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## Agricultural Value Chain Development in West Africa – Methodological framework and case study of mango in Benin

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### Abstract

Globalization and competitiveness of agricultural commodities could have significant potential benefits for food security and poverty reduction in West Africa. Participation in global trade and economy is potentially important but not enough to ensure benefits at all levels of the chains and equitable distribution of income for each participant. Efficiency is key in the commodity value chain, but effective support functions and services, infrastructure, legal and policy environment are important. This paper presents the framework of value chain concept and analysis, as a guide to enhance competitiveness of commodities at national, regional or global level. The paper applies the value chain framework to a case study on mango in Benin, West Africa. The international market for mango is characterized by stringent quality requirements regarding fruit flies. This needs to be addressed as a key value chain challenge for competitiveness of the commodity in Benin and West Africa.

Keyword: Benin, Mango, Value chain, West Africa,

### Introduction

Agricultural growth has always played an important role in the process of economic development. Increased employment and income growth in agriculture stimulate demand for non-agricultural goods and services, providing a boost to non-farm rural incomes (Pingali, 2006). The liberalization of trade and growing integration of the global economy has given an opportunity to many of the world's population to generate higher income and improve the availability of better quality and increasingly differentiated final products (Kaplinsky, 2000). In Sub-Saharan Africa, opportunities may be constrained by lack of effective and competitive participation of smallholders in the development of value chains. Key constraints include poor policy decisions with respect to emerging food safety and agricultural health norms and standards, export subsidies by developed countries and high transaction costs for compliance with norms and standards. These constraints may result in either exclusion of smallholders or unequal distribution of benefits. There is a need to manage effective participation of stakeholders in national and international economy, to ensure that incomes are not reduced or further polarized (Kaplinsky, 2000).

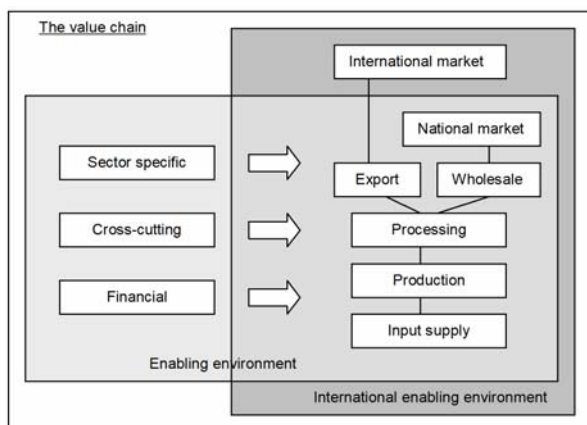
The objective of this paper is to develop an appropriate framework of value chain concept and analysis, as a guide for commodities in West Africa to enhance competitiveness of small producers at national,

regional or global level. The paper discusses the main elements of the framework and its applicability to 'West African commodity analysis' specific challenges and opportunities.

### The value chain concept

A schematic visualisation of the value chain framework is presented in figure 1. The physical flows of production and commercialization are outlined and the enabling institutional national and international environment needed for an effective value chain development (contextual issues like trade agreements, national policy and regulatory environment and supporting markets, research and training and assistance).

The history of the concept as presented above goes back to the 1960's, when French scholars developed the *filiere* concept based on the analyses of value added process in US agricultural research. The early *filiere* analysis emphasized local economic multiplier effects of input-output relations between firms and focused on efficiency gains. The later work gave the modern version of *filiere* analysis an additional political economy dimension (Kaplinski, 2001). Michael Porter was the first to use the term value chain in the 1980's. He defined the value chain as the various activities which were performed in particular links in the chain. In the mid-1990s Gereffi introduced the concept of Global Commodity Chains (GCC).



**Figure 1.** Schematic representation of the value chain

Source: adapted from USAID, 2007

Gereffi's contribution has enabled important advances to analytical and normative usage of the value chain concept, particularly because of its focus on the power relations. Roughly we can distinguish two types of chains; chains where coordination is undertaken by buyers ('buyer-driven') and those in which producers play the key role ('producer-driven'). More elaborate and nuanced classifications according to level of explicit coordination and power asymmetry exist (Gereffi, 2004). The governance concept is a key analytical contribution to the value chain concept.

In order to make the concept a useful analytical tool, Gereffi's GCC approach should be completed with insights from the *filiere* approach, like paying more systemic attention to regulatory change, and a more elaborate quantification of the distribution of profit/value added along the chains. Ponte and Gibbon argue that 'forms of coordination' should be distinguished from modes of governance. Governance is about defining the terms of chain membership, incorporating/excluding other actors accordingly and allocating to them value-adding activities that lead agents do not wish to perform. Marginalization/exclusion and upgrading/participation are the axes along which (re)distributional processes take place (Ponte and Gibbon, 2005). Economic agents set up 'quality conventions' that lead to four different forms of coordination that can occur side-by-side at the same time (domestic, industrial, market and civic coordination) (Raikes *et al.*, 2000). Quality issues are central in understanding the way lead firms shape the functional division of labor and entry barriers along a value chain.

### Value chain analysis

Integrating the elements of the value chain concept in order to make it an analytical tool may require simple and relevant approaches. Among them is the Structure-Conduct-Performance (SCP) approach which covers functioning structure (e.g. products, types of actors), conduct (behavior and interactions among actors) and finally the performance with respect to criteria like efficiency, flexibility, innovation and responsiveness. Table 1 gives an overview of the main elements of structure-conduct and performance.

Following this path of qualitative and quantitative analysis will generate insight in the limitations and opportunities of the chain. By using a 'Strengths, Weaknesses, Opportunities and Threats' (SWOT) analysis or problem and solution trees, the critical control points of the value chain can be determined. Responsive innovations should be tested for their feasibility and competitiveness. Finally a key element of the value chain analysis is to measure the ex-ante impact (expected incomes, equity and welfare) especially at the level of small producers and poor consumers.

### Agricultural value chains in West Africa

Most of the research in global value chains of agricultural commodities in Africa has been carried-out on horticulture exports from countries like Ghana, Kenya and South Africa to the EU. These chains are usually led by EU retailers who may dictate product characteristics to producers. These countries are ahead in the development of an innovative agribusiness infrastructure and conducive economic environment after the removal of government regulations, agricultural diversification and investment in processing agro-enterprises. In some African countries, including Kenya, chains that started with smallholder producers are replaced by large scale farms mostly under direct control of the export companies. Some studies (Maertens, 2006) conclude that the rural households that were involved in high value vegetable production through wage employment at large scale farms generate significant incomes, most likely bringing about a balanced development impact with equity and efficiency concerns addressed.

Another important development that is observed in countries like South Africa and Zambia is the

**Table 1.** Elements of structure-conduct performance approach

Elements of Structure	Elements of Conduct	Elements of Performance
Type of chain actors (public, private, NGOs, government, banking institutions, research, training and capacity building)	Relationships between actors (incl. power asymmetries)	Distribution of benefits
Type of marketing channels	Marketing	Efficiency of chain (-actors)
Type of products	Pricing	Effectiveness of chain produce
Type of markets	Technical barriers to trade (TBT)	Impact on income and welfare (equity and gender)
Quality norms and standards	Information flow	Responsiveness to innovation
Chain infrastructure	Innovation	
Regulations (customs, tariffs etc)		
Governance and coordination structure		

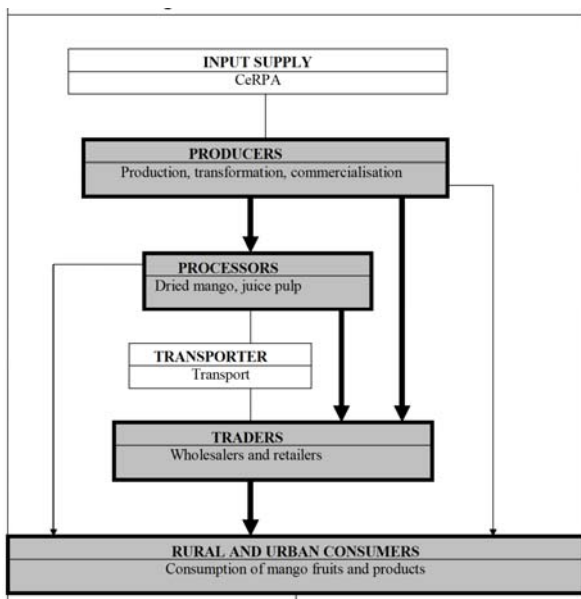
Source: Adapted from Lutz, 1994

emergence of local supermarkets (Reardon *et al.*, 2007). However in other African countries this development is not emerging, since the post-liberalization agribusiness environment is still in a starting phase, resulting in constraints as lack of formal cooperation and logistical coordination. What should be the strategy for this category of African countries in order to take full advantage of their high agricultural potential, and how can the value chain concept be used in defining this strategy? In order to shed some light at this question, we will use the case of mango from Benin as an example.

### Mango value chain in Benin

Besides pineapple and avocado, mango is considered a tropical fruit of great potential for national and international commercialisation. Benin produces high volumes of mangoes, which are commercialised nationally and regionally (Niger). See a schematic overview of the mango value chain in figure 2. Mainly women are involved in the trade of mangoes. The area with mango trees is estimated to be 2300 ha with an annual production of around 12.000 tons in 1998 (FAOSTAT). Currently the mango chain in Benin is showing many constraints linked to production, product quality and marketing. The actual production volume is based on estimates and not supported by reliable data, but preliminary results from analysing the value chain reveal saturation of local and national markets leading to wastes and lower prices at farm and retail levels. Following the SCP approach, the study has revealed first of all that mango quality is a key

constraint. The capacity of Benin exporters to be competitive and access foreign markets depends mainly upon their ability to sustain a reliable supply of fruits which meet increasingly stringent quality and safety standards. Mango fruit flies affect the product quality and disqualify products for exports. In 2006, 23 containers of mangoes from West Africa were rejected and destroyed by the EU because they lacked a treatment against quarantined organisms resulting in an estimated loss of nearly one million euros (Vayssieres, Personal communication 2007). Current production and post-harvest techniques are not appropriate and effective to produce a constant cost effective supply of mangoes in quality and quantity. Also logistical, mainly transport constraints undermine the competitiveness of the mango value chain. There is no formal market information and organisation/coordination of supply and demand. More data are necessary for chain performance assessment. Looking at the opportunities for enhancing the mango value chain, there is first the potential for Benin to target the international market. The EU market is still likely to continue growing given the increasing consumption of exotic fruits (mango imports rose by 20% from 178,666 tons in 2003 to 211,945 tons in 2006; Eurostat, 2006). Furthermore Benin has a potential to target the ecological niche market if sustainable production good practices are developed. Finally the country is geographically close to the EU market and has a direct sea link. However a quarantine organism treatment requires high investments in infrastructure, and a significant conducive institutional



**Fig. 2.** Schematic overview of the mango value chain in Benin

and policy environment. An opportunity is to process part of the mango production in-country to dried mango, pulp or juice for local and international markets. This would add value to the product and creates jobs and income opportunities. Interventions would be necessary to support ongoing research to develop sustainable methods to control mango fruit flies and empower farmers to best practices through training and information. Also the entrepreneurial capacity of traders should be built, the creation of mango producers and traders' organizations of chain actors should be supported and an effective market information system should be put in place. More research is required to assess the expected financial and economic costs and benefits for different options.

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