ylang, niaouli, ravintsara and cinnamon, but also from new, endemic or “exotic” plants.

Figure 3: Aromatic and Medicinal Plant Value Chain Map

# Madagascar Aromatic and Medicinal Plants Value Chain

**Functions**

**Support Services**



## 1. EXPORT MARKETS

In terms of value, it is estimated that 80-90 percent of Madagascar's AMP products are intended for export, the majority of which are essential oils. Exports totaled \$4 million in 2004. There is growing demand (8-15 percent per year)<sup>3</sup> for many popular species of medicinal plants in Europe, North America and Asia. Factors and market trends that will potentially increase the demand for medicinal plants are:

- increased costs of institutional and pharmaceutical-based health care
- search for new drugs and treatments of serious diseases
- consumers seeking an alternative or complement to pharmaceutical drugs and modern healthcare
- large pharmaceutical and over-the-counter companies placing botanical medicines more strongly on the mass market through increased advertising budgets and media attention
- increased emphasis on safety, efficacy and quality that could push producers in Madagascar to increase research and development, thereby improving the quality of medicinal products to conform to international standards
- increased requests for organically certified raw material or value-added products, especially for the development of new products (e.g., medicines, nutritional supplements, cosmetics).

The European Union is the largest importer of AMP products, accounting for 38 percent of the world market in 2001. The leading country for AMP demand in Europe is Germany, constituting over 42 percent of the European market, followed by France (25 percent), Italy (9 percent) and the UK (8 percent). The medicinal plant trade is largely conducted through Germany: most importers are found in Germany and it is the leading market for exporters from developing countries. In 2000, the world market for herbal remedies was U.S. \$19.4 billion: Europe \$6.7 billion, Asia \$5.1 billion, North America \$4.0 billion, Japan \$2.2 billion, and the rest of the world at \$1.4 billion.<sup>4</sup> The main world competitors for lesser-developed country exporters of aromatic and medicinal plants are China, Singapore, Brazil and Egypt, which are the leading suppliers in the world market (Table 2).

---

<sup>3</sup> FAO (2002), *Biodiversity and Ecosystem Approach in Agriculture, Forestry, and Fisheries*: <http://www.fao.org/docrep/005/Y4586E/Y4586E00.htm>

<sup>4</sup> WWF-UK, *Trade in Medicinal and Aromatic Plants*, Factsheet 4: <http://www.wwf.org.uk/filelibrary/pdf/tradepants.pdf>

**Table 2: Leading Countries in Import and Export of Medicinal and Aromatic Plants**

Country of Import	Volume (Tons)	Value (US \$1,000)	Country of Export	Volume (Tons)	Value (US \$1,000)
Hong Kong	73,650	314,000	China	139,750	298,650
Japan	56,750	146,650	USA	11,950	114,450
USA	56,000	133,350	Germany	15,050	72,400
Germany	45,850	113,900	Singapore	11,250	59,850
Rep. Korea	31,400	52,550	India	36,750	57,400
France	20,800	50,400	Chile	11,850	29,100
China	12,400	41,750	Bulgaria	10,150	14,850
Italy	11,450	42,250	Albania	7,350	14,050
Pakistan	11,350	11,850	Egypt	11,350	13,700
Spain	8,600	27,450	Morocco	7,250	13,200
UK	7,600	25,550	Mexico	10,600	10,050
Singapore	6,550	55,500	Pakistan	8,100	5,300
Worldwide	342,550	1,015,200	Total	281,550	643,200

**Source:** UNCTAD COMTRADE database, United Nations Statistics Division, 2002

It is thought that currently over 50,000 plants species are used for medicinal and aromatic purposes worldwide. Many of the numbers in Table 3 (below) are estimates, but Madagascar appears to have the largest percentage of medicinal plants among its plant species.

**Table 3: Prevalence of Medicinal Plants in Select Countries**

Country	Plant Species	Medicinal Plant Species	Percentage with Medicinal Value
China	26,092	4,941	18.9
<b>Madagascar</b>	<b>13,000</b>	<b>3,500</b>	<b>27.0</b>
India	15,000	3,000	20.0
USA	21,641	2,564	11.8
Thailand	11,625	1,800	15.5
Vietnam	10,500	1,800	17.1
Malaysia	15,500	1,200	7.7
Indonesia	22,500	1,000	4.4
Philippines	8,931	850	9.5
Nepal	6,973	700	10.0
Sri Lanka	3,314	550	16.6
Pakistan	4,950	300	6.1
Average	13,366	1,700	12.7
World	422,000	56,385	13.64

**Source:** <http://www.fao.org> : Biodiversity and Ecosystem Approach in Agriculture, Forestry, and Fisheries; IK Notes 91, World Bank, April, 2006.

Madagascar’s export market is predominately essential oils, which are high in value and—because concentrated—are relatively inexpensive to transport (an important consideration for an island nation). Europe is the predominant destination, buying more than 70 percent of exports. Other destinations include Asia and the Indian subcontinent. The aromatic and cosmetic industries have been traditionally the largest buyers.

A major trend favoring traditional aromatic plants, for which Madagascar has been a long-time supplier, is the worldwide expansion and use of aromatherapy. Related to this trend is the perfume industry’s search for new products to “reinvent” traditional lines. This trend also favors Madagascar because of its diverse flora, permitting producers, processors and exporters to innovate their product base.

Growth is noted in natural products and niche markets. These prefer high-end packaging and a “story” about the origin and people involved at the production source. Madagascar is presently not in a competitive position to respond to the former because it must import all quality bottling and packaging inputs. However, it can offer an interesting “story” through the national branding effort—“Madagascar Naturally”—put into place to promote environmentally-oriented tourism.

Products grown and produced according to strict organic regulations command a 15 to 20 percent premium over non-organically certified products. While Madagascar exported organic products to Europe and the U.S. for over a decade, these products were organic by default rather than through practiced organic methods. In more recent years, requirements for certification of organic production methods have become stringent. Several exporters of AMP

#### **TEXT BOX 1: RAVENSARA IN AROMATHERAPY**

“At the moment, demand for [Madagascar’s] Ravensara (*R. aromatica/ anisata* L) outstrips the supply and is likely to do so for some time. It is one of the most valuable oils in the aromatherapy repertoire and, supply permitting, has the potential for becoming a star such as lavender or tea tree.”

**Fragrance Earth, UK (2005)**

products have responded by producing in their own plantations to the higher standards and are being certified organic, not only for the premium prices but for the positive environmental impact of organics.<sup>5</sup> Madagascar's long distance from markets in Europe, Asia and the U.S. is less of a constraint for AMP products than for fresh organic fruits and vegetables that were attempted in the early 1990s. Table 4 shows the evolution of certified AMP products over a two-year period for which reliable date is available.

**Table 4: Exports of Select Organic AMP and Essential Oils from Madagascar, 1999 and 2000**

Essential Oil (Organic)	Quantity Exported (kg)	
	1999	2000
Ylang Ylang (essential oil)	2,319	3,500
Niaouli (essential oil)	1,600	825
Ravintsara (essential oil)	980	725
Cinnamon	7,690	5,520
Clove	1,645	8,290
Other	1,205	2,006

Source: World Markets for Organic Fruit and Vegetables<sup>6</sup>

## 2. DOMESTIC MARKETS

The domestic end-market consists of three types of retail outlets: small consumers of medicinal plant products, pharmacies and specialty wellness outlets including spas. There are 109 pharmacies in the capital, and five wellness spas in the country. A multitude of small-scale sellers operate from kiosks, small tables or blankets in community markets. There are no reliable numbers on these informal retailers.

There is a strong domestic demand market for medicinal plants and essential oils. Knowledge of natural medicine is widespread in Madagascar, and its use is integrated in everyday life. As an isolated, poor island nation, Madagascar traditionally relied on its own resources for health care. As a result, it developed over time an intricate pharmacopeia based on plants and their derivatives. Herbalists and herbal doctors (*tradi-praticiens*) are ubiquitous and highly regarded. Stalls are commonly found in weekly markets, selling AMP in varied forms—bark, dried leaves, flowers, roots, fruits, herbal teas, extracts, creams, powder and oils. Locally produced, plant-based “soft” or “green” medicines are available at affordable prices, sold in simple packages in powder form rather than in pills. A quality benchmark for these products are

### TEXT BOX 2: IMRA AND BIODIVERSITY

Research and marketing by IMRA (Malagasy Institute for Applied Research) helped protect the environment and slow deforestation by developing a product based on the seeds of the *Eugenia jambolana* tree, which was used by traditional healers to treat diabetics. In the past, *E. jambolana* trees were cut down for housing construction, furniture-making or fuel. Since the species' medicinal uses have been uncovered by IMRA and publicized, such destructive practices have declined. At the same time, rural people have generated extra income from seed collection and the entire country has profited from the trees' fruits which have been processed into jams, jellies and drinks.

<sup>5</sup> The Guidance Manual for Organic Collection of Wild Plants: [http://www.sippo.ch/files/publications/agri\\_wildplants05.pdf](http://www.sippo.ch/files/publications/agri_wildplants05.pdf)

<sup>6</sup> FAO (2001), <http://www.fao.org/DOCREP/004/Y1669E/Y1669E00.HTM>

the packets or herbal mixes sold by the respected IMRA the *Institute Malgache de Recherches Appliquées*, which conducts rigorous applied research to each type of medication sold under its name.

During the last 15 years, the medicinal part of the AMP sector has been particularly active as seen through the success of the *Association nationale des tradi-praticiens* (ANTP), an association with some 500 registered members. The association, through a recently launched census, claims that about 10,000 individuals are involved in traditional healing in Madagascar. This number encompasses several categories of individuals who grow or collect their own plants, diagnose illnesses and practice traditional medicine. We can use this figure to make a rough estimate of the industry's importance in Madagascar. Traditional healers earn on average around 10,000 Ariary (\$5.00) per day.<sup>7</sup> If we assume that two-thirds of these individuals are engaged in diagnosing and providing healing services for 300 days per year, we arrive at a domestic annual end-market of about \$10 million.

A recent World Bank report,<sup>8</sup> describes the Government of Madagascar's strong support of traditional medicine through the creation of a commission to study the regulatory environment of traditional medicine in the country. The committee has established general objectives, the most important of which is improving access for the population (especially the most vulnerable) to quality care and service. In collaboration with the Ministry of Health and Family Planning and the ANTP, the commission prepared a Convention that lays out procedures for placing traditional healers as partners with modern medicine professionals. The Ministry is responsible for assuring that traditional healer practices are in harmony with the regulatory environment of the modern medical profession.

Another dimension of the local market is the development over the past five years of "wellness tourism" along with its associated beauty products, health spas and eco-lodges. To date, these attract mostly local residents, but the aim is to attract international tourists. The Ministry of Health recently gave approval to HOMEOPHARMA, a large local pharmaceutical company, to enter the hospitality and wellness industry with its own brand of eco-lodges. Its program includes stay and treatment at three industry-run eco-lodges, combined with visits to essential oil productions.<sup>9</sup>

## C. ENABLING ENVIRONMENT

### 1. GLOBAL

Madagascar is signatory to several conventions that impact its AMP sector:

- Madagascar is a party to and has ratified the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The signatories agree to cooperate in international trade to ensure that the survival of wild animals and plants is not threatened. A recent example of a determination affecting Madagascar is listing a moratorium on the trade of *Prunus africana* because the plant's survival was threatened due to over-harvesting.
- Madagascar is signatory to the Convention on Biological Diversity (CBD) and has been member since 1996. In this context, Madagascar has developed national legislation to protect the intellectual property rights of local populations to plant genetic material, based on the *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable*

---

<sup>7</sup> Interview with an ANTP board member.

<sup>8</sup> IK Notes 91, Traditional Medicine Programmes in Madagascar, <http://siteresources.worldbank.org/INTINDKNOWLEDGE/Resources/iknt91.htm>

<sup>9</sup> This subsector includes an aggregate of the travel industry, essential oil, production, hotel rooms (e.g., Colbert, Amarina, Nosey Bay Hotel, HOMEOPHARMA eco-lodges), restaurants, nature park fees, tour operators, organic food, doctor consultations, guides and participating NGOs. The survey was not able to provide an estimate of the value of this industry, but can only attest to its recent expansion and growth in capital investments.

*Sharing of the Benefits Arising out of their Utilisation.* The law was initiated in 1999 and drafted 2001; it now awaits approval by the National Assembly.

International agreements and directives on natural products, as opposed to conventions, offer guidelines, benchmarks and recommended practices but compliance is voluntary. For the AMP sector, agreements cover areas that promote health, safety and sustainable practices at the production, harvesting and processing levels:

- Fair Trade Federation (FTF) provides guidelines and regulations for determining a product's classification of a Fair Trade label.
- As a member of WHO, Madagascar is asked to respect the Directive on Good Agricultural and Collection Practices (GACP) for medicinal plants.<sup>10</sup>
- Exporters to Europe must be mindful of the directive from the Committee on Herbal Medicinal Products (HMPC) of the European Medicines Agency (EMA).<sup>11</sup>

International markets increasingly demand natural AMP products that meet standards developed to protect the health and safety of their consumers. These standards are translated into certification protocols that affect all actors in the value chain, especially producers or wildcrafters. Organic certification is presently the most widely used protocol. Obtaining certification is often complex and expensive, but is compensated by price premiums and positive environmental impact, as discussed above.

Two factors influence certification in Madagascar. First, EcoCert is the only internationally recognized organic certification body residing fulltime in Madagascar. While EcoCert is approved to provide certification for both E.U. and U.S. market organic standards, the lack of competitiveness in this support service reduces accessibility for the widely diffuse AMP production area. Second, importers are increasingly demanding multiple certifications that include Biorganic® certified, Fair Trade standards, Traceability or Sustainable Wild Harvest certification—which are not provided by EcoCert.

There is a process in place to develop international standards for sustainable wild collection of medicinal and aromatic plants (ISSC-MAP). It is conducted under the joint leadership of the German Federal Agency for Nature Conservation (BfN), WWF/TRAFFIC (Germany) and the International Union for Conservation of Nature (IUCN) and the Medicinal Plant Specialist Group.<sup>12</sup>

## 2. NATIONAL

**Environmental policy:** A variety of institutions help shape national-level policies and priorities with a direct impact on the management, use and commercialization of natural products in general. The “Durban Vision” commits to expanding the country's protected area network, establishing both strict protected areas and multiple use zones. Government ministries and international donors have mobilized to implement this vision, with an anticipated deadline of 2012. While it is uncertain how this process will unfold, it may create an added incentive to find alternatives to destructive practices associated with wildcrafting.

The government has also been an active participant in a 15-year multi-donor Environment Program, which is presently in its last 5-year phase, during which Malagasy institutions will take full financial and management responsibility of the national program. The program provides a forum for coordinating environmental policies and programs, including policy recommendations affecting AMP. A number of specific government agencies participate in

<sup>10</sup> <http://whqlibdoc.who.int/publications/2003/9242546275.pdf>

<sup>11</sup> [www.emea.eu.int/pdfs/human/hmpc/24681605en.pdf](http://www.emea.eu.int/pdfs/human/hmpc/24681605en.pdf)

<sup>12</sup> [www.floraweb.de/proxy/floraweb/map-pro/](http://www.floraweb.de/proxy/floraweb/map-pro/)

this process and offer potential vehicles for influencing policies and delivering technical assistance related to AMP. These include the National Environmental Council (*Conseil National de l'Environnement*; CNE), the Inter-ministerial Environmental Council (*Conseil Interministériel de l'Environnement*; CIE), and the National Environmental Office (*Office National de l'Environnement*; ONE). These agencies are under the umbrella of the Ministry of Environment and of Water and Forests (*Ministère de l'Environnement et des Eaux et Forêts*; MEEF), and they work in collaboration with decentralized local governments (*Collectivités Territoriales Décentralisées*; CTD) and private enterprises.

**Regulations, fees and taxes:** Related to decentralization and the levels of government presence, the AMP sector is hampered by having to interpret and navigate within a set of confusing and overlapping regulations, fees and taxes. These factors impinge on the sector's competitiveness when compared with the environment in other competitor countries.

Historically, AMPs were considered forest-derived products and placed under the Ministry of Water and Forests. Gathering aromatic and medicinal plants wherever they grew originally fell under regulations of forestry hunting permits and timber products. The first step still today for “collecting in the wild” is to obtain an “authorization” or a permit from Water and Forests, now a Department within MEEF. The process is as follows.

- a) Permit: This authorization, given against payment, permits the holder to gather, cut and haul from the forest raw plant material. Under existing regulations payment is made to the regional office of MEEF, but presently there is no matrix for plant variety or location precision for obtaining the permit. One large company supplying the local market in medicinal plants has obtained a blanket authorization from the MEEF central authority to gather AMPs on the entire island territory.
- b) Once gathered, a tax or *redevance* must be paid to MEEF based on the actual amount of plant material collected and exported. The party obtaining the permit above is responsible for paying the *redevance* tax. Confusion arises because the tax is set at 4 percent of FOB<sup>13</sup> price if the product “emanates” from the forests” or 2 percent if it is “transformed” or processed. In addition, it is not clear if the tax applies to products gathered in areas that were but are no longer forests.
- c) If plant material is transported out of the commune from where it is collected, it is levied a tax or *ristourne*, established by the commune and paid directly to them. The fee is based on weight, which compared to timber products is usually low. Payment is usually made by the collector or the processor, and they often must also pay the *redevance* tax if neither the collectors nor wildcrafters paid their contribution. Proof of payment of the *ristourne* tax and the authorization permit issued by Water and Forests must accompany all vehicles transporting AMPs on major roads, and must be presented at regional and national police check points. However, if the plants are grown on agricultural lands, the cultivator and his/her collector no longer fall under Water and Forests regulations, do not have a signed *ristourne* document, and therefore could be exempt from paying the commune *ristourne* tax. The regulation is not clear on this, at least at the producer level of the chain. Dried plant material is relatively light weight and can be transported through informal channels along back roads and paths by bicycle, carts or on one's back, thus evading control and fees.

If AMPs are transported out of the region or province along major roads, these administrative entities also have the authority to levy their own tax on transported goods. Cloves, for example, are taxed 1,000 Ariary (\$0.50)/kg by the regional governments, whether wildcrafted or cultivated.

---

<sup>13</sup> FOB—Free On Board—indicates that the quoted price covers all expenses up to and including the loading of goods aboard a vessel.

d) AMP products exported from Madagascar (predominately essential oils) pay two export taxes (2 percent of FOB value and 3 percent of CIF<sup>14</sup> value), and processors/wholesalers pay an import tax on material used in the processing, testing and manufacturing of other AMP products (i.e., stainless steel, boilers, specialty bottles, containers and testing equipment, dryers, packaging). These tax rates are established by the Ministry of Finance.

The following table shows the cost structure of three AMP products, including various fees and taxes. Transport costs are factored at each step of the value chain (e.g., raw material includes landed cost at the collection places, collection includes collectors’ mark-up and transport, etc.)

**Table 5: Cost Structure of Three AMP Products**

Cost	Percentage of Total Cost		
	<i>C. camphora</i>	<i>R. aromatica</i>	<i>L. camara</i>
Raw plant material	50	28	30
Collection + taxes ( <i>ristourne, redevance</i> )	10	25	15
Processing	26	32	46
Export taxes	5	6	0*
Other	9	9	9
Total	100%	100%	100%

\* not exported

**Source:** Etude filière : Plantes aromatiques, médicinales, et huiles essentielles (SCAC, FOFIFA/DRD, 2003)

**Ministries:** The national and local enabling environment is further complicated by the number of ministries directly implicated in the AMP value chain. In addition to the Ministry of Environment, Water and Forests, there are:

- Ministry of Agriculture, Husbandry and Fisheries, which claims that since most AMP (aside from products derived from trees) grow or are produced in buffer or agricultural lands, the sector falls under their mandate
- Ministry of Finance, which oversees taxation
- Ministry of Health and Family Planning, which approves new drugs that emanate from traditional medicinal practice. It oversees the medicinal segment of the AMP value chain as well as conventional medical practice. It is tasked to provide the population a safe and equitable option to conventional medicine through traditional pharmacopoeia and medical practices.
- Ministry of Industry and Commerce and Support to the Private Sector. This Ministry’s Norms and Standards Bureau is tasked with defining and establishing norms, grades and standards for consumer products and, when possible, harmonizing these with importing countries’ norms. Presently there are only a few national level norms and standards related to AMP products. Some date back to the colonial

**TEXT BOX 3: SAME STANDARDS FOR 56 YEARS**

To export cinnamon bark in the form of “cigarette” bark rolls, a standard set in 1950 and still on the books stipulates these must not exceed 10 cm. However, consumers prefer and importers specify longer size rolls. Another decree stipulates that dried plants must be transported in jute bags, but international standards require non-contaminant plastic bags. An exporter either loses the client or breaks the law.

<sup>14</sup> CIF—Cost, Insurance and Freight—indicates that the quoted price covers all expenses and risks up to and including delivery at a named destination. The price excludes import customs clearance and other costs and risks.

period and do not take into account shifts in consumer preference (see Text Box 3 above).

A leading AMP producer (Label CBD) is responding to the lack of updated norms and standards by developing AMP products that are new to Madagascar and the international market. This allows Label CBD to diversify its traditional exports. Also, by setting the standards for these new products and registering the branded Malagasy name with the Ministry's Bureau and internationally, the firm leapfrogs the government process and assures a measure of protection for its intellectual property.

**Transportation infrastructure and logistics:** Transport costs at each level of the value chain are impacted by the poor condition of rural infrastructure. Because of inadequate transport facilities, wildcrafters pay up to 10 percent of the selling price to have their gathered plant material transported either on a person's back or by bicycle. The percentage cost reduces as the dry material is trucked to processing plants; transport to the port facilities accounts for between 0.5 and 5 percent of the price of the finished products.<sup>15</sup>

The slow growth in firms that specialize in providing logistical services—from freight forwarding to rapid loading/unloading, dispatching, distribution, tracking, dedicated software, broader ranged communications, inventory control and supply chain management—is understandable under Madagascar's present situation. The AMP sector is still too small to drive growth in logistical services, but as other sectors grow, improvements in the support environment will carry over to the AMP sector.

### 3. NATURAL RESOURCE GOVERNANCE

Two domains of governance with potential impact on the distribution of access and benefits in the AMP sector are decentralized local government and resource tenure practices. The potential contribution of local government in promoting sustainable practice is largely unrealized due to lack of capacity and resources. For the same reason, AMP has yet to yield significant tax revenue. Local tenure practices do not appear to significantly influence access to wild AMP, which are generally open access. These issues are discussed in detail below.

**Decentralization:** Madagascar's decentralized system of government is based on a hierarchy of territorial units comprising 6 autonomous provinces, 28 regions, 158 departments and 1,392 communes. Administered by elected mayors and councils, the rural communes have a potentially important role in promoting sustainable natural resource management. They articulate communal priorities and direct investments through the preparation of communal development plans; they can work with government technical agencies to raise awareness and circulate information about sound practices; and they can craft specific policies appropriate to local social and environmental conditions. Communes frequently perceive natural resources as a potential source of revenue, and a number of communes in the study sample have enacted taxes on AMP (generally around 20-40 Ariary per kilogram of raw material). However, many communes lack resources to effectively monitor and enforce environmental policies, including tax collection.

**Resources access and tenure:** Most wildcrafting is conducted on land that is in the public domain. Access is free and unrestrained for residents and non-residents alike. We did not encounter any gender differences in access to wild AMP. However, there is some gender specialization, as most wildcrafters are women. Cultivation of AMP is generally a household activity, following patterns of household decision-making, and there do not appear to be institutionalized means of favoring groups within communities (such as restrictions on access to land).

---

<sup>15</sup> Based on three products surveyed (*Cinnamomum camphora*, *Lantana camara* and *Raventsara aromatica*), Etude filière : SCAC, FOFIFA/DRD (2003) "Plantes aromatiques, médicinales, et huile essentielle : Proposition de scénarios de mécanisme fiscal et de systèmes de contrôle"

Open access conditions have enabled depletion of certain high-value AMP, such as kotofihy (*Prunus africana*) and ravensara (*R. aromatica*) in some places. When there is a surge in demand for such products, harvesters often use techniques that maximize yields but end up killing trees. For example, while it is possible to harvest *Prunus* bark and ravensara leaves in a sustainable manner, *Prunus* trees are frequently girdled to maximize bark harvest, and ravensara trees are cut to access upper twigs and leaves. The government has made efforts at a national level to develop a sustainable management strategy with little effect; attempts to regulate and enforce rules locally have proven ineffective. The government issued a moratorium on *P. africana* harvest and export in 2003 under pressure from CITES and harvesting ceased. Given current enforcement capacity, it appears unlikely that policy targeting producers would be effective. Instead, as this experience with *Prunus* suggests, it may be possible to promote sustainable management by targeting the end market. It remains to be seen whether it is possible to affect harvesting behavior by restricting end markets short of a full moratorium.

Our surveys indicate that customary rule systems do not govern access to non-timber forest products, such as AMP. However, in certain rural communes (e.g., the community of Antanala in the region of Ranomafana), customary ‘kings’ (*apanjaka*) play a role in biodiversity conservation. In effect, the collection of AMP in these areas is under their authority. The system does not have an official basis but depends on the moral authority of the *apanjaka*, which is widely recognized by the population. There is also tacit recognition of their authority by the administration. The cultural value of medicinal plants in this area also takes the form of strong attachment to traditional healers, *tangalamena*, and a deep-seated reverence for the therapeutic virtues of medicinal plants. Similarly, the community of St. Marie, near Toamasina, which is well known for its abundant *R. aromatica*, does not allow harvesting because of the tree’s spiritual significance (believed to have been left by their ancestors).

Cultivated land closer to villages is considered communal land and managed through customary, community-based land rights. Land use for cultivation of AMP or other crops is accessed through consent of township or commune. However, rights to trees on that land belong to long-standing families and to their descendents. Another traditional system allows “outsiders” conditional access to family-owned land on a temporary basis—a “sacred” transfer pact (*fatitra*) between a family and a close friend to cultivate fallow land. The verbal agreement gives the close friend rights to cultivate the land for a particular purpose and time period. This system allows fallow land to be used for cash crops such as AMP as well as for rice.

Customary land tenure is considered insecure, as it is not recognized by the state, though the effects of this insecurity on productivity and investment are uncertain. Land titles and registration are rare in rural areas. The government of Madagascar, with support of the Millennium Challenge Account, has initiated a major initiative (*Programme National Foncier*, PNF) to decentralize and simplify land registration and titling in order to make it more accessible to rural populations and to tailor it to rural land use patterns. A system of “*guichet fonciers*” creates a role for rural communes in registering and titling land that has been in use over time.

Several pieces of national legislation restrict resource-related activities that potentially negatively impact AMP. Tree cutting is regulated through the same system of permitting and fee collection that governs AMP production. Use of fire to clear land for farming is prohibited. MEEF is putting finishing touches on legislation to regulate collection of plants and tree products from protected and non-protected zones. This legislation will establish an updated fee structure for AMP, which are now regulated by the same guidelines used for timber. It is unclear when this legislation will go into effect. The GELOSE/GCF<sup>16</sup> program provides a mechanism for transferring management rights (but not

---

<sup>16</sup> The GELOSE/GCF (*GEstion LOcale SEcurisé/ Gestion Contractualisée des Forêts*; Secured Local Management/Contractual Forest Management) system establishes equitable benefit sharing of natural resources between the State, the commune and other natural resource users.

ownership) of natural resources from the state to a community for a specific period of time. It allows communities to determine who can have access to their resources (including AMP) and enhances their ability to exercise stewardship over fragile lands. However, the process for transferring rights is cumbersome, and lack of assistance to communities in implementation has hampered the program's performance.

## D. VALUE CHAIN ACTORS

This section presents actors and the role they play in each segment of the AMP value chain, from plant gatherers and producers to collectors, processors, wholesalers/exporters and retailers. The section focuses on the value chain's "mainstreamed" actors and firms, although there are lesser known elements who enter and exit the value chain at the flash of an opportunity. These are often referred to as "opportunists" and are not included in the following discussion.

The present AMP value chain is characterized by the informal nature of its upstream base (producers, gatherers and collectors) and its better organized and more formally structured actors downstream (processors and wholesalers/retailers). Overall the value chain operates with little vertical integration and almost no horizontal collaboration. Yet actors are conscious that there are local and export market opportunities for AMP products without necessarily being able to identify consumer trends or react quickly to them at their level of operation.

### 1. PRODUCERS

**Plant material "production systems":** Three groups comprise the "production" function of the AMP value chain—wildcrafters, cultivators and plantation operators. They differ in their level of power, their opportunity to benefit from the natural resource base and their cost recovery practices. Production strategy depends on the nature of the plant. Some plants are endemic and exist in the wild, while others are exotics and have traditionally been cultivated as agroforestry crops. There are ongoing attempts to domesticate wild plants that are increasingly scarce in the wild, such as *R. aromatica*, which indicates a trend towards AMP cultivation. While there are no reliable statistics on the percentage of actors among the three groups, community interviews suggest that a majority of households engage in seasonal wildcrafting. A much smaller number of households cultivate AMP on private land. For example, villagers estimate that approximately 10 percent of households own clove trees and that income in the community from the sale of cloves is second only to that earned from rice.

- **Wildcrafting**—individuals and groups who gather nearby plant material in the wild, part-time and carry them to small collection points. For many, gathering aromatic and medicinal plants is part of their

#### TEXT BOX 4: EXAMPLES OF PRODUCER PRICES

At Befontsy, the purchase price to wildcrafters for **talepetraka** is 1,400 Ariary per kg dry. Collectors buy from collection points (often hamlet stores) at 1,600 Ariary per kg. On average, a woman can gather 1 kg fresh during a half-day, producing on average 10 kg dry during the year. The daily wage for women in the region is approximately 2,000 Ariary.

In Vohamina, prices for wildcrafted **radriaka** are always fixed by buyers and have been declining over time. The price paid to wildcrafters dropped from 50 Ariary/kg, 2 years ago, to 30 Ariary and presently to 20 Ariary. At that price, women preferred to work in their rice fields and the volume collected has dropped.

In Vohimana, the price for **longoza** delivered to a collection point is 20 Ariary/kg dry. A wildcrafter can gather approximately 50 kg in a half-day.

In Moramanga, the price paid to producers for fresh **ginger root** is fixed by collectors. Prices increased from 180 Ariary /kg in 2005 to 200 Ariary/kg in 2006.

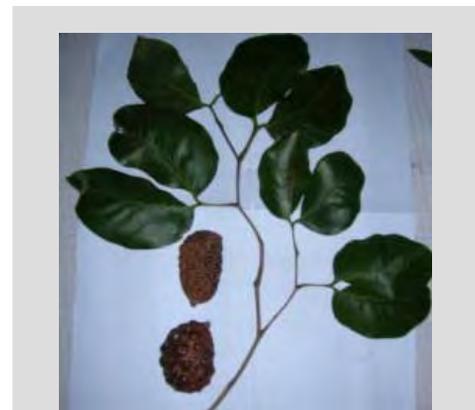
livelihood diversification strategy even if it is not an important source of cash income. They engage in other income generating activities that are generally more remunerative. Plants that are generally collected by this category of actors include radriaka (*L. camara*), talapetraka (*C. asiatica*) and wild ginger (*H. coronarium*).

- **Cultivating**—individuals and groups who plant and harvest plant material on land to which they have some rights or deeds. Plants cultivated by small private landholders include ginger (*Zingiber officinalis*), cinnamon (*C. verum*) and black pepper (*Piper nigrum*). There is also evidence of endangered species such as niaouli (*M. quinquenervia*) and katrafay (*Cedrelopsis grevei*) being cultivated in private plots.
- **Plantations**—Plantations are larger landholdings with little plant differentiation (i.e., containing one or two species). They are generally established by large distributors in an effort to improve product quality and availability and held under different types of tenure arrangements—deeded, rental or owned. Plants include cinnamon (*C. verum*), eucalyptus (*E. globulus* and *E. citrodora*), cloves (*E. caryophyllata*) and ravintsara (*C. camphora*).

**Wildcrafters:** This group is comprised essentially of individuals (almost entirely women and children) and informal groupings (MSEs), who seize an opportunity to earn additional income by responding to a call for plant material, usually available in their fields or on open access public lands and forests. Gathering sites are generally within 3 km of villages. Depending on their location in relation to natural resources, between 10 and 50 percent of a village is engaged in some part-time AMP gathering. Capital entry cost is zero, and time devoted to wildcrafting is balanced against the opportunity cost of cultivating rice and other activities. For most rural households, wildcrafting of AMP is generally only part of diversified livelihood strategies, which also include some form of agricultural production and/or handicraft activity. However, AMP can provide an important source of cash income, even if the amounts are generally small (see Text Box 4 above). A 1996 study found that in some communities over 30 percent of their cash income was derived from collection of *P. africana* bark.<sup>17</sup>

Wildcrafters do not gather plant material until they hear of a specific order from a sub-collector. Information flows as follows: wildcrafters are informed of an order (rough amounts, technical specifications and price) by word of mouth through a local collector, who generally specifies the order to the owner of a village's convenience store and gives the date he will return to the village (generally a week later) to collect what has been brought to the village store. Prices are fixed and non-negotiable regardless of quantity or quality gathered. Wildcrafters receive no other information, and have few means of gathering information about the location of the plant source other than by traveling by foot to find productive areas. Wildcrafters usually do not know the use or destination market of the plants. (Most plants gathered by wildcrafters are destined for the domestic medicinal market.) Income from wildcrafting is usually used to meet current needs and not saved. One-off orders for certain plants can translate into a good opportunity for wildcrafters, especially if the demand is great and prices are high, but such orders can also lead to rapid and uncontrolled depletion of the species.

Given the *ad hoc* nature of wildcrafting, there is presently little incentive to self-organize formal associations. Nonetheless, several organizations



**PHOTO 1**

This plant is commonly called “tandroho” and collected in the Niarovana commune in the Vatmandry district. Collectors and people interviewed knew neither the use nor the destination of the plant. According to interviews in Beforona, the plant repels mosquitoes.

<sup>17</sup> Walter, S. & J.C.R. Rakotonirina. (1995). “L'exploitation de *Prunus africanum* à Madagascar.” Unpublished report cited in FAO (2001). It should be noted, however, that unsustainable harvesting of *P. africana* led to a moratorium in 2003.

have begun facilitating informal associations of wildcrafters as a means of improving product reliability, quality and traceability. Wildcrafters generally have little time, information or interest in managing natural resources. However, those grouped together through an NGO or supported by professional processors and buyers appear more productive, better informed and more interested in protecting nearby plant life than do non-organized wildcrafters. Furthermore, NGOs frequently link community organizing around AMP to provision of community health services. For example, export firms such as Label CBD and Phael Flor structure prices to cover costs of village clinics and nurses while maintaining their own price competitiveness.

**Cultivators and Plantation Operators:** These actors are distinguished from wildcrafters by their purchasing power, which allows them to access a bicycle or public transport to take them and their goods to and from regional markets, where they can gather market information and establish relationships beyond the village level. They are able to buy seeds or starter plants from sources that can provide them with rough price information. Subsequently, they can better respond to market demand and have a better chance of negotiating prices than wildcrafters.

Cultivators plant aromatic and medicinal plants in addition to other crops usually in a separate part of the land and on a small scale, but have insufficient knowledge of production norms. Small-scale cultivators are MSEs and can upgrade their farming enterprise if opportunities arise in response to buyers who need plants that are difficult to source from the wild. Such is the case for *Artemisia annua*, which is sought by pharmaceuticals for its anti-malarial qualities. BIONEXX, a private for-profit company operating in Madagascar, has sought cultivators with small landholdings to plant the Artemisia (see Photo 2). Through representatives in villages, the company provides seeds and fertilizer and technical instructions for growing the plant from nursery to maturity, harvesting, drying and storing. The company announces a purchase price (5,500 Ariary/kg) within 4-5 months of planting but states it will negotiate a final price when the plant reaches maturity. BIONEXX indicates it will collect the dried products from the production fields. The cost of entry is relatively low under this model and cost recovery can only be calculated after a trial season.

AMP production in plantations (most are from 10 to 70 ha) permits closer relations to end-market players, since they are generally operated under the management of large domestic market suppliers or exporting firms. Typical AMP produced in plantations are clove, cinnamon, eucalyptus and recently ravintsara (*C. camphora*). Employment ranges from 4-5 people to several hundred. In the area surveyed, we estimated approximately 15 plantations.

Plantations provide a more stable production base and greater control over quality. Production is organized and is trending towards respecting norms of good agricultural practice (GAP). Participants have an understanding of their role within the value chain. The plantation model requires investment in management, training, equipment and labor, which makes financing an issue. Plantations initially do not promote biodiversity within their growing area, nor does the growing environment replicate the soil, ground cover or canopy of a natural setting. However, plantations provide a scaled option to regenerate endangered plant and tree species. Health care and health information are usually provided to employees under the plantation model. Plantations are more able to become certified organic than other producers (although it can be costly, time consuming and requires rigorous management) as they can better control production, provide traceability and input supply records, and can more easily pay for support services, even if these are scarce in the AMP sector.



**PHOTO 2**

BIONEXX poster instructing potential Artemisia cultivators on proper techniques; on wall of villages shop used as collection point.

Current access to new land for plantations in the public domain is determined in part by the NRM practices proposed by plantation management. The business must prepare a project description (business plan to include location, size, plants cultivated/harvested, duration, environmental considerations, maintenance practices, investment) and request authorization from MEEF. Recent policy shift has decentralized the decision-point from the capital to the regional offices. Water and Forests request an opinion from the local government authority (*Commune*) regarding their knowledge of the applicant, the project and the appropriateness of the business to the wellbeing of the commune. Based on this and their own evaluation, Water and Forests can grant a “*contrat d’exploitation.*” Entry costs are based on land size and species planted, and the expected time span for a decision is between 3-5 months, although this varies by location.

Communities view plantations as legitimate operations and as sources of employment. Land is privately leased or in the public domain, and since the investment aims are long-term and plants are planted and cared for, they are not perceived as being exploitive of the natural resource base.

**Table 6: Comparison of Production Systems**

Production system	Advantages	Disadvantages
Wildcrafting	<ul style="list-style-type: none"> <li>• It is cheaper and does not require infrastructure and investment.</li> <li>• Many species are only required in small quantities that do not make cultivation economically viable.</li> <li>• No pesticides are used.</li> <li>• It has been shown that plants in their wild state contain stronger medicinal properties than the cultivated variety.</li> </ul>	<ul style="list-style-type: none"> <li>• Uncontrolled demand may lead to extirpation of species; wildcrafters are first line to suffer.</li> <li>• Local knowledge of the plant ecology and biology is helpful, but wildcrafters only gather when there is an order, not on basis of optimal biological signals.</li> <li>• Haphazard harvesting and sourcing affects reliability in end-markets.</li> </ul>
Cultivation/Plantation	<ul style="list-style-type: none"> <li>• Cultivation provides reliable botanical identification.</li> <li>• Cultivation provides a steady source of raw material.</li> <li>• Collectors, intermediaries and other buyers can agree on volumes and prices with the grower over time.</li> <li>• Post-harvest handling and quality control can be assured.</li> <li>• Product standards can be made to meet consumer preferences.</li> <li>• Cultivated plants can be easily certified as organic.</li> </ul>	<ul style="list-style-type: none"> <li>• Land titling is not common in areas adjacent to protected zones.</li> <li>• Watering during dry season is unreliable and may require investment.</li> <li>• Entry and maintenance costs increase as size of cultivated area increases.</li> <li>• There is greater risk of crop loss due to weather, cyclone, pest invasion, disease.</li> <li>• Monocropping can degrade soil structure and fertility, rendering sites less sustainable over long run.</li> </ul>

## 2. COLLECTORS

Collectors and sub-collectors are aggregators or middlemen who collect harvested plant material from wildcrafters and, to a lesser degree, from cultivators. They deliver this raw plant material (often dried) to processors. Collectors and sub-collectors do not generally deal with plantation operators, who usually deal directly with processing plants.

Collectors operate among one, two or three layers of sub-aggregators, which is understandable given the geographical dispersion of wildcrafters. Smaller ones collect directly from wildcrafters or small hamlet collection sites, successively moving up to larger collectors at villages on rural roads, to even larger, often Chinese owned, trucking points on paved roads. The levels could be referred to as “first level sub-collectors” (ambulatory, on bicycles or at small hamlet shops), “second level sub-collectors” (medium sized, at villages on rural roads) and “third level collectors” (large). Sub-collectors are part-time actors of the value chain, while the larger collectors are more permanent.

As demand from end-markets is not always predictable, third-level collectors do not initiate a collection campaign until they receive an order from an exporter, a local wholesaler or a processor. Orders include purchase price parameters. Collectors then determine the sub-collectors to contact based on their knowledge of zones where the required plants are abundant and where competition is likely to be lower.

Collectors establish their purchase prices based on a calculated markup, differentiated according to the type of product and the extent of handling required. Roots, barks and organics have the largest markup, while small leaves and wildcrafted plants have the lowest. Our surveys indicate that margins for first-level sub-collectors are 10-20 percent and 25-35 percent for higher level collectors, who sell directly to processors (see Table 11 on page 41).

A typical first-level “ambulant” collectors travels by bicycle to villages where the plants are found and announces the plant required, some specification, the purchase price per kg dry-weight and the date of his return to collect the raw product. He does not provide advances to individual wildcrafters but does provide funds to the hamlet shopkeeper to pay for plant material as it arrives at the shop. While hamlet shops are convenient places to collect plant material, they also pose a constraint to quality control. Hamlet shopkeepers operate on low margins, providing basics goods (e.g., rice, sugar, oil) to local households, at times on credit. Shopkeepers are interested in keeping wildcrafters as customers, and thus are more likely to accept all plant material brought to them, even if the material does not conform to standards requested by ambulant collectors.

Typically, second- and third-level collectors regroup the collections of dry material made by those of the bicycle group, and are characterized by the use of pick-ups or trucks along more accessible roads. This level can be linked to suppliers to larger commercial outfits that feed directly into urban processing plants in Antananarivo, Fianarantsoa or Toamasina.



**PHOTO 3**

Hamlet shop serving also as a collection point. Shop owners are generally migrants. To maintain a good standing in the community, they must establish good relationships with collectors. They are generally willing to forfeit a small amount on the AMP collection transaction in order to gain a loyal customer for basic consumer products.

**Table 7: Estimated Numbers of Fixed and Mobile Collectors in Three Study Areas**

Type of Business	Commune			Total of Six Communes
	Tsirangiana Nairorvana Tsaraivany	Beforna Ambatovala	Ambouhibary Anosibe-Anala	
Collector/fixed	46	10	4	60
Collector/mobile herbalists	8	4	3	15
Collectors/opportunists	5	2	4	11
<b>Total</b>	<b>59</b>	<b>16</b>	<b>11</b>	<b>86</b>

Source: Interviews with Rural Commune officials (2006)

### 3. PROCESSORS

#### Processing (distilling/extracting/drying) plants:

There are approximately 37 large processing firms that convert vegetative material into bulk or consumer grade products; 26 of these are exporters. These firms are located in the capital city, Toamasina and other large towns. Additionally there are numerous small to mid-size distilleries located in small towns or near collection points closer to the plant source.

The smaller units can be divided into two types. The first are the “formal”<sup>18</sup> affiliated distilleries associated with larger exporting businesses (Label CBD, Phael Flor, HOMEOPHARMA and Talamanga). They are constructed of high quality material (welded stainless steel), use low pressure steam boilers to control heat, have access to testing equipment, possess up-to-date technical knowledge, and produce a quality product. These formal distilleries are either affiliates of exporting operations or are tied to exporters through production contracts. They are recent additions to the AMP value chain and their numbers are comparatively small. During the survey, the team identified four in the Fianarantsoa area, three in Moramanga and one in Tsivangiana-Mahanoro.

The other type of distillery is “informal.” These are generally constructed of lower quality material (steel drums instead of stainless steel, direct heat to the plant material in place of low pressure steam), with insufficient measuring and product testing equipment. They are inefficient and produce low-grade output. According to interviews with rural commune officials (Table 8), these small and medium-sized enterprises represent a “large” share of the processing sector, though as often the case with informal sectors that are highly mobile, accurate data is not available.

#### TEXT BOX 5: PHAEL FLOR

Phael Flor is a Malagassy firm established in 1985 by a perfume chemist who produces extracts from aromatic products. Its principal clients are in France, although it ships certified organic products to the U.S. The firm began by sourcing plant material from wildcrafters and processing them in Antananarivo. It now sources from its own plantations, from cultivators and from some wildcrafters. To move closer to suppliers, it decentralized its facilities by installing small modern distilleries and plant drying facilities in rural areas close to the plant source. Phael Flor initially places a head office employee to operate the decentralized mini-plants, then leases these rural businesses assuring a market through production contracts. In 2005, it sold 120 kg of cinnamon essential oil. One year later, its export has increased to 250 kg (at € 210/kg). It also exports raventsara, ginger, lemon grass and vetiver extracts.

<sup>18</sup> Tax-paying, registered companies that advertise and have a fixed office.

**Table 8: Estimated Numbers of Formal and Informal Processors in Three Study Areas**

Type of Business	Commune			Total
	Tsirangiana Nairorvana Tsaraivany	Beforna Ambatovala	Ambouhibary Anosibe- Anala	
Processor/formal	1	1	0	2
Processor/informal	10	2	2	14
<b>Total</b>	<b>11</b>	<b>3</b>	<b>2</b>	<b>16</b>

**Source:** Interviews with Rural Commune officials (2006)

Processing requires more skill than other stages in the value chain to operate successfully, both in producing varied products and in adapting to continually changing end-market demands. We observed this part of the chain to be the most innovative in both new product development and new technology adoption. It is not surprising that this link also shows the greatest drive to upgrade. Energy requirements for heating distilleries is an important cost factor; there appears to be inefficient use of water to cool the condensate coils, and upgrading might allow recycling of vegetative waste after distillation.

**Trend:** Export end-markets are increasingly demanding products that meet Fair Trade and sustainability criteria.<sup>19</sup> To conform to these requirements, processing plants require certification, which includes tracing finished products upstream to the production level. The trend requires processors to position themselves closer to the raw material source.

Exporters are responding by installing smaller formal processing units in the field (built with quality materials and according to standards with testing equipment). Sometimes they place company staff at the decentralized plants which they initially capitalize (through internal financing) and later spin off as independent companies. At other times, exporters promote small businesses through training, technical support and contracts for local-level collection and processing. This form of in-country outsourcing leads to performance-based purchase contracts, resulting in more reliable delivery of processed products and conformity to company specifications.

The trend is increasing awareness and involvement of Antananarivo and Toamasina firms to playing more proactive roles in sustainable natural resource management. Processors and exporters are not just linking downstream in the value chain but are involved in establishing nurseries, replanting threatened species and contributing to better stewardship of fragile lands. These investments do not appear to affect prices paid to producers, but they generally improve relations with communities and result in better availability of plant material.

Presently, processors cannot depend on sourcing much of their raw plant needs from plantations. Production from plantations is still relatively small compared to demand, which is still met mostly by wildcrafters. From the trend, we can estimate lower raw material costs and more reliable delivery with increased sourcing from plantations.

<sup>19</sup> Firms can be certified that their products come from “sustainable wild collection” by partnering with an NGO such as Conservation International, World Wildlife Fund or Wildlife Conservation Society, which will provide the conditions and certification: [www.floraweb.de/proxy/floraweb/map-pro](http://www.floraweb.de/proxy/floraweb/map-pro) Fair Trade conditionality and certification can only be granted by the Fair Trade Federation: [www.fairtrade.org](http://www.fairtrade.org)

## 4. WHOLESALERS AND EXPORTERS

**Marketing channels** consist essentially of three types of distributors of local natural products:

- exporters who retail or wholesale traditional Malagasy AMP products through established importer networks
- sellers of traditional AMP products for local consumption—these are generally small-scale actors who sell in local marketplaces; they do not export directly
- integrated firms that have established a presence in the rural sourcing regions to oversee wildcrafting, cultivation and processing into their wholesale/export or retail operation<sup>20</sup>

The more formal firms in the AMP sector are integrated processors and wholesalers who supply the local and export markets. Once they begin exporting to international markets, firms are obliged to develop capabilities to engage in activities that favor improved resource and land management practices in response to consumer demand.

Wholesalers to the local market usually begin as manufacturers of local medicinal products that source their dry or fresh plant material from small producers through direct contracts. They also source processed material from small distilleries on an as-needed and as-available basis.

The more aggressive companies have established plantations and their own distillation/processing facilities capable of producing diverse and large quantities of products on a regular basis. This also allowed these firms to enter the export markets and become integrated, more efficient value chain participants.

Among the largest local market wholesalers is HOMEOPHARMA, a firm that produces about 200 different products and distributes them through a network that includes 21 franchised retail stores throughout the country, the national pharmacy distribution system and supermarket chains. The firm has become a major exporter of essential oils, and, after joining an international consortium of AMP producers, has expanded its capabilities to develop new products and condition them to conform to international standards.

Another organization, IMRA (a foundation that operates as a private business and an applied research institute) uses small retailers, traditional healers, physical therapist/masseuses and street sellers to reach out to the

### TEXT BOX 6: THE LABEL CBD APPROACH

Label CBD was created in 1999 through the initiative of Oliver Behra as the for-profit arm of the NGO “Man and Environment.” It promotes rural development and biodiversity conservation through the commercialization of AMP. The Label CBD approach has several key features:

- environmental impact studies to evaluate whether production potential is sustainable and adequate for anticipated markets
- installation of distilleries in communities to process community-sourced material, and training of local producers to assure quality and traceability
- a commitment to paying producers fair prices and reinvesting a portion of its revenues in social services (health clinic, nurse or teacher) in producers’/partner communities
- calculating prices paid to producers based on (a) livable wage, (b) amortization of distillery, (c) distillery function, and (d) operation of social services

Label CBD supplies essential oils to a number of major European cosmetic firms (e.g., Chanel, Yves Rocher) and continuously searches for new products to expand into new markets. Several products form the core of its business: Ylang ylang (*Cananga odorata*), cinnamon (*Cinnamomum zeylanicum*), “saro” (a newly discovered plant with anti-bacterial properties), Calophyllum, Iary (*Psiadia altissima*), and Niaouli (*Melaleuca viridiflora*).

<sup>20</sup> As shown in the value chain map, there are opportunistic firms at this level that come and go as demand markets rise and fall. This *ad hoc* group is seasonal, difficult to define and quantify, and could not be treated in the present survey.

mass local consumer. The simplicity of packaging of its products (small plastic sacks, paper sacks and plastic vials) is aligned with the strategy to keep prices low and provide the appearance of an authentic natural Malagasy product.

Wholesalers and exporters rely on a small number of core export products, assuring some stability and providing capital for innovation. For example, the majority of HOMEOPHARMA's exports consist of three main products: niaouli (50 percent of exports; 1.5 tons), ravensara (25 percent) and eucalyptus (25 percent). Likewise, ylang ylang and niaouli are core products for Label CBD. Markets for these products are relatively stable, but competition is high and margins are low relative to other products (Table 9). Table 10 shows the estimated quantities of selected AMP products processed and sold by Label CBD in 2006.

**Table 9: Profit margins on selected AMP products exported by Label CBD, 2006 (prices in Ariary)<sup>21</sup>**

Product	Market price (MSE) essential oil (per kg)	Price paid by fair trade partners (per kg)	Price paid to producer communities (per kg)	Profit (per kg)	Estimated demand, 2006 (kg)	Annual profit	Margin (%)
Niaouli	9,000	10,000	9,000	1,000	1,000	1,000,000	10
Ylang ylang	50,000	62,000	50,000	12,000	500	6,000,000	19
Cannelle	190,000	190,000	90,000	100,000	100	10,000,000	53
Saro	50,000	50,000	22,000	28,000	500	14,000,000	56
Calophyllum	22,000	22,000	9,000	13,000	1,000	13,000,000	59
Iary	44,000	44,000	22,000	22,000	300	6,600,000	50

Source: Label CBD

**Table 10: Quantities of selected AMP products processed and exported by Label CBD, 2006**

Product	Price of raw material (Ariary/kg)	Estimated demand, 2006 (essential oil, kg)	Conversion factor (raw material to essential oil)	Raw material necessary (kg)	People employed as wildcrafters (regular) <sup>22</sup>
Ylang ylang	100	500	0.003	166,667	26
Cinnamon	300	100	0.007	14,286	7
“Saro”	100	500	0.010	50,000	8
Calophyllum	400	1,000	0.110	9,091	6
Iary	80	300	0.003	100,000	13
Niaouli	20	1,000	0.003	333,333	10
<b>Total</b>					<b>70</b>

Source: Label CBD

**Trend:** There has been a growing trend toward vertical integration among large downstream operators who seek a dependable supply of high quality product. These firms are following the trend of linking back into the production sector (i.e., Label CBD, Phael Flor and Talamanga of the Groupe Ratsimamanga) by establishing small processing plants in rural areas and training producers to attain high quality standards and to reduce costs, creating rural employment and providing advances on production as a form of financing.

<sup>21</sup> U.S. \$1 = ~2050 Ariary

<sup>22</sup> Livable wage calculated at ~ U.S. \$26/month

On the one hand, this move upstream in the value chain offers the opportunity for end buyers to better control the quality of raw material, and on the other, it provides wildcrafters and cultivators a relatively more stable buyer and allows them to become better informed of end-market demands. Talamanga developed a system to upgrade certain collectors in the field by providing them with training and a form of accreditation. This was a way to establish loyalty among qualified collectors, and to better assure the receipt of raw material conforming to Talamanga's specific standards.

In other cases, large-scale distributors have begun growing raw materials in plantations and operating their own distilleries. This approach provides greater control over availability and quality of final product, but it also bypasses rural producers and processors, potentially depriving them of revenue. In addition, it increases the risks for the distributor (see Table 6 on page 24).

## 5. SUPPORTING MARKETS

The number of support services, specialists and suppliers is presently insufficient to provide significant firm-level upgrading assistance. Packaging options are limited, there are too few nurseries, financing institutions are absent from rural areas, and there is a lack of specialized service providers such as communication/information services, technical training, events and fairs organizers.

**Finance:** The AMP sector suffers from a lack of access to financing. Madagascar's formal banking system operates mostly in regional capitals and is not present "outside the cities." There is a micro-credit sector with local representative agencies, and there is a national entrepreneur development scheme in place. The latter operates only in regional capital cities. Interviews with producers, collectors and processors in the field indicate they did not have access to informal financing systems and the micro-credit institutions were not present in AMP production areas. The sector is perceived as too unpredictable and high risk. Only a small percentage (less than 10 percent) of buyers provided some form of financing through advances to their suppliers; these came from large firms.

Donor projects, NGOs and private investors are the sole sources of external liquidity in the sector. With increased activity, professionalism and competitiveness of the AMP sector, private investment could be encouraged to increase its presence through derived businesses. With a concentration of activities in specific corridors, there could be increased opportunities for cluster development in the Fianarantsoa, Moramanga and Fenerif Est/Toamasina regions.

**Packaging/bottling:** Processors and exporters in the AMP value chain have access to three levels of packing, depending on where they situate themselves in the end market: a) imported specialized dark glass bottles and barrels for essential oils (expensive); b) moderately priced, locally produced plastic packaging (ordinary or Poly Ethylène Teraphalate; PET) in the form of plastic jars bottles and small receptacles for lotions, some essential oils, soaps, creams and medicine; and c) ordinary low cost packaging, which is essentially plastic sacks filled and sealed by hand. The two largest local producers of the intermediary level packaging are SFOI and PLASTIMA.

**Information/communication:** This type of supporting market remains weak in spite of important efforts made by the private sector (extension and development of telecommunications) and the State through opening and improving rural access roads. Other than personal contacts and the internet for those with access, there are no known sources for market, price and technical information that exporters, wholesalers and retailers can utilize. Although present at the local level, Water and Forests agents' support to the AMP sector is weak and sporadic. Agents are generally not well trained and lack access to technical information on sustainable cultivation and harvesting.

**Research institutions and laboratories:** Research and laboratory institutions conduct product phytochemical research, evaluation of medicinal properties, and testing and analysis required for export and third-party audit and verification. Three different types of institutions are conspicuous, based upon the type of support they provide:

- **Agronomy research:** Centre National de la Recherche Appliquée au Développement Rural (FOFIFA), Ecole Supérieure des Sciences Agronomiques (ESSA)
- **Environmental research:** Centre National de Recherches sur l'Environnement (CNRE)
- **Pharmaceutical and medicinal research:** Centre National d'Application des Recherches Pharmaceutiques (CNARP), IMRA, HOMEOPHAMA

Other laboratories, which receive funding and equipment from projects such as the International Cooperative Biodiversity Group (ICBG)/Centre ValBio,<sup>23</sup> focus on safeguarding and ensuring the sustainability of Madagascar's medicinal plants. The laboratories offer third-party evaluation, they are used by the private sector, fees are reasonable and services are reliable.

**Organic certification:** Internationally recognized EcoCert is an audit and certification body. However, it is also an important vehicle for disseminating information on regulations of importing countries and on technical information for meet organic standards, phyto-sanitary and safety updates, and advice on labeling products to facilitate entry into different markets.

**Business development services (BDS):** There is absence of private-sector training and consulting firms specializing in the AMP sector (e.g., negotiations, business planning, technical training in GAP and distillation techniques, good collection practices and quality control). This absence is particularly acute in the producing/collecting/processing zones, which are the areas that require the most upgrading. Through its Business Centers Ivoharena (BCI), BAMEX is filling a void by assisting AMP distributors to identify export markets and has sponsored research into technical and policy aspects of AMP.

## E. RELATIONSHIPS AND LINKAGES ACROSS ACTORS

This section presents factors that establish, maintain or strain relationships among actors—MSEs and larger firms—in the AMP value chain, and linkages that appear to regulate transactions and allow or prevent skill transfer across layers of actors. Competitive value chains are generally characterized by cooperation among actors and firms related both vertically and horizontally.

### 1. VERTICAL

Actors closest to the end market (wholesalers, retailers and exporters) are generally engaged fulltime in the AMP trade. As one moves upstream, progressively away from the consumer and closer to the natural product base (wildcrafters, cultivators), actors become increasingly marginalized, part-time players. There is an absence of trained and experienced professionals up and down the chain and little sharing of market and technical information.

Class suspicion, lack of confidence and bad past experiences color relationships among actors in the AMP value chain. The greater the physical distance between actors and the more difficult to navigate the transport and communication infrastructure that separates them, the lower are the chances that relations overcome distrust.

---

<sup>23</sup> Centre ValBio [Valorisation de Biodiversité]: International Training Center for the Study of Biodiversity, near Ranomafana National Park

Wildcrafters' link to market information is twice removed and passes through sub-collectors who are usually not generous in sharing information. In fact, the relationship between these actor groups is based less on information sharing than on a shared need to maintain stable social ties that transcend financial concerns. The two to three-tiered collector model is inefficient, time consuming and constraining for establishing long-term cooperative relations. Nevertheless, middlemen play an indispensable role under the present value chain structure, given the remoteness of production zones.

There is a distinction to be made between a relationship that links wildcrafters/producers (usually women) and **permanently based sub-collectors** (small hamlet convenience stores, both men and women) and the relationship that links wildcrafters with **ambulant** sub-collectors (usually men). For the former, the relation is generally neighborly and supportive. Producers rarely negotiate price or quality from fear of not being able to sell or of breaking a community bond. There are exceptions. Even when women band together as a group or cooperative, they are not prone to engage in price negotiations; Malagasy at that level are discreet in manner and non-confrontational in nature. In the same vein, there are small-shop, sub-collectors who will pay wildcrafters full price for a bag load (usually 30 to 50 kg) brought to them even though the load will contain foreign particles and plant parts that do not meet the next level collector's specifications. For the shopkeeper, it is more important to maintain good "neighborly" relations than to refuse merchandise. Payments to producers are generally made upon delivery; there are no advances in these transactions. There is shared trust at this level of the value chain. Buyers and sellers prefer maintaining a longstanding relationship rather than break it and seek another client or seller.

Conversely, the relationship that links wildcrafter/producers with **ambulant** sub-collectors (roving collectors on bicycles or small pick-up trucks) is generally distrustful and perceived as exploitive from both ends. The ambulant sub-collector is seen as an outsider to the community and does not want his client to know who he is, where he comes from, and to whom he resells. Information flow and knowledge sharing do not exist between the two actor groups, although the wildcrafter/producer wants information and more know-how. There are no advances from the sub-collector to the producer. Generally, relations are established on the basis of opportunity—who can deliver requested products on time or who pays on a timely basis upon delivery of products.

The processor/buyer is closer to the end market and has a longer-term view of business prospects than the collector. The collector requires a truck and warehouse space, which can both be rented at an entry cost of under U.S. \$8,000. A collector's survival is based less on capital investment than on a stable network of sub-collectors. If the collector cannot provide plant material according to specifications, the non-binding relationship is easily terminated. The processor/buyer either finds another collector or expands his business by establishing a presence in the production region.

## 2. HORIZONTAL

Cooperation among actors closest to the end markets is stronger than that expressed among actors closest to the natural product base where MSEs are concentrated. For the latter, a low level of cooperation is a function of the physical distance between individual wildcrafters or collectors (and poor transport infrastructure) as well as a general suspicion among competitors who vie for the same finite resources. When the plant source is either cultivated or grown in plantations, there is less tension among competitors. It is not clear which of these two forms of production systems result in a more effective allocation of resources within the chain.

There is little distinction among actors regarding the importance of protecting the natural resource base, from which they derive their livelihood. There are encouraging signs of individuals, groups and private firms taking affirmative

action to reduce pressure on the ecosystem and these same people are actively involved in working with or promoting projects that ensure more sustainable behavior.

Relationships between “resource owners” and other actors in the value chain are less tied to resource base considerations than to underlying suspicions of government bodies, socio-economic class differences and zonal distinctions between residents of the high plateau and those who live along the protected corridors and coastal regions.<sup>24</sup> The latter is subtle but not negligible and plays a role in formulating trusting relationships.

With the exception of limited, nascent efforts by some NGOs and projects, horizontal relations among cultivators and wildcrafters are virtually nonexistent. There is little evidence of information sharing since there is scant information available. Even information about where plants can be found is shared only among family members. Prices are announced by collectors and generally accepted by wildcrafters.

Among permanently based collectors, there is a degree of collaboration on pricing (i.e., collectors in a small region can agree upon the price to pay for a product to fill a specific order). Because they are located in small towns and along paved roads, they have greater access to transport and communication links. They need to be in frequent contact with their buyers to respond to their orders in a timely manner, as there are specific harvest and “higher yield” seasons for almost all aromatic and medicinal plants.

Processors, which require a higher degree of technical skills in order to be competitive, establish informal relationships among each other but do not have a platform to exchange experience and knowledge. Distilleries in the field practice similar technologies, but the variation in material, equipment and application of techniques indicates that firms could benefit from upgrading schemes, training and financing. As expected, distilleries managed by wholesalers and exporters are on the higher end of technical sophistication, but among them as well, there is a need to improve energy efficiency, and testing and analyzing of the end product. There is no association or federation of distilleries.

Relationships among wholesalers and exporters are haphazard and inconsistent. There have been attempts to form professional associations at this level (see Text Box 7), but these initiatives have proven difficult to sustain, as the associations did not function effectively or consistently as lobbying or collaborative structures and they were tied to donor-funded projects of limited duration. There is a clear need for organization at this level, given the range of policy issues that must be addressed. AMP workshop participants expressed enthusiasm for re-energizing PRONABIO, but there must be a concerted effort to foster local leadership to sustain such an association. Relationships and linkages between Malagasy firms and overseas importers are stronger than among the Malagasy firms in-country. Better integration at this level can improve the overall efficiency of the AMP value chain. For

#### **TEXT BOX 7: PROFESSIONAL ASSOCIATIONS**

Past attempts to organize professional associations have had mixed results. Two associations, SYPEAM and PRONABIO, exist but have not been active. There has been discussion of revitalizing PRONABIO.

- **SYPEAM** (SYndicat Professionnel des producteurs d'Extraits Aromatiques alimentaires et médicinaux de Madagascar) includes 33 members (80 percent of AMP distributors).
- **PRONABIO** (Professional Organization of Operators in Agribusiness of Natural and Organic Products of Madagascar) controls the “NATIORA” brand and includes 28 enterprises, including members of SYPEAM and other enterprises.

<sup>24</sup> There are no discernable differences in occupation (producer, wildcrafters, processors, exporters, collectors) related to one’s region of origin.

example, regrouping and better coordination of logistics would allow some economy of scale and increase the competitiveness of this segment of the value chain.

### 3. MAINTAINING ACCESS

As mentioned under natural resource governance, access to natural resources is currently not a barrier to participation in the AMP value chain. Collusion and permits are also not used as a means of controlling access to resources or creating entry barriers. Margins are not disproportionately large or extremely skewed among collectors (see Table 11). Margins run from 10 to 20 percent for first-level collectors, from 10 to 30 percent for high-level collectors (those who sell to processors), and from 10 to 50 percent for retailers and exporters (see Table 9). Margins depend on geography and the nature of specific products, which vary by scarcity and demand. The number of actors decreases moving downstream. Downstream actors deal with larger quantities per capita and earn higher margins. There may be opportunities to increase prices to producers and low-level collectors, but it must be recognized that downstream actors bear relatively higher levels of risk due to capital investment and fluctuating markets.

**Table 11: Estimated margins for collectors (Ariary per kg)**

Product	Location	Purchase price	Sale price	Profit	Margin (%)
<b>First level collectors</b>					
Kotofihy	Befontsy	200	500	300	60 <sup>25</sup>
Talapetraka	Befontsy (a)	1,200	1,400	200	14
Talapetraka	Befontsy (b)	1,600	1,800	200	11
Talapetraka	Ampitabe	1,200	1,400	200	14
Talapetraka	Morarano	1,500	1,800	300	17
Ginger	Beforona	320	400	80	20
<b>Second level collectors</b>					
Cinnamon (organic)	Niarovana	2,200	3,000	800	27
Cinnamon	Niarovana	550	600	50	8
Cinnamon	Ambalamanahazo	400	500	100	20
Ginger	Beforona	230	320	90	28

Source: Surveys (2006)

Value chain actors maintain a competitive edge by building exclusive networks of suppliers upstream. They form these networks by cultivating trust and loyalty over time, building reputations for dependability, and providing cash advances (in an area where credit is rare). For example, most collectors form exclusive relationships with wildcrafters and cultivators. These networks and the territories over which they extend are very difficult for outsiders to penetrate. Table 12 describes vertical relationships in terms of strategies used to maintain advantage at different levels (i.e., by gaining and controlling access to productive resources, assets and social networks).

<sup>25</sup> The exceptionally high margin for Kotofihy is due to its scarcity.

**Table 12: Access Map**

Actor	Type of Access	Mechanism for Maintaining Access
Producers	<ul style="list-style-type: none"> <li>• Access to productive resources (wild plants for wildcrafting, land for cultivation)</li> </ul>	<ul style="list-style-type: none"> <li>• Access to AMP in the forest and forest margins is generally open access; we did not encounter <i>Dina</i> (local ordinances) controlling access to non-timber forest products in study sites</li> <li>• Fields in which AMP are cultivated are maintained under customary land tenure arrangements; rights are hereditary</li> </ul>
Sub-collectors	<ul style="list-style-type: none"> <li>• Social networks of local AMP producers</li> </ul>	<ul style="list-style-type: none"> <li>• Collectors maintain exclusive relationships with local producers by providing a variety of services: (1) credit for basic consumer goods such as sugar, rice and oil; (2) barter; (3) small advances; or (4) non-insistence of norms for plant products</li> <li>• Purchase prices are generally non-negotiable</li> </ul>
Collectors (intermediaries)	<ul style="list-style-type: none"> <li>• Network of lower level collectors for raw material</li> </ul>	<ul style="list-style-type: none"> <li>• Build trust among lower-level collectors, especially through advances and timely payment; generally no written contracts</li> <li>• Maintain relations with processors and control flow of orders upstream (i.e., information); loyalty based on collection and storage capacity</li> <li>• Supply lower level collectors with materials such as bags and scales.</li> <li>• Proximity to transport and communication links</li> </ul>
Processors (informal)	<ul style="list-style-type: none"> <li>• Networks of collectors for raw material</li> <li>• Relations with local market buyers</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase agreement for raw products delivered; generally aligns purchase prices to other processors with a small, non-negotiable increase</li> <li>• Technological know-how (processing tools and methods)</li> <li>• Establishes contract on case-by-case basis</li> </ul>
Processors (formal), wholesalers, exporters	<ul style="list-style-type: none"> <li>• Networks of collectors</li> <li>• Access to foreign and domestic markets</li> </ul>	<ul style="list-style-type: none"> <li>• Exclusive collector networks considered proprietary knowledge</li> <li>• Loyalty based on mutual trust established over several years of collaboration; possibility of formal contracts</li> <li>• Technological know-how (processing tools and methods)</li> <li>• Relations with import partners developed over long periods of time</li> <li>• Knowledge of distribution and export norms and logistics</li> </ul>

## F. NATURAL RESOURCE BASE AND SUSTAINABILITY ISSUES

**Production systems and sustainability:** We have found it useful to consider AMP as a single value chain given the convergence of actors, but it is also necessary to distinguish among specific AMP from a management perspective in order to assess potential environmental impact and sustainability prospects (see Table 13). Our typology of AMP production systems corresponds to categories of producers discussed above. The basic distinction is between wildcrafting and cultivation. However, we further distinguish between wildcrafted products harvested in natural forests and those harvested in “disturbed” areas, such as *tanety* (cleared hillsides), fallow fields and roadsides.

Cultivation is differentiated between agroforestry systems and plantations. Most AMP are either wildcrafted or cultivated, and some wild plants are increasingly cultivated due to scarcity or instability (or seasonality) of production in the wild.

**Table 13: Natural Resource Management**

Botanical Name	Common Name	Habitat	Practice/ Production	Harvest Impact
<i>Centella asiatica</i>	Talapetraka; centella	Plains, prairies, rice fields	Wildcrafted; stalk and leaves cut	Little impact
<i>Cinnamomum camphora</i>	Ravinstara; camphor	Tanety	Wildcrafted & cultivated; cut stalks and leaves	Little impact
<i>Cinnamomum verum</i>	Cinnamon	Tanety (hillside); base of slope	Wildcrafted & cultivated; cut stalks and bark	Little impact
<i>Eucalyptus citrodora</i>	Eucalyptus	Tanety	Cultivated; cut stalks and leaves	Little impact
<i>Eucalyptus globulus</i>	Eucalyptus	Tanety	Cultivated; cut stalks and leaves	Little impact
<i>Eugenia caryophyllata</i>	Clove	Slope	Cultivated; cut stalks and flower cloves	Little impact
<i>Hedychium coronarium</i>	Longoza; wild ginger	Along river beds	Wildcrafted; cut stalks and leaves	No impact
<i>Lantana camara</i>	Lantana	Slope; base of slope; roadside	Wildcrafted; cut flowers	No impact
<i>Melaleuca quinquenervia</i> var <i>viridiflora</i>	Niaouli; paper bark, punk tree	Moist depressions	Wildcrafted; cut stalk and leaves	No impact
<i>Pelargonium x aspernum</i>	Geranium	Depressions; tanety	Cultivated; leaves	Risk of erosion on tanety
<i>Piper nigrum</i>	Black pepper	Base of slope; slope	Cultivated; cut bushes	Little impact
<i>Prunus Africana</i>	Kotofihy; African plum tree	Forest	Wildcrafted; cut stalks and leaves, tree and even root bark	Decrease in population
<i>Psiadia altissima</i>	Dingadingana	Slope; Savoka (old fallow)	Wildcrafted; cut leaves	No impact
<i>Ranvesara aromatica</i>	Ranvesara	Forest	Wildcrafted;	Decrease in population
<i>Tagetes minuta</i>	Tagetas	Forest	Wildcrafted; cut stalk and leaves	Significant decrease in population
<i>Zingiber officinalis</i>	Ginger	Slope	Cultivated; root	Serious risk of erosion

Most plants wildcrafted from disturbed areas are spontaneously occurring herbaceous plants or bushes (e.g., *Centella asiatica*, *Lantana camara*). They are frequently abundant, and harvesting does not appear to lead to depletion. In some cases (e.g., rosy periwinkle), harvesting is purported to stimulate growth, as plants are maintained in a state of secondary succession.

As discussed above, most plants wildcrafted from forests (e.g., *Prunus africana*, *Ravensara aromatica*, *Tagetes minuta*) are commonly open access and susceptible to overharvesting. Sustainable harvesting techniques exist for these plants, but demand surges and high values promote unsustainable practices, as wildcrafters (and opportunists at other levels) seek to maximize quantity (and therefore income) in a short period of time.

Agroforestry encompasses both trees grown as traditional components of farm systems (e.g., clove) and trees that are being incorporated into forest gardens as they become relatively scarce in natural forests (e.g., *Cinnamomum verum*, *P. africana*). In some cases, distributors have encouraged villagers to cultivate these products as a means of increasing supply and quality. The relative stability of demand and high value has therefore begun to foster incentives for sustainable management. While structurally and biologically less complex than natural forests, these agroforestry systems not only offer economic alternatives outside of protected areas but maintain relatively higher levels of biodiversity and ecosystem complexity outside of protected areas than do other agricultural systems.

For some plants, plantations can be an effective way of structuring production, particularly for plants that are exotic (e.g., *Cinnamomum camphora*, *Eucalyptus* sp.) or scarce in nature (e.g. *Cinnamomum aromaticum*). Plantation cultivation can lead to stable supplies, greater control over quality, and sustainable production. Because they are generally controlled by vertically integrated firms, they do not necessarily create alternative income opportunities for local people that might relieve some pressure from natural forest.

**Biodiversity linkages:** In a general sense, while AMP present an opportunity to promote sustainable management of specific resources and create income sources outside of forest corridors, their direct link to biodiversity conservation is tenuous. As noted above, economic value does not necessarily translate into incentives for sustainable management, much less biodiversity conservation. A stable demand could increase the time horizon and economic incentives for sustainable management. Clear and consistently applied norms could also improve harvesting behavior, though this is difficult to monitor for some products. These types of signals must come from downstream value chain actors, especially end market distributors.

The greatest incentives for conservation of biodiversity *per se* (as opposed to conservation of particular species) may come from bioprospecting, which places an option value on diverse plant species as a repository of yet undiscovered medicines. Programs such as ICBG in Zahamena provide local people with “up-front” compensation through support for income generating projects in return for commitments to conservation and rights to search for new plant-based drugs. The ICBG also makes provisions to share benefits and royalties for drugs that are discovered and taken to market (though this has not yet happened in Madagascar).

#### TEXT BOX 8: SELF-IDENTIFIED OPPORTUNITIES

Upon witnessing a serious threat to the survival of the cinnamon tree (*C. aromaticum*) due to over exploitation, a federation of exporters petitioned the Ministry of Environment, Water and Forests to impose a two-year ban on the export of its bark and by-products. This was enacted. During that period, members of the federation replanted cinnamon trees in plantations and through agroforestry practices. Exports have expanded twentyfold and trees are now under sustainable production.

Source: Phael Flor

# IV. STRENGTHENING THE AMP VALUE CHAIN

## A. STRATEGIC ISSUES & ORIENTATION

Madagascar is well positioned to expand domestic AMP markets and to increase its presence in global markets by strengthening aspects of the value chain. Moreover, given the nature of the raw material, the large number of rural poor participants and the direct links with health, the growth of this sector can promote equity, empowerment, conservation and health goals. In this section, we provide an overview of strategic issues to help orient the approaches of USAID and its partners to strengthening the AMP value chain. Section B presents a more detailed summary of constraints and opportunities in the value chain, and Section C suggests priority actions. Ultimately, responsibility for improving the competitiveness of the AMP value chain rests with the actors themselves. Section D presents a stakeholder-led action plan that was developed by participants in the July 26-27, 2006 AMP value chain workshop.

Value chain strengthening should be oriented around five key themes:

- (1) **Emphasize AMP in natural resource management and biodiversity conservation practices and training.** The AMP sector's livelihood depends on sustainable management of specific plants. Biodiversity *per se* is an important resource in the search for new products, a repository of genetic material. Madagascar's rich biodiversity favors it as a source for innovation, yet unpredictable export markets can lead to over-harvesting and resource depletion in some cases. If accompanied by appropriate training, the promotion of AMP cultivation in ecologically complex forest gardens will contribute to sustainable management and biodiversity conservation.
- (2) **Establish and diffuse AMP norms, standards and certification.** End markets increasingly demand that AMP products conform to specific norms and standards, including health and sanitary, certified organic, sustainable harvest and fair trade. To protect its competitive advantage, the AMP private sector (large, medium and MSE) in collaboration with concerned ministries (Commerce, Health, Agriculture, Forest) must accelerate the process already started by establishing equitable norms, standards and certification. Once formulated, these must be widely diffused among all segments of the value chain, with a mechanism to continually update to take market shifts into consideration.
- (3) **Support mainstreaming of traditional medicine.** The Malagasy Ministry of Health and Family Planning, the Medical Association and the Traditional Healers' Association recently adopted a new policy that recognizes traditional medicine and integrates AMP into the modern healthcare system. This initiative needs to be supported through advocacy and health policy projects. Mainstreaming traditional medicine will increase accessibility of healthcare for the rural poor and further legitimize traditional and herbal medicine.
- (4) **Mainstream "informal" processors, collectors, distributors.** The general quality of AMP products remains low, especially by international standards, because of the "informal" nature of many participants. Improving quality requires upgrading skills and providing up-to-date equipment and technologies for actors (MSE) at the margin of their profession. Skill upgrading is already provided by several large export firms through backward linkages and can be reinforced through supplier contracts. Offering the opportunity to mainstream those who want upgrading will improve vertical and horizontal relations as it will reduce a major

friction between formal and informal operators. It will open the way for a more dynamic and innovative value chain, facilitating the establishments of networks and overall integration of sector.

- (5) **Launch coordination and branding campaign.** The AMP value chain links micro and small enterprises at the rural level, mid-size processing businesses in semi-urban or village regions, and international markets through larger exporter firms in the capital and urban centers. For the chain to function more effectively in the future it requires initially a coordinating hand or a neutral institution to synchronize various activities and events planned for the value chain that will make it more competitive and more environmentally focused. It also requires a rallying point, a simple vision or objective that will appeal to the local end-market and provide a recognized brand appeal to the internationally market.

## B. CONSTRAINTS & OPPORTUNITIES

### 1. COMPETITIVENESS IN END MARKETS

Organic essential oil products for the export market and quality medicinal and herbal products for the domestic market have the greatest potential for growth now and into the future. Global markets in the aromatic, cosmetic and health sectors demand steady supplies of new and innovative scents and medicinal products. End market trends suggest that Madagascar is in a favorable position due to its natural product diversity and specialty brand as an “exotic island”. However, importers increasingly require these products to be certified organic, fair trade or sustainably produced. Suppliers must also adhere to broker terms (quantity, quality and timing of shipments), proper packaging and consistency on product, price and delivery.

Overall, in order for Madagascar to become competitive in the AMP global market place, its value chain must become more flexible, innovative and efficient, so it can bring to market new products in a timely fashion. Specifically, it must improve its efficiency through better vertical and horizontal integration; accelerate development and adoption of a clear regulatory framework, including product norms and standards; build capacity for certification; and promote sustainable production practices. In addition, the industry must establish effective channels of communication among value chain actors to allow them to respond quickly to shifting market demands.

An important concern is how MSEs can benefit, based on what has been learned through the value chain analysis and what is known of end-market data and trends. The spice, herb and medicinal plants sectors in general are dominated by agricultural MSEs. However, opportunities for MSE growth in the AMP value chain are limited. The two largest segments of value chain actors—producers (wildcrafters and cultivators) and collectors—are family and individual enterprises. The primary cost of entry at these two levels is time, and risks are spread by diversifying household livelihood portfolios. Processors and wholesaler/exporter/retailer segments of the value chain are much smaller in number. Their enterprises are larger, and their entry costs and risks higher. Increasingly, their livelihoods are based on their ability to source raw material from producers and collectors at competitive quality standards and prices. To maintain this access, they are frequently expected to meet economic, social and health demands from suppliers.

With these observations in mind, the following four tables (tables 13 – 16) summarize key constraints and opportunities for different aspects of value chain strengthening: enabling environment, inter-firm cooperation (vertical), inter-firm cooperation (horizontal) and firm-level upgrading. A customary “sustainable support markets” component is not added as a separate table because that segment of the value chain remains underdeveloped. However, references to support market opportunities are included in the four summary tables.

**Table 14: Enabling Business Environment**

Scale	Key Constraints / Opportunities
<p><b>Norms and standards, unclear tax protocols and overlapping ministries.</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraint:</b> The lack of clear norms and standards for AMP products encourages “opportunists” to jump into and exit the value chain, bypassing control. Poor quality products hinder establishment of branded quality labels.</li> <li>• Multiple levels of taxation and permits required of wildcrafters, collectors and processors are a disincentive for MSEs in the chain. Lack of uniformity in their application lead to confusion and marginalize MSEs.</li> <li>• Planning capacity of national institutions exists at the central level (i.e., the Ministry of Environment, Water and Forests and its multiple agencies: ONE, CNE, CIME) but are less evident at the community and village level.</li> <li>• <b>Opportunity:</b> Full participation of representative producer and collector MSEs in the formulation process of norms and standards would improve the likelihood of developing an appropriate and effective policy framework.</li> <li>• Cultivators avoid the taxes and fees that are imposed on wildcrafting. A training program could encourage some wildcrafters to increase knowledge of production techniques for certain AMP plants.</li> <li>• The proximity of Water and Forests and local authorities to producers should be increased. Training agents in production and environmental dimensions of AMP products will improve local participation in government-sponsored programs.</li> </ul>
<p><b>Certification</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraint:</b> Meeting certification standards is expensive and time-consuming for small cultivator, collector and processing MSEs.</li> <li>• <b>Opportunity:</b> Development of MSE support markets for local audits, certification bodies and training facilities. Training is needed to improve knowledge and skills to meet sustainability, fair trade and GACP standards.</li> <li>• Increased competition among nascent BDS providers will lower prices and, if decentralized, offer services closer to production and processing zones.</li> </ul>
<p><b>Overall AMP strategy</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraint:</b> Progressive depletion of high-value plant species and loss of biodiversity affects all actors in the chain by reducing availability of raw material and limiting opportunities to find new products. To counter this trend, producers must have sufficient information and incentive to cultivate and harvest using sustainable strategies.</li> <li>• <b>Opportunities:</b> The overall policy environment can be improved by establishing an AMP sustainability framework, developing coherent rules and regulations with the participation of actors from every value chain level, making the public aware of the reasons behind regulations, and ensuring an enforcement mechanism. BDS providers could provide training to public and private actors in sustainable techniques and market relevance.</li> </ul>

**Table 15: Inter-Firm Cooperation (Vertical)**

Level	Key Constraints/Opportunities
<p><b>Between producers and collectors</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Distances between producers and collectors are great. The virtual non-existence of transportation and communication infrastructure reduces chances of developing collaborative and durable networks. The concept of belonging to a full value chain is virtually unknown.</li> <li>• Relations are characterized by suspicion and lack of trust, especially regarding higher level collectors.</li> <li>• <b>Opportunities:</b> Negotiated transactions or contracts are limited. BDS providers can play an important role in promoting equitable contract models, providing training and support to expand contractual agreements, and building linkages between producers and collectors.</li> </ul>
<p><b>Cooperation along the value chain</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Processors must establish annual and seasonal productions cycles that specify raw material schedules. These are dependent on market signals from wholesalers, distributors and/or exporters. Yet insufficient information trickles to the collector and even less to wildcrafters.</li> <li>• By rapidly entering and exiting the value chain, opportunists at all levels create disincentives for upstream actors to form long-term collaborative relationships with downstream buyers.</li> <li>• Few benefits accrue to producers, apart from those provided by innovative exporters and wholesalers, who provide health benefits (clinics, medicine) or make commitments to purchase products. Label CBD provides a model for fostering win-win relationships by developing backward linkage from wholesaler/buyers to cultivators and wildcrafters.</li> <li>• <b>Opportunities:</b> Processing and export firms can expand education and provide information by distributing production schedules through information posters, radio bulletins and text messaging to reach producer and collector actors. Private firms such as BIONEXX and Label CBD have been proactive in knowledge sharing, creating visuals, posting schedules and informing wildcrafters and cultivators of technical requirements, improving dialogue among actors.</li> </ul>

**Table 16: Inter-Firm Cooperation (Horizontal)**

Level	Key Constraints / Opportunities
<p><b>Among wildcrafters and cultivators</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Producers operate in isolation and have little bargaining power for sales and prices.</li> <li>• <b>Opportunities:</b> Informal groupings of wildcrafters and cultivators exist, but they need reinforcement. They do not need permanent organization, as they can be grouped around a seasonal collection period. Informal groupings and cooperation promoted by wholesalers/distributors or exporters in a region could assist groups and perhaps associations (<i>kolabrenas</i>) in developing a brand of the product sourced from the region.</li> </ul>
<p><b>Among collectors</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Distances, scarcity of information and uncertainty of supply source reduce incentives to collaborate.</li> <li>• Informal nature of AMP collection encourages actors to remain independent rather than associating or establishing cooperatives.</li> <li>• <b>Opportunities:</b> Participants in the Action Planning workshop indicated strong desire and need to establish regional collector associations. Institutional follow-up to the Action Plan objective will provide incentive to continue and expand the initiative.</li> </ul>
<p><b>Among processors</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Distance and lack of trust between informal and formal distilleries prevent them from working together, developing relationships or uniformly improving quality.</li> <li>• <b>Opportunities:</b> Skill and knowledge upgrading of informal actors increases their integration into the value chain by increasing their legitimacy, encourages flow of technical and market information among them, and enables high quality standards to be achieved.</li> </ul>
<p><b>Among exporters/wholesalers</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Professional associations are difficult to sustain due to inability to adapt strategies to changing consumer demand.</li> <li>• <b>Opportunities:</b> Participants in the Action Planning workshop expressed need and interest in reviving two moribund professional associations. Institutional follow-up support to this initiative will provide an incentive to carry-out the plan.</li> </ul>

**Table 17: Firm-Level Upgrading**

Level	Key Constraints / Opportunities
<p><b>Exporters and local market wholesalers</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Adding value to AMP products is constrained by the lack of high quality packaging material (vials, cream and lotion jars, bags, bottles and boxes). Without adequate, affordable packaging, distributors, retailers and exporters cannot produce a finished, retail-ready product.</li> <li>• <b>Opportunity:</b> There are two levels of opportunities: (1) small and medium-sized firms can make use of hand-crafted, natural product-based packaging, baskets and other containers that appeal to niche markets; (2) with large investments, there is the opportunity to increase a cluster of firms supporting AMP products through high quality glass, ceramic and plastic bottling and jar manufacturing.</li> </ul>
<p><b>Processors (distillation)</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraint:</b> Madagascar’s comparative advantage 10 -15 years ago was exporting quality essential oils based on traditional distillation processes. Testing, technical practices and skill levels of processor/distillers have not evolved sufficiently over time. “Informal” processors have the rudimentary skills and their operations require equipment upgrading in order to regain competitiveness.</li> <li>• Quality testing and certification must be done by a third party. Laboratories have power over processors because they must certify chemical composition before products are allowed to be exported.</li> <li>• <b>Opportunities:</b> Opportunities exist for rural BDS technical and business training services, field/exchange visits and financing schemes.</li> <li>• There are qualified laboratories but most are in large urban centers. Opportunities lie in decentralizing laboratories to bring them closer to processing units and lower transaction costs.</li> </ul>
<p><b>Wildcrafters, cultivators, collectors</b></p>	<ul style="list-style-type: none"> <li>• <b>Constraints:</b> Wildcrafters and small cultivators are unable to upgrade their operations because of unpredictable orders schedules. They remain reactive rather than proactive value chain actors.</li> <li>• Learning (e.g., sustainable harvesting techniques, cultivation, quality control) is not taking place at these levels, condemning actors to remain reactive players. Poor information flow limits the ability of producers to better integrate into the value chain.</li> <li>• <b>Opportunities:</b> Learning could be facilitated by encouraging wholesalers/ exporters to strengthen backward linkages to wildcrafters and collectors through incentives, persuasion and traceability policies. There are encouraging signs from private companies that use the BIONEXX model, which gives small farmers opportunities for more regular income through a commitment to purchase specific AMP products that meet market specifications.</li> <li>• Rural radios offer an opportunity to circulate AMP price and technical information during harvest periods.</li> <li>• Processors are at the center of the value chain and should be seen as a potential partner for improving information flow. They have some knowledge of the natural resource</li> </ul>

Level	Key Constraints / Opportunities
	base (harvest cycles, production areas, and prices), and they maintain relations between their suppliers and wholesaler/retailers, who know markets and trends.

## C. PRIORITY ACTIONS

Table 18 describes six priority actions required to follow up on the field survey and maintain momentum created at the July 2006 stakeholder workshop. Some items appear repetitive, but if USAID is to adopt the AMP sector to test future decisions, work in Madagascar must begin with these relatively easy to resolve constraints. The recommended actions should take no longer than 12 months to accomplish.

We highly recommend that USAID recruit a one-year intern to coordinate and follow-up these and other recommendations and to facilitate the activities proposed during the stakeholder workshop (Section D, below).

**Table 18: Priority Action Table**

Constraint	Action	Timeframe	Lead
1. Disappearance of certain AMP species, loss of biodiversity, lack of national AMP strategy and vision	Establish a national AMP awareness initiative with national, regional and local governments, along with representatives of value chain actors (including <i>Tradi-praticien</i> association) and overseas and local buyers. Formulate an AMP sector short- and medium-term national strategic plan. Incorporate international standard organizations such the Committee on Medicinal Products of the European Medicines Agency. <sup>26</sup>	6 months	USAID with other donors
	Improve access to information about sustainable wildcrafting, collection and processing through <i>kolobarena</i> (local cooperatives) network	6 months	ERI
2. Unclear regulatory framework and standards	Pressure GOM to pass and publish proposed AMP regulatory framework.	Months 1-4	BAMEX
	Draw up standards and norms for the top 15 or 20 AMP products in collaboration with Ministry of Commerce and Industry's Bureau and value chain actors; include associations such as <i>Tradi-pratitien</i> , SYPEAM and new ones in the formation, VALBIO and IMRA	Months 2-10	
3. Insufficient information dissemination among rural population and local authorities	Initiate a major communication strategy that will include technical sheets and easy to distribute brochures on the AMP sector; include a) application and use of products, b) location of plant material and processing units, c) end market demands.	Month 8	BAMEX and ERI

<sup>26</sup> <http://www.emea.eu.int/pdfs/human/hmpc/24681605en.pdf>

Constraint	Action	Timeframe	Lead
about AMP	Prepare a multi-level training schedule. Support development of regional BDS firms that can provide training in required quality standards, cultivation and harvesting techniques.	Month 6	
	Reinforce role of mayors and local agents of government agencies (MEEF) in dissemination and training activities.	Ongoing	
4. Demand for steady source of quality and medicinal-grade plant material	Establish a three-pronged training and upgrading program for the production of medicinal-grade products sourced from wildcrafters, cultivators and plantations. Emphasis will be to improve skill levels to satisfy the needs of the local medicinal market.	Months 6-12	ERI
	Organize information days or special one-day events that bring producers (wildcrafters, cultivators, plantation managers) together with buyers/distributors/exporters with facilitators. Focus on establishing relationships, increasing trust and expanding information flow and knowledge sharing among participants.		
5. Disruption of AMP value chain by “opportunists”	Upgrade “informal” processors in the value chain through demonstration. Improve skill levels, material used and quality of processing units. Invite an experienced appropriate technology specialist to Madagascar who has built small and efficient (in water and energy) distilleries. Specialist will build a prototype in a local agricultural machine institution, test the distillery in an AMP production zone, design and implement a training program around the unit for “informal” processors, collectors and others.	Months 4-6	BAMEX and ERI
6.1 Need for an AMP coordinator	Recruit and hire an intern for one-year who will act as coordinator of the AMP development strategy and proposed program	Month 1-12	USAID
6.2 Branding to appeal to local and international end-markets	Work with Ministry of Tourism, hotels and spa sector to coordinate with “Madagascar Naturally” branding campaign.	Months 2-12	Ministries of Tourism and Health & Family Planning, BAMEX and ERI

Constraint	Action	Timeframe	Lead
6.3 High cost of retail-level packaging for AMP finished products that meet technical requirements (dark bottles, hermetically sealed jars, etc.)	Develop a supply plan jointly with importers/local suppliers, and exporters/local distributors for bulk purchasing of packaging.	Months 8-12	BAMEX and ERI, Ministry of Commerce and Industry, and private sector

## D. STAKEHOLDER-LED ACTION PLAN

The following table summarizes actions developed by all participants in the reporting and planning workshop held in Moramanga, Madagascar in late July, 2006. Representatives from each segment of the value chain, including the public sector, participated in the workshop. Each functional group of actors developed an action plan with short-, medium- and long-term objectives representing their own appraisal and priorities. Participants made commitments to take responsibility for implementation. The following table contains the main points included in the stakeholder-led action plan.

**Table 19: Stakeholders' Action Points**

WHO	ACTION		
	Short Term: 1-3 months	Medium Term: 1 year	Long Term: 3 year
<b>Wildcrafters, Cultivators</b>	<p><b>FOCUS:</b> Communication program</p> <ul style="list-style-type: none"> <li>Establish a data bank of producers, with each one's strength and weakness</li> </ul>	<ul style="list-style-type: none"> <li>Form a producer network</li> <li>Establish communication links, using new information technology when possible</li> </ul>	<ul style="list-style-type: none"> <li>Put into place local natural resource management structures to preserve environment and sustain production</li> </ul>
Support Partners		<ul style="list-style-type: none"> <li>Processors</li> </ul>	<ul style="list-style-type: none"> <li>Public sector, processors, financing institutions</li> </ul>
<b>Collectors</b>	<p><b>FOCUS:</b> Communication and creation of network</p> <ul style="list-style-type: none"> <li>Integration of network within value chain</li> <li>Identify reliable buyers</li> </ul>	<ul style="list-style-type: none"> <li>Conduct feasibility and profitability study of products collected</li> <li>Search for technical and financing partners</li> <li>Prepare seasonal plan, activities to undertake and a chronogram</li> </ul>	<ul style="list-style-type: none"> <li>Prepare seasonal plans</li> <li>Implement communication and network activities</li> </ul>

WHO	ACTION Short Term: 1-3 months	ACTION Medium Term: 1 year	ACTION Long Term: 3 year
Support partners	<ul style="list-style-type: none"> <li>Local and national administration</li> <li>Local communications platform</li> </ul>	<ul style="list-style-type: none"> <li>Local service providers</li> <li>ERI/BAMEX</li> </ul>	<ul style="list-style-type: none"> <li>Local service providers</li> <li>ERI/BAMEX</li> </ul>
<b>Processors, Exporters, Wholesalers</b>	<p><b>FOCUS:</b> Norms, certification, integration of value chain</p> <ul style="list-style-type: none"> <li>Diffuse workshop results</li> <li>Contact all other actors</li> <li>Contact local and national administrations to explain focus</li> </ul>	<ul style="list-style-type: none"> <li>Review and put into place uniform set of norms, standards and certification requirements</li> <li>Revitalize professional associations</li> </ul>	<ul style="list-style-type: none"> <li>Adjust norms, standards</li> <li>Expand functions and membership of professional associations</li> </ul>
Support partners	<ul style="list-style-type: none"> <li>USAID and others organizations</li> </ul>	<ul style="list-style-type: none"> <li><i>Bureau Nationales des Normes</i></li> <li>External organizations</li> </ul>	<ul style="list-style-type: none"> <li><i>Bureau Nationales des Normes</i></li> <li>External organizations</li> </ul>
<b>Public Sector</b>	<ul style="list-style-type: none"> <li>Report to respective ministries</li> <li>Call and hold an inter-ministerial meeting of departments involved with AMP</li> <li>Establish a AMP working group within each ministry</li> </ul>	<ul style="list-style-type: none"> <li>Prepare an AMP support project within each ministry (Environment/ Water &amp; Forestry; Health, Commerce and Industry; Finance)</li> </ul>	<ul style="list-style-type: none"> <li>Implement projects</li> <li>Monitor, evaluate and adjust where needed</li> </ul>
Support partners	<ul style="list-style-type: none"> <li>USAID and others organizations</li> </ul>	<ul style="list-style-type: none"> <li>USAID and others organizations</li> </ul>	<ul style="list-style-type: none"> <li>USAID and others organizations</li> </ul>

WHO	ACTION Short Term: 1-3 months	ACTION Medium Term: 1 year	ACTION Long Term: 3 year
<b>ERI/BAMEX</b>	<p><b>FOCUS:</b> Communications, value chain support, environmental conservation</p> <ul style="list-style-type: none"> <li>• Collect information on AMP value chain in specific locations (market, actors, technical aspects)</li> <li>• Diffuse information</li> <li>• Seek financing sources to assist firm-level upgrading and technical training</li> <li>• Provide technical support</li> <li>• Assist producers to prepare contracts, negotiation techniques, develop projects</li> <li>• Lobby public sector institutions</li> <li>• Assist in establishing partnership with public sector</li> </ul>	<ul style="list-style-type: none"> <li>• Information needs assessment</li> <li>• Organize and provide training according to needs</li> <li>• Support creation of locally-based associations and groups</li> <li>• Revitalize existing organizations</li> <li>• Seek financing sources</li> <li>• Provide technical support</li> </ul>	<ul style="list-style-type: none"> <li>• Track financing sources</li> <li>• Provide technical support</li> <li>• Assist in establishing partnership with public sector</li> </ul>

# V. CONCLUSION: LINKING VALUE CHAINS AND NATURE, HEALTH, WEALTH AND POWER

An important objective of this study has been to test a joint VCA/NHWP methodology. Our analysis of the AMP sector suggests value chain analysis can be enhanced through full consideration of the role of NRM, health concerns, and governance issues. It also suggests that value chain analysis can be an important tool for understanding the linkages between local-level NHWP dynamics and broader market systems. Our observations from the field suggest it is possible to increase value chain efficiency and competitiveness without necessarily improving the lives of the rural poor. Value chain strengthening is a potentially powerful tool for promoting NHWP-related development goals, but deliberate interventions are necessary to create opportunities for the rural poor. We conclude this report by summarizing some of the major points that link the AMP value chain to NHWP dynamics.

## 1. NATURE

- a. **Conservation incentives.** Economic opportunity does not necessarily translate into incentives to manage resources sustainably for all actors in the value chain. Wildcrafters generally respond to demand and do not appear to invest in sustainable management. This is not an issue where supply easily meets demand, but demand surges have led to over-harvesting and destructive harvesting techniques for some high-value products, as described in Section IV.F above. Deliberate, sustainable management of AMP (e.g., cinnamon, ginger, cloves) as plantation or agroforestry crops is associated with stable demand, which creates longer time horizons for decision-making. These signals generally must come from downstream value chain actors.
- b. **Cultivation.** While wildcrafting and agroforestry production systems are most common, there appears to be a trend toward plantation cultivation of some products by downstream firms, leading to vertical integration. Plantations allow regular supply and greater control over quality, which strengthens the value chain overall. But they also risk taking the means of production out of the hands of the rural poor and limiting their participation in the value chain. Several firms, such as Phael Flore and Label CBD, have helped local people upgrade production techniques by promoting improved harvesting and cultivation in agroforestry or forest gardens. These approaches can improve supply of raw materials (quality, timing, traceability) for downstream actors, while having positive effects for local producers and ecosystems.

## 2. HEALTH

- a. **Quality of and access to medicine.** The majority of Malagasy, particularly in the rural areas where 70 percent of the population lives, continue to depend on plant-based, traditional medicines for cultural and financial reasons. The strengthening of norms and standards for medicines, as international markets demand, should lead to effective medicines being available and accessible on the local market.
- b. **Legitimization of traditional practitioners.** As described above, the Government of Madagascar is actively promoting the role of traditional medical practitioners and herbalists in order to increase the range of health care

options. The legitimatization of traditional practitioners is an important element in upgrading the quality and availability of healthcare, stimulating demand for high quality AMP and strengthening the value chain overall.

### 3. WEALTH

- a. **Poverty reduction.** A fundamental question is whether the AMP value chain has potential to contribute to poverty reduction. The majority of producers are poor (and young and/or female). AMP are a source of cash income as well as a means of diversifying household livelihoods. The amounts are small but not insignificant. AMP is a viable sector in Madagascar, with potential for competitive advantage in the global marketplace, but sector growth will not necessarily lead to poverty reduction. For example, the trend toward vertical integration may increase sector competitiveness through efficiency gains while marginalizing rural producers. There are opportunities to improve the position (and income) of the poor—by improving their power to negotiate prices (perhaps through some type of producer association), by providing stable markets for their products, or by creating opportunities for local level value-added processing (perhaps through community-level distilleries or incentives for quality control and traceability). The experiences of Phael Flor and Label CBD provide a model for win-win relationships along the value chain. Some producers feel that employment in plantations could increase income security, health standards and connectivity to more formal agricultural technology. A more detailed economic analysis is necessary to compare the relative advantages of production systems for smallholders.
- b. **Social relations between producers and collectors.** AMP are only one element of the relationships between producers and collectors. Collectors often deal in multiple products (many of which, such as rice, are more important than AMP) and provide additional services such as credit. Producers complain about receiving low prices for AMP, determined by the collectors, but because of the complex relationships that develop between them, they cannot seek alternative markets. Moreover, there are frequently few or no alternative markets (i.e., producers cannot take their products elsewhere). Local producers have little power to influence prices in the face of effective local-level monopsony (single potential buyer), and they accrue limited direct benefits from participation in the value chain as a result. Efforts to improve the bargaining position of producers must address the multifaceted nature of this relationship. Integrating AMP producers into a broader, existing cooperative structure could improve their bargaining position. Providing services, such as small credit or cereal banking, through the cooperative could further strengthen the bargaining position by reducing dependence on collectors.

### 4. POWER

- a. **Producer organizations.** Poor information flow and lack of bargaining power is partially the result of poorly organized producers. Producer associations are almost non-existent in the AMP sector, in part because production is part-time for most gatherers and producers, and in part because of the immense distance between actors, both in travel time (by foot) and due to low penetration of transport infrastructure in the productive areas studied. Producer organizations that could disseminate market and technical information to members and provide the services of an advocacy group would be difficult and time consuming to form and sustain. However, they are necessary to improve the position of producers, to enhance the efficiency and equity of the entire value chain, to enable participation in decision-making and to promote sustainable practices. At current levels, it is unlikely that producers will have incentive to self-organize. However, it may be possible to organize them under pre-existing groups, such as the federated *koloharena*. It may also be possible to work with downstream actors to promote producer organizations as a means of obtaining quality product.

- b. **Strengthening local government.** Receipts from payment of taxes are a potential source of revenue for cash-strapped communal governments. However, few of them have the capacity to monitor or enforce their own policies in this regard, so there is significant leakage. Strengthening this capacity, enabling communal governments to collect taxes, could provide incentive and ability for them to monitor resource use—particularly to limit destructive harvesting of high-value, wildcrafted forest AMP. These funds could be used in part to invest in natural resource management. But they can also contribute to improving the effectiveness and responsiveness of nascent local governments in a general sense by fostering accountability from constituents if seen as contributing financial resources of consequence.

# ANNEX 1: METHODS

The AMP value chain analysis consisted of seven discrete steps.

1. **Selection of natural product subsector or industry(ies)** with significant potential for competitiveness, employment growth, MSE participation, improved environmental governance, sustainable resource management and other crosscutting objectives.

A panel of USAID staff and partners considered several sectors for study, using these criteria. The aromatic and medicinal plants sector was selected as a single value chain encompassing diverse products, many of which have relatively small markets individually but a large potential collectively. AMP initially appeared to involve a single set of actors who work simultaneously with numerous, diverse products in order to respond to changing demand. The value chain becomes somewhat differentiated at the producer level because of the geographic distribution of the plants and the ecological impacts of harvesting behavior.

2. **Desk study utilizing secondary materials as preparation for field study.** A desk study was conducted prior to launching the field study, including identification and synthesis of existing market research on AMP, such as current characteristics of and trends in the global market; a bench-marking exercise to assess Madagascar's position in the market; and identification and synthesis of major findings in existing studies on impacts of the selected industry on the ecology of the resource itself in Madagascar.
3. **Selection of study sites** based on the characteristics of the selected product including major growing areas, trade routes, processing facilities and markets. This approach focused on AMP at the national level but noted regional variance as appropriate.
4. **Study design** including survey instruments that integrate the NHWP and value chain frameworks. The research team developed survey instruments for a variety of value chain actors, including producers, intermediaries, processors, distributors/exporters and public sector actors. We selected survey participants by referral, starting with end market actors and working back up the value chain. Staff of USAID/Madagascar's BAMEX project assisted in identifying end market actors among their clients. Our pool of survey participants was selected to provide a broad and representative orientation to the AMP value chain. We did not use random sampling to select survey participants, as we did not intend to generate statistical valid data.
5. **Selection and training of local research team in integrated NHWP/value chain approach.** Training built on the experience of local consultants with established industry, natural resource management and business development experience to capitalize on the integrated model for industry competitiveness and conservation.
6. **Field visits, interviews and fact finding** to apply the integrated framework in order to identify opportunities to increase the competitiveness of the AMP value chain in tandem with the sustainable use and improved management of its base in forest, periphery and non-forest zones. The research team consisted of five individuals: Criss Julliard (AMAP-BDS), Maziar Sassanpour (AMAP-BDS), Charlie Benjamin (FRAME), Aro Ratovonomenjanahry (independent consultant) and Pascal Ravohitrarivo (independent consultant). Over 5 weeks (May-June 2006), the team conducted 41 interviews with 52 individuals representing different stakeholder groups (see Table 20). These interviews focused on:
  - The value chain's main actors, critical opportunities and constraints to sustainable growth

- The relationships between these actors, including learning (e.g., information, skills transfer) and benefit (e.g., income, reduced risk) flows, and opportunities to increase value chain competitiveness and sustainability
- The enabling environment, including the natural resource base, local environmental governance, the existence and quality of infrastructure and support services, and related “power,” “health” and “wealth” aspects.

**Table20: Interviews**

Actors	No.
Transporters, distributors, & exporters	6
Intermediaries: processors	4
Intermediaries: collectors	8
Community groups	6
Producers (wildcrafters & cultivators)	7
Local government	4
Public sector (Ministries of Health, Environment, Water & Forests, Industry & Commerce)	3
Research laboratories, certification civil society	3

7. **Stakeholder workshop.** The AMAP/FRAME/USAID-Madagascar team brought together a group of 51 stakeholders to discuss the results of the study, review preliminary findings and identify strategies and implementation plans for strengthening the selected value chain. The present report integrates the results of this workshop.

## 2. SITE SELECTION

The AMP sub-sector contains a large number of plants gathered and processed relative to their real or perceived virtues and availability. Identification of survey sites began by surveying value chain actors closest to the end markets. These are the downstream players who process or export AMP products and/or sell to the domestic market. Through these downstream players and their network the team was able to identify suppliers, intermediaries, collectors and producers as well as the plant-types gathered and cultivated.

Based on information obtained from the Antananarivo-based exporters and distributors about their collection zones, the team was able to define two corridors that were not only AMP production areas but also zones where USAID has allocated resources for economic development and environmental interventions. These include the Moramanga-Toamasina-Brickaville and nearby coastal zone, and the Fianarantsoa plateau to the Manakara-Manazara zone. Meetings with community groups living on the periphery of the Zahamena-Ankeniheny corridor, as well as with actors in Toamasina, led us to conclude that the majority of gathered or cultivated AMP in the region grew or were gathered in the periphery of the corridors, rather than in the protected forests themselves.

Table 21 summarizes location of study sites and schedule of field visits.

**Table 191: Study Sites**

Week	SUDY SITES		
	Region	Commune Urban/Rural	Town/Village
16/05/06	Antsinanana	Toamasina Anjahamana	Toamasina Andranambolaha, Anjahamana
30/05/06	Mangoro	Moramanga Amboasary-Gara Ambohibary Beforona Andasibe	Moramanga Ambohimadana Befontsy Beforona Ambavaniasy ; Vohimana; Sandrasoa
05/06/06	Mangoro	Beforona	Beforona
	Antsinanana	Tsivangiana Niarovana	Tsivangiana Ambalamangahazo; Niarovana
19/06/06	Haute Matsiatra	Ranomafana Fianarantsoa	Ranomafana, Masomanga Fianarantsoa
	Analanjirifo	Fenerive Est	Fenerive Est

# ANNEX 2: EXPORT PRICE OF SELECT MALAGASY ESSENTIAL OILS (MARCH-APRIL 2006)<sup>27</sup>

Products	Botanical Name	FOB Tana (US\$/kg)	Quota (kg/month)	Stock (kg)	Production Season
Bourbon Geranium (C)	<i>Pelargonium graviolens</i>	171.70	20	0	2-4 x/year
Cinnamon leaf (W)	<i>Cinnamomum zeylanicum</i>	27.57	100	5	Whole year
Cinnamon bark (W)	<i>Cinnamomum zeylanicum</i>	143.60	150	10	Whole year
Clove claw (stem) (C)	<i>Eugenia caryophyllata</i>	24.59	400	0	Whole year
Clove bud (C)	<i>Eugenia caryophyllata</i>	42.60	200	50	Whole year
Clove leaf (C)	<i>Eugenia caryophyllata</i>	18.50	600	0	Feb-Oct
Dingadingana/Iary (W)	<i>Psiadia altissima</i>	62.60	200	30	Whole year
Eucalyptus citriodora (C/W)	<i>Eucalyptus citriodora</i>	33.20	100	15	Whole year
Eucalyptus globulus (C/W)	<i>Eucalyptus globulus</i>	36.79	100	30	Whole year
Ginger root (C)	<i>Zingiber officinalis</i>	124.00	200	10	July-Nov
Helichrysum (W)	<i>Helichrysum bracteiferum</i>	122.30	50	25	Whole year
Helichrysum (W)	<i>Helichrysum gymnocephalum</i>	128.15	50	25	Whole year
Katrafay (W)	<i>Cedrelopsis grevei</i>	88.20	100	60	March-Oct
Niaouli (3%) (W)	<i>Melaleuca viridiflora</i>	18.34	200	150	Whole year
Niaouli (5%) (W)	<i>Melaleuca viridiflora</i>	21.28	200	120	Whole year
Pepper, black (C)	<i>Piper nigrum</i>	107.94	200	20	March-Dec
Ravensara anisata (W)	<i>Ravensara anisata</i>	59.50	100	50	March-Oct
Ravensara aromatica (W)	<i>Ravensara aromatica</i>	59.50	200	100	March-Oct
Ravintsara (C/W)	<i>Cinnamomum camphora</i>	68.78	100	0	Nov-May
Ylang ylang 1 (C)	<i>Cananga odorata</i>	106.00	100	25	March-June and Sept-Dec
Ylang ylang 2 (C)	<i>Cananga odorata</i>	84.85	150	30	
Ylang ylang 3 (C)	<i>Cananga odorata</i>	57.50	200	50	
Ylang ylang extra (C)	<i>Cananga odorata</i>	132.40	30	5	

<sup>27</sup> From Aroma, Malagasy affiliate of the Brazilian Peppertrade Board: <http://www.peppertrade.com.br/baunilha-listapreco.htm> (accessed 8/29/06)

## ANNEX 3: PHOTOGRAPHS



*Lantana camara*, a thorny bush, is ubiquitous and grows wild. Only the flower is wildcrafted. Photo taken near a railroad bed.



Newly planted artemisia in a cleared forested area



Wildcrafting talepetraka



Wildcrafting talapetaka



Wildcrafter bringing in wild ginger; weighed and paid on the spot



Cultivating *ravensara aromatica* in a forest garden



Small, formal distillery



Stakeholder workshop: Developing a common understanding of constraints and opportunities



Stakeholder workshop: Acting out a shared vision of the AMP value chain



Stakeholder workshop: Mapping the AMP sector, a step in developing a shared action plan



**U.S. Agency for International Development**

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

**[www.usaid.gov](http://www.usaid.gov)**