

The Shrimp Cluster in Madagascar

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I. Introduction

This paper provides an analysis of the shrimp cluster in Madagascar. It begins with an overview of the country and an assessment of its recent economic performance before turning to an examination of the country's competitiveness. Then, given the dependence of the cluster on exports, it looks at the market dynamics of the global shrimp industry before honing in on the cluster in Madagascar. The final section presents a set of recommendations to improve the competitiveness of the cluster.

II. Country Analysis

Madagascar is the fourth largest island in the world, lying off the southeast coast of Africa. Its geographic isolation and distinct history have combined to separate it from its nearest neighbors in a number of important ways that continue to influence the country's development. The population is mostly of mixed Malayo-Indonesian and African descent, and the Malagasy language is part of the Malayo-Polynesian branch of the Austronesian language group. According to the World Wildlife Fund “[a]n astonishing 98 percent of Madagascar’s land mammals, 92 percent of its reptiles, 68 percent of its plants, and 41 percent of its breeding bird species exist nowhere else on Earth”¹. Perhaps most famous are the lemurs, which are unique to the island and are among the most endangered primates on the planet.

The island is also associated with vanilla exportation. Although vanilla is not indigenous to Madagascar, the country has long dominated the vanilla export market (although this market position is currently under severe threat from other developing countries).

¹ World Wildlife Fund (2006). “Madagascar.” <http://worldwildlife.org/wildplaces/mad/about.cfm>.

The country's recent history has been dominated by the experience of French colonialism, which began in 1896 and ended in 1960. The legacy of the French administrative system and economic policies outlived the end of colonialism, with the country formally adopting socialism in 1975 and the long-serving President, Didier Ratsiraka, promoting close political and economic ties with the country. After 23 years in power, Ratsiraka was replaced by Marc Ravalomanana (the country's richest businessman) in 2002, following a bitterly contested 2001 election in which both candidates declared victory and the country nearly descended into civil war. As shown in Figure 1 below, this period of instability significantly impacted economic growth. Ravalomanana's rule has seen the rapid introduction of market-based economic reforms aimed primarily at freeing up the private sector from decades of restraining policies and bureaucratic stifling.

The 18.1 million inhabitants of the island have relatively low social indicators, although these are somewhat better than would be predicted by the country's economic performance. Its Human Development Index (HDI) rating is 146, 24 slots above where its per capita income would place it (UNDP, 2005). Its HDI rating has been improving consistently since 1975, although progress has been slow. In particular, indicators for literacy, life expectancy, and under-five mortality are relatively good compared to a group of similar countries.

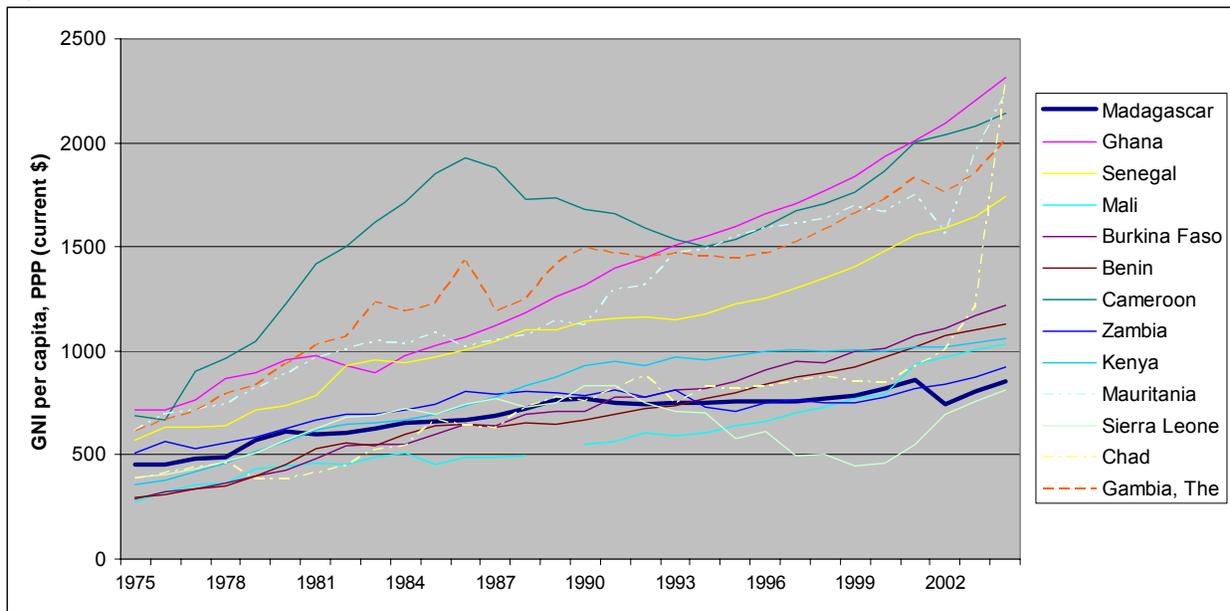
II.A. National economic performance²

Madagascar is one of the poorest countries in the world, with a GDP per capita at purchasing power parity (PPP) of \$851 in 2004, which ranks it 168th out of the 176 economies on which the World Bank provides data. It is unsurprising, then, that nearly three-quarters of the workforce is still employed in agriculture, which comprises 28% of the GDP (World Bank 2005, World Bank 2006a).

² Unless otherwise cited, data in this section are drawn from World Bank, 2006a.

To examine Madagascar’s economic performance over the past thirty years, it was necessary to identify a group of countries that could serve as a basis of comparison³. Figure 1 presents the growth in GDP per capita from 1975 to 2004 of Madagascar and the twelve most similar countries (listed in order of similarity, from most to least). In 1975, it had the seventh highest GDP per capita (at PPP) of the thirteen countries, but by 2004 it had slipped to twelfth, with only war-ravaged Sierra Leone still lower (and even this country had gained ground on Madagascar).

Figure 1



Data source: World Bank, 2006a

This poor performance has multiple causes, which can be divided into two categories: problems associated with the high cost of finance and problems related to low returns to economic activity. The high cost of finance relates to both inadequate access to international finance and weak local finance. Foreign direct investment reached a peak of \$93 million in 2001, but even this

³ The neighboring countries in southern and eastern Africa do not provide suitable comparators, given the divergent histories, structures of the economies, and natural assets. Therefore, an index of similarity to Madagascar was developed, using a methodology pioneered by Amartya Sen for the Human Development Index (UNDP, 2005, page 341), and based on a weighted set of characteristics that included initial (1975) income, geographical attributes, population, institutional quality, and agricultural dependence.

constituted barely more than 2% of GDP. For the broader period stretching back to 1975, FDI comprised only 0.6% of GDP, well below the average in the comparison group of countries (1.8%). This was the result of the combination of policies that restricted trade⁴, the country's isolated location, and relative lack of conditions that would attract large investments. Domestic savings did not compensate for this international isolation, as the domestic savings rate was a meager 5.3% of GDP, barely half of the comparison group's average of 10.4%. Banks were thus starved of capital, as seen in an average lending interest rate over the period of 27.4% (more than two and a half times the real interest rate), which in turn choked off investment: gross capital formation was only 11.9% of GDP for the period, well below the comparison group's average of 17.6%.

The low returns to economic activity stem from a negatively reinforcing combination of flawed macroeconomic policies, a constrained business environment, and poor productivity. In addition to this, the country did not focus on the globally competitive pressures from abroad. The macroeconomic policy weakness is seen in both composite rankings and indirect proxies. The Heritage Foundation's Index of Economic Freedom is one of the most frequently used measures of a country's economic policies, and its ratings of Madagascar are instructive: for the period from 1995 (the first year of the Index) to 2000, Madagascar's monetary policy was rated an average of 4.3 (on a scale of 1 to 5, with 5 being the worst), its trade policy 4.8, and the fiscal burden that the government imposed a 4.0 (Heritage Foundation, 2005). The ineffectiveness of macroeconomic policy can also be seen indirectly in the inability to control inflation, which peaked at nearly 50% in 1995 and was above 10% for much of the period since 1975, and in the current account balance, which has averaged -6.4% over the period. Additionally, the government has become increasingly dependent on foreign aid, with all of the incumbent problems of volatility. After having accounted

⁴ The country scores poorly on two commonly-used measures of trade: the Sachs-Warner index (Sachs and Warner, 1995) and the Penn World Tables index (Heston, et al., 2002). In both cases, Madagascar is below the average for the group of comparison countries.

for an average 4.9% of GDP from 1975-1985, aid increased its share to an average of 12.2% in the subsequent twenty years.

The business environment is described in more detail below, which paints a picture of an economy suffering at the hands of a constraining microeconomic context. Finally, the country's total factor productivity is poor, although not considerably out of line with other countries in sub-Saharan Africa. In the words of a World Bank-sponsored Investment Climate Assessment,

Cross-country regression results show that when Malagasy firms are compared as a group (including EPZs⁵) with other countries, their performance is on par with Uganda, Tanzania, Senegal, and Kenya, better than Zambia, but worse than Mali. However, when we distinguish between Madagascar EPZ firms and others, and then compare the non-EPZ firms with enterprises elsewhere, we see that non-EPZ enterprises only perform at par with firms in Uganda and Tanzania. They have lower productivity compared with firms in Senegal, Mali, and Kenya. (World Bank, 2005, page 36-37)

Decomposing Total Factor Productivity, the same study found very low labor productivity, as seen in the fact that the average value-added of a Malagasy worker is only \$1,453, well below almost all of those in the group of comparison countries used by the study. Capital intensity is also quite low, even when compared to countries such as Tanzania and Zambia.

Amidst this sea of problems, there is some good news. The political instability that began in late 2001 and continued through much of 2002 was devastating for the economy – GDP shrunk by nearly 13% – but resulted in the coming to power of a government that has embraced reform and significantly opened the economy. The new government has succeeded in improving its ratings in the Index of Economic Freedom significantly: by 2 points (in 2005 from a baseline in 2000) in monetary policy, by 3 points in trade policy, and by 1.075 in fiscal burden. As discussed below, a number of key dimensions of the business environment have also improved. Moreover, the country is increasingly benefiting from trade agreements, particularly the U.S. African Growth and

⁵ Export processing zones. The study found significantly different TFP in EPZs (particularly in foreign-owned firms) and in the general economy.

Opportunity Act and the European Union “Everything But Arms” scheme, which are opening up protected markets in developed countries.

II.B. National Competitiveness

Given the above, it is hardly surprising that an analysis of the competitiveness diamond in Madagascar reveals a number of deficiencies.

Figure 2



These conditions suggest the difficulties that face businesses as they try to operate in Madagascar, helping to explain the poor economic performance in recent decades. Moreover, several of the plusses in the diamond are recent developments: the reformist government only came to power in 2002, and it is responsible for a new campaign to brand the country as “Madagascar Naturally”, which in turn has helped boost the ecotourism cluster.

Unfortunately, the recent improvements to the business environment have yet to shift the country's overall competitiveness rating: the Global Competitiveness Report's Business Competitiveness Index ranks Madagascar 97th of the 116th countries assessed. This is considerably better than the country's rank of 112th in GDP per capita at PPP but still dismal. Madagascar has only been ranked since 2003 and despite some improvements in microvariables (see below), the overall picture has not changed much in this period, as seen when the country is compared to a consistent set of 93 countries ranked over each of the past three years:

<u>Table 1</u>	2003	2004	2005
Business Competitiveness Index	86	82	83
National Business Environment	85	83	82
Company Operations and Strategy	85	83	87

A more nuanced picture of the country's competitiveness emerges by looking at microvariable data. In recent years progress has been made in relation to the factor conditions and the context for firm strategy and rivalry. Nine of the 16 microvariables related to factor conditions in Madagascar improved by at least 5 places in the ranking from 2003 to 2005 (among the consistent set of 93 countries), and in 6 of the 16 the jump was at least 10 places. Three of the 6 microvariables related to the context for firm strategy and rivalry improved by at least 5 spots, one (prevalence of trade barriers) shooting up by an impressive 30 places.

The improvements are primarily in the areas of government getting out of the way of business and improving the security situation. For example, on the "extent of bureaucratic red tape", "prevalence of trade barriers", and "favoritism in decisions of government officials" microvariables, Madagascar scores well above both its overall position and its GDP per capita at PPP ranking, coming in 49th, 59th, and 62nd, respectively. Similarly, "reliability of police services" (56th), "intellectual property protection" (62nd), and "judicial independence" (65th) are all relative strengths. These findings are borne out by comparative data from other assessments of the business

environment. In the World Bank's Doing Business survey, Madagascar is considerably better than the averages for sub-Saharan Africa for starting a business (which takes an average of 38 days and costs 54% of GNI per capita, against regional averages of 64 days and 215%), for protecting investors (in an index of 1 to 10, with 10 representing the best investor protection, Madagascar scores 5.7, as opposed to a regional average of 5; this figure ranks the country 41st in the world, its highest score by far and ahead of Germany, Sweden, and Switzerland), and for enforcing contracts (which take 280 days and costs 23% of debt, against regional averages of 439 days and 42%) (World Bank, 2006b). In the Index of Economic Freedom's assessment of government intervention (in which a lower score indicates less government intervention), Madagascar scores an impressive 1.5, ahead even of the U.S. (2.0) (Heritage Foundation, 2005). In a set of World Bank governance indicators, the country's regulatory quality scores 0.10, well above the average for the group of comparison countries described above of -0.43 (Kauffmann et al., 2005).

However, although the government has taken important steps to free up the economy and create the fertile conditions for business, the private sector has yet to take advantage of these conditions. The Global Competitiveness Report microvariables on related and supporting industries are particularly discouraging, as rankings for both "local supplier quality" and "local supplier quantity" fell more than five spots between 2003 and 2005. The "intensity of local competition" actually fell seven places between 2003 and 2005, to an uninspiring 79th. The Company Operations and Strategy microvariables also suggest that the private sector is not yet taking advantage of the improved policy microeconomic environment, as only 3 of 12 microvariables improved by at least 5 spots (and one fell by that amount).

There appear to be several explanations for this. Part of the problem is clearly demand conditions, as both of the microvariable scores here were poor (buyer sophistication: 88; prevalence of demanding regulatory standards: 86) and were stagnant from 2003 to 2005. The World Bank's

Enterprise survey provides another part of the explanation: nearly 70% of firms list “access to/cost of financing” as a “major” or “very severe” constraint to doing business in Madagascar⁶. This is also seen in the Global Competitiveness Report data, in which Madagascar is ranked a poor 85th for “local equity market access” and 80th for “financial market sophistication.” The Enterprise survey showed that more than three-quarters of firm had to rely on internal financing for investment, with only 11.8% getting bank financing. Similarly, infrastructure is still a constraint in this large, mountainous island. Only 12% of roads are paved (World Bank, 2006a), and although the “overall infrastructure quality” microvariable in the Global Competitiveness Report has improved in recent years, it is still ranked 80th, the same as the “port infrastructure quality” indicator. “Telephone/fax infrastructure quality” comes in even worse, ranking 83rd globally. Firms reported electricity outages on 77 days a year, costing 6.6% of sales (World Bank, 2006c).

Finally, although the new government is business friendly, it is uncertain if this political climate will continue as elections are being held at the end of the year and Ravalomanana’s popularity is mixed.

III. The World Shrimp Market

The limited local demand in Madagascar for a product as costly as shrimp means that the cluster’s growth is almost entirely dependent on exports. To assess the viability of the cluster, then, it is necessary to understand the global market dynamics.

The world shrimp market has been growing steadily in recent years, with total production increasing from 2.6 million metric tons in 1988 to 5.3 million metric tons in 2003⁷. Of this,

⁶ The only other barrier that was listed by more than half of firms as a “major” or “very severe” constraint was macroeconomic instability. This is hardly surprising given the history of the country’s economic policymaking, but should improve as business gains familiarity and comfort with the current administration.

⁷ FAOSTAT (http://www.fao.org/es/ess/index_en.asp). Throughout this section, the term “shrimp” encompasses both shrimp and prawns, since international data sources (e.g., FAO, UN COMTRADE) do not distinguish between the two.

approximately 70% is wild captured shrimp, the balance being farm-raised (aquaculture) shrimp.

The use of aquaculture has increased over this period, rising from under a quarter of production in 1988 to 30% in 2002 (Josupeit, 2004b).

The export production market is worth more than US\$12.3 billion in 2004, 75% of which is in frozen shrimp (the balance being fresh and prepared/preserved)⁸. The export market is highly fragmented and widely scattered geographically. The top exporters are Thailand, Vietnam, India, Indonesia, China, Bangladesh, Argentina, and Mexico, but there are a further ten exporters with at least 1% of global market share. As this list suggests, the major players are predominantly developing countries, although these are primarily middle income nations, rather than the poorest. Asian countries led the pack, followed by Latin American ones, although there are also important developed country exporters, such as Denmark and Australia. Few African or Middle Eastern countries have become major exporters; Madagascar is the largest in Africa.

The import market is more highly concentrated, with the U.S. and Japan alone comprising more than half of the world market. Spain, France, the U.K., Belgium, and Italy are the next largest importers, accounting for a further quarter of the market.

After trending upwards from the mid-1970's to the mid-1990's, world market prices have been falling slightly over the past ten years; however, the World Bank is forecasting a gentle rise in prices over the next decade⁹. Price volatility is a major feature of the market, as one would expect for a primary commodity for which production is unpredictable, given its dependence on climatic conditions and disease patterns (farmed shrimp are particularly vulnerable to disease outbreaks), and for which stockpiling cannot be used to smooth out supply fluctuations.

⁸ Data in this section come from the United Nations Commodity Trade Statistics Database (COMTRADE) online, <http://unstats.un.org/unsd/comtrade/>, and is calculated by the authors using data classified as imports, rather than data classified as exports (export data appears to be significantly underreported).

⁹ World Bank commodity forecasts, <http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/EXTGBLPROSPECTS/0,,contentMDK:20675357~menuPK:627723~pagePK:64218950~piPK:64218883~theSitePK:612501,00.html>.

The traditional major form of product differentiation was a simple division between frozen and fresh shrimp. The latter typically command a significant price premium, although there is considerable variation across import markets¹⁰. The current, highly competitive export market has led suppliers to respond to increasingly sophisticated consumer demand by competing for niche markets through differentiation of products, either by species, preparation, denomination of origin, or all three. There is an growing trend in the global industry towards adding value though increasing convenience, such as by individually quick-freezing (as opposed to block-freezing) or shipping “easy-peel” shrimp (in countries in which there is a preference for “shell-on”). Increasingly, export countries are building capacity to not only fish or grow shrimp, but to process, cook, freeze, and label shrimp as well¹¹. The impact of these approaches can be seen by comparing spot prices, as the below table does for New York average FOB prices per pound on April 28, 2006¹²:

Table 2

Origin and product (size)	Block frozen, shell-on		Individually quick-frozen		Peeled and deveined		Cooked and peeled	
	Price	Premium vs. block frozen	Price	Premium vs. block frozen	Price	Premium vs. block frozen	Price	Premium vs. block frozen
India Tail-On (26/30)	\$4.20	N/A	\$4.55	8%	\$4.95	18%	-	
Thailand Tigers Tail-On (16/20)	\$5.55	N/A	\$5.75	4%	-		\$7.50	39%
Vietnam Tigers Tail-On (16/20)	\$5.45	N/A	-		\$5.90	8%	\$7.70	41%

The following box describes some characteristics of a “good” shrimp and a good shrimp exporter as defined by sophisticated import markets such as the EU, USA, and Japan.

¹⁰ Among major markets, the average premium on a kilogram of fresh shrimp (against a kilo of frozen shrimp) ranges from 84% in the US, 68% in Belgium, and 66% in Italy, down to 27% in Japan, 21% in Italy, and only 12% in the U.K. (authors’ calculations from UN COMTRADE).

¹¹ Emily Stavis, Personal Interview, April 2006.

¹² Shrimp News International, <http://www.shrimpnews.com/Prices.html>.

What makes a good shrimp?

- Freshness, texture, taste, and color;
- Traceability: Provenance and well-controlled path to final market.

What makes a good shrimp exporter?

- For aquaculture: Ability to replicate nature (rearing density and feeding);
- For wild: Geography key determinant of quality of shrimp;
- Processing: Quality control, value-add, and speed to market (e.g., reliable cold chain, processing capabilities, disease management);
- Environmental management, sustainability and yield maximization;
- Ecosystem preservation and certification;
- Ability to respond to consumer preferences for specific species (e.g., some countries prefer giant tigers, while others prefer white shrimp).

Trade policy is an important feature of the competitive environment for shrimp exports. The European Union applies a tariff of 12% on frozen shrimp imports, although Africa, Caribbean and Pacific (ACP) countries covered by the Cotonou Agreement currently enjoy a 0% tariff. Although this ACP provision will expire in 2007, countries classified by the United Nations as “least-developed” will maintain tariff-free entry to the EU under the “Everything But Arms” initiative (Technical Centre, 2004). While frozen shrimp enter the U.S. duty-free, aggressive application of anti-dumping provisions is a major feature of the market, to the extent that four separate World Trade Organization complaints have been filed against the US efforts to restrict shrimp importation (Josupeit, 2004*a*; WTO, 2006). Japan’s tariff is only 1% (UNCTAD, 2006).

Marketing by country-specific institutions for collaboration is increasing. For example, the Mexican Shrimp Council has focused on a denomination of origin marketing campaign on the US market that includes a seal for “authentic Mexican Shrimp”¹³.

Finally, environmental considerations play a growing role in global trade in shrimp. Developed country governments have acted to restrict imports out of concern both for the environmental consequences of the industry (e.g., the U.S. has restricted imports from countries that cannot certify that shrimp fishing nets do not contain “turtle excluder devices” that enable sea turtles to escape from the nets) and for consumer safety (e.g., the EU has detained shrimp from countries such as China, India, Indonesia, and Thailand when they were found to contain levels of antibiotics [which are commonly used in aquaculture to reduce the risk of disease epidemics] that were deemed potentially unsafe) (Josupeit, 2004*a*). There is also growing concern among environmental groups about the destructive effects of shrimp farming (which usually relies on the destruction of large swathes of mangrove forests), although there is no sign that this has yet impacted the market¹⁴. These concerns have very recently led to the development of draft “International Principles for Responsible Shrimp Farming” by an international consortium of the World Bank, the Network of Aquaculture Centres in Asia-Pacific, the World Wildlife Fund, the Food and Agriculture Organization, and the UN Environment Programme¹⁵. While still very new, this initiative could have considerable implications for the future of the aquaculture industry.

¹³ Emily Stavis, personal interview, April 2006. See <http://www.mexicanshrimp.org/index.html>.

¹⁴ See, for example, the World Wildlife Fund’s description at http://www.panda.org/about_wwf/what_we_do/policy/agriculture_environment/commodities/shrimp/environmental_impacts/index.cfm.

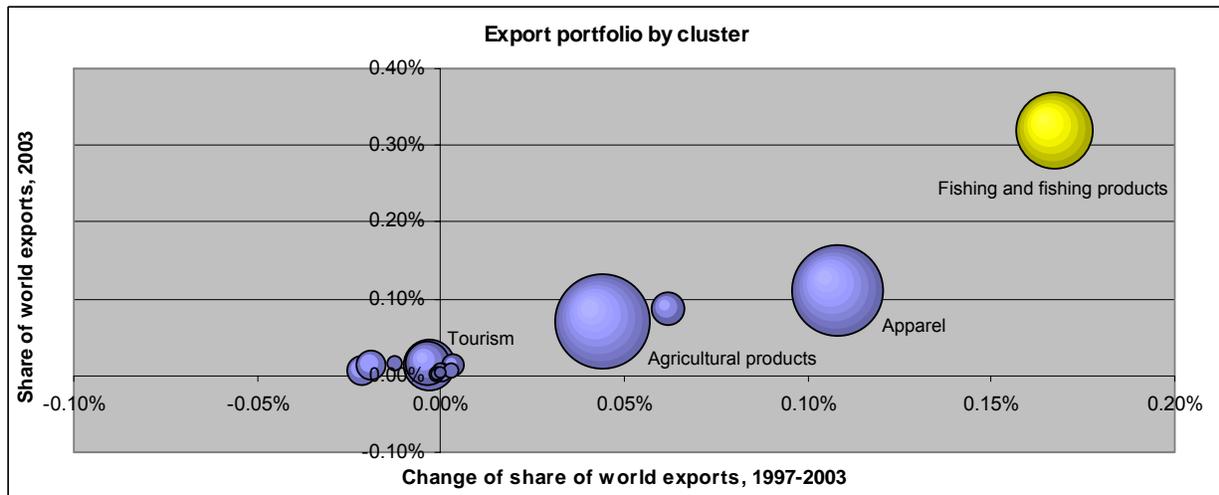
¹⁵ See <http://www.enaca.org/modules/tiny2/index.php?id=1>.

IV. Cluster Analysis

IV.A. Shrimp Cluster in the Context of Madagascar's Economy

Shrimp harvesting and farming form an important feature of Madagascar's economy. Shrimp was the third largest source of export receipts in 2004 behind textiles and tourism, accounting for about 13% of export revenues (World Bank 2005, 20). The country exported nearly US\$165 million worth of shrimp in 2004, or nearly 4% of GDP¹⁶. Madagascar is Africa's largest exporter of shrimp and globally has ranked as high as 12th after a bumper year in 2002 (it slipped back to 21st in 2004 after a bad year)¹⁷. Fishing and fishing products is the sector in which Madagascar enjoys both its largest share of world exports and its fastest growing share¹⁸:

Figure 3



Data source: International Cluster Competitiveness Project

As is often the case with clusters in developing countries (Porter, 1998, 230 *ff*), the Malagasy shrimp cluster is both shallow and narrow compared to clusters in developed countries.

Nevertheless, it is relatively sophisticated and mature compared to others in Madagascar in that it has a defined identity, a track record of success and appears to be deepening, as manifested by the

¹⁶ Authors' calculations based on data from UN COMTRADE and World Bank (2006a).

¹⁷ UN COMTRADE

¹⁸ According to the World Bank (2005, 94), the lion's share of the fishing sector is made up of shrimp exports.

efforts of an active institution for collaboration, *Groupement des Aquacultures et des Pêcheurs de Crevettes de Madagascar* (GAPCM, discussed further below). In a country where jobs are scarce, the cluster is a significant source of formal employment: Rojat et al. (2004, 2) estimate that the wild capture and aquaculture parts of the cluster provide 9,000 direct jobs (4,000 and 5,000 respectively). Labor in the fisheries sector is relatively productive: although only 1.13% of the workforce is employed in fishing, (World Bank 2005, 14), shrimp exports alone comprise nearly 4% of GDP, as noted above.

Shrimp are one of the three largest goods exports from Madagascar, along with apparel and vanilla (IMF, 2005, 48). The textile cluster has been growing rapidly in recent years, but it exists largely within dedicated export-processing zones, is relatively unsophisticated and is completely dependent upon trade preferences for its success. It competes solely on the basis of cheap labor with other low-labor-cost countries, and labor productivity in the cluster is low (World Bank 2005, 20, 31). Preferences were seriously eroded in 2005 with the expiration of the GATT Multi-Fiber Agreement; expiring provisions of the US African Growth and Opportunity Act in 2007 and 2015 are also likely to impact the cluster (*ibid.*, 19). Vanilla has long been Madagascar's largest export earner, but its dominant position has been eroded in recent years "due to a switch to lower-quality vanilla by the final consumer and purchasers of vanilla" (IMF, 2005, 49).

Tourism to Madagascar has grown rapidly in recent years¹⁹, but the tourism cluster remains in its early stages of development. A survey of tourism-related websites shows that Madagascar is regarded in the travel community as a wild, adventurous and undeveloped destination, with poor infrastructure for visitors²⁰. Nevertheless, investment in the cluster is growing quickly, including construction of new hotels (World Bank 2003, 3). With EU support, a public-private tourism IFC has been created (the *Maison du Tourisme*, MDT), although the government has considered

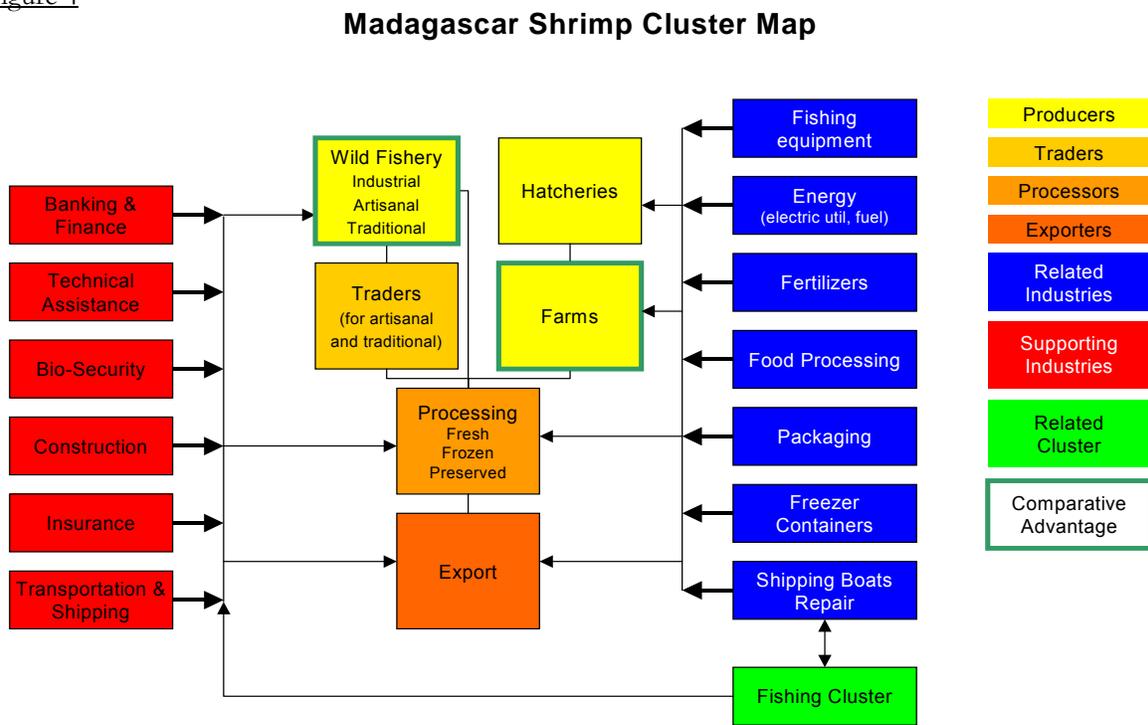
¹⁹ Visitors to Madagascar jumped from 138,800 in 1999 to an estimated 228,800 in 2004 (IMF, 2005, 93).

²⁰ For a typical example see <http://www.embassy.org/madagascar/intro.html>.

disengaging from this to allow industry to work alone and although MDT is charged with tourism promotion, it has no funds to carry this out (*ibid.*, 4, 5, 59). The World Bank assesses that despite its raw potential, the tourism cluster faces numerous constraints including limited flights and problems securing land for development; it has recommended creating “clusters of excellence” to improve competitiveness (*ibid.*, 8-10).

IV.B. Structure of the Cluster and Diamond Analysis

Figure 4



Large-scale commercial harvesting of shrimp in Madagascar began in 1967, with exclusive licenses granted to two companies, *Pêcheries de Nosy Be* and *Somapêche*, in which the government held a minority interest. Today, the industry has expanded considerably, with shrimp production occurring through a combination of wild harvesting and aquaculture (shrimp farming). Harvest of wild shrimp has remained “relatively stable” over the past ten years at 10,000-12,000 tons per annum (Rojat et al., 2004, 1-2).

Fishing for shrimp is carried out at three levels, as described by Oceanic Développement (2003, 2-3):

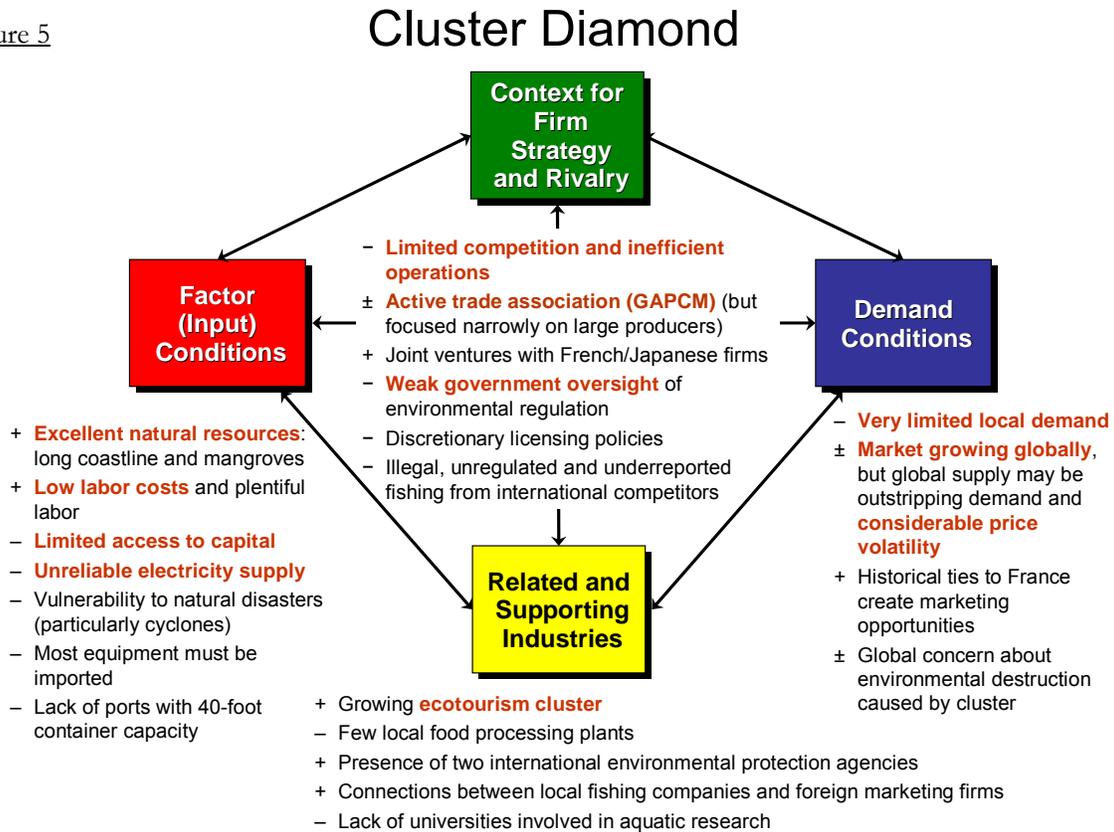
- Industrial: trawlers between 15 and 29 meters in length; 70-75 licenses distributed amongst 10 companies; responsible for between 67%-78% of catch. Of these 10 companies, only one is domestically owned; the remainder are predominantly owned by French and Japanese interests (World Bank, 2005, 95).
- Artisanal: trawlers around 10 meters long; 36 licenses held by 8 companies; responsible for less than 10% of catch.
- Traditional: small unmotorized boats; unregulated; catch estimated to be as high as 3,500 tons/year²¹.

While data are somewhat unreliable, the annual maximum sustainable yield of Madagascar's wild shrimp fishery has been estimated at a little less than 9,000 tons (Oceanic Développement, 2003, 4), below the average harvest of the last decade. The leveling off of wild-caught yields has been accompanied by the rise of aquaculture, which increased production from 500 tons in 1994 to 7,000-plus tons in 2003 (Rojat et al., 2004, 2). Madagascar's west coast has geographic features that make it well suited to aquaculture (discussed below) and recent estimates such that there is considerable scope for expansion, with only 6,300 ha exploited, out of a possible 10,800 ha that are exploitable (Government of Madagascar, n.d.).

Turning now to the cluster diamond, this section examines each of the four components of the diamond conditions facing the shrimp cluster in Madagascar. Descriptions of the role of government are included throughout. After each subsection, the most constraining challenges are highlighted.

²¹ Rojat et al. (2004, 2) puts the estimate of catch by the traditional sector much lower, at between 1,000 and 1,500 tons, a discrepancy that illustrates the paucity of reliable data on this subsector.

Figure 5



IV.B.1 Factor Conditions

Madagascar’s geography is conducive both to harvesting wild shrimp and to shrimp farming. The significant number of inlets and bays provide ample shallow, brackish water in which shrimp can breed, and which can also serve as aquaculture sites (Oceanic Développement, 2003, 9). The species of shrimp found in Madagascar include *Penaeus monodon*, the giant tiger shrimp that is the most popularly exported shrimp globally (Josupeit, 2004b).

Many of the challenges in the business environment identified above in section II.B constrain the shrimp cluster. For example, a World Bank survey of the fishing industry found that 100% of firms identified the “cost of finance” as a “major” or “severe” constraint (World Bank, 2005, 96). This is likely to limit the possibilities for new, domestic entrants in the commercial shrimp fishery. Labor costs are low – but are also associated with very low labor productivity (*ibid*,

6, 25). Unreliable electricity supply is cited as a constraint to growth (EIU, 2005, 9; World Bank, 2005, 7). Shrimp farmers highlight high shipping costs and limited port facilities, particularly the inability to load 40-foot containers, as major constraints (Autrand, cited in World Bank 2005, 98).

Key challenges:

- Poor infrastructure: road links between coastal areas are inadequate; competitiveness of port infrastructure needs improving; electricity supply is irregular.
- Limited access to capital restricts investment and new entrants.
- Links between the cluster (including foreign firms) and rest of economy are weak.

IV.B.2 Demand Conditions

Porter (1998, 174-175) argues that sophisticated local demand is important for competitiveness in that it forces firms to constantly improve the quality of their products, making them more likely to succeed in a global export market. However in Madagascar local demand for high quality shrimp is limited, due to the comparatively high cost of the product and low purchasing power²². Therefore, any discussion of demand conditions must focus on international markets, rather than domestic demand. Madagascar's exports are highly concentrated: in 2004 86.9% of exports went to France, 8.2% to Japan, and 2.3% to Spain. This suggests an increasing dependence on France, given that as recently as 2002, the French market represented only 73.8% of exports, as opposed to 14.4% for Japan and 9.1% for Spain. Exports to the world's largest consumer, the US, as well as to major European markets such as Belgium, Italy, and the UK are negligible. (UN COMTRADE 2006).

The costs for importers to switch between different exporting countries and species are very low. As a result, importers frequently change suppliers and species based on price and availability²³. This poses a problem for Malagasy exporters, given that the country have difficulty competing on

²² Local demand for low-cost shrimp seems to be met by the traditional fishing sector.

²³ Emily Stavis, Personal Interview, April 2006

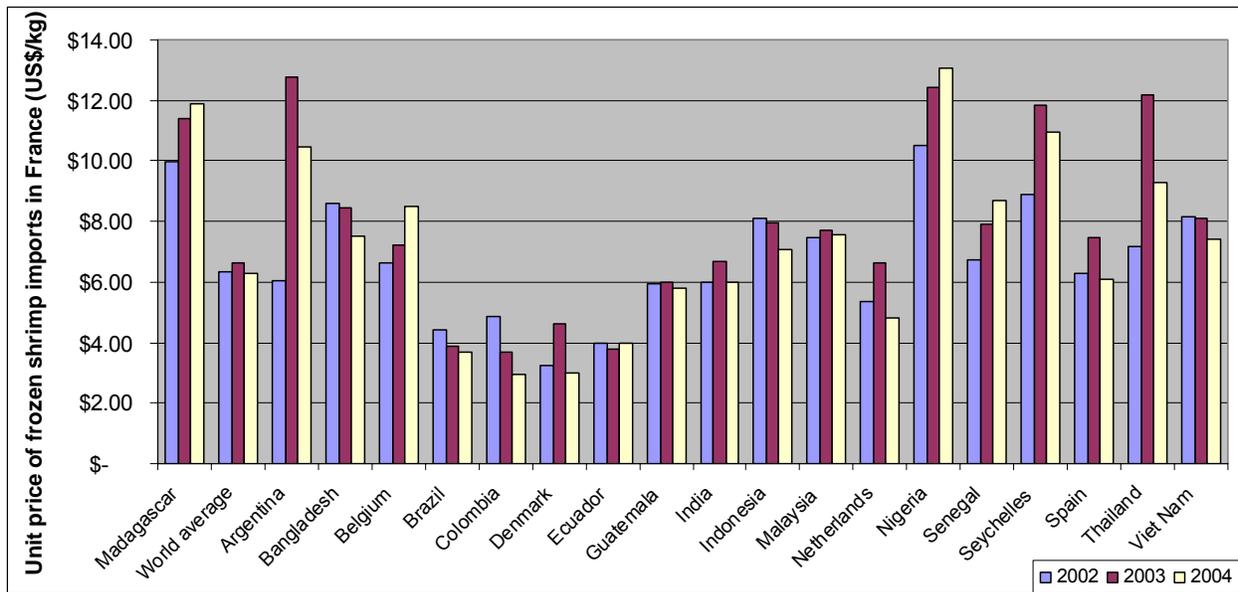
volume terms with the large producers in Asia and Latin America. The challenge is thus for Malagasy exporters to differentiate their product and build brand loyalty in destination markets.

Comparing the performance of Madagascar across its major markets, one initial fact stands out: Madagascar has enjoyed a price premium in France but not in Japan or other markets, suggesting that Malagasy exporters have managed to achieve this in at least one market.

IV.B.2.1 The French Market

Madagascar has positioned itself as a high-value supplier to the French market...

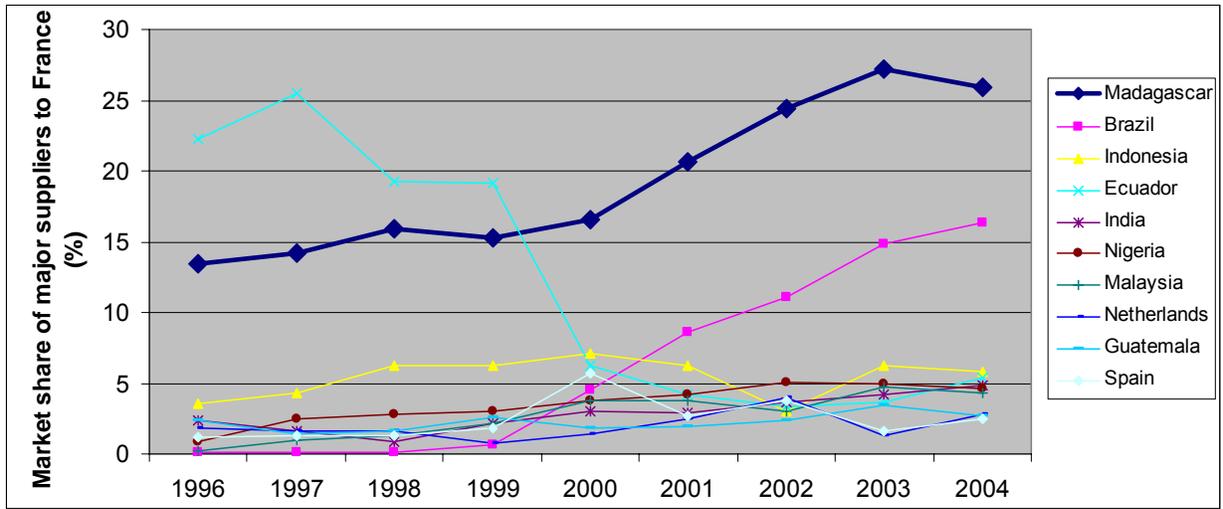
Figure 6



Data source: UN COMTRADE

...while simultaneously making significant gains in market share:

Figure 7



Data source: UN COMTRADE

Madagascar’s prominent position in the French market is probably due in part to ties of history, people and language. Anecdotal evidence suggests that this effects both demand (as the brand has a strong reputation in France) and supply (as there are strong links between some of the firms involved in the shrimp cluster in Madagascar, and France, which may translate into the French market receiving the cream of the Malagasy crop)²⁴. An important lesson from the French experience is that it is possible to develop national brand recognition that translates into a price premium.

In France, Madagascar’s main competitors appear to be at the higher end of the market, in particular Nigeria (a new entrant that supplies high value shrimp at increasingly significant volumes). While Madagascar’s share gain is outstripping Nigeria’s in absolute terms, Nigeria’s share increased five-fold from 1996-2004, compared to a doubling for Madagascar. This should be a source of some concern for Madagascar exporters, although Madagascar will continue to enjoy zero tariffs after ACP preferences phase out in 2007, whereas Nigeria (a middle-income country) will not. Brazil is also taking an increasing share of the French market, however it has gained primarily on the

²⁴ Dean Williams, personal interview, March 2006.

basis of low cost: Brazil's exports to France are exclusively of cheap, minimally processed shrimp (FAO Globefish, 2003, 2002). Thailand, the world's largest producer, does not feature in the top 10 suppliers to the French market. Thailand concentrates at the value end of the market supplying farmed shrimp, but in France this segment is captured by suppliers including India, Indonesia and several Latin American countries including Brazil.

IV.B.2.2 Other Markets

Japan, Madagascar's second-largest market, is dominated by Asian suppliers. The top five exporters to Japan in 2004 were Viet Nam, Indonesia, India, China and Thailand. Madagascar's market share has hovered around 0.8% from 1996-2004 (17th largest supplier in 2004). Madagascar has not enjoyed a price premium in Japan, attracting instead similar prices to East Asian suppliers; the premium end of the Japanese market is served by Australia, and more recently Argentina. Madagascar's recent price improvement in Japan may be due to falling overall prices in that market coupled with demand shifts towards favoring larger shrimp (such as those produced by Madagascar) (Josupeit 2004*b*), but the trend in Japan towards importing more prepared/preserved shrimp²⁵ (of which Madagascar currently produces very little) presents a challenge for Madagascar due to their limited food processing capability.

Spain is both Madagascar's third largest export market and the world's third largest importer. Argentina has a dominant position in the market, but its position as the largest supplier is under threat from Brazil and China, particularly for lower-value product. At the higher end of the price spectrum, the main competitors for Madagascar are Argentina and Mozambique, which managed to command prices 163% of the Spanish average in 2004 while capturing more than 4% of the market (more than ten times Madagascar's share).

²⁵ Nineteen percent of Japanese shrimp imports in 2004 were prepared/preserved, up from 17% in 2003 and 15% in 2002 (UN COMTRADE, 2006).

As noted above, Malagasy exports to several of the other major shrimp importing countries have remained at very low levels, and opportunities exist in a number of these markets (e.g., US, Italy and Belgium).

Key challenges:

- Limited value-added to exports, whereas competitors are aggressively moving into processing, cooking, and otherwise making their shrimp exports more appealing to consumers.
- Inadequate diversification of export markets: Current narrow range of export destinations represents a risk because conditions can change rapidly (e.g., changes in demand as in Japan; disease epidemics, sanitary and phyto-sanitary requirements and changes in trade policies).

IV.B.3 Context for Firm Strategy and Rivalry

The importance to competitiveness of political and macroeconomic stability cannot be overstated; Porter notes these are the first competitiveness responsibilities of any government (1998, 245). Madagascar's overall weaknesses in macroeconomic policy, infrastructure, regulation, governmental oversight and financial intermediation all have impacts on the competitiveness of the shrimp cluster.

More specific to the cluster's competitiveness are the presence of an institution for collaboration, environmental management challenges, and limited firm competition.

The Madagascar shrimp cluster institution for collaboration, *Groupement des Aquacultures et des Pêcheurs de Crevettes de Madagascar* (GAPCM), shares many features with developed-country IFCs. Created in 1994 as a joint venture between government and industry with support from the French government aid agency (Agence Française de Développement), GAPCM has focused on issues of sustainability including over-fishing and by-catch (World Bank 2005, 93). It has also begun to look at the issue of eco-certification by the Marine Stewardship Council, commissioning the pre-assessment study by Oceanic Développement which is cited in this report. The study identified a number of information gaps that would need to be filled prior to Marine Stewardship Council eco-

certification, including better data gathering and analysis; monitoring of success in avoiding turtle by-catch, as well as implementing a management system for traditional fisheries and improving their representation in GAPCM (Oceanic Développement 2003, 12, 16).

As discussed above, developed country markets may be becoming more sensitive to the environmental impacts of shrimp capture and farming, and several steps have been taken to respond to this. GAPCM instituted a program to deploy turtle-excluder devices in 2004 (World Bank 2005, 94). The government has taken significant steps to ensure the sustainability of the wild fishery, in particular by issuing an administrative decree in 2000 that strengthened the fisheries licensing system and instituted a variety of other measures directed at maintaining catch within the estimated maximum sustainable yield (*ibid.*). One such measure was to put a freeze on new fishing licenses, to enable better monitoring of existing players. However, this has had the negative effect of preventing new entrants and limiting competition, perhaps reducing the scope for innovation in meeting environmental standards and market demands. Additionally, the lack of regulation of the traditional fishing sector has raised concerns about the extent to which juvenile shrimp stocks are being endangered (Oceanic Développement, 2003, 14, 19).

The limited number of firms described above may be limiting competition: Autrand (2004, 72 ff) finds that Malagasy firms are not particularly efficient compared to those in the Asian countries that are producing larger volumes of shrimp.

Key challenges:

- Wild fisheries lack adequate protection, while efforts to ensure sustainability of aquaculture are only beginning.
- Governmental oversight is weak: the State Fisheries Department and other government institutions have limited capacity to manage the shrimp resource.
- Lack of competitive pressure to innovate and move up the value chain.

- Data collection is inadequate, limiting the ability to monitor stocks and determine sustainable yields.

IV.B.4 Related and Supporting Industries

Tourism, particularly “eco-tourism”, is becoming an important feature of the Madagascar economy and accounted for 0.46% of employment and 19% of exports in 2004 (up from 8% the previous year) (World Bank 2005, 14, 19). President Ravalomanana launched a major branding initiative, “Madagascar Naturally”, which sought to capitalize on the country’s flora and fauna to, among other things, increase the number of tourists by fivefold in ten years²⁶. There is clearly scope to leverage this branding for other Madagascar products, including shrimp. One corollary of increasing tourism numbers may be increased airfreight capacity. Madagascar signed an “open skies” agreement with the US in 2004, unlocking potential to increase passenger and cargo opportunities²⁷. This could open the door to increased exports of fresh, chilled shrimp (currently negligible, but potentially very high value).

If Madagascar is to move up the value chain, marketing and packaging will become increasingly important. Some efforts have been conducted in the past to improve the marketing of Madagascar’s fisheries products²⁸, but this may be one area for future work by GAPCM, in conjunction with relevant industry associations and the government.

Key challenges:

- Seeding demand in new markets, particularly by developing co-marketing campaigns with the tourism cluster.
- Broadening and deepening the cluster: moving up the value chain despite weak supporting industries, such as packaging and food processing.

²⁶ See <http://www.maep.gov.mg/fr/actumadanaturel.htm>.

²⁷ US Department of State Press Statement, March 10 2004, <http://www.state.gov/r/pa/prs/ps/2004/30328.htm>

²⁸ See <http://www.onefish.org/servlet/CDSServlet?status=ND0xMDU4LnByaklQQTmzOTYmNj1lbiYzMz1wcm9qZWw0cyYzNz1pbmZv>.

- Better integrating the cluster into the broader economy.

V. Cluster Recommendations

The Malagasy shrimp cluster competes in a global market. To build its competitive position amongst other shrimp exporters and address the challenges highlighted in the cluster analysis above, a dual strategy is needed. The cluster must strive to maintain parity with competitor countries. Simultaneously, it must focus on actions that will both develop and exploit its unique strengths²⁹. The recommendations are structured accordingly.

V.A. Seeking and maintaining parity with competitors

Madagascar is unlikely to be able to compete with large Asian and Latin American producers on cost terms alone – although it should do all it can to ensure competitive pricing. Madagascar also needs to match the increasingly differentiated range of products being exported by competitors. In order to maintain parity with competitors, the shrimp cluster needs to be better integrated within the broader Malagasy economy, firms need to develop value-added shrimp processing capacity, and infrastructure limitations must be addressed. Government, firms and the IFC need to build the following recommendations in their planning cycles and prioritize them for investment.

Government	Firms and IFC
Remove restrictive regulation in the financial services sector and encourage foreign investment to improve access to capital, to facilitate market entry and to promote competition.	Move up the value chain by meeting demand requirements in individual markets (e.g., cooked or individually quick-frozen shrimp).
Provide incentives for reinvestment of profits by foreign firms: encourage investment in capital equipment by providing tax incentives (e.g., accelerated depreciation), tax holidays and duty-free importation for capital equipment.	Take advantage of improving business environment to reinvest profits locally.

²⁹ This bifurcation of the cluster strategy approach is based upon Microeconomics of Competitiveness class notes.

Enhance post-harvest infrastructure: improve port capacity, including the ability to handle 40 foot containers); encourage investment in electric power generation and distribution (to enhance cold chains); improve the road network; and address limited competition in shipping transport.	
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V.B. Developing unique strengths

V.B.1 Target the premium end of market with Madagascar “eco-shrimp”:

To avoid being trapped into competing with large, low-cost producers in Asia and Latin America, Madagascar must strategically position its shrimp exports. In particular, it must engage in what Porter (1998, 49 ff) terms “variety-based positioning,” or basing its positioning on the “choice of product rather than customer segments.” Malagasy shrimp have managed to accomplish this in France, but efforts to distinguish Madagascar from competitors by branding the country’s unique features have not been carried out in other key markets. The steps necessary to bring this about are detailed below.

Government	Firms and IFC
Strengthen environmental regulation and oversight: - Impose sanctions on irresponsible practices and incentivize sustainable practices (e.g., through instituting industry-best practice awards; requiring companies to deposit bonds prior to resource exploitation; and imposing fines on companies that break the rules); - Enlist support from donors and national and international non-government organizations where appropriate.	GAPCM should lead a collaborative effort with firms and government to make eco-certification of Madagascar shrimp a reality, guaranteeing traceability, quality and environmental sustainability. This could be marketed under a “seal of excellence” program.
Improve auction-licensing schemes to ensure sustainable use of the wild shrimp resources.	Take a leadership role in finalizing and implementing the “International Principles for Responsible Shrimp Farming”.
Improve data collection, working closely with cluster firms (this would, <i>inter alia</i> , improve the conditions for eco-certification).	Leverage “Madagascar Naturally” branding to distinguish Madagascar shrimp in export markets
	Forge community-company partnerships to incentivize small producers to utilize and manage resources sustainably.

V.B.2 Develop synergies with ecotourism cluster

The growth of the tourism cluster presents a unique opportunity for the shrimp cluster. A considerable number of the tourists are attracted by the country’s unique flora and fauna and so form a ripe market for a food product that is branded as “eco-friendly”. Co-marketing initiatives could expose tourists to the quality of Malagasy shrimp, seeding foreign markets when these consumers return to their home countries.

Government	Firms and IFC
Conclude open-skies agreements with a broader range of partners to boost tourism and increase number of flights/airfreight capacity for fresh shrimp.	Work with tourism cluster to promote Madagascar shrimp with tourists (e.g., through events at prominent hotels, distribution of small gifts of preserved shrimp, etc.), building brand awareness in tourists’ countries of origin.
Develop a targeted marketing campaign to raise awareness of the “Madagascar Naturally” brand, with positive implications for both tourism and Madagascar’s exports (including shrimp),	
Increase efforts to address deforestation and preserve uniqueness of environment.	

V.B.3 Promote market diversification:

The reliance on a limited number of markets exposes the cluster to unnecessary risks, which could be mitigated through strategic diversification. The aim of this diversification is not to establish Madagascar as a dominant player in multiple markets, but rather to concentrate on the premium end of the market in a limited number of carefully targeted countries. Those listed below have been selected based on the combination of their having sizeable import markets and natural openings for Malagasy shrimp.

Government	Firms and IFC
Use trade missions and diplomatic networks to improve access to import markets and participate in multilateral fora to advocate against erosion of Madagascar’s trade preferences .	Target premium segments of promising markets of Italy, Belgium, and Spain by utilizing existing links with French retailers that currently carry Malagasy shrimp and that are major players in these three countries.
	Target the premium end of the US market by

	leveraging French connections to secure placement in high-end restaurants run by French chefs and/or upmarket seafood chains. ³⁰
	Reformulate strategy in the Japanese market to satisfy changing consumer demands.

³⁰ The authors are indebted to Emily Stavis for this suggestion.

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