African natural products: globalisation, technology and lessons from enterprises providing export markets for African farmers.

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ABSTRACT

This paper reviews the ingredients for success and policy lessons from micro- and small enterprises producing African natural products for export. Unlike previous comparative studies that focussed mainly on informal sector production on non-timber forest products (NTFP's) for local and national markets, we assess two very different export sectors for practical and policy lessons: (1) Private Sector Development (PSD) and "venture socialism", where export business is linked to African producer associations and (2) export of two narcotic plants, *Catha edulis* and *Cannabis sativa*. In the case of PSD, during most of the 20th century, from 1900 to the 1980's, scale of natural product exports was achieved with grading and basic processing done in Africa, but most industrialized value-adding and re-exports done from Europe. Since the 1990's, this is been changing on two fronts. Firstly, through support for Trade Hubs and processing facilities within Africa and secondly, due to the China and India as growing markets for several important natural product market niches: natural cosmetics, flavours and fragrances. Wider recognition of the value of recent policy developments is needed, for example for processing technology transfer, US-AID's development of Trade hubs, and favourable trade agreements (such as the African Growth and Opportunity Act (AGOA) and EU cocoa butter directive). International technical assistance through systematic, evidence-based reviews combined with legal support can help lift additional barriers (such as EU Novel Foods legislation) applied to African fruits such as baobab (*Adansonia digitata*) fruits that have been eaten for thousands of years of use without documented side effects, yet are currently barred from trade to Europe as "novel foods".

1. Introduction

Sub-Saharan Africa (SSA) is widely viewed as not having benefited much from globalization[1], particularly when compared with Asia and several Latin American countries. Nevertheless, Africa's economy is projected to grow at its best rate since the 1970s, increasing from 6.1% in 2007 to 6.8% in 2008[2]. African policymakers are increasingly confident, however, that they are developing the basis for sustained growth over the next decade, when income gaps will start to narrow[3]. African countries with mineral resources, oil, liquefied natural gas (LNG) and tropical timber have experienced rapid increases in exports, stimulated in part by economic growth in China and India. A key question is how much of this growth will improve the lives of the rural poor? It is widely expected, for example, that one of the major the Millennium Development Goals (MDGs) – that of halving the number of people living in poverty by 2015 - this is unlikely to be achieved in most of SSA.

Over the past decade, extensive research and analysis has developed lessons related to enterprise development, but at vastly different scales. At a global scale, Fagerberg, Srholec and Knell (2007) analyzed factors behind the performance of 90 countries, examining why some countries succeed, while others fail, highlighting how technology, capacity, and demand competitiveness have enabled Uganda to catch up in terms of real GDP growth, while South Africa has lost momentum and Burundi, Cote d'Ivoire and Zambia have fallen behind during the period 1980-2002[4]. Collier (2007)[5] has similarly analyzed factors influencing

[1] Pearson, D.R., S L Aranoff, D T Okun, C R Lane, I A Williamson and D A. Pinkert, 2007. Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries. First Annual Report Investigation No. 332—477. U.S. International Trade Commission, Washington, DC

[2] International Monetary Fund (IMF) 2007 World Economic Outlook. October, 2007.

[3] The Economist 2007 Africa's boom is not only because of pricey commodities (19 Oct). http://www.economist.com (23 Oct 2007)

[4] Fagerberg, J., Srholec, M and M Knell. 2007. The Competitiveness of Nations: Why Some Countries Prosper While Others Fall Behind. World Development 35 (10): 1595–1620

poverty in developing countries, while at a continental scale; Rogerson (2001) has reviewed small enterprise developments across sub-Saharan Africa in order to identify the ingredients of 'success' and best practices of policy support for African small enterprise development[6].

Small businesses anywhere face many challenges. Even in urban areas of developed countries, and failure rates are high. Research in both developed[7][8] and developing[9] countries has assessed why firms fail (or are successful), enabling policymakers and small business advisors to better serve the small business sector. Since 1994, when a democratic government was formed in South Africa, for example, there has been strong policy support for rural enterprises through incorporated a Rural Economic and Enterprise Development (REED) framework have been into integrated development planning (IDP) or into strategic local economic development (LED) plans. Despite this policy support, failure rates are high and support for micro-enterprises has been low compared to small and medium enterprises (Davis, 2006; Rogerson, 2004). In addition, while agriculture gets significant policy support, there is little recognition most rural farmers obtain significant household income through use of indigenous plants or plant-derived products such as honey[10], edible caterpillars[11] or ectomycorrhizal mushrooms has also been poorly recognized[12].

This paper synthesizes lessons from enterprise development in farming communities based on indigenous and naturalized plant species with regard to three questions: (1) what has been missing in comparative analyses of micro- and small enterprises based on indigenous or naturalized NTFP's? (2) What are the characteristics of "winning products" and how are these likely to help with poverty alleviation? and (3) what lessons can be drawn from successful enterprises that are relevant to policy makers, the private sector and in practice to African farmers? To answer these questions, we review published literature and draw on our experiences as researchers working with successful enterprises to address these issues, structuring the paper as follows. In Section 2, we summarize how this paper differs from previous analyses of trade in non-timber forest products (NTFP's) and why we have chosen to focus on export oriented micro-enterprises. Section 3 sets out the characteristics of winning products, illustrating lessons drawn from successful enterprises. Section 4 identifies unresolved issues and new opportunities that need research, followed by Section 5, that concludes the paper.

2. Enterprises and non-timber forest products: what about export markets?

Micro-enterprise development is widely recognized as important in Africa, where self-employment helps create economic opportunities for low-income households with limited employment options or

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[5] Collier, P. 2007. The bottom billion: Why the poorest countries are failing and What can be done about it. Oxford University Press, New York.

[6] Rogerson, C.M., (2001): In search of the African miracle: successful small enterprise development in Africa, Habitat International 25 (1):115-142

[7] Bruderl, J., P Preisendorfer and R Ziegler. 1992. Survival Chances of Newly Founded Business Organizations. *American Sociological Review* 57: 227-242

[8] Stokes, D and R Blackburn. 2002. Learning the hard way: the lessons of owner-managers who have closed their businesses. *Journal of Small Business and Enterprise Development* 9(1):17-27

[9] Rogerson, C.M. 2004. The impact of the South African government's SMME programmes: a ten-year review (1994-2003*). Development Southern Africa* 21(5).

[10] Mutamba, M. 2007. Farming or foraging? Aspects of rural livelihoods in Mafulira and Kabompo districts of Zambia. Paper presented at the workshop Policies and Incentives for Miombo Woodland Management, October 30–31, Lusaka, Zambia

[11] Ghazoul, J. (ed). 2006 Mopane woodlands and the mopane worm: enhancing rural livelihoods and resource sustainability. Forest Research Programme Report R7822, DFID, UK

[12] Shackleton, C and S Shackleton. 2004. The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. South African Journal of Science 100: 658-664

earning power[13]. While most assessments of medium, small and micro-enterprises have dealt with the manufacturing, mining, agricultural or timber sectors, it is only recently that comparative studies have been carried out on the non-timber forest product (NTFP) sector. Recent studies of NTFPs commercially traded in Asia, Africa or Latin America have all cautioned against undue optimism[141516] with Belcher and Schreckenberg (2007) calling for a "reality check" on what these micro-enterprises can – or cannot - deliver[17]. Similarly, Wunder (2001)[18] has suggested that forms of land-use other than sustainable harvest of NTFP's from tropical forests may provide a better route out of poverty than forest based enterprises. While this is likely on soils with high arable potential, land-use options in regions with low arable potential are more complex, with indigenous plants playing a crucial social safety net role and as a source of income[1920].

Although the comparative studies of commercially NTFP's examined a wide range of cases (61 cases by Ruiz-Perez et al (2004) and a sub-set of 55 these same cases (Kusters et al., 2006), with 18 separate Latin American cases analysed by Marshall et al (2006), relatively few of the 61 cases (17 cases (28%)) even were African examples. In addition most African cases were products for domestic markets rather than for export. In his recent book, Collier (2007) points out the extent to which the African manufacturing sector has stagnated due to protectionism, low productivity and more recently, competition from India and China, stressing how important it is for African economies to break into export markets[21]. It is useful, therefore, to examine the exports of NTFP's that have been missed in previous comparative analyses in order to tease out wider lessons for other products. Started in 2001, Phytotrade Africa a trade association across southern Africa, had over 10000 producers and an income of US$ 2.5 million per year by 2005, generated 40% of its annual recurrent costs and expected to have 40 000-50 000 producers within five years[22].

The natural product export cases we consider can be divided into two main categories. Firstly, those driven by Private Sector development (PSD) or "venture socialism" (where export business supports

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[13] Woller, G. 2004. A review of Impact Assessment Methodologies for Micro-enterprises Development Programmes in Evaluating Local Economic and Employment Development, OECD, 2004.

[14] Kusters, K., R. Achdiawan, B. Belcher, and M. Ruiz Pérez 2006. Balancing development and conservation? An assessment of livelihood and environmental outcomes of non-timber forest product trade in Asia, Africa, and Latin America. *Ecology and Society* **11**(2): 20. [online] URL: http://www.ecologyandsociety.org/vol11/iss2/art20/

[15] Marshall, E., Schreckenberg, K. and Newton, A. C. (eds). 2006. *Commercialization of Non-timber Forest Products: Factors Influencing Success: Lessons Learned from Mexico and Bolivia and Policy Implications for Decision-makers.* Cambridge: UNEP World Conservation Monitoring Centre.

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[17] Belcher, B and K Schreckenberg. Commercialisation of Non-timber Forest Products: A Reality Check. Development Policy Review 25: 355-377

[18] Wunder, S. 2001. Poverty alleviation and tropical forests—what scope for synergies? World Development 29(11): 1817-1833.

[19] Cunningham, A.B. 1985. The resource value of indigenous plants to rural people in a low agricultural potential area. PhD thesis, Faculty of Science, University of Cape Town.

[20] Shackleton, S E. 2005. The significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa. PhD thesis, Department of Environmental Science, Rhodes University.

[21] Collier, P. 2007. The bottom billion: Why the poorest countries are failing and What can be done about it. Oxford University Press, New York.

[22] IFAD. 2005. Report and recommendation of the President to the Executive Board on proposed grants under the global/regional grants window for Agricultural Research and Training by non-CGIAR-supported international centres. EB 2005/85/R.26/Rev.1, Agenda Item 15(b). International Fund for Agricultural Development, Executive Board, Eighty-Fifth Session, Rome, 6-8 September 2005. www.ifad.org (downloaded 12 December 2007)

African producer associations) in five growth sectors: (a) natural and organic cosmetics; (b) flavours & fragrances (including aromatic resins); and (c) functional food ingredients (or nutriceuticals); (d) colloidal gums (principally gum arabic from *Acacia senegal* or *Acacia seyal*); and (e) alcoholic beverages using African fruits. Secondly, the very lucrative trade in two plant-based drugs, *khat* (*Catha edulis)* from an indigenous African tree and cannabis (*Cannabis sativa*), originally from South Asia, but is naturalized in Africa. The scale and value of market sectors in these two categories is significant:

- **Natural and organic cosmetics:** Global sales of natural and organic cosmetics were worth almost US$7 billion in 2007, reaching US$10 billion by 2010[23]. Although driven by demand from Europe and North America, India and China are important emerging markets. Since buying Sanoflore and The Body Shop in 2006, L'Oreal is working with African producers of cosmetic oils. Also at the high end of the market, Origins Natural Resources, part of Esteé Lauder, has launched a certified organic cosmetic called Origins Organics. In addition, European supermarkets are marketing natural and organic cosmetics under private labels. New Product Development (NPD) has become a key feature of the natural cosmetics market. Certification is an important component of this market, with Ecocert and UK Soil Association working closely with cosmetic manufacturers, who are innovating developing new product formulations, including natural preservatives, surfactants and colorants in a shift away from synthetic chemicals. There already is a significant export trade in African plant products for this market, including:

  Shea butter, from seeds of *Vitellaria paradoxa*[24] has two main components, stearin (used in chocolates and margarine) and olein (used in cosmetics). Lovett (2004) suggests that shea exports do not exceed 150,000 t per year, the FOB value would be worth about $37.5-45 million per year. In the global market, four companies dominate refining of shea butter, two in Scandinavia (Aarhus United (Denmark) and Karlsham (Sweden), one in Japan (Fuji Oils) and one in the Netherlands (Loders Croklaan)[25];

  ***Terminalia sericea* root bark** exported from Tanzania, from which sericoside is extracted to produce a high value component for cosmetic skin cream by the company Indena Spa. In Milan, Italy;

  Marula seed oil (*Sclerocarya birrea*) exported to Europe through production by over 5000 members of Eudafano Women's Cooperative association. Projected demand (2008) is 20 tonnes of oil, worth N$2.9 million locally, extracted in a recently opened processing centre for export to Europe;

  Cosmetic oils from **Kalahari Melon seeds** (*Citrullus lanatus,* Cucurbitaceae), the ancestor of the watermelon, which has been domesticated into many farmer varieties in Namibia. About 250 tonnes of Kalahari Melon Seeds (KMS) (equivalent to c. 36

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[23] NPIcenter. 2007. Global Natural Cosmetic Sales Approaching US $7 billion. Monday, 17 September 2007. www.npicenter.com (accessed 26 December 2007)

[24] Holtzman, J. 2004. The shea butter value chain: study synthesis and recommendations for WATH. WATH technical report no.1. USAID, Washington, DC.

[25] Addaquay, J. 2004. The shea butter value chain: refining in West Africa. WATH Technical Report No. 3, USAID, Washington, DC.

tonnes of KMS oil) were exported from Namibia from 2001-2005, collected by 600-1000 women, about a fifth of whom are members of Eudafano Women's Cooperative association;

Sour-plum seed oils (*Ximenia americana* and *X. caffra*), by 700 members of a *Ximenia* collectors group in north-central Namibia for export to Europe.

- **Flavours & fragrances:** The world flavour and fragrance market is predicted to reach US$18.6 billion in 2008. *Flavours* are used commercially in beverages, foods (confectionery, bakery, savoury and snack foods), pharmaceutical products and mouth-washes. *Fragrances* are used in perfumes, cosmetics and toiletries, soaps and detergents, household cleaners, air fresheners and in aromatherapy. Four companies currently account for around 40% of the global market. Two are Swiss (Givaudan SA and Firmenich International SA), one (Symrise) is based in Germany while the fourth (International Flavors & Fragrance (IFF)) is based in New York. At this stage, few African countries can compete in the manufacturing of flavours and fragrances, but they can supply quality, value-added products to a market looking for innovative new products and blends. International flavour and fragrance houses are dealing with rising labour costs in Europe, North American and Japan by shifting to India and China as manufacturing capabilities as hubs. In addition, both China and India are growing markets for flavour and fragrances products as people increase their spending on sophisticated personal care products. The Indian flavours and fragrance market is valued at around $225 million, 55% of which comprises fragrances. Wash products, including soap, hand washes and shower gels, account for 42% of this, with shampoo (5%), hair oil (3%) and fine fragrances (2%) of the Indian fragrance market. Market success in this sector depends on African ability to select key commercial partners, use its "natural advantage" in endemic aromatic plants to develop new market segments at an early stage and in its the ability to function on a globally integrated scale.

- **Functional foods (or nutriceuticals):** these are foods promoted to have health benefits in addition to their nutritional value. The global functional food market is over US$73 billion/yr. Breakfast cereals account for 26% of this market. Energy drinks (which often contain *guarana* (from the South American liana, *Paullinia cupana*) as an ingredient, form another 20% of the market. With ageing and health conscious populations in Europe and North America, often wanting to take their own responsibility for their health, this is a growing market, but is a risky and costly one to get into. In the UK, however, the functional food and drink sector grew by 159% between 1999 and 2001 and is now valued at £667 million. Africa has a high diversity of edible plants that are still commonly eaten today[26] and have a long history of human use, so side effects, if they occur at all, are well known by local people.

- **Colloidal gums:** The specifications of gum arabic are defined within the European Union as 'the dried exudate from the trunks and branches of *Acacia senegal* or *Acacia seyal* in the family Leguminosae'. This limits competition from other gums with hydrocolloidal properties, which are not only found in other *Acacia* species, but also in *Combretum* and *Terminalia* (Combretaceae). Gum Arabic is used in the food industry as a stabilizer, in soft drink syrups, (including Coca-cola), for making gummy sweets (gum drops), chewing gums and

[26] Cunningham, A B and C M Shackleton. 2004 Use of fruits and seeds from indigenous and naturalized plant species. Chapter 20 in: H Eeeley, C Shackleton and M Lawes (eds) *Use and Value of Indigenous Forests and Woodlands in South Africa*. University of Natal Press, Pietermartizburg.

marshmallows, in shoe polish and in watercolour paints. In 2002, Africa exported over 54 000 tonnes of gum arabic, with Sudan dominating the world market and exporting to about 30 countries. Ethiopia and Eritrea, contributing 1.6% and 0.6% of world production, respectively, are small-scale producers. While raw material harvesting, processing and grading are done in Africa, most value-adding is done in importing countries. The same applies to flavours and fragrance products. France is the leading importer of gum arabic (accounting for more than 40% of global imports), with Colloïdes Naturels International in Rouen the world leader in gum arabic processing.

- **Alcoholic beverages using African fruits:** Launched as a spirit in 1983 and as a liqueur in 1989, Amarula is now exported to over 90 countries worldwide, with 25.6% growth in Amarula sales volumes in international markets in 2006[27]. Although this case would be difficult to replicate without a partnership with a major company like Distell (with annual income of R7.95 billion (2006)), this category is included here for two reasons. Firstly, it demonstrates how the South African Distell Group (a publicly listed company formed through a merger between Distillers Corporation and Stellenbosch Farmers Winery) has created South Africa's internationally best known consumer product through masterful branding, using two African icons – elephants and the marula (*Sclerocarya birrea*) fruit. Secondly, although income from marula fruit sales to Distell was similar to that earned by women brewing marula beer for local markets, marula fruit traders still earned 1.3-2.1 times more than the average local farm-worker[28].

- **Marijuana (*Cannabis sativa*):** Cannabis is the world's largest illicit drug, produced in over 140 countries, with a consumer market of about 160 million people. Global cannabis production in 2005 was 42,000 metric tonnes, compared to global heroin production (472 mt) and global cocaine production (980 mt)[29]. Although more cannabis was produced in the Americas (46%) than in Africa (26%) in 2005[30], cannabis remains an important source of income for small-scale farmers, particularly in South Africa, Malawi, Zambia and Swaziland), Nigeria, Ghana, the Democratic Republic of the Congo, Tanzania and Morocco (although Morocco is better known as a cannabis resin producer). In South Africa, where the Cannabis crop is worth R5 billion/year (c. US$900 000/yr) cultivation can be an important source of cash income in some rural areas[31]. Due to high demand and high cannabis prices in Europe, the late, great journalist Carlos Cardoso suggested legalized production in Mozambique for export to Holland[32] (which along with Albania currently is a major re-exporter to the rest of Europe). Although cannabis cultivation is illegal in sub-Saharan Africa, the value of the *khat* (*Catha edulis*) trade to the Ethiopian government in the final market niche covered below bears out Cardoso's reasoning. In South Africa, however, Kepe (2003) suggests that although Cannabis is a useful income source for some rural farmers (and even more so for urban traders), legalization in South Africa may not benefit small scale producers due to competition that would ensue from large-scale commercial producers;

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[27] Distell Annual Report, 2007. The Distell Group, Stellenbosch.
[28] Wynberg, R.P., Laird, S.A., Shackleton, S., Mander, M., Shackleton, C., du Plessis, P., den Adel, S., Leakey, R.R.B., Botelle, A., Lombard, C., Sullivan, C., Cunningham A B. and O'Regan, D.P. 2003. Marula policy brief. Marula commercialisation for sustainable and equitable livelihoods. *Forests, Trees and Livelihoods*, **13**: 203-215
[29] UNDOC. 2007. World Drug Report, 2007. UN Office on Drugs and Crime. ISBN 978-92-1-148222-5
[30] UNDOC. 2007. World Drug Report, 2007. UN Office on Drugs and Crime. ISBN 978-92-1-148222-5
[31] Kepe, T. 2003. *Cannabis sativa* and rural livelihoods in South Africa: politics of cultivation, trade and value in Pondoland. Development Southern Africa 20 (5):605-615
[32] Fauvet, F and M. Mosse. 2003. Carlos Cardoso: Telling the Truth in Mozambique. Double Story, Cape Town.

- **Khat (or miraa) from *Catha edulis*:** In 1998-1999, the *khat* trade accounted for 13.4% of Ethiopia's export revenue[33]. In Kenya, cross-border trade (including daily flights from Nairobi's Wilson Airport to Mogadishu) is largely unmonitored, but in 1993 the Kenya–Somalia trade was considered to be worth US$100 million per year[34]. The trade in Ethiopia was estimated at US$500 million annually[35]. Farmers in Meru district, Kenya, and in Harrarghie, Ethiopia, are the world's most important producers. Farmers in the Habro district in Ethiopia earn 70% of their income from *khat*, as a maize-*khat* intercropping system is 2.7 times more profitable than maize mono-cropping[36]. More recent estimates of *Catha* leaf imports to the UK are 6 tonnes per week. This export feeds into a smuggling network to the US, where *khat* sells for US$28–50 for a 200 g bundle, or US$300–440 per kilogramme[37], putting the UK–USA trade at approximately £150 million per annum.

3. Characteristics of winning products: lessons drawn from successful enterprises

Despite their diversity, African natural products produced for international export markets have many characteristics in common. Particularly important is the need to understand supply chains, understanding who the consumers and actors are along the supply chains in terms of prices, roles and market potential. Successful enterprises have concentrated on a few species that are potential winners instead of trying to do everything, aiming to get economies of scale where production is by small-scale harvesters by coordinating producers for the same market. Common weaknesses as enterprises grow, is their inability to get the large volumes to meet market demand, paying attention to quality, quantity[38] and production on time. The characteristics of winning products in successful enterprises hold useful lessons for natural product development with African producers, and are summed up as follows:

(i) Winning natural products are built on Africa's plant diversity and through maintaining or developing **an abundant natural resource base:** With the exception of the *Cannabis* trade (based on a naturalised species from South Asia), all export enterprises have developed on the basis of Africa's "natural advantage". Although endemism gives a national advantage (such as with rooi-bos (*Aspalathus linearis*) and honey-bush (*Cyclopia*) teas, which are endemic to the Cape region, South Africa, interestingly most successful enterprises are based on species that are widely distributed across Africa (*Acacia senegal, A. seyal, Adansonia digitata, Sclerocarya birrea, Vitellaria paradoxa, Ximenia americana* and *X. caffra*). This ability to grow in a wide range of soil types also reflects the abundance of this species, which means less of a supply problem compared to highly habitat specific species with a restricted distribution and therefore limited supplies. This advantage is further

[33] US Department of Commerce. 2000. Ethiopia: Overall export down, khat sales up. www.tradeport.org (cited by Feylsa and Aune, 2003)
[34] Randall, T. 1993 Khat abuse fuels Somali conflict, drains economy. Journal of the American Medical Association 269: 12–14
[35] Green, R.H. 1999 Khatt and the realities of Somalis: historic, social, household, political and economic. Review of African Political Economy 26: 33–50
[36] Feylsa, T.H. and Aune, J.B. 2003 Khat expansion in the Ethiopian highlands: effects on farming system in the Habro district. Mountain Research and Development 23: 185–89
[37] Crenshaw, M.J. and Burke, T. 2004 Focus on illegal drugs: khat—a potential concern for law enforcement. FBI Law Enforcement Journal 2004. http://www.fbi.gov/publications/leb/2004/august04/august04leb.htm#page_11 (20 Oct 2007).
[38] Lovett P N. 2005. The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa. WATH Technical Report No. 2., US-AID West Africa Programme.

enhanced in several cases by farmer-based selection of genotypes or chemotypes (such as *Sclerocarya birrea*[39], *Vitellaria paradoxa*[40] and *Citrullus lanatus*[41]). How long this advantage is maintained depends on whether production shifts to other places and whether germ-plasm is exported or not: but with abundant, relatively slow growing tree species, at least small-scale producers in rural Africa have a head start. Any long-term advantages are lost – sometimes forever, when local extinction of species or unusual genotypes occurs, such as has happened to endemic cycad populations (*Encephalartos cerinus* in South Africa, *E. pterogonus* in Mozambique) which have been plundered by "collectors"). Growth of the *Prunus africana* industry, which has an estimated over-the-counter (OTC) value of US$220 million/yr[42], for example, is threatened by resource-mining rather than resource management, weak tenure and a slow transition to cultivated production in agroforestry systems or plantations[43].

(ii) **Clear land and tree tenure and user rights:** Secure tenure is an important component of any strategy that aims to deliver fair and equitable benefits to African farmers from the natural product commercialisation. In many African countries, communal land ownership is vested in the State, yet under customary law, individual households have access to popular edible fruits in farmers fields or near their homesteads. Commercialization has a positive effect through increasing incentives to conserve trees, but where tenure is unclear, can result in conflict[44].

(iii) **Local self-sufficiency is not undermined:** Sustainable harvest cannot be assumed, particularly with commercial harvest and where land & resource tenure is weak. There are many examples where this assumption has been made, with the result that local people have ended up walking further and further to get the same resource or paying more for a now scarce resource. Examples are the basketry export industry in Botswana, which also resulted in loss of a edible fruit bearing tree, *Berchemia discolor*, whose root bark was overexploited for dye; local depletion of *Terminalia sericea* in Tanzania for root-bark exports to Italy and overexploitation of *Prunus africana*, a popular traditional medicine, due to unsustainable bark exports to Italy and France. Commercial enterprises need to be based on species that are not only resilient to harvest, but where there is a surplus above subsistence need. For this reason, Phytotrade Africa has deliberately focused on enterprises where products can be sustainably harvested, such as fruits (rather than roots or bark). Where necessary (for example in Namibia, where *Terminalia sericea* is has invaded large areas of formerly open savanna and where root bark harvest is possible as part of thinning operations), it can be useful to develop participatory management plans with simple, enforceable rules, with monitoring

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39 Leakey, R. 2005. Domestication potential of Marula (*Sclerocarya birrea* subsp. *caffra*) in South Africa and Namibia: 3. Multiple trait selection. Agroforestry Systems 64:51-59.

40 Sanou H, Picard N, Lovett PN, Dembélé M, Korbo A, Diarisso D and Bouvet J-M (2006) Phenotypic variation of agromorphological traits of the shea tree, *Vitellaria paradoxa* C.F Gaertn, in Mali. *Genetic Resources and Crop Evolution*, *53* (1): 145-161

41 Rodin, R J. 1985. The ethnobotany of the Kwanyama Ovambos. Monographs is Systematic Botany from Missouri Botanical Garden, 9. Allen Press, Kansas.

42 Cunningham, M; A B Cunningham and U Schippmann. 1997. Trade in *Prunus africana* and the implementation of CITES. Bundesamt fur Naturshcutz, Bonn, Germany

43 Cunningham, A B. 2005. CITES Significant Trade Review of *Prunus africana.* CITES Management Authority, Geneva, Switzerland.

44 Wynberg, R.P., Laird, S.A., Shackleton, S., Mander, M., Shackleton, C., du Plessis, P., den Adel, S., Leakey, R.R.B., Botelle, A., Lombard, C., Sullivan, C., Cunningham A B. and O'Regan, D.P. 2003. Marula policy brief. Marula commercialisation for sustainable and equitable livelihoods. *Forests, Trees and Livelihoods,* **13**: 203-215

at a community level should only focussed on key issues, as people have many other things to do.

(iv) Existing markets, information access and strategic choices: in many cases across developing countries, well-meaning development workers with good intentions but without business acumen have started production of natural products in order to generate income for poor local people, only to see them fail and local hopes shatter. Unlike to movie "*Field of dreams*", this model ("build it and they will come" (or produce it and markets will buy)) rarely works. Today, more and more enterprises are first get to know the characteristics of the market, then work from there, organizing producers to get the right product to the appropriate partners in sufficient quantity, on time, at the right price. Successful enterprises have taken business oriented, strategic choices first, focussing on the five growth sectors outlined above (natural and organic cosmetics; flavours and fragrances; functional foods; colloidal gums and in one case (as an add-on to a large wine and brandy company), alcoholic beverages using African fruits.

(v) Visionary "champions": insight, innovation and staying power: Visionary "champions" – often external actors - play a fundamentally important role, regardless of whether enterprises are family owned companies, publicly listed companies, a co-operative cluster of small businesses under one name (such as Phytotrade Africa) or a clan-based businesses (such as WaKamba woodcarving enterprises in Kenya). Colloides Naturels International (CNI) the world's leading acacia gum importer and processor was started over a century ago when in 1895, Charles Dondain the grandfather of the current family owners, experimented with water-soluble Acacia gums and realized their industrial value. Today, CNI operates in over 75 countries, remains a family-owned company and retains its reputation for quality products and hydrocolloid innovation. In South Africa, the rooi-bos tea (*Aspalathus linearis*) export industry was also started by A B Ginsberg in 1901[45], growing into a multi-million dollar export industry today. Similarly, the Devil's Claw (*Harpagophytum procumbens* and *H. zeyheri*) export trade was started in the 1950's by a G.H. Mehnert, based on traditional uses of the tubers which were then sent to the University of Jena for additional study before the Namibian company Harpago (Pty) Ltd started exporting tubers in larger quantities to Erwin Hagen Naturheilmittel GmbH in Germany in 1962[46]. In Kenya, the woodcarving industry, worth US$20 million/yr in export revenue was started in the 1920's by Mutisya Munge from Wamunyu district, Machakos district, as a result of his exposure to Zaramo carvers in Tanzania when a soldier during World War 1. More recently, the Marula Oil producers Network started by Cyril Lombard and developed further by Pierre du Plessis at CRIAA-SADC, Namibia has grown enabled rural producer associations to also produce Kalahari Melon Seed oil and *Ximenia* oils for the international cosmetics markets.

(vi) **Co-ordination and supply reliability: quality in sufficient quantity, on time**: Quality standards are crucial for natural products exports, particularly if they are used in cosmetics or as functional foods. Due to poor quality gum arabic (caused by adulteration and poor grading) for example, Nigeria totally lost its U.S. market share, dropping from 100 tonnes in 1997 to zero imports of Grade 1 gum arabic in 1999-2001[47]. Like any relationship, once a reputation is lost (in this case for good quality), it is difficult to regain. To assist Nigerian exporters to try to regain their market share, USAID/Nigeria and a US-based consultancy company worked with Nigerian exporters, the National Association of Gum Arabic

[45] Morton JF. 1983. Rooibos tea, *Aspalathus linearis*, a caffeinless, low-tannin beverage. Economic Botany, 37(2), 164-173

[46] Wegener, T., 2000. Devil's claw: from African traditional remedy to modern analgesic and anti-inflammatory. In *HerbalGram*, Vol. 50, pp. 47-54.

[47] Harrison, G and Roberge. 2002. Best Practices, Best Markets: Training the Nigerian Gum Arabic Producer and Small Trader. USAID/Nigeria Gum Arabic Program/ ARD, Inc., Washington, DC.

Producers, Processors and Exporters of Nigeria (NAGAPPEN) and two major U.S. gum arabic importers (Importers Service Corporation (ISC) and TIC Gums) to prepare a training guide for improved quality standards[48]. To avoid loss of reputation, Lovett et al (2005)[49], on behalf of the West African Trade Hub (WATH) have similarly prepared a easy to use an export guide on international quality standards for shea butter, to raise awareness amongst West African producers and exporters of what quality requirements are most important to cosmetics manufacturers.

Developing and maintaining market share is not just an issue of quality. What is also required is to get sufficient quantity to the market, on time. Reliability of supply is commonly affected by fluctuating yields from year to year, requiring an organizational structure to source products such as Kalahari Melon Seed (KMS), shea nuts or marula fruits across a wide geographic area. Dealing with fluctuating yields effectively, in some cases backed up by decentralized tree planting in fields or enrichment planting in savanna, woodland or forest systems where tree tenure can be applied has an added benefit. It avoids a situation where horticulture becomes a form of "elite capture" by wealthy farmers with greater access to land and technology, cutting poorer farmers out of the supply chain. Harvest from wild or local managed trees certainly offers opportunities for organic or FairTrade marketing, but harvesting sufficient quantities requires hundreds – or even thousands – of rural farmers to collect these products. In Africa today, well-established and effective local institutions are using communications technologies such as mobile phones to coordinate "bulking up" of resources, reduce transport costs and improve supply chain capability. In Namibia, the Eudafano Women's Cooperative, who produce marula (*Sclerocarya birrea*) seed oil, coordinates over 5000 members for collection and oil pressing to get high value cosmetic oil to the European market. Similarly in Zambia, North Western Bee Products (NWBP) has invested in training on quality control along the supply chain as well as honey certification and is able to coordinate supplies to get them to export markets in Europe.

(v) Pricing: incentives to collect, incentive to buy: high price/volume: poor African farmers generally are "price-takers", with limited bargaining power. For some products, this remains the case in order for new enterprises to remain competitive, but in several other cases, value-added processing and price negotiations by external brokers working with producer associations such as CRIAA enable producers to get a better price and returns well above average local daily wage rates. Prices also act as an incentive to harvest larger quantities of a product, enabling exporters to meet export short-falls (such as those experienced in *Citrullus lanatus* seed supplies). In the case of *Vitellaria*, Lovett (2004) estimates that just over half (52%) of the total shea harvest in the major WATH producing countries is not collected or even used locally[50]. Higher prices are an incentive for women to collect more for *Sclerocarya, Ximenia, Citrullus* and *Vitellaria* fruits (and seeds) during peak harvests over a wider geographic area. For species that regenerate from seed, it is important, however, to leave some seed for natural regeneration[51], although tagua palm (*Phytelephas seemannii*) populations have been shown to survive when as much as 85% of fruits are harvested[52].

(vi) Diverse niche markets to reduce competition: niche markets give African producers an edge, whereas with mainstream crops, massive subsidies to OECD producers reduce the chances of

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[48] Harrison, G and Roberge. 2002. Best Practices, Best Markets: Training the Nigerian Gum Arabic Producer and Small Trader. USAID/Nigeria Gum Arabic Program/ ARD, Inc., Washington, DC.

[49] Lovett, P., E. Miller, P. Mensah, V. Adams and C. Kannenberg. 2005. Shea butter export guide. West Africa Trade Hub, USAID West Africa Regional Program. September 2005.

[50] Lovett P N. 2004. The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa. WATH Technical Report No. 2., US-AID West Africa Programme.

[51] Cunningham, A B. 2001. Applied ethnobotany: people, wild plant use and conservation. Earthscan, London

[52] Bernal, R. 1998. Demography of the vegetable ivory palm *Phytelephas seemannii* in Colombia, and the impact of seed harvesting. Journal of Applied Ecology 35:64-74.

success for African farmers. Diversification helps grow the overall niche market. Marula oil, for example, is now found in over 140 products produced by The Body Shop. Like marula oil, shea butter can also be used for a range of products beyond it's bulk market, the production of a cocoa butter equivalent, but also for a range of cosmetics formulations. Marula, shea butter and *Ximenia* all contain bioactive constituents relevant to skin-care and opportunities for product diversification.

(vii) The power of strategic partnerships: business, producer associations and universities backed through policy support: Unlike natural products sold in local markets, local farmers can't be expected to have detailed knowledge about export markets or their quality control or research requirements. For this reason, the research and development (R&D) capabilities of national or regional universities or R&D facilities in of large firms with whom partnerships are formed meets an important need once necessary intellectual proerty rights (IPR) protocols is met. The Namibian Indigenous Plants Task Team (IPTT), where government departments, NGO's and a business-mined "champion" from CRIAA-SADC sit around the same table to coordinate strategy, is a model example of how to avoid decision-making inertia. Based on "Product Pipeline Approach", which selects and backs potentially winning species for key export markets, the IPTT has backed a series of successes in indigenous cosmetic oils sourced from poor rural farmers (*Sclerocarya, Ximenia, Citrullus lanatus* (Kalahari Melon Seed)). Strategic partnerships that have been formed with European businesses, with CRIAA-SADC also playing an important role in the regional network, Phytotrade-Africa. Starting with small-scale exports of marula oil extracted in an urban area (Katatura), scale and local value-adding have been achieved through upgrading processing facilities close to supplies of *Sclerocarya, Citrullus* and *Ximenia* and through the good relationships established with large buyers in the UK and France. In West Africa, the shea nut trade has been assisted through establishment of the West African Trade Hub (WATH), supported by US-AID and expert advice leading to greater efficiencies and the opening of a major shea butter refining facility following recommendations by Addaquay (2004)[53].

(viii) Conflict resolution mechanisms: Although rural "communities" are widely spoken about as if they were cohesive, in many cases they are not. Instead, they are divided along the lines of families, clans, and power relations. Natural product commercialization can widen these rifts, particularly where value-chains are complex and neither costs nor export markets are well understood by producers. Profit-sharing within producer associations is another potential pitfall. In Mexico, for example, less than half (15 of 42) of communities running Community Forest Enterprises (CFE's) distributed profits[54]. The decision to distribute all or part of the profits to legal members of CF's depends on levels of trust, poverty and the probability of investing other enterprises. Establishing transparent, acceptable and fair means of conflict resolution is therefore a good investment.

(ix) Regional co-operation in order to compete: With endemic species, there are commercial advantages in maintaining germplasm within the single source country, but for widely distributed species such as *Adansonia digitata, Sclerocarya birrea* and *Vitellaria paradoxa* commercial advantages have resulted through regional cooperation. These advantages go beyond the obvious ability of harvested commercially viable quantities of fruits or seeds that was mentioned earlier, extending to shared R&D and legal or coordinated, multi-country lobbying for policy change, such as for recognition in the EU that baobab pulp is not a "novel food"[55]. The two best known are PhytoTrade Africa, a trade organization based in southern African and the regional ProKarité

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53 Addaquay, J. 2004. The shea butter value chain: refining in West Africa. WATH Technical Report No. 3, USAID, Washington, DC.

54 Klooster, D. 2000. Institutional choice, community, and struggle: A case study of forest co-management in Mexico. World Development, 28(1), 1–20

55 Wilkinson, J and M Hall. 2007. Baobab fruit: The upside down tree that could turn around the drinks industry. *Soft Drinks* International 26-28. April 2007.

Project, that started in 2004 as a pilot project in Burkina Faso, Mali, Senegal and Niger to help develop international standards, improve product quality and developing capacity in West Africa for the shea export trade. Formation of West Africa Trade Hub (WATH) now covers more shea producing countries, representing an estimated 81% of sub-Saharan Africa production potential and 94% of actual shea collection across all *Vitellaria paradoxa* producing countries[56].

(x) Upgrading within value-chains: As Giuliani et al., (2003)[57] point out in their seminal paper:

> *"upgrading within a value chain implies escalating on the value ladder, moving away from activities in which competition is of the "low road" type and entry barriers are low. However, upgrading also has a sectoral dimension, and may differ depending on the specific features of different groups of industries".*

The African enterprises we have examined fit into four types of upgrading identified by Humphrey and Schmitz (2000)[58] and used by Giuliani et al. (2003), namely:

(i) ***Process upgrading*:** where the transforming production process has been re-organized or improved processing technology introduced, such as marula, KMS and *Ximenia* collection and oil pressessing in Namibia or shea butter refining in Ghana;

(ii) ***Product upgrading,*** where natural products are developed into diverse and more sophisticated product lines, with higher values per unit volume. For example, marula oil is now used by The Body Shop in a wide range (over 140) high value cosmetic and personal care products. In addition to trade-marked products from gum arabic (Spraygum™ and Instantgum™), CNI has developed the Fibregum™ product line as a soluble fibre source for the functional food market and Equacia™, a blend of *Acacia* gum and wheat fibres;

(iii) ***Functional upgrading*** refers to cases where new, superior functions are developed in the value chain. Examples are new marketing and packaging for Amarula or organic Devil's claw production in Omaheke area, Namibia. In some cases, traditional labour intensive, low-value added local markets are completely abandoned in favour of higher value added exports, as is the case with *Ximenia* seed oils in Namibia;

(iv) ***Intersectoral upgrading*** occurs when new research or technology enables a product to shift from the one sector into a different, new sector. For example, the diverse compounds in shea butter, usually exported as a cocoa butter substitute have enabled a shift into high value in cosmetics and personal care products, based on shea butter's unsaponifiable and anti-inflammatory components[59].

(xi) Strategies to reduce or avoid "elite capture": In her study of locally traded non-timber forest

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[56] Lovett P N. 2004. The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa. WATH Technical Report No. 2., US-AID West Africa Programme.

[57] Giuliani, E, C Pietrobelli and R Rabellotti. 2003. Upgrading in global value chains: lessons from Latin American clusters. *Paper presented at the Conference on "Clusters, Industrial Districts and Firms: the Challenge of Globalization"*. Modena, Italy, 12-13 September, 2003. http://www.economia.unimore.it/convegni_seminari/CG_sept03/index.html

[58] Humphrey J., and H. Schmitz. 2000. Governance and Upgrading: Linking Industrial Cluster and Global Value Chain Research", *IDS Working Paper*, No.120, Institute of Development Studies, Brighton: University of Sussex.

[59] Alander, J. 2004. Shea butter — a multifunctional ingredient for food and cosmetics. Lipid Technology 16(9):

products in South Africa, Shackleton (2005)[60] found little evidence of "elite capture", perhaps due to their low value. As Mansuri and Rao (2003) point out, however, "elite capture" is almost inevitable[61]:

> *"Even in the most egalitarian societies involving the community in choosing, constructing and managing a public good is a process that will almost always be dominated by elites because they tend to be better educated, have fewer opportunity costs on their time, and therefore have the greatest net benefit from participation"*

In the cases we have examined, "elite capture" of natural products occurs at various levels and in different forms (production, transport, processing and manufacture).. At the supply end, large-scale commercial production of organic certified rooi-bos tea (*Aspalathus linearis*) is a threat to wild harvested, Fairtrade product by small-scale producers. Illegal or semi-legal natural products are particularly vulnerable to elite capture. In Kenya for example, the lucrative *Catha edulis* trade is controlled by prominent elites[62], just as the *Cannabis* trade in Canada is dominated by Chinese and Vietnamese gangs, as it is by local gangs in Cape Town. In terms of permits and trade, well connected Cameroonian businessmen with access transport dominated the *Prunus africana* bark trade once the French company Plantecam Medicam lost it's monopoly on harvest, leading to overexploitation of wild stocks. Careful choice of the types and locations of processing technology is also required. Wynberg et al (2002) point out for example, that the introduction of new mechanised technologies In the case of *Sclerocarya birrea* processing in southern Africa, for example, men had control over marula-processing technologies such as fruit and oil presses.

Choosing the location of processing facilities also influences who benefits. In West Africa, for example, many large shea cooperatives are located in urban centres, disproportionately benefitting from donor support and benefiting urban rather than rural women[63]. Even use of process patents can also restrict high value harvest for trade as a form of "elite capture". The process patent for *Terminalia sericea* root bark extract (reportedly worth US$15000 per kg) is held by the Italian company Indena Spa., restricting independent extraction and sale of sericoside to competitors. Several strategies can reduce or avoid "elite capture" so that more benefits flow to poorer households. Firstly, the choice of enterprises based on fruits from slow growing tree species such as marula and shea nut where the bulk of supplies are in farmed landscapes where farmers have tenure over the trees. Secondly, efficient coordination of producer association members to produce a quality product in sufficient quantity at a competitive price. Thirdly, use of patents in a joint venture between a producer association and private enterprise (such as the marulein patent between Phytotrade and Aldivia) or use of trade-marks and branding. Finally, the establishment of African regional Trade Hubs (see www.watradehub.com), processing facilities (for example for marula oil in Namibia and shea butter, Ghana) or of enterprise clusters[64] that support natural products value-adding for small or micro-enterprises.

(xii) Traceability: Unlike local informal-sector markets in Africa, it is a the ability to trace where a product came from is a necessary requirement in many export markets. From January, 2005 for

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[60] Shackleton, S E. 2005. The significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa. PhD thesis, Department of Environmental Science, Rhodes University.

[61] Mansuri, G and V Rao. 2003. Community Based (and Driven) Development: A Critical Review. Development Research Group, The World Bank, Washington.

[62] Cunningham, A B. unpublished interview notes, 2002.

[63] Elias, M., J. Bayala and M. Dianda. 2006. Impediments and innovations in knowledge sharing: the case of the African shea sector. KM4D Journal 2(1): 52-67 www.km4dev.org/journal

[64] D McCormick. 1999. African Enterprise Clusters and Industrialization: Theory and Reality. World Development, 27(9): 1531-1551

example, the EU required that all agricultural products, including shea nuts, are traceable from source[65]. New technologies such as bar-coding offer opportunities for training producers to track products to meet these requirements. Although certification is too costly to implement, as is discussed below, chain-of-custody requirements are a useful form of traceability.

(xiii) Strategic use of labelling, branding, trade marks and certification: Product branding, trade marks and certification can play an important role in natural product export markets. Examples of *Acacia* gum trade marks used by CNI, have already been given. In addition, CNI also has organic and kosher certification for its products, which are also *halaal*. In Europe, farmer-owned brands play an important role across a range of products[66]. For branding, trade-marks or certification to work anywhere requires two things, however: first, a "caring" market prepared to pay a significant premium for these products and secondly, access to a wider share of the market due to consumer awareness. Although many consumers care about quality and price they often are an "uncaring" market. Export markets are increasingly interested in "clean, green" products. If claims of sustainability are made, then it is crucial to ensure that those claims can be backed up. This requires a system of traceability through "chain of custody" systems. If certification of bush products is to be successfully implemented in Australia in the long run, then producers need to have the opportunity to weigh up the costs and benefits of different certification options in order to decide whether or not a particular set of standards is a good fit for their product, consumer market, budget and their organizational capacity. There are opportunities for:

- **Good agricultural and collection practices (GACP)** guidelines that set standards for proper handling and sanitation of products during harvest, storage and shipping are widely accepted, as are;
- **Good manufacturing practices (GMP)** that set guidelines for infrastructure, staff and processing procedures, including for food and herbal products; and
- **Organic certification,** which already applies to Devil's Claw harvested in Namibia and is of increasing interest to cosmetic companies wanted to market natural organic products;
- **Certification of geographic origin**, originally developed for the wine industry in France – *appellation d'origine contrôllée*. The only type of certification that recognizes traditional knowledge of processing, certification of geographic origin has great potential for application to African natural products. Since 1992, the European Union has adopted an approach which is slightly different, termed *Appellation Origine Protégée*, which includes protection not only of the product, the know-how related to it, but also it's protection in terms of conservation of the habitat;
- **Forest Stewardship Council (FSC) certification**, which is applied to sustainable harvest of timber, and more recently, natural products such as maple syrup and chicle.

(xiv) Effective trade fair participation: offers the opportunity to become fully familiar with the necessary knowledge, tools and skills to prepare and co-ordinate professional group/country presentations in international trade fairs in Europe.

(xvi) Donor support to help "level the playing field": Although the Millennium Development Goal on the global partnership for development calls for an open trading system that is rule-based, predictable and non-discriminatory, yet recognizes the special needs of the least developed countries

[65] Lovett P N. 2004. The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa. WATH Technical Report No. 2., US-AID West Africa Programme
[66] Hayes, DJ and S H Lence. 2004. Farmer-Owned Brands? Agribusiness 20:269-285

in relation to tariff- and quota-free access for their exports, this goal is far from being achieved[67]. In 2001, the Organisation for Economic Co-operation and Development (OECD) countries total public support for agriculture (US$311 billion), was *six* times the total amount spent on official development assistance, while producer support (domestic subsidies, import tariffs and export subsidies) was estimated to equal nearly one third of total farm receipts[68]. Aside from mainstream farm crops, private enterprises based on plant products for niche markets in OECD countries like Australia, including joint ventures with major multi-national companies, have received significant subsidies in the form of State research support (such as for *Macadamia* nut production or production of opium-poppies for alkaloids). International donor support to "level the playing field" for small- and micro-enterprises is therefore encouraging, and has been a key factor in the development of Phytotrade Africa, for example, through a start-up grant of US$1 million from IFAD (2002-2003) and a subsequent grant of US$1.5 million, plus additional funds from other donors[69]. Similarly, US-AID support to Nigerian gum arabic traders and to African regional Trade Hubs has helped develop commercial networks so that African natural product producers are being taken seriously in the international market.

(xv) Limited policy "bottlenecks": Although market demand is a key factor influencing affecting growth of natural product exports, export success is directly affected by government policies within producer countries as well as in importing countries such as Europe, Japan and North America. In the US, the African Growth and Opportunity Act (AGOA), for example, provides a useful opportunities for African enterprises. Even seemingly small policy changes can make a big difference. Unlike the EU, which allows up to 5% of chocolate to consist of cocoa butter substitutes, thus expanding the market for shea butter trade, the US does not permit non-cocoa vegetable in products labelled as chocolate. The EU, on the other hand, does not allow use of baobab (*Adansonia digitata*) pulp, yet in Australia, fruits of boabs (*Adansonia gregorii*) are not considered a "novel food" by the Australian Food Standards agency as "not novel" and were given food status in March 2005[70].

4. Future steps: unresolved issues, research needs and additional product categories

5. Conclusions

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70 Wilkinson, J and M Hall. 2007. Baobab fruit: The upside down tree that could turn around the drinks industry. *Soft Drinks* International 26-28. April 2007.