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ABSTRACT: The paper addresses the prospect of facilitating meat exports from countries in developing Africa to developed countries worldwide. Given that many developing African countries are natural animal producers, a critical issue is whether the global system of sanitary regulations governing trade in meats effectively negates their comparative advantage. We argue that the sanitary regime is trade-facilitating, that countries wishing to export must comply, and that compliance is achievable in the short-term. Drawing on the cases of Namibia and Botswana and their respective cattle and beef industries, we posit a central role for government in promoting the industrialization of the sector, both through credible disease control services and a market intermediary function. We further argue that the long-term challenge faced by developing African countries is one not of compliance, but of capacity building for export. Crucial to the “industrialization” of this sector is the provision of proper incentive structures for suppliers, an effort at which the governments of Namibia and Botswana have not succeeded. We highlight efforts at capacity building in both countries and note how our conclusions are pertinent to the rest of developing Africa.

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1. Introduction

Many developing countries in Africa are natural animal producers. Land there is typically cheap, labor is inexpensive, and a majority of people depend on agricultural activities for their livelihood. These countries possess abundant pasture and grasslands for raising livestock such as cattle, and given the dry climate in many places and the paucity of arable land, animal production rather than crop cultivation makes better use of their natural resources. There is for developing Africa, therefore, a *prima facie* case for its comparative advantage in the production of livestock and meat products. Add to this the fact that demand for cuts of meat, especially beef, is high and growing in developed countries around the world, and trade theory would predict a steady flow of exports from these countries to markets in the United States, the European Union, and elsewhere.

Gaining access to developed markets, however, is difficult and expensive, and for much of developing Africa has proved impossible to date. A primary barrier facing potential exporters is strict government policy in developed countries regarding food production and consumption. Developed countries display extreme risk aversion on issues concerning the health and well-being of their populations. This behavior is manifest in strict policies to ensure that their livestock, meat, crops, and other foods—whether domestic or imported—are free of disease, and that veterinary drugs, hormones, additives, harmful bacteria, and pesticide residues are limited to scientifically mandated levels. These policies reflect the rational behavior of welfare-maximizing governments. The income effect dominates the expectations of populations of rich countries about food safety and security. They demand strict food standards. In response, their governments supply those standards through legislation and enforcement.

In developing countries and in Africa in particular, income effects are not as dominant. The demand side of domestic markets does not force on governments the same need for stringency that is present in developed countries. Governments thus have less incentive to enact food safety laws and enforce them, since both legislation and enforcement are costly. Their experience and capacity in this regard is therefore reduced.

The result of these differences is an international system of food safety regulations that is dominated by developed countries. Their standards typically become the international norm and are diffused through such mechanisms as the World Trade Organization (WTO), the World Organization for Animal Health (OIE), the Codex Alimentarius Commission, and other standard-setting bodies. No doubt, poorer countries bear the brunt of these strict regulations. Those with a comparative advantage in livestock and meat production may find that advantage negated by the international barriers they are forced (and many times are unable) to surmount.

The standards themselves are unlikely to be the problem, however. While charges of protectionism are occasionally leveled at developed countries on account of their standards, these are generally based on sound scientific principles of food safety and human, animal, and plant health. We note a conspicuous lack of cases at the WTO brought by developing countries regarding rich countries' use of sanitary measures as protectionist barriers. At a more grassroots level, our interviews of agricultural officials and academics in South Africa, Namibia, and Botswana reveal few complaints about international and developed-country standards as barriers.² Indeed, it would be naïve to expect governments in the developed world to lower their standards and increase the risks to their food supply and populations. Perhaps more importantly, all indications are that as incomes in developed countries grow, and as tastes shift to more natural and organic foods, regulations will become even more stringent.³

We come, then, to a major premise on which this paper proceeds: developed countries' sanitary standards are not a guise for protectionism. On the contrary, they represent the rational behavior of a government that responds to the demands of its polity for food safety. Thus, animal producers, whether in Africa or elsewhere, desiring to export to developed markets, neither have ways of circumventing the sanitary regulations, and nor should they be thinking that there are

² Many of those interviewed acknowledged developed markets' higher standards as unalterable fact, and perceived that market access was worth the cost of compliance.

³ For more on this point, see Boland, Boyle, and Lusk (2002) and "Retailers" (2004), amongst others.

ways of doing so. Countries must meet relevant international and developed-country standards in order to exploit their comparative advantage in livestock and meat production.⁴

Compliance with high food standards is costly. We contend, however, that this cost is not insurmountable, nor does it necessarily trump a country's comparative advantage. As evidence, we offer two examples from Southern Africa: Namibia and Botswana. These developing countries have been successfully exporting beef products to developed markets in the EU for decades. With the specific purpose of shedding light on factors that have motivated their success, we present a case-study analysis of both countries' cattle and beef industries.

Our findings are twofold. First, governments in Namibia and Botswana have played a leading role in catalyzing the industrialization of their beef-producing sectors. They have been excellent providers of public veterinary services, and their effectiveness at controlling the spread of animal diseases through disease zoning and animal traceability has been critical in establishing their credibility with their developed trading partners. In addition, these governments, through parastatal entities, have stepped in to solve a "coordination failure", providing the institutional infrastructure necessary for a functioning and cost-competitive industry.

Second, looking forward, the long-term challenge for Namibia and Botswana in exporting beef lies not with barriers to trade posed by importers' sanitary measures, but rather with *building capacity*. It is interesting to note that both countries enjoy preferential access to EU markets by means of a tariff-rate quota, allowing their products a cost advantage over other exporters; yet despite this near-guaranteed market, these quotas have remarkably and consistently remained unfilled. Short-run constraints may account for part of the deficiency: drought is not too uncommon in Namibia and Botswana, and Namibia in particular has recently struggled with "bush encroachment" (desertification). In the long run, however, we find misguided policies and distorted incentives to be the primary culprits. Namibia's onerous land policies and Botswana's poor management of the Botswana Meat Commission have both inhibited better capacity utilization and an expansion of supply in the commercial and communal sub-sectors.

⁴ Stevens and Kennan (2005) note that using the WTO's dispute mechanism to challenge what are perceived to be overly stringent SPS measures would result in "pyrrhic" gains (iv). "Botswana," they state, "has no option but to comply" with relevant sanitary standards (v).

Rectifying—or at the very least, mitigating—these distortions will be instrumental in increasing cattle and beef production at the intensive and extensive margins.

Putting these arguments together, we advance two important lessons for the rest of developing Africa. First, provided that a country enjoys a comparative advantage in animal or meat production, it can exploit that advantage even within the context of the current sanitary regime. The standards currently in place in developed countries are transparent and, as Namibia and Botswana have shown, possible to satisfy. In our view, hoping that developed countries might lower their food safety standards or seeking circumventive “alternatives” to the regulations are endeavors that will almost certainly be strongly resisted. These countries are low-cost producers and can most certainly export beef. But first they must comply, and do so fully.

Second, the government has a significant part to play. It must credibly ensure disease control. In pursuit of this argument, we contend that in Africa the use of veterinary cordon fences, certainly in the short- to mid-term before their learning of how to otherwise control diseases is complete, is inescapable. Perhaps equally importantly, government must be instrumental in solving coordinate problems in production by establishing intermediary institutions and requisite supply chain assets, and provide stable and credible market signals that incentivize market participants to optimize over the long run.

This paper proceeds through three sections. In Section 2 we take a brief but focused look at international cattle and beef markets and the international sanitary regime. The main message is there exists a set of multilateral standards that members of the WTO agree to adhere to, but it is a minimal set of standards which do not necessarily satisfy the domestic standards in many developed countries with the most lucrative export markets. In Section 3 we present evidence from case studies of Namibia and Botswana. We highlight economic conditions in both countries, and provide a detailed look into their respective cattle and beef industries, disease control services, and the role that parastatals have played. Section 4 analyzes our case evidence. The motivation here is to convey our understanding about what capacity building in this sector implies. In the final section we conclude with our recommendations which have implications for developing Africa.

2. The International Beef Trade and Sanitary Regime

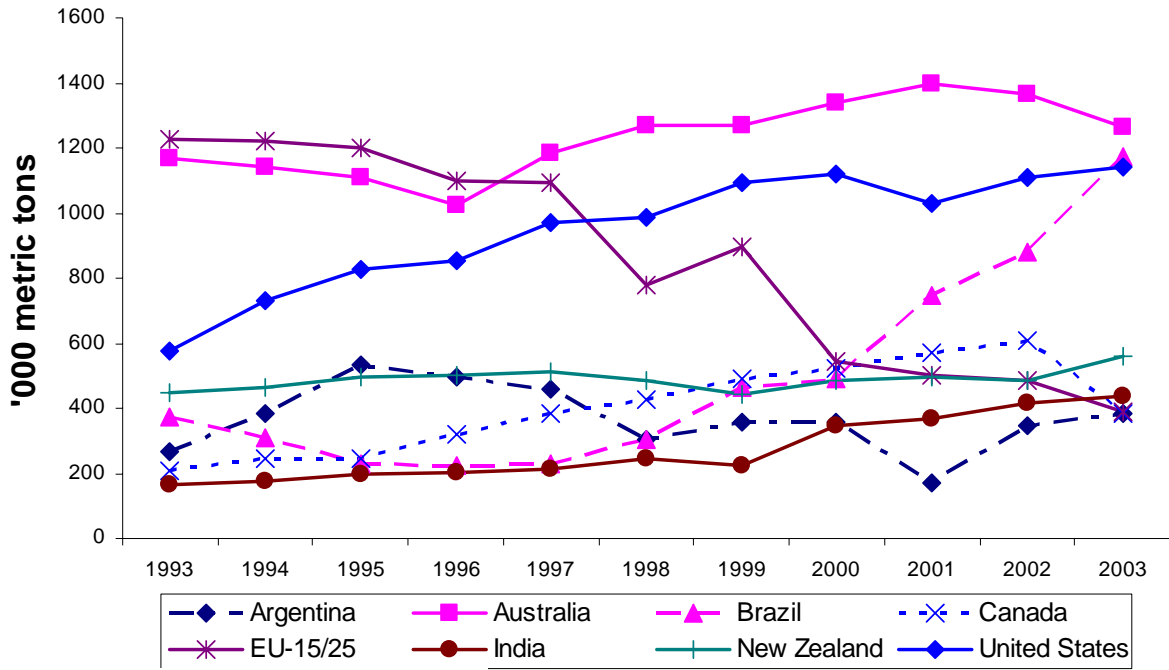
2.1 The World Beef Market

World trade in meats has grown steadily since the mid-1990s. Main products are meat cuts and edible offal, while trade in carcasses and live animals is significantly less. In 2001, the Food and Agriculture Organization (FAO) reported the aggregate value of live animal trade as \$8.5 billion, while the same for meat exceeded \$43 billion (FAOSTAT 2007). The growing importance of the beef industry is gaining attention as demand for this product increases around the world (see Appendix 1). However, only a select number of countries are major participants in the global beef trade, and a mere handful of developing countries are able to successfully compete.

Figures 1 and 2 depict some of the world's major exporters and importers of beef for the period 1993-2003. On the export side, we make three observations. First, there is rising competition among three countries—Australia, the US, and Brazil—to be the world's leading exporter of beef. While the former two have managed steady increases in their exports, Brazil has emerged as a powerhouse. In just over five years, it nearly quintupled its beef exports. Second, the quantity of beef exported by the EU has been declining. From being the largest exporter of beef for years, it is now a lesser competitor. Third, occupying a distinct and competitive second tier is the set of smaller exporters that include Argentina, New Zealand, Canada, and India. They have all maintained steady levels of exports, ranging from 200,000 to 500,000 metric tons per annum.

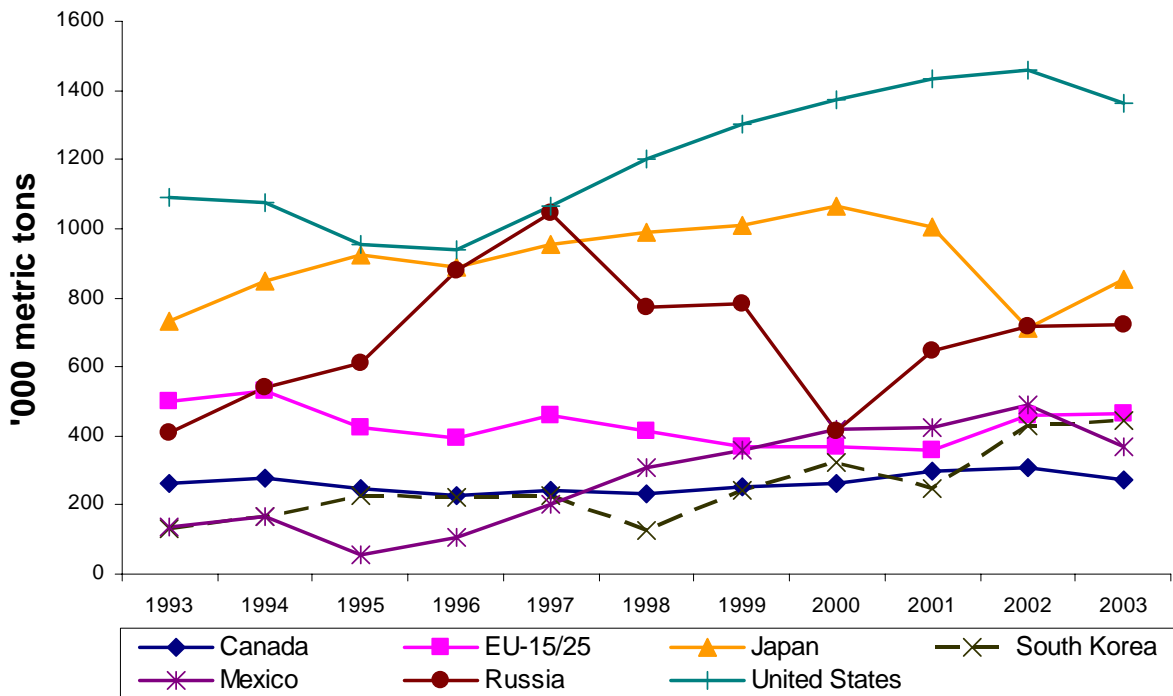
Imports of beef in Figure 2 show two principal patterns. First, quantities of beef imported in developed countries have leveled off. While beef imports in the US are significant, they have remained relatively stable. This pattern of slow or no growth in is also present in Canada and the EU. Second, quantities of beef imported into recently developed and emerging middle-income countries have increased over the years. The high import growth in Mexico and South Korea are

Figure 1. Beef exports, selected countries



Source: USDA PSD

Figure 2. Beef imports, selected countries



Source: USDA PSD

the most significant in this regard. There appears to be an optimal amount of beef consumption, below which it is considered a superior good whose consumption grows with income, and beyond which its consumption is discouraged relative to healthier alternatives. With emerging China still being far below the optimal, we can expect import demand in this sector to be strong and continuing in the future.

The implications over the next few decades for potential exporters of beef are as follows. On the production side, the availability of grazing land confers a comparative advantage on producers. Since land is a fixed resource, long-run changes in beef production must be accompanied by competitive wages and rents in order to encourage the capital investments, and productivity improvements required to remain competitive in this sector. Countries that are able to provide the environment in which prices provide the stable and credible long-run incentives are most likely to succeed as exporters in this sector. But, in addition, countries that are learning to convert their natural comparative advantage in beef production into export success must make investments in human capital at a variety of levels to ensure quality control in production.

On the demand side, it works to the great advantage of potential exporters that beef is a normal good whose consumption increases with income. A large number of studies have attempted to measure price and income elasticities of beef demand. While the generation of studies from the 1960s and 70s arrived at a consensus of a unitary income elasticity for beef, recent studies using disaggregate data are more optimistic (for producers) about the size of the income effect. Chern et. al (2003) use household level survey data to estimate elasticities in Japan's beef market. From data on expenditures made by more than 94000 Japanese households in 1997 (1997 Family Income and Expenditure Survey), they estimate an income elasticity for beef to be between 1.12 and 1.41 (their Table 5.6, p. 53). Importantly, the study also finds that the price responsiveness of beef demand in the 1997 data is inelastic. In sum, beef is a price-inelastic and superior good.

The changes in Japanese beef demand elasticities over time are striking. Hayami (1979) found that Japanese demand for beef in the 1970s was price elastic and income inelastic, that is, beef was then a normal, though not superior, good. The implication is that as incomes grew, beef became the meat of choice in Japanese households. Further, it has few substitutes. The Chern et.

al and Hayami results are relevant to a future world in which populous countries like China will weigh in on the consumption side of the beef market as their incomes increase. Applying the Chern et. al estimates indicates that the average Chinese household that has achieved a threshold level (e.g. Japan's average household income in 1997), will increase its beef consumption at a rate greater than its increase in income. A back-of-the envelope calculation indicates that we should see steady increases in (real) beef prices as large consumers like China become deficit producers of beef at the same time as their incomes increase.

We therefore see a huge potential for developing countries that have a natural comparative advantage in the production of cattle to export beef. But bringing this potential to fruition requires reliable disease control and traceability systems in accordance with international sanitary standards. In the next section we argue that while standards are costly to comply with, satisfying those standards is requisite before natural meat producers can become competitive beef exporters.

2.2 The international sanitary regime

Any discussion of the international regulatory regime for trade in agricultural products begins with the WTO and its Agreement on Sanitary and Phytosanitary Measures (commonly called the SPS Agreement or simply "SPS"). The SPS Agreement entered into force on January 1, 1995, along with the establishment of the WTO (previously the GATT). The underlying intent of the agreement is to promote trade in animal and plant products while simultaneously ensuring human, animal, and plant health and safety (World Trade Organization (WTO) 1998).

The provisions of the SPS Agreement, stated succinctly, are sevenfold. First, it aims to prevent protectionism by proscribing the use of SPS measures as a disguised barrier to trade. The second provision is an outgrowth of the first, mandating that measures taken for food safety must have a sound scientific basis. Third, in an effort to achieve harmonization, the agreement encourages the use of international standards. Fourth, it prohibits importers from arbitrarily discriminating among suppliers from various regions or countries. The fifth provision maintains that an exporter's SPS standards need not be identical to the importer's, but should provide an

equivalent and appropriate level of protection. Sixth, the agreement requires governments to use appropriate and transparent risk assessment procedures in setting up their standards. Finally, governments are required to notify other countries of new or changed standards, to set up informational offices, and to allow scrutiny of their standards (WTO 1998).

On the first two points, we find the SPS Agreement to be resoundingly successful. Furthermore, international sanitary regulations have great potential to be trade-facilitating. They provide a measurable standard, and the measures that exporters must take in response to importers' concerns about risk are fairly transparent. In theory, exporters' scrutiny of an importer's standards, and the potential for litigation before the WTO, helps keep the importer "honest." The scarcity of WTO cases involving SPS measures as a guise for protectionism in part attests to this.

In accordance with the third provision, the SPS Agreement recognizes three international standard-setting organizations: the World Organization for Animal Health (OIE), the Food and Agriculture Organization (FAO)/World Health Organization (WHO) Joint Codex Alimentarius Commission, and the Secretariat of the International Plant Protection Commission (IPPC) (WTO 1998). Given our focus in this paper on cattle and beef products, we provide a brief overview of the OIE's Terrestrial Animal Health Code ("the Code") and provisions for meat safety in the Codex Alimentarius.

The foremost concern of the Code is animal health. Its guidelines seek to minimize the introduction and spread of animal and zoonotic diseases through international trade in animals and animal products. These include standards for risk analysis and evaluation of national veterinary administrations, procedures for import and export of live animals, and recommendations applicable to specific diseases. The Code's appendices contain provisions for, among other things, animal identification/traceability and surveillance for specific diseases. The OIE also maintains recommendations for the structure and operations of national veterinary administrations and certifies particular countries, zones, or regions as free of specific diseases—namely, foot and mouth disease (FMD), rinderpest, bovine spongiform encephalopathy (BSE, or "mad cow"), and contagious bovine pleuropneumonia (CBPP) (World Organization for Animal Health (OIE) 2006).

The primary focus of the Codex Alimentarius is the protection of human health in the context of trade in animal and plant products. As such, with respect to meat, it contains guidelines primarily applicable to abattoirs, meat processors, and meatpackers: ante-mortem inspection of animals, slaughter, post-mortem inspection, and guidelines for the handling, production, processing, packaging, and shipment of meats (Codex Alimentarius Commission 2005).

These three sets of guidelines—the SPS Agreement, the Terrestrial Animal Code, and the Codex Alimentarius—represent the minimum standards a country must meet in order to engage international livestock and meat markets. They are especially crucial for developing countries. Nonetheless, as noted, governments in developed countries, such as the United States and EU member states, are highly intolerant of risks to their food supplies and populations. It is not surprising, then, to find a “standards gap” between guidelines established by international organizations and standards imposed by a particular developed country.⁵ As a result, it may not be enough simply to certify livestock or meat exports according to international standards. The international regulations serve merely as the starting point. Meeting the relevant international standards is a necessary, but not sufficient, condition for access to a particular developed market.

Despite these differences, we point out two major obstacles, covered exclusively in the Terrestrial Animal Health Code, which a country will encounter on the road to export certification, whether with an international organization or a particular developed country. They are

- (1) maintaining the disease-free status of herds within particular zones, and
- (2) implementing a traceability system for animals.

We highlight these for several reasons. First, both involve significant up-front investment. To control the spread of animal or zoonotic disease, domesticated livestock must be separated from

⁵ See Silverglade (1998) for an example of these gaps with respect to US standards. Indeed, Silverglade advocates *more* of a gap between US standards and those of international bodies, not believing the latter to offer appropriate protection of US consumers. In a similar way, EU regulations are regarded as some of the most stringent in the world, thus providing a benchmark for exporters who also wish to sell their products in other foreign markets. This point is made briefly by Stevens and Kennan (2005, v).

other animals that act as vectors for disease. In Namibia and Botswana, for instance, free-roaming African Buffalo are the primary carriers of foot-and-mouth disease. Controlling such diseases demands the use of barriers, either natural (such as rivers or forests) or artificial (such as veterinary cordon fences, or VCFs). This in turn necessitates “disease zoning” throughout a country, and particularly the creation and maintenance of disease-free zones that are recognized by international bodies and developed countries. In the same way, a traceability system for livestock will entail the use of some individual or group means of identification (ear tags or boluses, for example), a system of permits to monitor animal movements throughout the country and through the supply chain, and some centralized database to manage and track this information.

Second, there is a “negative externality” dimension to the problems. Disease-zoning and traceability involve, in one way or another, nearly the entire population of the particular species of animal in a country. Even if an individual export-oriented abattoir is able to certify its meat processing operations as meeting the relevant standards (e.g. provisions of the Codex Alimentarius), but other abattoirs do not, it is beyond the ability of individual animal producers to ensure the disease-free status of their herds unless other producers undertake similar measures.⁶ This negative externality renders a traceability system effective only if all segments of the supply chain participate. This is one of the “coordination problems” that must be solved for exporting potential of a country to be realized.

If the veterinary authority is unable to provide the importer with credible and verifiable evidence of disease control and traceability, an abattoir stands no chance in trying to move its meat to foreign markets. This is a third reason for why disease zoning and traceability measures are prerequisite to effective implementation of sanitary measures in the exporting country.

Thus, the problem of building capacity to export beef has characteristics of the problem of providing public goods. In the absence of private provision of such goods, there is a strong case for the role of government in doing so. We develop this argument in our analysis of the Namibian and Botswanan case studies.

⁶ Indeed, communal and low-income farmers in Namibia, Botswana, and South Africa rely completely on the government for vaccination against FMD.

3. Case Evidence: Namibia and Botswana

3.1 Economies and Institutions

Namibia and Botswana are both middle-income countries with median rank on the human development index (UNDP 2005). Each boasts good infrastructure relative to the broader region, political and economic stability, and a relatively strong rule of law. The mining industry represents the largest source of foreign exchange in both countries, followed at a distance by tourism. Agriculture constitutes 3.8 percent and 9.9 percent of GDP for Botswana and Namibia, respectively (World Bank 2005). Most FDI initiatives are focused on the mining and manufacturing sectors. Government policies and strategies tend to emphasize the development of the manufacturing and service sectors, which are considered to be more conducive to economic growth. Nevertheless, agriculture remains the largest source of livelihood for these countries' and the region's population.

At 2.46 residents per square kilometer, Namibia has one of the lowest population densities in the world, leaving much of the land (nearly 70 percent) available for agricultural use. Furthermore, the rural population has been steadily decreasing, while urban population growth has remained relatively stable, leading to a higher urban concentration. Namibia is rich in natural resources, with mining (diamond, zinc copper) accounting for 20 percent of GDP in 2003. Botswana is more densely populated than Namibia, with 3.1 residents per square kilometer. Botswana, too, is rich in natural resources with mining accounted for 38 percent of GDP in 2004.

Regionally, both countries are members of the Southern African Customs Union (SACU), along with South Africa, Lesotho, and Swaziland. They are all also members of the Southern African Development Community (SADC), an alliance consisting of fourteen countries. SACU members enjoy free trade within the Union and a market protected by common external tariffs against non-members. Tariff revenues are pooled and distributed across member states according to an established formula. All member currencies (with the exception of Botswana's

pula) are pegged at par to the South African rand, forming a common monetary area and tying each country's hand on monetary policy.⁷

Namibia and Botswana are active participants in the global economy, and both are founding members of the WTO. As SACU member states, they have trade agreements with Mercosur (Brazil, Argentina, Uruguay, Venezuela and Paraguay), the European Free Trade Association (EFTA), and the United States (the US-SACU Free Trade Agreement, the first such agreement between the US and an African entity). Namibia and Botswana hold several bilateral trade agreements, as these were grandfathered into the most recent 2002 SACU Agreement, which came into force on July 15, 2004 (WTO 2003). Subsequently, modifications to or additional trade agreements must be entered into via a common negotiating mechanism.

Currently, the most significant trade agreement for Namibia and Botswana with respect to meat exports is the Cotonou Agreement, successor to the Lomé Convention which expired in 2002. Under this agreement, meats and other products from ACP (Africa, Caribbean and the Pacific) countries enter the EU at reduced tariffs up to a quota amount (separately determined for each country), allowing these countries preferential market access over other competing exporters to the EU market. Botswana and Namibia are the only African countries to have taken advantage of this agreement with respect to meat exports. They accounted for 47.5 percent and 31.3 percent, respectively, of total African meat exports in 2000 (WTO 2003).

However, the Cotonou Agreement extends current trade preferences only until 2008, by which time ACP countries and the EU must negotiate new trade agreements compatible with WTO rules. There is some concern that new agreements may erode market access, but we will indicate evidence that these countries are not exporting up to their quotas. Not meeting the quotas will put them at a disadvantage when negotiating with the EU to retain the quota. Our argument about capacity building is especially relevant in the light of this evidence.

⁷ Botswana pegs its pula to a basket of currencies but the rand still predominates.

3.2 Namibia

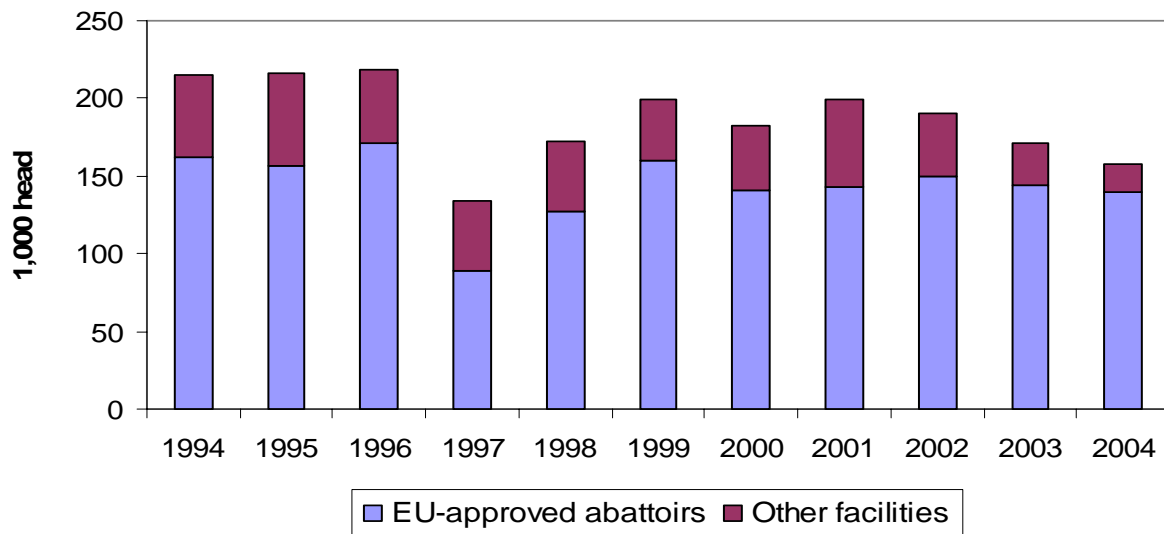
Situated on the western side of the Southern Africa subcontinent, Namibia is bordered by five countries and nearly 1,000 miles of Atlantic coastline. The country has the driest climate in sub-Saharan Africa, with mean annual rainfall of less than 16 inches, so that much of the land is either arid or semi-arid. 46 percent of the total land area is under permanent pasture. These characteristics make Namibia great “cattle country.” Livestock production is an important component of the economy, responsible for seven percent of GDP and 80-90 percent of the value of commercial agricultural production. Cattle predominate in Namibia, with a national cattle herd size of over two million head since 2000.

There are two cattle production systems in Namibia: commercial (“freehold”) and communal (“traditional”). The commercial sub-sector is well developed, capital-intensive, and export-oriented, and occupies 52 percent of the grazing land. Communal farmers utilize the remaining 48 percent (Sweet and Burke 2000). While the two sub-sectors maintain more or less equal holdings of cattle, commercial producers are the primary suppliers of beef production, providing 75-80 percent of annual off-take.

Namibia carries on a thriving export trade in weaner calves. It exported approximately 210,000 head in 2005, an increase of 160 percent from 2000. The vast majority (over 95 percent) of these are to South Africa. Total slaughtered head in Namibia declined in the period 1994-2004, from about 215,000 to just under 158,000. As Figure 4 indicates, the numbers at Namibia’s two abattoirs approved for export to the EU remained fairly steady, despite a dip in 1997 and 1998. Of its total beef production, Namibia typically exports about 80 percent (Meatco, n.d.). Exports from 2001 to 2004 averaged over 24,000 metric tons annually. Figure 4 shows that about half of this has been destined for South Africa (Meat Board of Namibia 2007b).

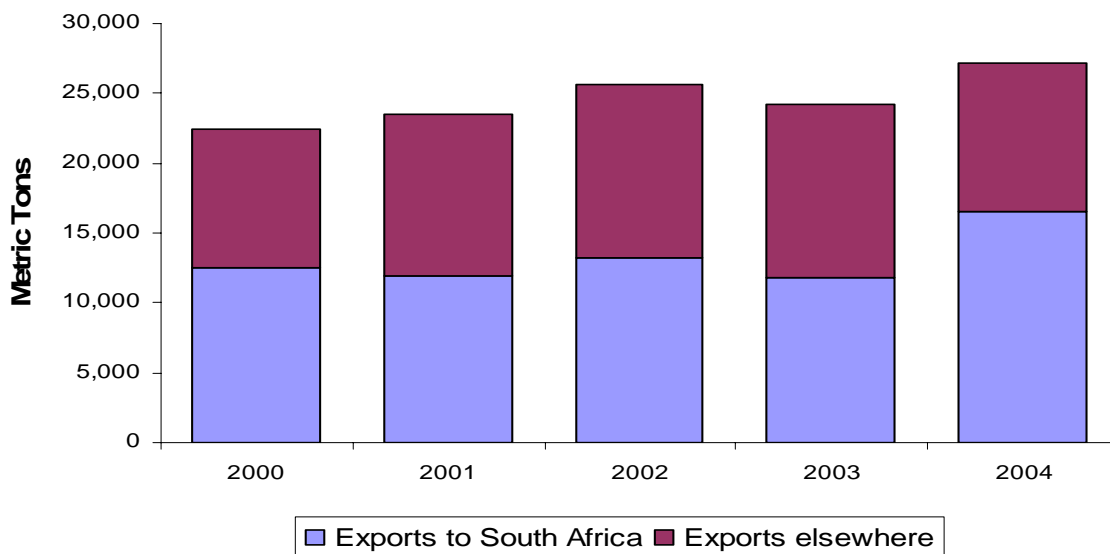
EU members are also major destinations for Namibian beef. They import fresh, chilled, and frozen boneless cuts. Fresh and chilled cuts are clearly preferred, making up nearly 70 percent of their total beef imports from Namibia from 1995-2005. The UK is by far Namibia’s largest

Figure 3. Cattle production, slaughtered head



Source: Meat Board of Namibia

Figure 4. Namibian total beef exports



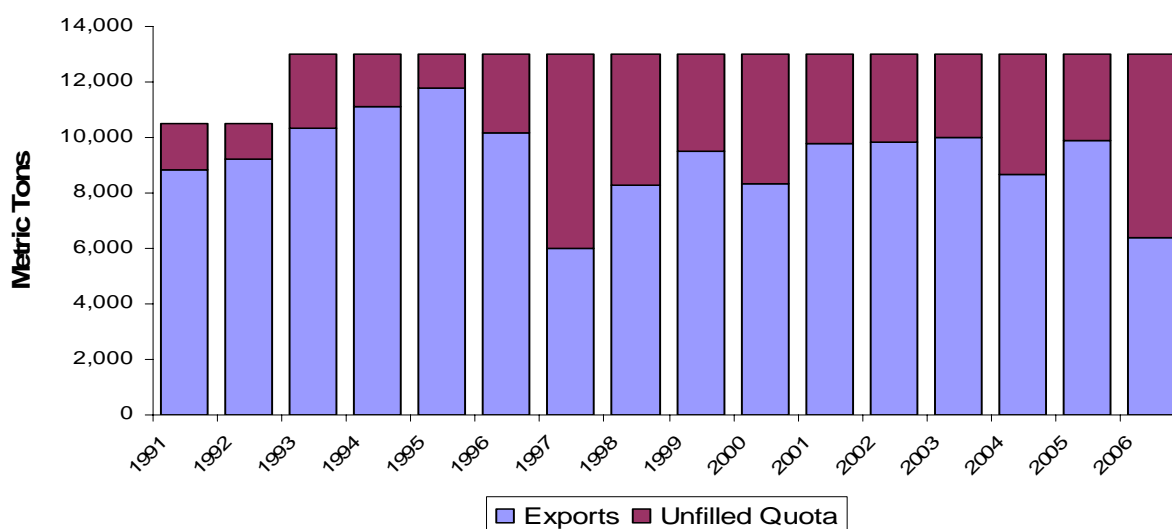
Source: Meat Board of Namibia

European customer, followed by Germany. Other importers include France, Greece, the Netherlands, Norway, Spain, and Switzerland (Eurostat 2007, FAOSTAT 2007).

The most surprising statistic for Namibia relates specifically to these exports to the EU. Under the Cotonou Agreement, the country enjoys an annual beef export quota of 13,000 metric tons.

Since 1991, the earliest year for which we have data, this has remained consistently unfilled. Figure 5 indicates an average fulfillment of only 73 percent, a fact that motivates the need for capacity building. Before turning to capacity building, we examine the factors that have made the Namibian cattle and beef industry successful at exporting. The involvement of the Namibian government in promoting industrialization has taken two forms: effective disease control services and market intermediation through parastatal entities. Through the first, the government has ensured sanitary compliance; through the second, it has helped solve the coordination problem. We deal with each of these in turn.

Figure 5. Namibian beef exports to the EU under Lomé/Cotonou



Source: "ACP Export" 2007

Disease control services

Two features of Namibia's disease control services make the quality of its beef credible in overseas developed markets -- disease zoning, facilitated by the use of a veterinary cordon fence (VCF), and a traceability system by which all cattle are tracked on an individual basis. These services are administered by the Directorate of Veterinary Services (DVS), a department under the Ministry of Agriculture, Water, and Rural Development. Its functions include coordinating

and supervising the overall animal health programs as well as regulating and controlling international commerce in live animals and animal products (APHIS 2005).⁸

DVS maintains surveillance programs for its high-priority diseases: foot-and-mouth disease (FMD), contagious bovine pleuropneumonia (CBPP), rabies, and exotic Newcastle disease. There is also ongoing surveillance for BSE. Of primary concern to developed countries when importing from developing countries is exposure of local livestock to FMD. The majority of Namibia's veterinary resources are thus devoted to controlling outbreaks of FMD (APHIS 2005).

Figure 6 shows how the country is divided into four FMD control zones: an infected zone, buffer zone, surveillance zone, and free zone. The Caprivi region in Namibia's "panhandle" comprises the infected zone, with its free-ranging African Buffalo. Since FMD outbreaks are not uncommon, DVS conducts vaccinations here to control the disease. The buffer zone is south and west of the infected zone and is at risk of FMD outbreaks due to its proximity to the infected zone and neighboring countries with poor FMD controls (e.g. Angola). Vaccination and movement controls are utilized in this zone (APHIS 2005).⁹

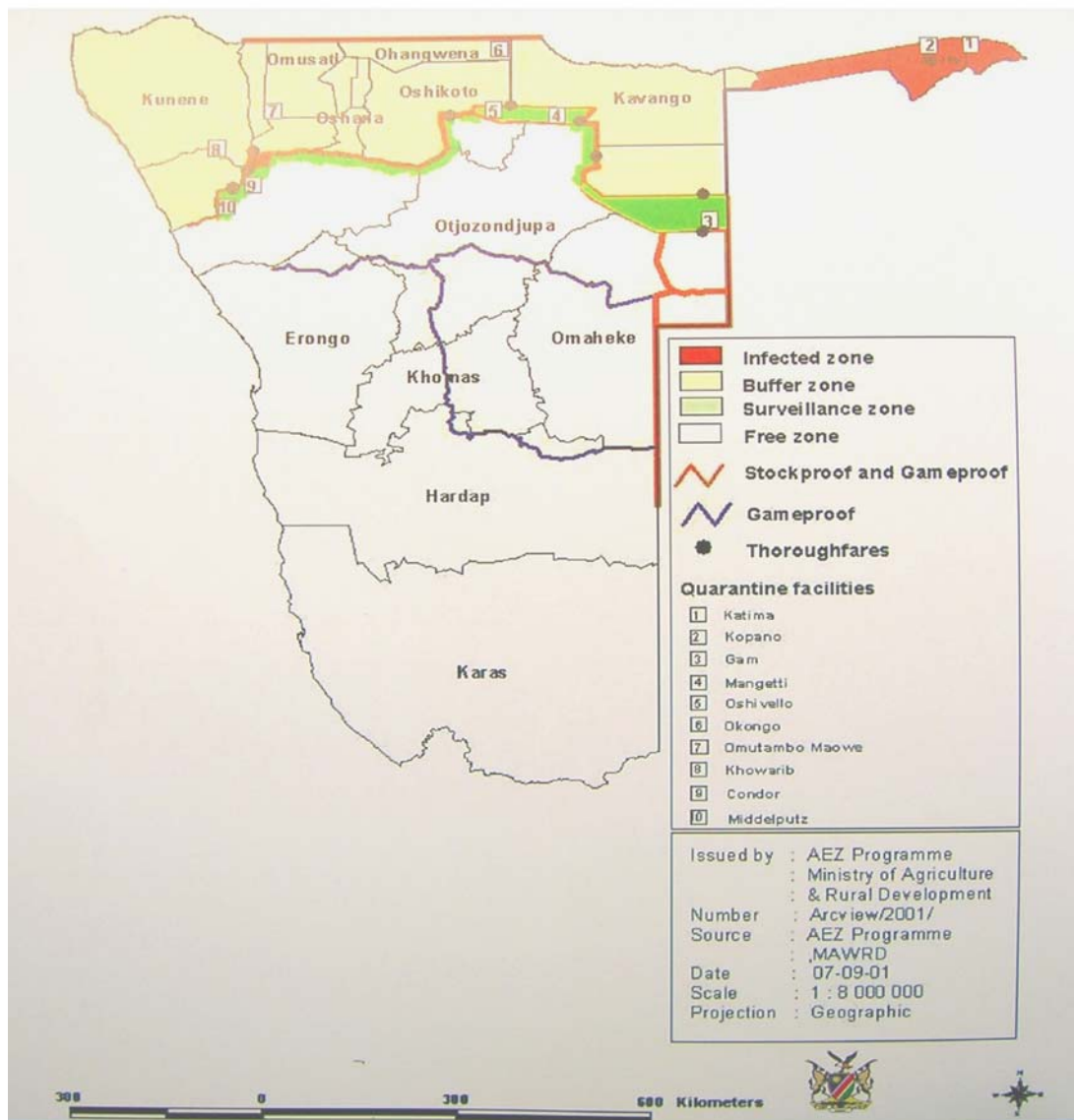
A veterinary cordon fence separates these two zones from the surveillance zone and the free zone. It consists of two fences, one eight feet in height, the other four and a half feet in height, separated by a dead space of approximately 32 feet. The surveillance zone borders the VCF and is inside the FMD-free area. FMD vaccination does not occur in this area, allowing DVS to

⁸ The 15 state veterinary districts are staffed by one to three veterinarians who administer state veterinary programs and provide veterinary services. The veterinarian is assisted by a chief animal health technician (CAHT), several animal health technicians (AHTs), and administrative personnel. In the communal farming areas there are community animal health workers (CAHWs) who though they are not federal employees undergo state-sponsored training. The federal, state, and private veterinary sectors cooperate and participate in information sharing. Namibia has maintained a computerized collection system for data on animal disease and agriculture issues since 1986. The system is used to collect, manage, analyze and report on animal health issues in Namibia. DVS also has a close relationship with the police who guard the VCF gateposts into the country's FMD-free zone. There are several other organizations involved in communication and information exchange regarding animal health, among them the National Agriculture Union, Namibia National Farmers' Union, and the Meat Board of Namibia. Since the latter is responsible for the administration of FAN Meat, it trains veterinary officials regarding the implementation of program provisions (APHIS 2005).

⁹ The buffer zone's last outbreak was in 1992, and as recently as 2002, FMD has been detected in the infected zone. The outbreak was controlled with vaccination and determined to be over in 2003 (APHIS 2005).

watch for signs of FMD and take appropriate action if necessary.¹⁰ The free zone lies south of the surveillance area and is entirely free of FMD. It primarily contains commercial farms, though communal farming areas are also present.

Figure 6. Veterinary zones of Namibia



Source: Meat Board of Namibia 2006

¹⁰ FMD has not been diagnosed in the surveillance or free zones since 1965, also making vaccination unnecessary in these areas since that time (APHIS 2005).

DVS manages the control of animal movement throughout Namibia. Permits are required for any animal movement, for high-risk animals, or those originating in the infected or buffer zones. Police monitor various checkpoints, check truck permits throughout Namibia, and help control areas when there is an outbreak. Inspection and quarantine is required for animals moving from the infected zone to the buffer zone. Live cattle are not allowed to move from the buffer zone to the free zone, though beef, after inspections, processing, and freezing, is allowed to move from the buffer zone to the free zone.¹¹

DVS is also responsible in part for the Farm Assured Namibian Meat Scheme (“FAN Meat”), the cornerstone of Namibia’s animal traceability system. Initially paper-based, all animals, most notably cattle, were tracked on a group basis as they moved from their farm of origin through the various stages of production. Each animal was identified by a particular brand symbol, and permits were required when any movement of the animal took place (Toto 2007).

In 1996, in the midst of the BSE scare in Europe, the EU passed regulations requiring its members and importers to establish a computer-based system for registering and tracking livestock, especially cattle, on an individual basis. A compulsory beef labeling system was also introduced, mandating that marketers of beef display origin information on their labels, noting particularly where the cow or cows were born, fattened, and slaughtered (European Parliament and Council of the European Union 2000). In response, Namibia introduced FAN Meat in 1999. It is a computer-based tracking system, and while each animal continues to bear a distinctive brand symbol, it now also boasts an ear tag containing a unique serial number. This allows for individual identification of animals as they move from their farm of origin. The Namibian Livestock Identification and Traceability System (NamLITS) is the electronic component of this system. It issues electronic permits for animal movement that are recorded in a centralized database (Toto 2007).

¹¹ Due to the lack of private veterinary services, DVS officials visit farms regularly throughout the year. Official inspections of each farm occur on an annual basis. For these visits, farm personnel are notified one month in advance and are required to present at least eighty percent of their livestock for inspection. DVS officials also inspect the farms’ food supply and any medications administered (APHIS 2005).

FAN Meat is jointly managed by the Meat Board of Namibia and DVS, the latter being responsible for its execution. Creation of the scheme was funded both by the Meat Board and the EU (Toto 2007). FAN Meat-branded beef is highly regarded in Europe not only because of the traceability (and therefore safety) standard, but also because the beef is hormone-free, and cattle-raising under the scheme is done according to welfare standards (Bowles et al. 2005).

Market intermediation

Two parastatal entities in Namibia make production and exports possible for its cattle and beef industry. These are the Meat Board of Namibia and the Meat Corporation of Namibia (Meatco). As far as Namibian parastatals are concerned (and there several others), these two are successful. Meatco, for instance, has been profitable and thus self-sustaining since 1997.¹²

The Meat Board, while government-owned, is privately financed and serves as the country's leading industry lobby. Its primary focus is the maintenance and development of export markets for its animals and meat products. The Board is also responsible for allocating export and slaughter quotas to farmers and for the administration (in conjunction with DVS) of FAN Meat.

Meatco is jointly owned by the government and private sector and is the country's largest meat processor, with four abattoirs (Bowles et al. 2005). Two of these—one in Windhoek, the capital, and one in Okahandja—are the only abattoirs in Namibia approved for export of meat products to EU countries, and each has a combined throughput of 500 to 600 head of cattle per day. The other two abattoirs process meats for South Africa and other markets. Meatco holds a monopoly on meat exports, but no restrictions inhibit the establishment of more abattoirs, provided they are able to comply with health and other regulations. Perhaps the high fixed costs required to “industrialize” the beef sector has deterred potential producers in other countries with a similar natural comparative advantage. We refer to this as the main “coordination problem” (see e.g. Murphy et. al 1989; Rodrik 1996; Saint-Paul 1992 for views and solutions to this problem in

¹² Motinga (2004) indicates that over the 1997-2003 period, Meatco's ratio of income to expenditure exceeded unity (a number greater than one implies profitability).

different contexts). The setting up of abattoirs and incurring the costs (reputation as well as monetary) to ensure food safety for EU consumers is substantial and establishing Meatco, the certified abattoirs, and providing disease eradication services has successfully solved this coordination failure problem and industrialized this sector in Namibia.

For its European customers, Meatco maintains sales subsidiaries in the United Kingdom, Germany, and the Netherlands. Meatco ships its meat primarily via Cape Town, South Africa, into Tilbury, England; Bremerhaven, Germany; and Piraeus, and Greece. Meatco's largest beef market is South Africa, and the company has offices in Durban and Johannesburg. Given the infrastructure, it is a small step to make investments to serve other lucrative markets with high safety standards such as the U.S., South Korea and Japan.

The comparison with India's manufacturing experience is relevant. For years India produced low quality goods in a protected import-substituting environment, but its experience with these activities endowed it with the human capital (if not the high-quality physical capital) required to compete in quality. When access to capital arrived with the 1991 liberalization, India has become the world's lowest cost and highest quality supplier in many manufacturing (e.g. steel) and services (e.g. software). The spillovers from having industrialized a sector are not to be underemphasized. Capacity building confers these benefits in the long run. In the context of African countries with the potential to produce beef, it may pay to industrialize the beef sector at the present time, even in countries with little or no experience at doing so. The current market conditions are right for building such capacity. For countries possessing a comparative advantage in beef production, our case analysis demonstrates that solving the industrialization problem is possible with the right government policy – undertaking infrastructural expenditures into the supply of disease control services and investment expenditures into intermediate activities such as setting up export-quality abattoirs.

2.3 Botswana

Situated in the heart of Southern Africa, Botswana is primarily an arid and semi-arid plateau. Its climate is hot and dry, and rains are erratic. About 45 percent of country's land area is under

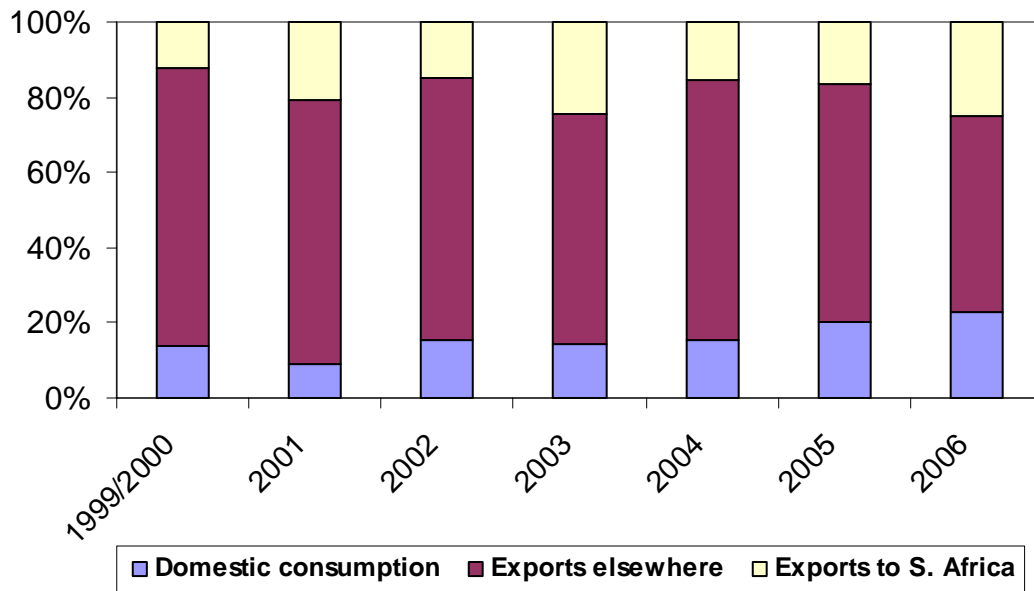
permanent pasture, and less than one percent is arable land or under permanent crops. Like Namibia, Botswana is well suited for cattle-raising. Livestock contributes about two percent to Botswana's GDP, but this accounts for nearly 90 percent of its total agricultural GDP. Some 20-25 percent of households are involved in raising cattle, whether as owners or employees (USAID 2006). Due to a drought in xxx the national herd in 2002 was an estimated 1.7 million head (FAO 2005a), well below the 1980s peak of 3 million. Regenerating a herd is possible to do in only a few years, but requires proper incentives. We will see how this is a central problem in Botswana.

Botswanan cattle farmers, like those in Namibia, are classified into one of two sub-sectors: commercial or communal. The former are generally freehold landowners and own around 15 percent of the national herd. Communal ("traditional") farmers maintain the remaining 85 percent on unfenced rangelands, and average communal herd size ranges from ten to 15 head of cattle (Von Bach et al. n.d.).

In 2002, Botswana slaughtered over 154,000 cattle, produced 31,000 metric tons of beef and veal, and exported about 42 percent of its production (nearly 13,200 metric tons) (FAO 2005a). Its major export markets are South Africa and the EU. Figure 7 shows Botswana's total exports and domestic consumption of chilled, frozen, and canned beef by percentage of quantity value for 1998-2006. Both, exports to South Africa and domestic consumption have grown, while exports elsewhere have declined, causing a "squeezing of the middle." This fact is evidenced by falling exports to the EU (Botswana Department of Agriculture 2007).

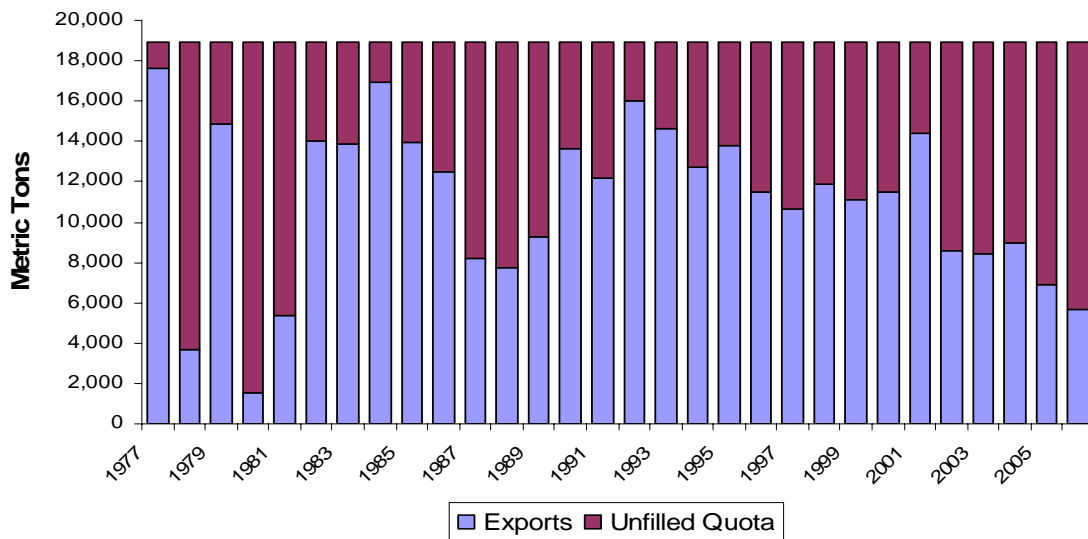
While Botswana's beef has successfully penetrated the EU market, like Namibia, Botswana's exports to the EU have consistently been unable to fill its annual beef export quota of 18,916 metric tons. While total EU exports have fluctuated since 1977 (the earliest year for which this data is available), they display a distinct downward trend since 1992. Figure 8 shows that average fulfillment over the period 1977-2006 was 58 percent. Since 1992, the average annual decline in total EU exports has been six percent.

Figure 7. "Squeezing of the middle": Destinations for Botswanan beef
Chilled, frozen, and canned products; by percentage of quantity value



Source: Botswana Dept. of Agriculture

Figure 8. Botswanan beef exports to the EU under Lomé/Cotonou



The need for capacity building seems even greater here than in Namibia, a problem to which we return below. We focus our attention at this point on the factors that, despite these statistics, have accounted for some measure of Botswana's success in accessing developed markets for its beef.

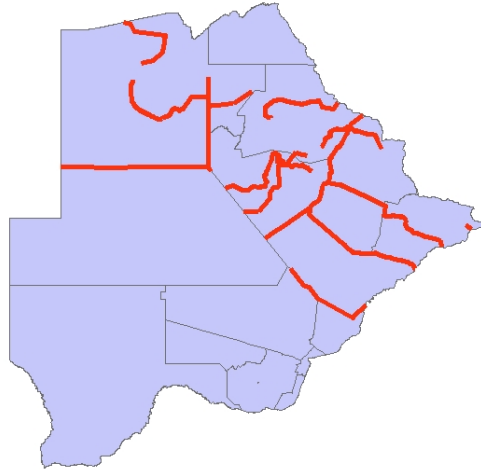
As with Namibia, we posit a two-fold role for the government that has been critical in catalyzing industrialization: disease control services and market intermediation through a parastatal.

Disease control services

The main components of Botswana's veterinary services that have enabled exports to developed countries are its disease zoning and traceability systems. In a broad sense, these are each a mirror image of their counterparts in Namibia. Zoning is accomplished by means of a veterinary cordon fence and vaccinations, and the traceability system, in accordance with EU standards, tracks cattle on an individual basis. Veterinary services in Botswana are primarily vested in the Ministry of Agriculture, and more specifically in that ministry's Department of Animal Health and Production (DAHP). DAHP is responsible, among other things, for animal disease control, maintenance of Botswana's veterinary zones, and the Livestock Identification and Trace-back System (LITS).

Botswana is partitioned into six veterinarian zones. Vaccinations for FMD, anthrax, and black leg are regularly conducted in the "red" or infected zones. Some 150,000 cattle receive two vaccinations per year, and another 30,000 in high-risk areas (particularly in the north) receive three. Buffer zones have been created to head off the presence or spread of FMD or other viruses. Figure 9 depicts the country-wide system of veterinary cordon fences in Botswana. The first fence was erected in 1958, and in the following decade, a double fence was built on Botswana's borders with Namibia and Zimbabwe. Today, veterinary personnel regularly patrol these areas for early protection against and prevention of disease outbreaks. Through the years, fences have been continuously added and modified to ensure a high standard of disease control and surveillance. Buffalo-proof fences are necessary in the north, as African Buffalo are considered to be the preponderant (and possibly the only) source of FMD in Botswana (European Commission 2000). Movement of animals between fenced regions is allowed only at specific, supervised checkpoints. The fences have played a key role in helping control animal movements and the spread of disease.

Figure 9. Botswana's veterinary cordon fence (VCF) system (in red)



Source: SADC Official.

Botswana's animal and meat traceability system, the Livestock Identification and Trace-back System (LITS), is similar to Namibia's. It utilizes a centralized electronic database to report and record cattle movements throughout Botswana. Rather than ear tags, however, LITS employs RFID-enabled boluses that are inserted into each cow's reticulum (second stomach) and contain scannable information (owner's name, personal ID number, brand, brand position, sex, color, location, date of the bolus insertion). A radio frequency reader is able to detect the signal each bolus emits and transmit that information to central government and district computers (Department of Animal Health and Production (DAHP) 2005; European Commission 2000).

LITS was initiated in 2000 after the adoption of the EU's new regulations. As in Namibia, the system's creation was motivated by Botswana's desire to maintain its lucrative market access. The system has beneficial spillover effects. Veterinary officials can now isolate animals for treatment more quickly, monitor weight gain in selected animals, select specific bulls for breeding, and even construct animal family trees. Cost savings have resulted as well. The system is now used to locate lost or stolen cattle, and for identification purposes, less time is spent manually checking cows' ear tags, the previous traceability medium (Burger 2004). LITS consolidated all previous tracking systems in Botswana, and the central database is linked to the

countrywide Government Data Network Infrastructure, permitting access to the farming community. 85-90 percent of the national herd is covered by the system (DAHP 2005).

Market intermediation

A parastatal organization known as the Botswana Meat Commission (BMC) makes beef exports possible for Botswana. Headquartered in Lobatse, BMC maintains sole responsibility for the slaughter and marketing of beef bound for export markets. As such, it functions as a monopsonist for export-oriented producers (Botswana Meat Commission (BMC) n.d.).

BMC, as a state-owned monopoly, sets the price at which it buys cattle from domestic producers. It extracts a profit on the margin between that price (as well as related operating costs) and the resale price in foreign markets such as the EU or South Africa. The price-setting mechanism was recently altered. In the past, the commission followed a seasonal pricing method that encouraged farmers to sell during off-peak times (i.e., the dry season), allowing BMC to smooth and maximize capacity utilization throughout the year (Nkhori 2004). Current official policy is somewhat obtuse. The prices for a so-called prime carcass is benchmarked to the price South African consumers are paying for the product. How BMC establishes prices for other carcasses remains unclear, though it is certainly not “export-parity” pricing...

The parastatal is an extensive network of facilities and subsidiaries. It operates two EU-approved abattoirs, one in Lobatse and the other in Francistown, with a combined throughput of 1,200 cattle per day. It maintains sales subsidiaries in South Africa, the UK, Germany, the Netherlands, and Greece, as well as cold storage facilities in Johannesburg, South Africa; Bremerhaven, Germany; and London (BMC n.d.).

Allied Meat Importers (AMI) is the name by which BMC subsidiaries are called in Europe. AMI was originally established (also in 1966) to import and market Botswanan beef in the UK, and as noted above, the UK remains an important export destination. In 1982, AMI expanded its operations to the three other European countries and is now able to maintain a significant pan-European presence. Despite Botswana’s EU export quota deficiency, AMI has exploited the

Cotonou Agreement (and its predecessor) with some success, garnering significant expertise in facilitating the beef trade under the agreement. In fact, in addition to Namibia's Meatco, Swaziland's Swaziland Meat Industries also contracts AMI to market and distribute its beef to European customers. BMC ships its beef via Cape Town and Durban, South Africa, to ports in Tilbury, Bremerhaven, and Piraeus. Durban is the preferred point of export due to its geographical proximity to Botswana.

A Problem

Technically, BMC is not permitted to operate at a loss (Samatar and Oldfield 1995), nor is it allowed to make a profit. Surplus revenues are returned at the end of each year to farmers who sold to BMC during the year, which is meant to encourage them to sell to BMC (Nkhori 2004) and not an alternative abattoir. The no-loss policy is a source of price distortions since it takes away from the important function of providing stable long-term signals. BMC's response to a supply shock (drought) is to make up the losses by squeezing the price paid to suppliers in order to make good on average costs, which are substantial during lean times due to underutilized capacity. The lack of marginal cost pricing and the transparent pass-through of export prices to producers badly distort market signals and present producers with often perverse incentives. In Botswana's case, this means selling to the domestic market when export markets are profitable, and not making the investments to regenerate the herd size since the price signals do not encourage increased production. Thus, a drought can make for a sudden stop when a more stable price signal would have enabled the industry to recover easily from the shock. Thus, while the BMC has made the necessary interventions to industrialize the beef sector and made exports viable – a major step in the right direction – its price distortions have worked to reverse those efforts. Capacity building thus takes on a different meaning in Botswana's context.

4. Analysis: Lessons from Namibia and Botswana

Namibia and Botswana serve as two exemplary cases of developing countries' capability of integrating into the global beef market. We elaborate on two lessons we consider particularly relevant to developing Africa. First, we have noted that governments in both countries have played a leading and positive role in promoting the industrialization of the beef-producing sector

by 1) ensuring effective, country-wide disease control and 2) assuming a market intermediary function. This institutional framework has allowed both countries to solve their respective coordination problems.

Second, we contend that the challenge for these countries moving forward is not one of sanitary compliance, but of capacity building for export, involving, more specifically, the expansion of intensive production and better incorporation of extensive (communal) farmers in the export process. We feel that the capacity constraints that Namibia and Botswana currently face are self-imposed, the products of misguided policies and a distorted incentive structure. Namibia's problematic land policies and Botswana's poor management of the Botswana Meat Commission have impaired productivity and led to an underutilization of resources in both countries. Thus, while these governments have been effective in coordinating production and providing some market signals, they have largely failed at putting the right incentives in place to promote full industrialization. The governments' willingness to amend the institutional framework in which their cattle and beef industries operate will be a key determinate in these industries' futures.

4.1 Explaining success: The government's role in industrialization

The scale and scope of disease zoning and traceability systems make a case for the necessity of government involvement. When the central government is able to effectively and credibly provide these services on a nationwide basis, private (or semi-private) actors such as individual farmers and abattoirs have an incentive to participate in the production process. They adopt a longer term view of their (profitable) place as intermediates or final goods producers in the supply chain. This is clearly one of the reasons that Namibia and Botswana have demonstrated their abilities in export markets, while other countries with similar resources (e.g. Angola, Mozambique) have not.

However, while government provision of disease zoning and traceability services facilitates resource-based comparative advantage, a successful beef-export industry is not "automatic." In low-to-middle-income developing countries access to credit is limited, and property rights are

not well defined.¹³ In addition, a transparent and diffuse price signal from buyers is necessary to coordinate production efficiently, but this may be hampered by a lack of intermediating institutions or by slow information diffusion. Above all, if private actors do not have the capability (whether through lack of funds, excessive risk, or lack of property rights) to build necessary infrastructure, establish meat-processing and cold storage facilities, and certify processes as meeting relevant standards—all elements crucial for a live animal or meat supply chain—animal producers will have no outlet for their products.

In this case, the government has a major role to play in solving the “coordination failure” that results. Industrialization of the sector needs the participation of producers of intermediate activities that comprise the supply chain. If potential participants are uncertain about the participation of others in the supply chain, they will hesitate to sink in the investment needed to participate. In turn, their non-participation will discourage others from participating as well. By establishing a market intermediary and the necessary infrastructure, the government can catalyze the industrialization of the cattle and beef sector, helping coordinate production and move products to market. This is exactly the path taken by both Namibia and Botswana. In the former, the Meat Board of Namibia helps link the industry to its customers and Meatco, as the country’s sole exporter, works closely with the board in marketing and selling its beef.

In Botswana, the Botswana Meat Commission fulfills a similar role in connecting domestic producers to foreign consumers. In addition to sourcing cattle from domestic farmers and processing the off-take, it manages the supply chain from its abattoir doors to the final customer. It transports beef products overland to South African ports; maintains cold storage facilities in Cape Town, Bremerhaven, and London; and handles marketing and final sale to European buyers through its AMI subsidiaries. Meatco is also a beneficiary of this supply chain, utilizing BMC cold storage in all locations and contracting with AMI for marketing and sale of its beef in Europe.

The substantial communal sub-sectors in both Namibia and Botswana, whose holdings comprise 50 percent and 85 percent of the national herd, respectively, has also benefited from

¹³ For more on property rights in Africa, see Kaakunga and Ndalikokule (2006).

intermediating institutions. They are linked into foreign markets via Meatco and BMC, without whom traditional farmers would lack market access. Meatco, for instance, sources 20 to 25 percent of its cattle supply from the communal sub-sector. But this can be increased greatly with the right incentives. Incorporating these producers more fully into the “formal” sector, particularly in Namibia, confers two benefits. It raises productivity and standard of living of communal farmers (encouraging them to produce to the market rather than for subsistence) and their increased participation can augment unfilled EU quotas.

4.2 The challenge: Capacity building

As we noted above, Namibia and Botswana have consistently been unable to fulfill their tariff-rate quota to the EU. Namibia exported less than 50 percent of its quota amount to EU countries in 2006. Botswana’s situation is more striking. Its annual beef export quota of nearly 19,000 metric tons per year has been in place since the late 1970s. While it has never fully achieved this level of exports, its sales to European markets began an especially precipitous decline in 1992, dropping, on average, six percent annually.

The primary cause of the deficiency in both cases is a redirection of exports. For Namibia, beef exports have been primarily redirected to neighboring South Africa where, as noted, Meatco enjoys a transportation cost advantage over its European sales. Also, the significant (160 percent) growth in Namibia’s live weaner exports to South Africa since 2000 means there are fewer cattle available for eventual slaughter in-country.

In Botswana, the redirection has been both to the domestic market and South Africa. Domestically, the prices offered to local producers by the export-oriented BMC have been in decline (a problem on which we elaborate below). The result has been a higher volume of cattle sales to local abattoirs and butcheries, who offer more attractive prices. Cattle farmers also contend with fewer transaction costs in moving their animals to slaughter locally. For instance, the domestically oriented establishments are likely to front the cost and equipment necessary to transport livestock to a processing site, sparing many farmers, especially small-scale producers, from concerns about vehicle, time, and gasoline.

The redirection of exports provides only a first-order explanation of the unfilled quotas. For Namibia, a puzzle is why Meatco has not taken advantage of the guaranteed European market for its exports *in addition to* exporting to South Africa. For Botswana, it is puzzling why, given the profits to be had in the EU, BMC does not raise its prices to compete with those offered by the local establishments. From a rational point of view, we would expect producers, in the absence of distortions, to expand production to the point of fulfilling the European demand for their products. That they have not is evidence of the presence of capacity constraints.

Might environmental factors help explain Namibia's and Botswana's failure to reach their production and export potential? After all, both countries are subject (many times simultaneously) to occasional drought, which is sometimes severe.¹⁴ Namibia, in recent years, is facing the additional problem of "bush encroachment" or desertification. This may become a long-term issue if not effectively addressed, and the impact on the cattle and beef industry could be severe.¹⁵

We believe, though, that neither of these is able to account for the persistent inability of Namibia and Botswana to fill their quotas, or in Botswana's case, for declining production and exports over the past 14 years. Drought is cyclical and short-term, and the effects of bush encroachment are only beginning to be felt. The real reason is that misguided policies and a distorted incentive structure are the factors primarily limiting an expansion of production and exports. We reiterate our contention that for countries that have partially solved the industrialization problem, like

¹⁴ In Botswana, the drought cycle lasts from 15 to 20 years, during which actual drought (defined for livestock as 40 percent less rainfall than the local average) occurs in two out of every three years. This cycle is followed by an above-average rainfall cycle. The early to mid-1980s and the early 1990s were times of drought in Botswana (Burgess n.d.). In Namibia, there is a lack of general consensus about drought patterns. Research suggests nine-year oscillations between predominant wet and predominant dry years. The country experienced serious droughts in 1970, 1982-1984, 1992, and 1995 (Sweet 1998).

¹⁵ The interaction of increased tourism in Namibia and the bush encroachment phenomenon may be blamed for production declines. Foreigners pay handsomely to participate in wild game hunts or sighting expeditions, and costs are typically low. On the other hand, bush encroachment onto land previously used for grazing stock has resulted in decreases in productivity. Producers find it profitable to exchange their domesticated herds for wild game, to intermix wild game with their herds, or simply to sell their land to tourism promoters.

Namibia and Botswana, further capacity building constitutes the removal of distortions and development of institutions, not compliance with health standards.

For other countries that have been gifted the resource abundance and hence the comparative advantage in beef, but whose potential for exports has yet to be tested, capacity building implies industrialization of the sector in the manner achieved by Namibia and Botswana, as well as avoiding their mistakes.

Addressing distortions

In the case of Namibia, land policies are especially onerous.¹⁶ The Namibian government maintains the right of first refusal for any new commercial land offered for sale. If it chooses to buy, the government then distributes the land in small parcels to non-whites who have volunteered to settle there. With their recently aggressive resettlement policy, the government's demand for such land is high,¹⁷ and this prevents allocation of the land to its more productive uses, among them commercial cattle-rearing for farmers looking to expand production.¹⁸ We note that the country's passage of the Agriculture (Commercial) Land Reform Act in 1995, when the government assumed the right to expropriate land from private owners as it saw fit (Banning 2004), coincided with beginning of a general decline in total cattle production (Figure 3). Total

¹⁶ The land tenure system in Namibia is divided into three categories: customary, freehold, and leasehold. (i) Customary land is communal land that may be used as arable land, for residential or grazing purposes, or for forests. The Namibian government holds this land "in trust for the people." Tenants have rights to use the land but do not own it. (ii) Freehold land is private property and primarily designated for commercial farms. A private owner possesses title and administrative rights to the land. Naturally, freehold land tends to be well developed, as owners are able to pledge their land as collateral in obtaining credit and (relative) security of ownership provides the proper incentive for economic exploitation of resources. This is not the case with the other forms of land tenure. (iii) Leasehold land is the subject of the most controversy in Namibia. Under the willing-seller, willing-buyer program, the government has the right of first refusal for any commercial farm offered for sale. It also reserves the right to expropriate farms from commercial owners and offer them compensation. Since 2004, the government has been keen to utilize this more aggressive approach (Banville 2004). The aim of the policy is to resettle historically disadvantaged populations on more productive land. Currently, some 4,000 white landowners control nearly half of Namibia's land. Under the resettlement program, individuals voluntarily apply for and choose a desired area of resettlement (this may also include communal (customary) land). The government then leases the land to tenants for a period of 99 years (Kaakunga and Ndalikokule 2006).

¹⁷ In the words of a Ministry of Lands and Resettlement official, "We are in need of at least 9 million hectares of land (nearly 35,000 square miles) to satisfy the need" (quoted from Banville 2004).

¹⁸ Admittedly, the resettlement policy has been undertaken for socio-political purposes. We are in no position, nor do we wish, to judge the efficacy of the policy on this front. We adopt an economic perspective.

production has dropped nearly 40 percent, from roughly 498,000 head exported or slaughtered in 1996 to about 302,000 in 2004.

Of course, tenants that have resettled productive land may engage in cattle production and might help make up the quota shortfall. This is difficult, however, as these producers are sure to remain on the extensive margin. With no rights to the property on which they settle, they find credit access necessarily restricted.¹⁹ Coupled with generally smaller lots of land (even if these farmers have the requisite knowledge for production) farmers have little incentive to use their land more intensively.

Botswana's incentive problem is primarily that of a perverse price signal to producers. The Botswana Meat Commission functions as a relatively effective intermediating institution and manages an extensive supply chain. However, in its capacity as a monopsonist, it has adopted a policy of setting prices to cover average costs. This excessively short-term view has had a deleterious impact on the domestic cattle and beef industry. Droughts and other supply shocks reduce capacity utilization, but with the correct price policies the herd may be expected to regenerate in a matter of 4-5 years.²⁰ Instead, capacity utilization at the BMC abattoirs is currently estimated to be a dismal 37 percent (its abattoir in Maun has not been operational since 1996 due to an outbreak of CBPP at that time and the subsequent killing of all cattle in the area (BMC n.d.). As we have mentioned, due to its policy of not taking even short-term losses, BMC sets a purchase price in order to make up its average cost. Underutilization of capacity due to an initial supply shock due to a drought then results in lower prices. This kills any incentive for producers to take the necessary steps to reinvest in their already depleted herd. Further, it encourages producers to look elsewhere to sell their produce reducing utilization at BMC even further. As a result, when there is upside potential in export markets, Botswana is unable to even come close to fulfilling its quotas. Even though prices have been stagnant in the EU they can still

¹⁹ Restricted credit access is "due to the fact that (a) the land is owned by the government and not the resettled people; (b) this ownership structure makes it difficult for the banks to reposes this land in case the borrowers in the resettlement area default on their loans; and (c) the leasehold of ninety-nine (99) years granted by government is not tradable, because it is not registered in the deeds office" (Kaakunga and Ndalikokule 2006, 8).

²⁰ Current throughput is about 130,000 head of cattle per year (Jefferis n.d.), or 37% of potential (from conversation with BCPA Official).

generate profits if there is an adequate supply into the BMC abattoirs. But their adverse pricing makes this impossible.

In sum, BMC's consistently lower price offers for cattle have reduced producers' investment returns and productivity. Even though BMC introduced export-parity pricing in early 2006 for prime carcasses, the majority of their prices do not reflect supply and demand conditions and discourage efficient long-term production and investment decisions by farmers. The result is falling cattle and beef production and a decline in the national herd. Both portend a crisis in the industry, and its future is even bleaker as Botswana confronts the end of its preferential access to European markets in 2008, reforms in the EU's Common Agricultural Policy, and further increases in domestic demand for beef (Jefferis n.d.).

Global institutions can build capacity in the Botswana context. In order to encourage export-parity pricing, allowing market signals to more efficiently allocate resources, these institutions could offer to take on part of the losses during periods of supply shocks in return for compensation when market conditions are good. This has the effect of allowing BMC to provide stable long-term prices signals to producers, in turn encouraging the investments that are vital to maintaining and growing herd size in order to take advantage of the upside movement in prices whenever they occur. BMC could then offer producers a price floor, and the opportunity to participate fully when market conditions are favorable. Producers would surely respond to a policy that benefit them from upswings in price but insulates them against an excessive downturn. Such an insurance scheme is not only possible, but necessary, in Botswana. The surplus generated from the price upswing (larger herd size, greater capacity utilization and thus lower unit costs) greatly outweighs the costs (difference between the guaranteed floor offered to producers and the market price) that must be borne by the three parties that bear the risks, namely BMC, the global institutions that may underwrite such a scheme, and the producers. What remains is an agreement on how to share the gains among the parties and the extent of risk bearing among the parties.

Communal farmers

In Namibia, one project with the potential to positively impact communal farmers is the proposed translocation of the VCF northward. The Meat Board of Namibia has undertaken the project to expand the country's FMD-free zone (Meat Board of Namibia 2006). Areas north of the fence, currently outside the disease-free zone, represent some of the best livestock land in Namibia, and much of it is occupied by communal farmers.²¹ Translocation of the fence and subsequent incorporation of these areas as disease-free thus promises greater integration of extensive producers and a boost to general supply and exports of Namibian cattle and beef.

The fence is eventually to be translocated to the border with Angola, where the Kunene and Okavango rivers would serve to extend the barrier naturally on its eastern and western flanks. The most eastern section of Namibia, the Caprivi region, is to remain an FMD-infected and buffer zone area (Meat Board of Namibia 2006). The Namibian government has recently created the VCF Task Force to accomplish its goal. A program is in currently place to help improve the health status of animals north of the cordon fence and transform the communal system there into a modern industry. The Meat Board will need the support of both the Namibian and Angolan governments in carrying out its task. Construction of infrastructure, disease surveillance, livestock traceability, and steady expansion of the meat industry are critical to success. The process is expected to take at least ten years, and projected costs for the entire project are some N\$249 million (US \$36.8 million). Currently N\$28.1 (US \$4.15 million) has been funded by the Cabinet of the Republic of Namibia (Meat Board of Namibia 2006).

While the translocation of the fence itself does not necessarily constitute capacity building, moving the fence will commence an opportunity for these farmers to be integrated into Namibia's broader production and export process. It may allow these farmers to buy into efforts by the government to provide effective extension services, familiarizing the farmers with best management techniques and with FAN Meat's quality controls and traceability functions.

²¹ See Sweet and Burke (2000) and the map of Namibian land's ability to support livestock.

Botswana's on-the-ground effort at capacity-building directed towards the communal sub-sector is considerably less than Namibia's. One reason is that communal cattle farming are very much the norm. Approximately 50 percent of the population owns at least one cow. The BMC does not play an active role in assisting producers and does not appear commercially sensitive to their needs. As the country's parastatal intermediary, it is in position to fill that need. Conditional on solving the price signal problem described above (which would elicit more output on the intensive margin from commercial producers), it can then go about aiding focusing on capacity-building efforts in order to increase supply on the extensive margin, that is, from communal farmers.

One way of increasing productivity in the communal sector, which is characterized by subsistence-level ranching, is consolidation among communal farmers, perhaps in the form of local cooperatives. Namibia provides a successful example. Local Namibian farmers often will form into a small cooperative, usually based on geographic proximity or tribal ties. The cooperative appoints a procurement officer as its head, and this individual handles the necessary paperwork and arrangements between producers and Meatco. The procurement officer communicates with the farmers to determine when they are ready to sell. The abattoir incurs the cost of transport from a local point to which farmers bring their cattle. Upon inspection, the cattle are slaughtered and the procurement officer collects from the abattoir and pays the farmers. While distorted incentives in Botswana make this scenario unlikely at present, it is a feasible option for future efforts. What makes the cooperative work is that consolidating small individual herds has the potential to regenerate and grow faster when they are organized collectively. There are economies of scale and scope. The surplus thus generated can now be sold on the market, without individual farmers worrying about their subsistence (which remains with them).

The development question of involving the informal sector in market activities is a crucial one for, just as in Botswana, most African countries to which the lessons from our case studies may be applied also have large informal sectors. We hope our study generates research interest in this understudied and important area.

5. Conclusion

Our analysis conveys two important lessons for converting latent comparative advantage in beef production into export success in profitable developed country markets:

- that compliance with health standards in destination countries is necessary and achievable, and
- that government has a crucial role in solving coordination failures.

First, international compliance is necessary. A country should seek to exploit its comparative advantage in livestock and meat production *within the context of* the current sanitary regime. SPS standards are transparent, trade-facilitating, and, as Namibia and Botswana demonstrate, attainable. This notion should be the point of departure for any policy aimed at building meat export capacity in developing Africa. In our view, hoping that developed countries might wax lenient in enforcing their food safety standards or seeking somehow to circumvent the regulations are wrongheaded endeavors. Developing African countries most certainly can cost-effectively export. What is required first is that they fully comply with international standards. Efforts to this end in developing African countries with the aid of technical assistance programs such as the Standards and Trade Development Facility can make this achievable.

Second, the government's role is critical in solving coordination problems that stand in the way of industrializing the meat-producing sector. The first set of policies in this regard are (i) ensuring disease control and (ii) assuming a market intermediary function. The facts on the ground in Namibia and Botswana serve to reinforce our repeated contention that publicly provided, effective disease control services are critical in a country's path to export certification. Among these, the foremost elements are strict disease zoning and traceability systems. In the case of the former, we offer a further argument in the African context, namely, that zoning will require the use of veterinary cordon fences (VCFs). There seems to be no more effective, cost-efficient way of controlling animal movement and preventing contact between disease-free herds and disease-carrying animals. Namibia and Botswana both utilize a VCF system, which has proved effective in gaining them access to the EU market.²²

²² Disease control and eradication efforts in the absence of VCFs have to be a regional endeavor. Where neighbors are also committed to surveillance for and control of disease outbreaks, a country may enjoy

The second set of policies in the industrialization process is to facilitate market access for suppliers. Coordination failures may arise where capital markets are inefficient and financing is limited, where information is hard to come by, and where a price signal is lacking. We expect this will apply for much of developing Africa and, for examples, look to the functioning of Meatco and BMC as parastatal coordinators of production to assist the cattle and beef industry in becoming cost-competitive.

Finally, we expect many of these countries to find, as Namibia and Botswana have found, that capacity building in order to overcome obstacles to competitively exporting animal and meat products implies the crafting an incentive structure that shields producers from supply shocks and passes to them the benefits from favorable market conditions, which we expect to be the rule in this market due to growing world demand. We leave open the development issue of how best to provide the incentives for the informal sector to participate in the market and enjoy some of the same upside as the already commercialized sector. Research in the direction of consolidation of this sector may produce useful answers.

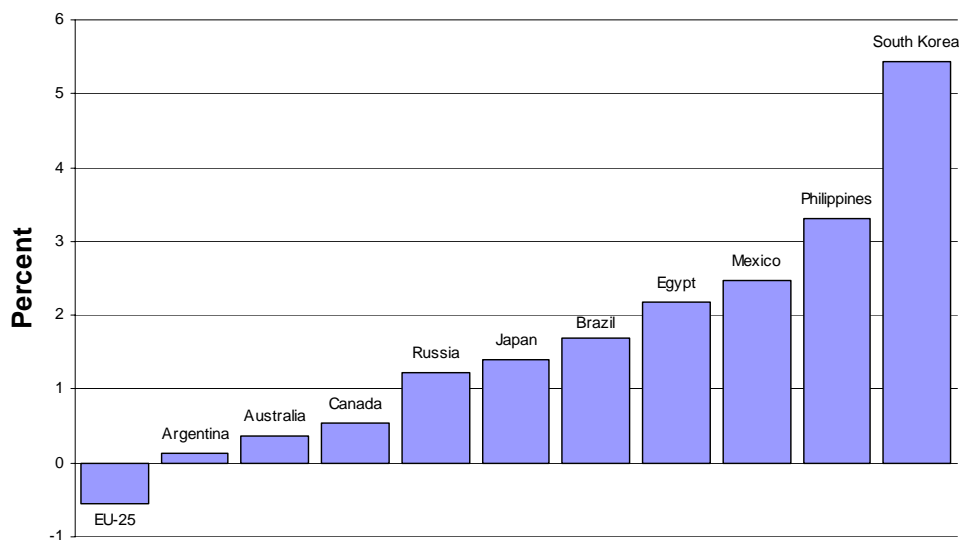
This research has involved two specific countries in a particular region on the vast African continent. The constraints faced by many African countries are many, various, and perhaps entirely different than those faced by Namibia and Botswana. Nevertheless, we advance our arguments in the hope of providing a springboard for future policy discussions and research.

complete freedom from disease within its borders and may not require the erection of artificial barriers to monitor and control animal movements on a national scale. Uruguay is a case in point. It is bordered by Argentina and Brazil, two large beef-exporting countries whose governments continuously and effectively enforce policies for disease control and maintain a reliable traceability system in order to maintain their own competitiveness in the industry. These actions create a positive externality for Uruguay: it need not be constantly concerned about the presence of disease in neighboring countries which may threaten its own beef industry. In Namibia and Botswana, though, this is not an immediate possibility. Their neighbors (Angola and Zambia, for instance) are not similarly committed to disease surveillance and control, opening up the possibility of contagion. Even relatively developed South Africa wrestles with FMD problems in certain areas. Thus, the need for Namibia and Botswana to create their own disease-free. It is impossible to completely and at once eradicate diseases such as FMD from a national herd; nothing short of slaughtering vast numbers of animals would accomplish this. A stepwise process is needed, and a VCF provides that.

Appendix 1: Growth projections in the global market for beef

The USDA's baseline projections for growth in beef consumption for a variety of countries are depicted in Figure A1.²³ Figure A1 indicates the EU is expected to reduce its consumption of beef by about 0.5 percent per year during the next decade. Consumption in other developed countries such as Australia and Japan is expected to rise, but at a very slow pace. Emerging countries, on the other hand, are projected to increase their beef consumption significantly during this period. Since these markets include China and other large markets such as Brazil, we posit that the world demand for beef will raise prices and provide attractive export opportunities for countries with a comparative advantage in the production of beef. This has important implications for growth in countries in Africa who have the demonstrated potential to produce beef beyond what they consume. The income and price elasticities (superior and price-inelastic for high-income Japan) estimated by Chern et al. (2003) indicate that in many emerging countries we can expect to see beef consumption increases of the order of magnitude depicted for South Korea.

Figure A1: **Annual projected change in beef consumption, 2005-2016**



²³ These projections take into account several important factors including increased diet diversification, population growth rates, trade agreements, and disease concerns. The projections assume stability in the current path of individual countries' domestic and agricultural trade policies; continued economic and trade reform, as is underway in developing countries; trends in technology; and consumer preferences in this market.

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