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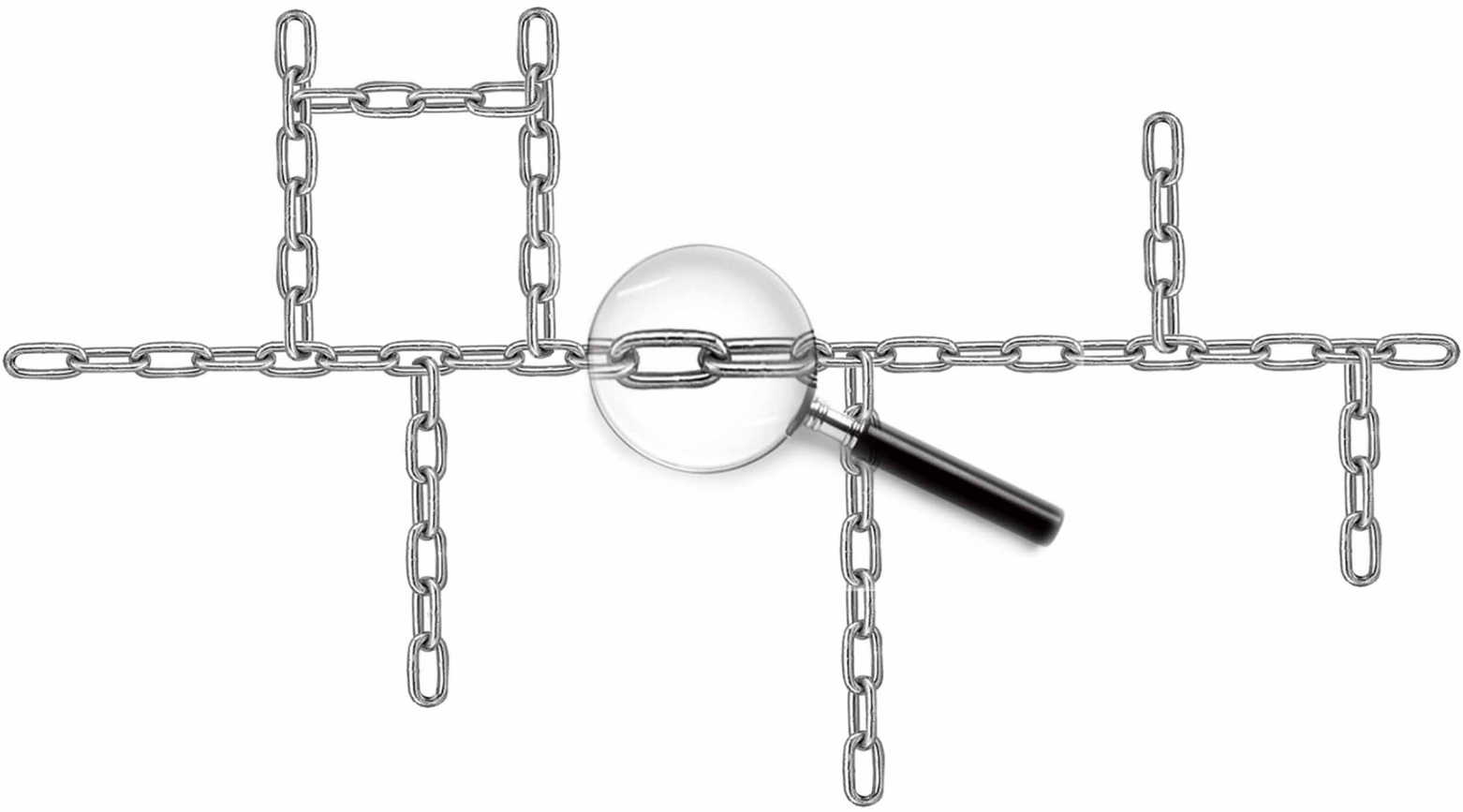

Value Chain Diagnostics for Industrial Development

Building blocks for a holistic and rapid analytical tool

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO Working Paper

VALUE CHAIN DIAGNOSTICS FOR INDUSTRIAL DEVELOPMENT

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Vienna, 2009

PREFACE

This document has been developed by Frank Hartwich of the Bern University of Applied Sciences and Patrick Kormawa of UNIDO's International Financial Institutions Partnership Unit. The information for the report was compiled on the basis of intensive discussions with representatives of UNIDO Branches and Units between November 2008 and June 2009, a thorough review of UNIDO documentation and the further literature on value chain approaches, as well as discussions during an expert group meeting held at UNIDO headquarters in Vienna in September 2009. The authors acknowledge the valuable comments and contributions made by many colleagues and experts. Special thanks go to the Value Chain Analysis team at UNIDO and particularly Manuel Albaladejo, Michele Clara, Mohammed L. Dhaoui, Jan Grenz, Allison Griffith, Tillmann Guenther, Tom Kenyon, Stefan Kratzsch, Olga Memedovic, Predeep Monga, Lizbeth Navas-Aléman, Ami Okamoto, Philippe Scholtes, René van Berkel and Albert Vernooij for their comments and thorough review of the document.

LIST OF ABBREVIATIONS AND ACRONYMS

DFID	Department for International Development (UK Development Cooperation)
EU	European Union
GDP	Gross Domestic Product
GTZ	Gesellschaft für Technische Zusammenarbeit (German Development Cooperation)
ILO	International Labour Organization
ISO	International Organization for Standardization
ITC	International Trade Centre
NGOs	Non-governmental Organizations
OECD	Organization of Economic Co-operation and Development
R&D	Research and Development
SDC	Swiss Development Cooperation
SMEs	Small and Medium-sized Enterprises
SPX	UNIDO's Industrial Subcontracting and Partnership Exchange Programme
UNCTAD	United Nations Conference for Trade and Development
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
UTEPI	Technical Unit for Industrial Studies

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EXECUTIVE SUMMARY

This paper reviews common practices of value chain analysis in academics and development practice and identifies opportunities for developing a rapid but holistic value chain diagnostic tool at UNIDO. Value chains are mechanisms that allow producers, processors, buyers, sellers, and consumers — separated by time and space — to gradually add value to products and services as they pass from one link in the chain to the next. Value chain analysis has been popularized by Michael Porter who analysed firms' competitiveness in a context where products are transformed adding value, step-by-step, until they finally reach the consumer. Since these works the value chain approach has diffused into a wide array of scientific studies and practical development approaches and nowadays constitutes an important concept complementing other development approaches such as enterprise development, sectoral development, as well as territorial or integrated regional development.

The value chain literature is diverse and confusing but principal distinctions can be made between four main schools of thought: (1) strategic management and business administration approaches which promote supply chain management with a focus on the individual firm, (2) industrial cluster development approaches where arguments for strategic firm alliances but also for regional government in terms of infrastructure and political framework conditions are made, (3) the global value chain concept which emphasizes the importance of economic rents and governance structures shaped, for example, through the dominance of internationally operating buyers and retailers and the resulting difficulties of upgrading of producers and processors in developing countries, and (4) the innovation systems approach which focuses on the building of individual and collective competences among value chain actors in networks of knowledge exchange and technological development and the importance of institutional and policy frameworks which create the enabling environment.

Value chain analysis can work towards different development goals including the effective participation of certain actors in the chain, the improvement of their performance, their interactions, the overall management and governance of the chain, and the improvement of its functioning and competitiveness. The value chain approach has proven useful in providing important information for decision making in industry development and promotion: it focuses on development options and allows for the identification of intervention opportunities. However, the approach has not been without critique; particularly when it comes to its limits to focus on human, social and environmental development. Another critique, less related to the analysis than to the actual interventions, questions the legitimacy and effectiveness of actions of governments, development agencies and NGOs in the pursuit of value chain promotion which often distort markets.

Value chain development constitutes an opportunity for policy and development institutions to support development processes in industries but a balance is required between public interventions and private sector initiatives. Particularly in less developed countries value chain development occurs in reaction to support from actors outside the chain such as government and development agencies. However, there are also situations where value chain promotion does not produce sufficient social benefits or simply the chances of success of public interventions are too low.

UNIDO's competence in value chain analysis is substantial; various UNIDO Branches and country offices have used elements of value chain analysis to diagnose industrial development options. This and the importance of the value chain concept in the current development agenda as well as the benefits that can be drawn from such analysis for the coordination among UNIDO Units with partners in industry development suggest the development of a common analytical approach when starting to work with value chains. There are many tools and guidelines for value chain analysis and development published by academic institutions and development organizations, which all in one way or another face one of the following limitations:

- Existing value chain analysis tools mainly do not focus on industrial value chains in developing countries.

- Existing value chain analysis tools are not holistic but partial in nature dealing, depending on the goals of the user, only with a subset of the development spectrum, e.g. the market penetration, enterprise development, or small producer development while neglecting other aspects such as economic growth, poverty reduction, social well-being, or environmental issues.

- The large amount of existing value chain analysis tools do not provide an overview on all existing value chain development opportunities and do not help develop a rationale for development; rather they are applied after a certain rationale for development has already been chosen by the analyst.

- Existing value chain analysis tools often require much effort with regard to time and resources for data collection and analysis and stakeholder participation.

The paper concludes that there is room and opportunity for developing a diagnostic tool for industrial value chain development to be used by UNIDO and partners before involving in further (partial) analysis and value chain development. The tool would include a diverse analysis of various aspects of the value chain in a holistic and systematic manner. With this, it would be distinct from common practice in value chain analysis where decisions on if and how to develop the chain are made prior to the application of the value chain analysis. Rather, the suggested tool is meant to become an input into the wider process of choosing the chain and identifying opportunities for how to develop it. By no means is the tool capable of replacing further in-depth analyses and project feasibility studies.

Due to these conditions, the tool should be rapid in nature and rigorous in the way it covers all possible opportunities for value chain development. It would enable a systemic holistic understanding of value chain development bottlenecks and opportunities, a common rationale for interventions and a better coordination among agencies that contribute to value chain development but which all pursue different goals and rationalities. Ultimately this would assure orientation towards higher impacts across value chain development interventions.

Main building blocks of the diagnostic tool would include:

1. Mapping Actors and Product Flows in the Value Chain
2. Analysing Costs, Margins and Competitiveness
3. Identifying Marketing Options and Responses to Market Requirements and Quality Standards
4. Analysing Governance and Linkages
5. Analysing Resource Productivity and Environmental Performance
6. Analysing Options for Development, Innovation and Upgrading
7. Analysing Actual and Future Income Distribution, Employment and Livelihood Impacts

The information contained in the present paper concerning the building blocks could help sketch a diagnostic tool for industrial value chain development. The tool, over the next year or so, would need to be tested and adjusted in a number of case value chains and countries in Africa, Asia and Latin America. Diffusion of the final tool to a wide audience of promoters of industrial value chains in the form of a guideline and subsequent capacity strengthening events must be envisaged as well.

1. INTRODUCTION

UNIDO's mandate is to work towards improving the quality of life of the world's poor through sustainable industrial development. Sustainable industrial development, according to UNIDO, is considered to encompass the economic, social and environmental dimensions. Many schools of thought and approaches exist on how to bring about sustainable industrial development for the poor. An important overarching aspect is that industrial development is embedded in the development of sectors and subsectors that reach, in a kind of continuum, from primary production to the consumer. A generic approach to position industrial development in this continuum and put the focus on the flow of specific commodities and products is the value chain approach.

A value chain can be understood as a set of businesses, activities and relationships engaged in creating a final product (or service). It builds on the idea that a product is rarely consumed in its original form but becomes transformed, combined with other products, transported, packaged, marketed etc. until it reaches its final consumer. In this sense, the value chain describes how producers, processors, buyers, sellers, and consumers — separated by time and space — gradually add value to products as they pass from one link in the chain to the next.

The value chain approach is becoming intensively used both by private sector agents as well as government and development agencies to both identify options for industrial development and implement development programmes. Its particular attractiveness draws from, among other things, its capacity to deal with a new business environment prevalent in industrial development in the context of today's globalized markets. In particular the value chain approach is capable of:

(1) *Pointing to* the process of *value addition*, meaning that through transformation as well as quality improvement and traceability, the value of the products and services increases.
(2) *Mapping* the various *industry agents* that participate in the process of value addition, from the initial primary production to its final shape in which it gets consumed and identify measures that can improve their capacities.
(3) *Picturing* the increasing *interrelatedness* of industry agents. Local producers need to link up to global buyers and brand-owners in order to market their products while suppliers need to produce to standards and factor in the requirements of the end-consumer and trade regimes. Close interaction generates efficiency in business transactions, builds capacities among industry agents and leads to overall chain efficiency.
(4) Bringing various public and private actors together and engage them in targeted activities of value chain development.

Value chain issues are very relevant in the developing country context: as traditional isolated production systems struggle to develop relationships with local and global markets, small-scale producers and processors in less developed countries miss out on opportunities to produce and market their products. Globalization and the opening-up of their domestic markets have made developing country industries further vulnerable to the interventions of global players and competition from abroad. Revolutionary developments in communication and information technology are driving the emergence of, and quest for, global knowledge and increased environmental and social awareness are pressing companies and producers to account for the provenance and quality of their products. Meanwhile many small-scale producers and processors lack capacities to comply with new business rules and quality standards and to make use of new technologies, all of which constitute obstacles to their integration into value chains.

In this context, the value chain approach can be seen as a generic approach to industrial development going beyond the boundaries of the traditional industrial sector where the provenance

and destination of products are usually not well considered. Value chain development can be pursued in such a way that it brings benefit to industries, regions and certain agents, prominent among which are producers and processors in less developed countries.

However, the value chain approach does not come with a unified theory. Rather it relates to an array of analytical methods as well as various approaches in development that deal with product transformation processes and exchange relationships among economic agents. Concepts such as supply chain management, enterprise development, logistics, cluster development, market chains, or global commodity chains are all related to the value chain idea; depending on the scholarly approach value chain analysis can focus on many of those aspects simultaneously.

Value chain analysis also has been commonplace in many project identification, programme planning and capacity strengthening activities at UNIDO. However, given the diversity in value chain analysis practices and the different nature of their work, UNIDO departments have emphasized different aspects of value chain analysis for industry development in their work and applied different tools to promote the development of industries. This is in line with experiences of other development agencies. GTZ (2008) for example, in analysing its experiences with value chain development in Asia, finds that none of its value chain development projects has used a comprehensive approach to value chain analysis nor has any come to a systemic analysis of the causes of value chain underdevelopment.

The aim of this working paper is to build on (a) the existing theory and practices of value chain analysis and development as applied by various scholars and development agencies and (b) UNIDO's experiences and expertise in value chain analysis and industry development in its partner countries, and define cornerstones for a generic tool for value chain analysis at UNIDO. A generic approach to value chain analysis at UNIDO would have the advantage that thanks to a holistic understanding of the value chain the whole range of obstacles to industry development would be identified and on the basis of a common rationale for interventions the different UNIDO, as well as governments and development agencies, could be called in to provide complementary services that allow for development of the value chain in question in a composite manner.

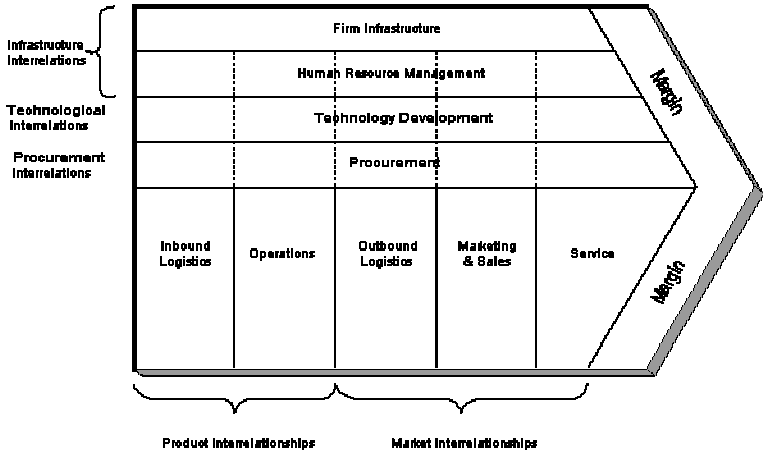
The document is structured as follows. Section 2 describes the various strands of value chain analysis that have been used in the academic and development literature and points out some of the cross-linkages between them. Section 3 discusses the advantages of value chain analysis for the field of industry development and elaborates on some of the common critique. Section 4 presents commonly used concepts and analytical dimension in value chain analysis. Section 5 draws lessons from the applications of value chain analyses among governments and international development agencies as well as from the use of various value chain analyses studies at UNIDO and develops some broad analytical dimensions for a common approach to value chain diagnostics. The final section provides conclusions and an outlook towards future actions.

2. VALUE CHAIN ANALYSIS: MAIN IDEAS AND COMPETING APPROACHES

Some origins of the value chain approach can be traced back to works in the 1960s and 1970s in which the aim was to identify development options for mineral-exporting countries (Girvan 1987, cited in Kaplinsky 2000). Some scholars also trace its origins back to Davis and Goldberg (1957) who coined the term "agribusiness" which included the sum of all operations concerning agriculture from the manufacturing of farm inputs, to production on farm, to the storage, processing and distribution of products. The approach also has origins in the "filière" approach which was used to study contract farming and vertical integration in French agriculture in the 1960s. Methodologically less rigorous, the filière approach was then applied to agriculture in developing countries, mostly by French scholars. The primary focus was on export crops from West Africa such as rubber, cotton, coffee and cocoa, all crops channelled through state-controlled marketing boards which regulate producer prices and aimed at generating state income. In this context the filière approach was less concerned with price liberalization and free markets but rather with establishing the best institutions to make the chain operate according to the objectives of the state and of development in general. Initially the approach focused on production and commercialization and only since the 1980s have elements of transformation and value addition been added to it[1].

The value chain approach became popular with the works of Michael Porter who, in the 1980s, introduced the term in his book "Competitive Advantage: Creating and Sustaining Superior Performance" (Porter 1985). Porter sought to assess the contribution of various firm activities — he distinguished *primary* and *supportive activities* — to the overall added value of its business (see Figure 2.1). Primary activities relate to the production process and include inbound logistics, operations, outbound logistics, marketing and sales, and services. Support activities are necessary for the effectiveness and efficiency of the firm, such as procurement, human resource management, technology development and firm infrastructure. Porter used the term "margin" to denote the difference between the total value and the cost of performing the value activities while other scholars use the term "added value" (Macmillan et al 2000, Lynch 2003). Total value can be understood as the price that the customer is willing to pay for the firm's product or service.

FIGURE 2.1: PORTER'S VALUE CHAIN



SOURCE: PORTER, 1985

[1] For a more extensive discussion of the approach and a comparison to the value chain approach see Rijkes, Friis-Jensen and Ponte (2000).

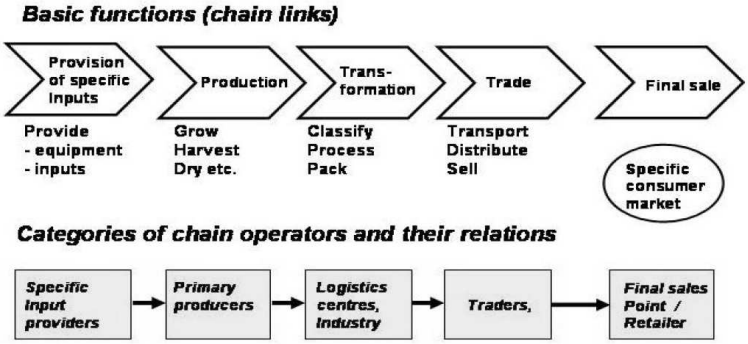
Porter's main aim was to enhance the *competitiveness of the firm*, which is subject to three forces of "horizontal" competition: threat of substitute products, the threat of established rivals, and the threat of new entrants; as well as two forces from "vertical" competition: the bargaining power of suppliers, and the bargaining power of customers. With the value chain concept Porter was able to emphasize that the profitability of a firm depends on how effectively it manages the various activities that create value added. Only if those activities are performed in a way that enables the firm to generate a sufficient margin between the overall costs of the activities and the price the consumer is willing to pay, is the firm profitable. The value added in each of the activities and overall determines how competitive the company is and whether it will maintain its competitive advantages in the future.

Since Porter's first works on the value chain, the approach has been extended and reshaped leading to a wide range of interrelated and sometimes contradictory concepts. Value chain analysis *à la Porter* entails a thorough examination of how each activity might contribute towards added value in the firm and how this may differ from competitors in the same branch or industry. In practice the analysis is a challenging exercise for every firm as it engages in (a) breaking down its key activities, (b) assessing the value adding potential by identifying cost advantages or differentiation potential, and (c) developing strategies that focus on those activities that enable the company to attain competitive advantages. In that respect the value chain framework is a tool to analyse the activities in which the firm can pursue its distinctive core competencies in the form of a low cost strategy or a differentiation strategy.

The concept has been used by subsequent scholars to study the *value added along a value chain*. For instance, a shirt that is sold in Europe for 30 euro might break down into 2 euro for the fabric, 3 euro for labour, 5 euro for production costs and profit to the local subcontractor in Bangladesh, 5 euro to the contractor and 15 euro to the retailer. This type of measurement not only allows us to tell what the profits and margins are but also how firms are linked, who can exercise power over whom and can also induce processes of organizational and technological improvement.

A common feature among the extended approaches to value chain analysis is that the focus has been shifted from the firm to the *interconnected set of firms* that together create the value added of the product. A visualization of this generic idea is given in Figure 2.1. Also, newer value chain concepts do not stop with the perspective of a certain commodity but also deal with the associated by-products and further components of the final product that are all important to determine the competitiveness and sustainability of the chain.

FIGURE 2.1: GENERIC ELEMENTS OF A BASIC LINEAR VALUE CHAIN MAP



Source: GTZ 2007

A general distinction can be made between the positive and the normative approaches to value chains. The *positive or analytical approach* suggests that the value chain is an heuristic device that helps in understanding the actors and linkages that are engaged in the production, processing and

marketing of products and services; value chains exist — well-developed and articulated or not — and it is up to positive research and analysis to find out how they function. The *normative or operational approach*, on the other hand, suggests that the focus on the value chain leads to development: improved coordination among the chain actors together with the development and upgrading of critical activities in the chain improves the competitiveness of certain actors and the entire chain, to achieve a more rewarding position in the marketplace. The normative development approaches can be distinguished with regard to the type of development at which they aim:

- *Firm development:* As in Porter's original approach the focus here is on the firm's activities to add value. The firm's value addition strategy can also include the backward linkages to suppliers and the forward linkages to buyers, marketers and consumers. This approach is used by scholars in the field of strategic management, business administration, production economics and logistics and frequently applied by corporate developers and business consultants. Commonly used terms in this literature include "*value chain management*" and "*supply chain management*" which both emanate from the idea of optimizing the supplies of the firm, reducing its costs and hence improving the competitiveness of the firm. More recent approaches in supply chain management include the development of a broad variety of business relationships to the procurement sector and often extend to the idea of the management of technological and product quality aspects in the product chain. Among others, large transnational companies in the apparel and food industries have used this approach to improve their businesses.
- *Commodity and Product Group Development:* Many governments and also private sector organizations turn to the value chain approach to develop certain commodities and products considered to hold potential for being developed, further processed or produced in larger quantities. The identification of such products is often based on ad hoc analysis of the existing product portfolio, marketing opportunities and the activities of competing firms and countries.
- *Industry and Sector Development:* The value chain approach also became part of policies for industry and sector development strategies. Development of the fresh fruit and vegetable industry in Chile or India's efforts to support the allocation of the computer industry in Bangalore are examples of concerted efforts on the part of the state to stimulate the development of a whole sector. Another example is the development of the dairy value chain in New Zealand which is driven by the private sector but draws on substantial governmental support. New Zealand has coined the term "industry good" for those products and services which are of benefit neither to the whole population nor to individual firms but to all entities comprising a particular industry. International agencies such as UNIDO, the OECD, the World Bank, regional development banks and, to a lesser extent, bilateral development agencies support government policy for industry and sector development.
- *Development in the less developed countries:* Recently the value chain approach has also become part of the approaches that governments and international development agencies, such as ILO, UNIDO, the World Bank and others, use to support the development of individual producers and processors, including farmers, and small to medium-sized enterprises in less developed countries. The focus here is on the building of capacities among marginalized and under-developed businesses and small producers in less developed countries to participate in local and global value chains. The redistribution of value added to the poorer parts by agents participating in the value chain often forms part of the concept. In these cases development efforts also embark on the creation of entire new value chains.

A number of principles that unify different strands in normative value chain development are (i) the development of competences and skills (often labelled as upgrading), (ii) the setting-up and improvement of forward and backward linkages among chain actors, and (iii) the drive for competitiveness among chain actors and within entire chains, clusters and industries.

The use of the value chain concept has been dominated by a range of schools of thought which draw in part from the above approaches to development. However there are many cross-linkages and overlaps. Four main strands of value chain analysis approaches are discussed in the remainder of this section (Figure 2.2 serves as an overview).

TABLE 2.1: VALUE CHAIN APPROACHES AND THEIR FOCUS ON DEVELOPMENT

Approaches/Schools of thought	Firm Development	Commodity & Product Group Development	Industry & Sectoral Development	Development in less developed countries
Supply Chain Management	X			
Industrial Clusters	X	X	X	X
Global Value Chains, Governance and Upgrading		X	X	X
Innovation Systems and Value Chains		X	X	X

2.1 SUPPLY CHAIN MANAGEMENT

Supply chain management implies managing repeated interactions between the firms responsible for the supply and transformation of products from primary commodities to consumables, to meet consumers' requirements in terms of quantity and price. Supply chain management can be seen as a business administration and strategic management concept; its aim is to match demand and supply with minimal effort and thus gain competitive advantages over competitors in crucial activities along the value chain. In practice, this often includes the *management of both horizontal and vertical alliances*. Increasingly supply chain management also embraces concepts of customer relationships management.

Strategies of optimization for supply chains include liaising with suppliers to eliminate bottlenecks; procurement to find the balance between lowest material and transportation costs, implementing Just-In-Time (JIT) techniques to optimize manufacturing flow; maintaining the right mix and location of factories and warehouses to serve customer markets, and using location/allocation, vehicle routing analysis, dynamic programming and logistics optimization to maximize the efficiency of the distribution of products and services to customers (Christopher 1998). Common business models for industrial supply chains include Make-To-Stock (MTS) which is usually applied for goods produced in large quantity, Build-To-Order (BTO) which is often for the one-of-the-kind customized order and Configuration-To-Order (CTO) which is a common practice for mass customized products.

Part of this optimization can be achieved by negotiating contracts with suppliers and buyers to specify prices and product conditions as well as by exchanging information regarding market fluctuations and production capabilities. Through *targeted linkage policies* firms are able to integrate some of their key business processes, from original suppliers providing products, services and information to end users. Supply chain management can lead to a situation on local and particularly global markets where competition is no longer between firms but rather takes on the form of supply chain versus supply chain: networks of firms compete against networks of firms.

Traditionally, supply chain management has been regarded as a *one-way, integrated manufacturing process* wherein raw materials are converted into final products. However, gradually issues of marketing, quality control, environmental concerns and consumer preferences have been built into supply chain management stressing the importance of a two-way flow through the chain. In fact, there is a field in management science which looks at supply chains in the sense of letting the customer establish the value "en-lieu" of the seller's products.

Supply chain management is usually seen as a tool that helps managers to identify key activities within and outside the firm that have the potential to give the firm competitive advantages. In

contrast, *logistics* deals with procurement but only in relation to activities within a firm. In relation to logistics, supply chain management has a somewhat broader focus encompassing linkages to supplier manufacturing and procurement as well as to processing among buyers and quality control along the chain. However, logistics in the traditional sense is gradually adopting elements of supply chain management beyond the firm gate. A step in this direction is for example the outsourcing of logistics by partnering with Third-Party Logistics (3PL) providers. Increasingly, companies also outsource production to contract manufacturers, particularly in regions and countries with comparative advantages (e.g. in terms of wages) thus making the development of the supply chain an integral part of their businesses.

The *nature of supply chains differs* greatly in accordance with the types of firms, industries and products and consequently, in the advancement in production technologies as well as information and communication technologies and changing business environment. For many companies in the computer, apparel and automotive industries it is not possible to provide all the products and services from start to finish. They need to work with supplier networks making use of integrated product quality control mechanisms and often also engage in the marketing and distribution of their products. Other firms, such as those in the food industry, work with only one level of primary suppliers but need to align with key partners in the retail and wholesale segments who deal with marketing and distribution functions.

The idea of supply chain management has also entered the agenda of development and *less developed countries*. Initially, supply chain management dealt with less developed countries mainly for sourcing cheap supplies to internationally operating companies. Minerals and tropical food crops are traditional products supplied by less developed countries but recently these countries have also become actively involved in the world economy through providing cheap labour for example in the garment, computer assembly and software programming industries, even running call centre services. In some rapidly developing countries particularly in Southern and Eastern Asia even second and third stage processors and assemblers have mushroomed, engaged in the production of many electro-domestic and consumer products. A distinct feature in less developed countries is the existence of *many suppliers in the primary sectors* (Woods 2004) with limited capacities to expand on productivity and product quality. Supply chain management in developing countries has therefore often dealt with setting up producer organizations and procurement schemes. More recent applications of supply chain management in less developed countries, however, also emphasize supporting small and medium-sized enterprises to build up efficient linkages

Supply chain analysis methods in the *corporate sector* are often carried out by company analysts and consultants exploring the firm's annual reports with regard to costing, change of activities over time and whether they are in unison with the competitive strategy of the firm. This information can be compared with reports of key competitors. Analysts also use planning tools and techniques like Porter's generic strategies, analysis of critical success factors and others in conjunction with the supply chain framework. Product life-cycle management is a method which provides modern internet-based information sharing among value chain partners (Chiang and Trappey 2007). One of the challenges in supply chain analysis is that the costs of the different activities of the value chain need to be attributed to an activity. There are few costing systems that provide detailed information on the activity level, unless an Activity Based Costing (ABC) system is in place.

The supply chain framework has been used as a powerful analysis tool for strategic planning in companies around the globe for nearly two decades now. Critiques often argue that supply chain management does not focus on future consumer needs (Al Mudimigh et al 2004); it is therefore ill-equipped to guide future investment strategies for product and organizational innovations as well as future strategic partnerships. New (1997) challenges the narrow approach of early supply chain management and argues that supply chain management research should not be driven by the

objective of efficient sourcing of supplies alone but also focus on the social function and the political and economic implications of supply chain development in less developed countries.

Somewhat related to the business-oriented supply chain approach is the field of small and medium-sized enterprise development. In developing countries *small and medium-sized enterprises (SMEs)* have a pivotal role in development and therefore many governments and developing agencies have set out SME support programmes of considerable size and scope. Among the many approaches to SME development the integration into local and global supply chains is a prominent goal. Such small and medium-sized enterprise development approaches seek to understand how and when SMEs can successfully compete in value chains. The aim then is to improve the competitiveness of industries in which significant numbers of small firms participate while addressing the constraints that hinder enterprise development. As UNIDO (2001a) argues, assisting low-income entrepreneurs to compete in global value chains requires an integrated approach to addressing the constraints and opportunities along the value chain.

2.2 Industrial Clusters

Economic clusters can be understood as "geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field that are present in a nation or region" (Institute of Strategy and Competitiveness, Harvard Business School 2009). One can distinguish between *geographical clusters* as defined above as well as *sectoral clusters* which operate from within the same commercial sector, *horizontal clusters* which build on relations between businesses such as resource sharing and exchange of knowledge, and *vertical clusters* in which the focus is vertical integration in the sense of a value chain.

The term "cluster" was popularized through Michael Porter's influential book The Competitive Advantage of Nations (1990). Porter refined the idea of economic clusters in his article on Clusters and New Economics of Competition in (1998) and since cluster development has become a focus for many government programmes and industry as well as company development efforts. The first principles of cluster theory, however, have been laid out already by Marshall (1920) who showed how firms that engage in similar activities generated "external economies" through pooling specialized workers, easy access to suppliers of specialized inputs and services and the quick dissemination of new knowledge. However, the common academic wisdom today is that incidental advantages in the sense of Marshall's external economies need to be complemented with concerted efforts in continued collaboration among the members of the cluster as well as sustained external linkages in order to maintain the functioning and comparative advantage of the cluster[2].

Since the early works of Czamanski and de Ablas (1979) many analysts determine the *identification of industrial clusters* through analysing the degree of vertical and horizontal integration and trading patterns among firms in an industry. Often, industrial clusters are also identified intuitively through recognizing the geographic allocation of certain types of businesses. However, more recent authors such as Renski, Koo and Feser (2007) contend that the criteria of industrial interdependence, i.e. the degree of inter-firm trading as well as the fact that firms do the same business are not always the most appropriate criteria for defining clusters and suggest alternative criteria such as human resource pooling economies and knowledge spillovers.

A large number of empirical and theoretical works exist on the *causes of cluster development*. Economic approaches usually elaborate on the effects of resource allocation, specialization, intensification and networking. In a given geographic space, producers and service providers as well as suppliers of raw materials and components start to operate in regions where superior natural, industrial, and institutional resources support efficient operations (Krugman 1991). Firms then specialize in a

2 *See Schmitz and Nadvi 1999 for a comprehensive discussion on the issue of collaboration in cluster development.*

certain production and intensify their operations over time. They jointly develop and exchange industry-specific knowledge and technology and use similar procurement and marketing channels. Efficiency in business transactions as well as knowledge exchange allows members of the cluster to increase their productivity while social networking processes improve access to cutting-edge information (Sorenson 2003). Other agents that are not part of the cluster usually cannot compete against the higher performing cluster members and hence cluster members profit from the reputation and market power of the cluster. Examples of clusters range from the high tech-industry in California's Silicon Valley, to high-end watch production in Switzerland and Jamón Serrano in Spain, to the "telenovelas" industry in Colombia, rice milling in India and shrimp farming in Nicaragua.[3] A comprehensive review of cluster initiatives around the world can be found in Soelvell, Ketels and Lindqvist (2003).

A wide array of *studies on clusters*, their characteristics and their evolution over time has been produced by scholars of various fields, e.g. political geography, economics, systems theory, strategic management, etc. These studies have shed light on the dynamics of cluster formation and the benefits of clusters for productivity, innovation and development. For example, some scholars of industrial clusters have found that cluster development is particularly important in the early stages of industrialization where effects of collective efficiency become relevant (McCormick 1998). Others argue that effects of cluster efficiency are important to maintain the competitiveness of certain industries also when they are more developed (Schmitz 2000). More recent studies are concerned with how the competitiveness of the firms evolves and changes over time. Pietrobelli and Rabelotti (2004) could show for a range of industrial clusters in Latin America that SMEs located in clusters have a competitive advantage with respect to isolated firms because of their higher collective efficiency that stems from their joint actions. Schmitz (2005) finds that the density and quality of local relationships within industrial clusters matter for competing in global markets. However, studying clusters of SMEs in Latin America Abaladejo (2001) finds that joint action is seldom and that additional efforts need to be made in terms of capacity strengthening to truly improve the competitiveness of clusters of SMEs in developing countries.

Industrial clusters are not only common in industrialized but also in *less developed countries* where they are often subject to industrial development policies. Frequently a kind of development incubator role is attributed to them. Schmitz and Nadvi (1999) have argued that the emphasis on cluster development in less developed countries grew out of the small-scale industry debate emphasizing success stories with small firm development within clusters in Europe, especially Italy, to oppose the unfruitful large firm development efforts in less developed countries in the 1980s. Schmitz and Nadvi (ibid) further argue that there is significant variation in the way that clusters grow, ranging from un-dynamic artisanal clusters to clusters that have successfully developed an internal division of labour and become competitive on international markets. They conclude that with successful cluster development in less developed countries often medium to large firms have emerged adopting specific governance and leadership roles. Ketels and Memedovic (2008) analyse cluster-based economic policies from around the world and conclude that cluster development is a useful and efficient tool of economic policy and that there are many ways in which economic benefits can be generated from the development of existing clusters. Ketels and Memedovic illustrate the case of natural resource-rich economies, where the need to diversify into new clusters is high but the barriers to success are considerable.

In conclusion, there is now sufficient empirical evidence to suggest that clustering helps small firms in less developed countries overcome development constraints, build capacities and compete in

3 *For a comprehensive overview on industrial clusters see the cluster meta-study of the Institute for Strategy and Competitiveness at Harvard Business School at http://www.isc.hbs.edu/econ-clustermetastudy.htm.*

distant markets. Among the advantages that the creation and further development of industrial clusters brings to the development process are the following:

(1) Cluster development fosters the industrial transformation of locally produced primary products and thus enables the generation of a higher share of value added.
(2) Cluster development can be used to spur the local economic development of certain regions.
(3) Cluster development can lead to higher efficiency and increasing competitiveness in an international context and thus to opportunities to penetrate markets abroad.
(4) Cluster development enables industries to confront competition in global markets.

Given these benefits, cluster development has become a prevalent component of industrialization and development policies in less developed countries prominently supported by many national governments, as well as the World Bank, OECD, UNIDO, Harvard Business School and a range of other development agencies. Through organization in clusters, SMEs are expected to overcome problems associated with small size as well as lack of capacities and knowledge and jointly be able to access foreign markets.

However, there is also recognition that the development of clusters in less developed countries is not an automatic process and therefore countries and governments are putting packages together that aim at supporting the development and upgrading of clusters. Ketels and Memedovic (ibid) argue that the issue of economies developing new clusters is most complex and a field where many mistakes are made. Moreover, many scholars consider the state having to play a substantial role in protecting the infant cluster industries and rolling out cluster support programmes to be implemented by parastatal development agencies specialized in cluster development. Cluster development cannot simply rely on private joint action but requires public agencies as catalysts and mediators (e.g. Waits 2000). A condition for starting a cluster is usually the existence of a critical mass of firms and knowledge and skills among the people. Upgrading can be understood as building technological, managerial and organizational capacities that enable the actors in the cluster to participate effectively in businesses; it means acquiring knowledge and technologies, but at a faster pace than competing clusters and industries.

Measures that are expected to spur cluster development and upgrading often try to enhance the collaboration and synergies among the members of the cluster; they include for example establishing credit lines, subsidizing R&D, strengthening technological capacities, diffusion of knowledge and information, building trust among cluster members, support to contracting with suppliers, linking up with traders to access sizeable markets, etc. In this vein, scholars of the Institute of Development Studies at Sussex University suggest a "Triple C" approach to local industry development: For effective cluster development interventions need to be (i) *Customer-oriented*, enabling firms to learn about and from the needs of their customers, (ii) *Collective,* encouraging cooperation and mutual learning, and (iii) *Cumulative*, generating the capacity to continuously upgrade and improve (Humphrey and Schmitz 1996). Public support becomes increasingly obsolete while the cluster develops towards (iii).

Soelvell, Ketels and Lindqvist (2003) suggest a different framework, the Cluster Initiative Performance Model which suggests that the performance of clusters results from three drivers: (1) the social, political and economic setting within the nation, (2) the objectives of the cluster initiative and (3) the process by which the cluster initiative develops. In a somewhat different approach Pietrobelli and Rabellotti (2004) suggest a menu of actions to support cluster development related to (a) facilitating the development of external economies, (b) promoting linkages between firms, and (c) strengthening the local position of clusters within value chains.

Cluster development is currently becoming more closely linked to the *value chain approach*. Much research on clusters in the 1990s was driven by the assumption that competitiveness depends on the quality of relationships in the clusters. More recent research, however, suggests that it also depends strongly on the interaction with local and global players outside the cluster, hence potential partners in the value chain. While clusters are primarily the accumulation of economic agents that are engaged in the same type of activities (e.g. producing shoes), their backward and forward linkages (e.g. to the leather industry and the shoe retailers) are also of crucial importance to the functioning of the cluster. In a cluster, producers are expected to profit from parallel links to suppliers and buyers. As such, the cluster can be seen as an integral part of a value chain. Cluster development focuses both on the improvement of operations at a specific segment of the value chain as well as the integration of these operations in the overall value chain. Indeed, many scholars of the cluster development approach converge to the arguments of value chain approach and vice versa.

2.3 Global Value Chains, Upgrading and Chain Governance

The concept of global value chains emphasizes the embeddedness of local production in global markets. Scholars of global value chains often assume that much of the international trade is coordinated by certain lead firms of global value chains (Humphrey and Schmitz 2008). However, the perspective of global value chains goes beyond situations where suppliers search for markets abroad. Rather the emphasis is on the standards and types of contractual relationships that exist in the production, processing and marketing of a certain commodity product or service worldwide. Global value chains can be understood as *networks of functionally interrelated producers and buyers that are engaged on a global scale in processes of value creation as products pass across borders and between different actors in the chain* (Gereffi 2001). Adopting a global perspective in value chain analysis enables recognizing that trade, the coordination of productive activities and technology transfer are increasingly organized across borders. This implies that key players in value chains are often located far away from the country of origin of the primary product.

Numerous empirical studies on the structure and evolution of global value chains by authors such as Peter Gibbon, Garry Gereffi, John Humphrey and Hubert Schmitz have shown that there are different types of global value chains, some of which are driven by the power of multinational buyers in industrialized countries and others by the power of large manufacturers. For example Bair and Gereffi (2003), for the case of the apparel industry, and Schmitz (2006), for the case of the footwear industries, could show that companies in these industries were organized in the form of a *buyer-driven* value chain. Buyer power often occurs in labour intensive, low-tech, traditional sectors where the manufacturing knowledge required to make them is ubiquitous and cheap. The consumer goods industry provides a number of examples of these types of chains but also food value chains dominated by large food conglomerates show signs of buyer-power. In fact, global agribusiness chains appear to be more buyer-driven because in many cases they are governed by the wholesalers, retailers and brand-name companies that are closer to final customers, while the producers in less developed countries struggle with a more vertical integration due to coordination problems. Meanwhile producers are also subject to supplier power of the various agrochemical and seed companies. In general, buyer-driven commodity chains are often characterized by multinational corporations or vertically integrated enterprises that control the production system and allocate the production on the basis of comparative costs advantages. Often retailers, brand-name merchandisers, and trading companies play a pivotal role in such chains.

Some of the buyer-driven value chains, particularly in the apparel industry, have been highly criticized for the unjust working conditions they provide to their workers in India, Bangladesh, Indonesia, Mexico, Honduras and many other low wage countries. Bair and Dussel Peters (2006),

for example, found little evidence that the apparel industry in Mexico and Honduras is generating conditions for endogenous growth and sustainable development. Memedovic and Mattila (2008) could show for the case of the global leather value chain that environmental policy instruments with respect to process standards and eco-labelling schemes constitute a burden to developing country producers. They found that particular financial and managerial skills are required for successful implementation and monitoring of these standards. Meanwhile trade barriers still exist in both the EU and the US for developing country leather producers. For the global clothing and textile value chains, Morris and Barnes (2009) found that sub-Saharan Africa could only further develop their industries if they had access to preferential trade agreements. However, agreements also have the disadvantage that sub-Saharan countries do not learn how to compete.

Producer or manufacturer-driven chains, on the other hand, are chains where firms lead and coordinate the activities of their suppliers and often those of their distributors. The firms usually draw their power from a combination of high capital investment and (proprietary) knowledge of key aspects of the industry's technology (Weiss 2002). Producer-driven value chains tend to have high barriers of entry as they require capital and technology intensive production and economies of scale, such as in the automobile, aeronautical or electrical machinery industries (Sturgeon et al 2009). One of the main differences between buyer-driven and producer-driven value chains is that the former often do not own production facilities, but rather act as key agents investing in design, marketing and sales.

Related to the argument of power is that of *barriers of entry*. Schumpeter (1934) showed that an entrepreneurial surplus can accrue to those who create barriers of entry, which is what happens when entrepreneurs innovate, creating new combinations and conditions, which provide greater returns from the price of a product. Gereffi (1994) and Ponte (2002) could show that producers and exporters from developing countries face considerable barriers of entry; they depend on lead firms in value chains such as manufacturers but also brand name companies and retailers that allow them access to developed country markets.

Related to the concept is that of *economic rents*. Rents can result from the ability to construct barriers to entry or from access to or control over existing scarce resources. There are a variety of economic rents, some of which are endogenous and are constructed by the firm, e.g. having command over scarce technologies, having access to better skills than competitors, possessing superior forms of internal organization, or possessing better marketing capabilities. Other rents are endogenous to the value chain, e.g. through having superior quality relationships with suppliers and customers. Other rents occur externally e.g. policy rents which construct barriers to the entry of competitors, infrastructural rents which stem from access to high quality infrastructural inputs and financial rents which are related to preferred access to finance (Kaplinsky and Morris, 1991).

Many authors in the vein of the global value chain approach argue that certain companies and countries establish *standards, rules and regulations* that prevent certain types of actors from participating in the value chain. For example, small producers in developing countries often find it difficult to comply with the requirements of large food retailers with regard to quantity and quality to be delivered. Another example is the EU which establishes standards of production, e.g. EurepGAP (GAP stands for Good Agricultural Practices) that many producers in less developed countries are unable to comply with. Its successor, GLOBAL G.A.P., is more private-sector driven with reduced influence of legislators. Meanwhile, there are also cases where the establishment of standards does not act as a barrier of entry. Maertens and Swinnen (2008) could show for the case of vegetable exports from Senegal that exports grew sharply despite increasing standards, contributing importantly to rural incomes and poverty reduction but they then led to structural change from smallholder contract farming to integrated estate production. Analysing the potential of global value chains for medium-income developing countries, Pietrobelli (2008) finds that

opportunities exist, but are hardly utilized. Public policies have an important role to play in improving the prospects of leveraging benefits of developing countries' industries to integrate into global value chains. Indeed, public policies are often crucial in providing public support and leveraging funds, and are often also decisive in the choice of which value chain to support.

One major consequence that is often drawn from the analysis of global value chain is that in order to participate in global value chains and to reduce adverse effects of the power of buyers and manufacturers, developing country producers need to *upgrade*. Upgrading can be understood as building technological and managerial capacity that allows local players to participate effectively in value chains. Value chain upgrading means acquiring knowledge and technologies, but at a faster pace than the actors in the competing chains. Taking the global furniture value chains as an example, Kaplinski, Readman and Memedovic (2009) could show that in buyer-producer relationships based on simple purchasing contracts upgrading is a crucial process for developing country producers to participate in the value chain; in their words "*buyers reward producer upgrading by increasing orders*". In some cases local producers can also try to upgrade in such a way that they develop their own value chains to reach consumers on global markets but this requires substantial support from governments and development agencies for a longer period of time. More common is that local producers in less developed countries get approached by larger buyers and retailers who continuously restructure the scope of their activities within the globalization process searching to collaborate with new suppliers.

Upgrading must not be a precondition for participation in value chains. It can also occur through contact and information exchange with advanced companies enabling local suppliers to upgrade their capacities. However, as Hobday and Rush (2007) could show for the case of relations between transnational companies in the electronics industry and their local partners in Thailand, this process is not automatic; in fact, the authors found evidence for many different pathways of upgrading for electronics firms in Thailand ranging from remaining "assembly only" plants to developing process engineering and product design skills. Morrison, Pietrobelli and Rabellotti (2008) find that the global value chain approach does not sufficiently emphasize the endogenous process of technological capability development among value chain members in less developed countries.

Focusing on the core competencies of the chain different *types of upgrading* can be envisaged such as (a) process upgrading, meaning to increase the efficiency of internal processes, (b) product upgrading, that is the introduction of new products or improvement of existing products, (c) functional chain upgrading, by increasing value added by changing the mix of activities in the firm, and (d) overall chain upgrading, meaning to engage in a new chain or improving the functioning of the existing one (see Kaplinsky and Morris 2001). Product upgrading has been found to be crucial for example among suppliers in the case of the Russian furniture industry (Avdasheva 2007); despite the considerable achievement Russian suppliers made in restructuring businesses, their production skills are the reason why they cannot become more important suppliers to West European furniture retailers. Giuliani, Pietrobelli and Rabelotti (2005) could show for a range of industrial clusters in Latin America that different types of upgrading occur in different types of clusters; overall however, they found process and product upgrading more common, while chain upgrading where the focus is on improved functioning of the chain is more rarely achieved. Organizational upgrading deals with the organization of producers and processors in business units such as cooperatives and joint businesses. Tonzanli and Gauthier (2007) could illustrate for the case of fresh tomato exports from Morocco and Turkey by large European retailers that local players must adopt collective strategies in order to curtail the bargaining power of retailers. Territorial upgrading has a focus on a certain locality or underdeveloped region and structural upgrading deals with firm sizes and business structures.

Chain governance has to do with the coordination function in a value chain, particularly how and by whom it is performed. In today's globalized markets where collective and systemic competitiveness becomes increasingly important, chain coordination allows agents to reduce costs and risks in production, transport and storage and permits timely production in response to the demands of buyers and consumers. Chain governance ensures that interactions between firms along a value chain are more than simply random, it allows for the establishment of efficient producer/supplier and buyer relationships with low transaction costs and increased liability.

Chain governance is not the duty of a single member of the chain but of collective character drawing from a multiplicity of nodal points of governance. The government can and should involve itself in chain governance and deal with issues of price policy, subsidies, research and development and infrastructure development. However, chain governance does not always require legislation as informal intra-chain regulations can also be efficient; the right to participate in the chain is often enough to make actors comply with rules. Chain governance also deals with the issue of power and its abuse by certain chain agents; if monopolistic structures allow for it, certain buyers or sellers in the chain could try to push for win-lose relationships which would increase their benefits but harm the overall functioning and competitiveness of the chain. For the *analysis of value chain governance structures* usually most influential agents and interest groups in the chain are scrutinized with regard to how far they set the rules and keep the rules and to what extent they influence existing structures and contractual arrangements.

Commonly, the focus in the *analysis of global value chains* is not on the profits of the companies in each of the segments of the value chain but on the overall value the chain generates and how this is distributed along the different segments of the chain. In this context, upgrading and governance influence the distribution of value among the actors in the chain and the aim of many developing country governments and development agencies to increase the value added share for developing country producers and companies. However, adverse dynamics can also occur: while on some markets prices of final products have increased or dropped only modestly, producers' prices in less developed countries have fallen dramatically as Gilbert (2007) could show for the case of the coffee and chocolate commodity markets. However Gilbert was cautious not to single out monopoly-monopsony power in the food retailers as the only reason of reduced value addition for developing country producers but also identified as important factors the increasing processing, marketing and distribution costs paired with a decline in production costs at the origin.

2.4 TECHNOLOGY, NETWORKS AND INNOVATION SYSTEMS

A common subject in academic literature on firm development is that incumbent enterprises have great difficulties in developing and adopting *technological innovations* and, thus, go into decline, while new entrants rise to market dominance by exploiting the new technology (Schumpeter 1934, 1950). Competition acts as a selection mechanism weeding out non-innovative actors from markets. There are certain technology-intensive industries such as automobiles, aircraft, computers, semiconductors, and heavy machinery in which this phenomenon is particularly important; however it also applies to firms in less technology-intensive industries which try to enter global markets where product and process sophistication is an important consumption criterion. However, radical technological innovation can also be a source of incumbent performance of firms in less developed contexts (Soete 1985, Hill and Rothaermel 2003).

The emergence of innovation requires technology, technical feasibility and new knowledge on the application of technology. Evolutionary economists such as Dosi (1982) have made the case that innovation occurs in technological trajectories in response to technology push (resulting from a creative and well-funded R&D system) and technology pull (demand for innovation by buyers and consumers). Technology push and pull can occur simultaneously at any particular point in the value

chain and in this interface innovation occurs as an evolutionary process governed by economic incentives and the specific technological characteristics.

Related to the idea of technology is that of technology systems (Metcalfe 1995) and techno-economic networks (Callon 1993). A system or network may be defined as a closed set of selected and explicit linkages with preferential partners in a firm's space of complementary assets and market relationships, having as a major goal the reduction of static and dynamic uncertainty. The *technology systems* literature emphasizes the important role of technology in development processes. Policymakers must differentiate between the different aspects of technology: knowledge, skills and artefacts. For each case there are different variety-generating mechanisms, different selection processes and different institutional structures that support their development. The main assumption in the *techno-economic networks* literature is that science networks are organized along three dimensions: science, technology and market. Its methodology suggests analysing networks on the level of actors, their interests, problem identification, negotiation and convergence, legitimation of the leading actor, intermediaries who facilitate the action, assignation of roles and functions, control systems, and transparency and irreversibility of the system. Also related is the idea of *sociotechnical systems* that recognizes the interaction between people and technology in workplaces.

Drawing on the above schools of thought of neo-Schumpeterian and evolutionary economics but also from strategic management, institutional economics, and new political theories, over the last decade the *innovation systems approach* has gained much attention not only as an analytical tool in science and technology policymaking but also as a general framework for industrial development. The early concepts of innovation started with Schumpeter who saw innovation as a new combination of existing resources which occurs as a sudden, outstanding event that takes its origin from scientific break-throughs and entrepreneurial initiatives. Decision makers in public and private innovation policy have experimented with innovation system approaches as suggested by Freeman (1987), Dosi et al (1988), Lundvall (1992), Nelson (1993), and Edquist (1997). Today organizations like the OECD, the European Commission and UNCTAD have adopted the innovations systems approach in their analytical perspective. Non-OECD countries seem to be following swiftly as current national science and development policies in India, Brazil, South Africa and China demonstrate.

An innovation can be considered as anything new that people introduce successfully in productive and/or social processes. Innovation events mark the introduction of new products or processes and represent the end of a process of knowledge sourcing and transformation (Roper, Du and Love 2008). They also represent the beginning of a process of exploitation which may result in an improvement in the performance of the innovating business. This recursive process of knowledge sourcing, transformation and exploitation comprises the innovation value chain.

At the core of the innovation systems approach stands the analysis of the innovation system itself which is made of (1) the agents involved in its development, distribution and use, (2) the interaction among those agents, and (3) the structure and rules which guide the actions and interactions of the agents. The innovation system approach also emphasizes that there are different modes of knowledge creation, storage and diffusion inside and between economic agents and internal and external learning processes through which knowledge and capacities are built up and deployed.

The value that the innovation systems approach provides to development policy can be summarized in the following arguments:

- It shifts the focus from research and technology to the productive or otherwise valuable use of knowledge by producers and consumers at the user level. The analysis is focused not only on how to best prioritize and allocate development resources and subsidies but also on how to bring about innovations that will be applied by users rendering value and quality of life.
- It replaces the traditional assumptions on the research-development continuum which suggested that innovation is created through a linear process that gradually leads from conducting research, transferring technology and applying results by producers in developing countries. Instead it suggests the existence of complex, non-linear and interdependent learning processes that lead to innovation.
- It emphasizes that innovation is generated through context-specific processes of interaction among agents that are strongly influenced by country, sector, economic, cultural and socio-political conditions and experiences in the past. By monitoring the dynamics of information exchange and interactive learning the complexity of innovation development can be understood and more adequate policies can be formulated to foster innovation development.

There are qualitative and quantitative differences in the roles innovation systems play in developed and developing countries (Melo 2001). In fact, the innovation systems approach to science, technology and innovation policymaking is recently being given increased consideration in developing countries (Cimoli 1998, Johnson and Segura-Bonilla 2001, Juma et al 2001, Arocena and Sutz 2003). In developed countries the focus is usually on maintaining or improving already established levels of knowledge, technology, and competitiveness, whereas in developing countries the issue is to bridge gaps and catch up. In his work for UNIDO Edquist (2001) introduced the notion of a system of innovation for development, which he considers to differ from an innovation system in a developed economy in four main areas:

1. Product innovations may be more important than process innovations because of the effect on the existing deficiencies in the product structure of developing countries.
2. Incremental innovations may be more important and attainable than radical ones.
3. Absorption of innovations may be more important than development of innovations that are new to the world.
4. Innovations in low- and medium-technology sectors may be more attainable than ones in high-technology sectors.

In cases where producers are not at the technological frontier or when their research and development capacities are limited, producers can benefit from imported information and technology. At times this gives a certain "latecomer advantage" to developing countries because using knowledge and technology developed by others is often less costly then developing it on its own. However, critics argue that developing countries should also utilize domestic knowledge and technologies (and eventually blend it with knowledge and technology from abroad) to develop their own capacities. Otherwise, they risk remaining third or fourth rank suppliers producing to the specifications of international buyers without being able to use opportunities for product differentiation. In this respect it may also be important that developing countries not only engage in product innovation but also in process innovation.

Considering a historical context where developed countries are technological leaders and developing economies are followers, the absorptive capacity of the latter is of crucial importance in the innovation process. Developing countries can obtain available technology by contracting or

setting agreements with firms, universities, labs, and so forth in developed countries; one framework in which this process can happen is within global value chains where developing economy players participate in upgrading and learning processes. Kale and Little (2007) for example have analysed how the Indian pharmaceutical industry has developed from an imitator to an inventor. Once a leading supplier of generic drugs to both developing and developed countries India conducts substantial research and development and has become an innovator of drugs. The authors could show how public industrial and technology policies along with changes in regulation of intellectual property rights played a crucial role in this development. Fromm (2007) could show for the case of Honduras how local producers, in their interaction with local processors or exporters and international retailers could acquire new skills and knowledge.

A related issue is that of disruptive technologies. Most value chain development frameworks suggest that firms innovate successfully when they do not disrupt relationships with value chain members such as suppliers and buyers. But, as Hall and Martin (2005) could show for example for the case of Monsanto's biotechnology products, there are also technologies which disrupt existing chain relationships causing substantial social uncertainties. However, given today's challenges in the world including poverty, social inequality, environmental problems, and climate change, many argue that disruptive technologies are required at large scale and it is the question whether these will stem from existing value chains or rather come from newly created value chains.

In industrial development innovation often occurs in the context of supply or value chains. In fact the innovation systems literature has considerably enriched the value chain approach particularly with regard to the fields of cluster development and global value chains. Chaminade and Vang (2008) for example argue that upgrading to higher value activities in global value chains seems possible when there is a local environment that supports interactive learning and innovation among chain actors, labelling this local environment the *regional innovation system*. They could show for the case of the software industry in Bangalore, India, that the setting up of innovation system like structures on the regional level helped in the transition of indigenous firms in less developed countries from competing on low costs towards becoming knowledge providers in global value chains. In a different study Bell and Albu (1999) could show that in a developing country context cluster development needs to focus on longer-term competitiveness among businesses suggesting a shift from production systems development to a system that is focusing on knowledge accumulation. Cook and Memedovic (2006) find that public support institutions in the knowledge production and innovation have a crucial role to play in regional development.

A number of recent studies in the vein of the innovation systems framework analyse the mechanisms which make members of value chains collaborate, develop synergies and link to businesses outside the value chain. Ceglie and Dini (1999), for example, have shown for the case of Central America, Mexico and Jamaica where the promotion of relations between enterprises and institutions allows enterprises to overcome their isolation and reach new collective competitive advantages beyond the reach of individual small firms. Firms' isolated efforts to make this transition tend to fail in the longer term. Activities at the higher end of the product range involve a high degree of innovation and interaction with customers, other firms and organizations. Firms' isolation in innovation can be overcome through networking activities where groups of firms that work on a joint development objective complement each other and specializing to overcome common problems.

Related to the idea of innovation systems is that of *networking and partnering for innovation*. Innovation networks can be understood as a specific socio-economic setting in which adopters and promoters of innovations interact in learning cycles to pursue an innovation opportunity. Such an innovation network is often related to a certain commodity and may well include producer-buyer relationships and knowledge exchange across value chain borders. There are countless studies from the strategic

business and innovation systems community which emphasize the point of knowledge exchange and networking for developing the competitiveness of industries. Partnerships can be understood as collaborative mechanisms among a few public or private value chain partners that agree to share resources, knowledge, and risks in order to achieve more efficiency in the production and delivery of products and services (Hartwich et al 2007). Also here many studies have shown how partnerships and joint ventures have enabled firms to improve their performance. In the case of the Argentinean wine clusters, McDermott et al (forthcoming) find that both inter-firm networks as well as partnerships with other public institutions help firms upgrade capabilities and gain access to a variety of knowledge.

3. THE USEFULNESS OF VALUE CHAIN ANALYSIS IN INDUSTRY DEVELOPMENT INTERVENTIONS

Industrial value chains can be characterized by a more advanced level of transformation beyond primary processing, by the level of sophistication and quality of the end product, by the multiple steps and actors engaged in the transformation process, and by the use of more advanced knowledge and technologies in production and processing. However, in a developing country context, industrial value chains might not yet have reached this level of sophistication and it is rather due to the process of industrial value chain development that they attain a certain level of industrialization. Industrialization — the process of social change and economic development that usually is accompanied by technological innovation — often happens in the frame of global and national value chains. In the past this process has often been dominated by the coal, steel and heavy machinery sectors. Today, however, industrialization can be found in sectors such as information technology, communications or garments.

Value chain analysis and development must be put in the context of new industrial realities. The industrial world is increasingly becoming dominated by transnational companies, which today make up more than 20 per cent of global GDP and 75 per cent of the global trade volume. While technical standards rise, many developing country industries have difficulties coping with barriers of entry and environmental, employment and health norms set by more developed countries and international trade rules. Meanwhile the distinction between industry and services becomes more and more blurred as the service share in many products is growing steadily. New industrial realities also bring challenges with regard to new market conditions such as stricter consumer requirements for quality, standards, packaging, etc., new marketing methods and channels, and the enhanced role of strategic partnering and regional economic cooperation.

Value chain analysis seeks to understand how value chains function and in what way they allow for the effective participation of various types of actors. Value chain analysis put into a new and broader perspective business development approaches traditionally concerned with factor endowments and comparative advantages. They show how production and trade are, to varying degrees, coordinated and linked between various actors in the value chain and at times shaped by dominant institutions and lead firms. Value chain analysis helps to understand critical conditions and circumstances in industrial development, related to competitiveness deficits and development bottlenecks that can exist simultaneously at various levels of the value chain.

In essence value chain analysis results are able to reveal if and which parts of value chains should be considered for development interventions and provide insights on how those interventions should be designed. Common parameters of value chain analysis include:

1. Who are the *actors* that *participate in businesses across value chains* and support the functioning of the chain? Often it is not enough to know the direct seller and buyer but also the actors behind them in the entire business chain with their specific demands and influence as well as the institutions which provide support services.
2. The way these actors *interact* and exchange products and information. Contractual relationships as well as customs and rules define to a large extent how effective supply and procurement can be organized. They also define how information on best business practices is exchanged and solutions for improved organization of the chain are developed.
3. The dynamics of *value creation* and how and where value is created at the different stages of the value chains. Identifying where the main value accrues and if and where profitability can be achieved helps to identify appropriate upgrading strategies for all the actors involved. Further, breaking down value chains in different stages and analysing their

performance enables entrepreneurs and policymakers points of entry to improve competitive advantages.

4. The *power relations* in the chain which determine how economic gains and risks are distributed among chain actors and how certain actors face barriers of entry and eventually remain excluded from participating in the value chain.
5. The *governance and management structures* that allow the value chain to function and develop over time meeting various challenges with regard to value chain coordination, competition, and technological improvement.
6. The *institutional and political frameworks* which guide the behaviour of chain actors enable or impede the development of value chains.
7. The distribution of value generated and the contribution to socio-economic development of poor and vulnerable groups through *effective and fair participation in businesses* that are part of the value chain.

3.1 IDENTIFYING POINTS OF ENTRY FOR VALUE CHAIN PROMOTION

Value chain analysis enables government and development agencies to identify development options, and leverage points to improve the functioning of the chain and the benefits it renders to its actual and potential members (Schmitz 2005). To put it in the words of GTZ (2007): "*value chain analysis is not an end in itself, but must feed into decisions of both private and public promoters of chain development*".

Kaplinsky and Morris (2008), for example, emphasized that the value chain framework provides a rich agenda for the *design and implementation of policies of industrial development*. They also argue that in this, the value chain framework goes beyond traditional Washington Consensus-style development policies that focus on liberalization of distorted markets but often remained silent on enhancing the organization among chain agents and the promotion of marketing and export supply functions. Others, such as GTZ, focus on the importance of influencing the distributive outcome of production and marketing processes and its benefits to the poor (GTZ 2007).

While the value chain framework can be operational to identify different development options, such options are usually related to different development goals such as subsector, industry and regional development, import substitution, export promotion, poverty alleviation, employment generation, improved natural resource management, environmental safety and others. The most important *development goals*, for whose achievement value chain analysis may be instrumental, are outlined below:

- Development of technological and organizational solutions and marketing to strengthen and extend production, processing and sales of an industry, a subsector or a value chain.
- Exploitation of opportunities that exist for producers and processors to participate in the value chain, such as building capacities with regard to knowledge and technology, development of competitiveness, compliance with standards and product and service quality.
- Development of value chains and industries in which significant numbers of small and medium-sized firms and poor workers participate in order to help them to benefit from value chain growth.
- Development of sectors and regions where the poor are concentrated such as for example agriculture, natural products, and labour-intensive industries.
- Development of marginalized producers and firms that could achieve a more rewarding position in the value chain. Likewise, actors can be identified that are stuck in value chains in such a way that they insufficiently exploit income possibilities.

- Exploitation of situations whereby strengthening a limited number of actors in a value chain can result in advantages for the whole value chain being achieved and a large number of actors can benefit from its development in a cost-effective manner.
- Development of production technologies and those parts of the value chain, sub-sector or region that enable cleaner production and compliance with environmental safety standards.

Public agencies and development projects depend on value chain analysis results for implementing chain promotion projects and planning supportive actions. Furthermore, chain analyses can be used to formulate impact indicators and for monitoring value chain promotion projects. Based on the identification of development options value chain analysis can produce a combined set of interventional strategies and tools for value chain promotion and industrial development in less developed countries including:

(a) Improving quality of products and services
(b) Improving efficiency of production and processing
(c) Creating new processing and transformation activities in developing countries to benefit from the additional value added (e.g. selling teabags instead of tea)
(d) Building strategic partnerships among chain actors and/or with extra-chain agents to foster product development, marketing strategies or other innovations
(e) Improving the marketing and distribution of products and services
(f) Providing critical technologies, information, know-how and skills to certain actors in the value chain
(g) Improving the capacity to learn and innovate
(h) Reducing entry barriers through adjusting regulatory frameworks that inhibit participation of actors in value chains or helping actors to comply with existing standards
(i) Strengthening the negotiation power of certain actors
(j) Improving the vertical integration of the value chain through improved contractual arrangements and chain governance
(k) Improving regulatory frameworks and inducing policy reforms to create an enabling environment for value chains to function
(l) Promoting fair conditions between the actors in the chain
(m) Strengthening capacities in the long-run through training programmes and business coaching
(n) Promoting clean technology and production and trade under criteria of environmental sustainability

At present, these intervention opportunities are often addressed in a fragmented manner, with many organizations and agencies applying only one, or perhaps two of them. This is related to the fact that most value chain analytical tools only focus on a subset of the development potential of the value chain. Ideally, however, value chain analysis should be applied in a way that detects all existing bottlenecks and development potentials and help managers and policymakers to deploy a combination of value chain development interventions which only jointly can lead to chain development.

3.2 WHEN AND HOW TO CONDUCT VALUE CHAIN ANALYSIS

Value chain analysis is often conducted by public policy and development agents but this does not mean that its results are only of benefit to these actors; it can also be used by private companies and industry based organizations. In fact, many of the interventions and recommendations that value chain analysis produces can only be implemented by or in collaboration with stakeholders in the private sector and associations that represent private firm interests. For example, private

companies can use the results of value chain analysis to develop their vision and technological upgrading and marketing strategies.

It is, however, important to see *value chain development not as an imperative*. In fact, some value chains may not require any further development, while in other cases development interventions may only reach unintended beneficiaries. There are also situations where value chain promotion is unlikely to help intended actors to improve their situations but would rather render advantages to some few chain-dominating agents. In other situations, alternative development interventions, e.g. SME development, integrated regional development or educational programmes, to name but a few examples, are likely to be more efficient than measures of value chain development. The decision on which type of value chain promotion to apply also depends on the type of organization concerned (e.g. public organization, development agency, private company or association), the pertinence of development opportunities and the possible effects. GTZ for example, in its value links approach (GTZ 2007), proposes to assess (a) the potential and limits of value chain promotion in a given development situation including the criterion of whether minimum conditions for the participation of the poor in commercial markets are fulfilled and (b) the potential to combine value chain promotion with other development approaches such as regional economic development, service market development and natural resource protection.

A crucial issue in value chain development is whether the value chain becomes coordinated (and developed) by an outside value chain promotion agency of public character or by a member of the value chain, usually a lead firm. Structural-adjustment-type development approaches in the 1980s and 1990s largely focused on reducing state interventions in chain development and attributing developing roles to self-organizing markets and lead firms. Gibbon and Ponte (2004) could show for the case of African agricultural commodity chains how, through product branding and buyer-driven commodity circuits, international lead firms have become dominant players leaving little room for value addition on the side of African producers. Such producers then often failed to comply with the standards set by the lead firms. Without further public support in technological upgrading and training, these producers missed opportunities to benefit from value chain integration. More modern approaches in value chain development suggest that interventions towards improving the participation in and functioning of value chains are legitimate and useful elements of state development policies. However, this does not necessarily justify that NGOs, governments and development agencies dominate value chains, take over roles that private sector organizations could perform, or even take market positions (buy and sell products).

Stimulating and promoting value chain development from the outside is difficult and requires a balanced approach considering the interests of stakeholders, development opportunities and social and private benefits. Value chain actors compete with regard to price and quality in their day-to-day business, which inhibits the development of trust and concerted action. Many developing country governments, often with support from international agencies, have set up development bodies that promote value chain development ranging from support to individual firms, to improving production and product flows at different stages of the chain. In fact, parastatal organizations that foster value chain development have mushroomed around the developing world. For example, organizations such as the Cooperation for the Promotion of Export and Foreign Investment (CORPEI) in Ecuador or the Foreign Trade Corporation of Costa Rica (PROCOMER) have been instrumental in fostering value chain development in their countries while also supporting business planning and the development of sectoral market strategies. Commonly, such bodies do not limit their activities to pure chain development policies such as the development of SMEs, the promotion of exports, the attraction of foreign investment, cluster development and others.

Another important aspect of value chain analysis is that it enables chain actors to "*become involved*" in the process of value chain development. Kaplinsky and Morris (2008), for example, emphasize that

the value chain framework helps engage policymakers, policy intermediaries (such as value chain brokers), firms and other actors in formulating strategies for value chain development and this process can be considered as important as the strategy itself. This goes in line with the arguments of Rodrik (2004) who emphasizes that industrial policy must focus less on the policy outcomes and more on the process of policy formulation bringing together private and public actors to solve problems in the productive sphere, each side learning about the opportunities and constraints faced by the other.

3.3 Some Critique of the Value Chain Framework

Academics and practitioners alike have questioned the value chain model and its application in the form of value chain analysis and development. The main points of critique rather extend to the value chain concept as a tool for development and less on the analyses of value chains. They include:

- Value chain development focuses rather on economic development and less on integrated human development and people's livelihoods. In the same vein value chain development is criticized for focusing on transversal subsector (chain) development thus neglecting aspects of a more integral territorial, local or regional development, which emphasizes the systemic effects of activities in different subsectors and sectors. Crucial conditions for human development (e.g. basic education, infrastructure, food security, health, etc.) are excluded from the development process. Bair (2005) for example argues that value chain analysis can explain only the sectoral but not the regional and national development, downplaying the role of structural political economy, local socio-institutional context, and the role of state and politics. Gilbert (2007) argues that value chain analysis can only complement conventional tools of policy analysis by providing a "richer" context in which these tools can be employed.
- Often development organizations have the option of choosing from a wider range of value chains and the parts of them they want to support. However, through the choice of the value chain, development organizations can substantially intervene in economies and interfere with market equilibriums. Also, often the choice is made to support existing chains rather than to create new ones from scratch.
- Value chain development may not always be the appropriate means to support the poor and vulnerable. Roduner (2005) argues that for the promotion of value chain development one usually needs to work with the most promising (non-poor) change agents and entrepreneurs. The poor can hardly be considered the engine of value chain development but they can profit from spillover effects and efforts to include them in the production of value added.
- Value chain development has focused on typical products of developing countries, often of agricultural origin. Small farmers' and producers' returns were often the ultimate basis for evaluating the benefits of value chain development efforts. The approach, however, has produced fewer lessons on industries other than agricultural industries, at least for the case of developing countries. For the case of non-agricultural industries in developed countries, a wide range of empirical evidence is available with limited relevance to developing country conditions. Furthermore, some critics emphasize that the value chain model describes a process whereby raw materials are transformed into physical products; it is hence less useful for the analysis of business relationships in the service industry.
- Value chain development can augment competition among producers in and across developing countries. For example, the fact that a number of Latin American countries undertake substantial efforts to upgrade their coffee value chains and enter premium quality coffee markets can be seen as a development wherein the final only consumers of

the coffee benefit from lower prices while producers face more harsh competition. For those agents without possibilities to upgrade incentives to join value chains may be too insignificant and barriers of entry too high; as a consequence they end up in a situation in which, excluded from the value chain, they are worse off than without support to value chain development.

- Efforts towards value chain development usually create both winners and losers. For those agents that do not upgrade incentives to join value chains may become too low and barriers of entry too high leading into a situation in which, excluded from the value chain, they are worse off than if no value chain had existed. Eventually, the common value chain analysis procedures provide an incomplete picture on the winners and losers focusing too little on working conditions, job security, wages, livelihoods etc. (Bair 2005).
- Some more business-oriented scholars critique the notion of "value to the final customer" which only can be understood in a theoretical context, and not in practical terms (Svensson 2003). The real value of the product is assessed when it reaches the final customer, and any assessment of that value before that moment is based on cost considerations and bargaining between buyers and sellers.

In conclusion, one can argue that governments and development agencies must consider value chain development as a complementary approach in the wide array of development policy measures and should only intervene in value chain development after careful consideration of the possible effects of interventions. Among the conditions that should preferably be in place in order to foster value chain development by public and international aid agencies are:

(1) Some sort of development opportunity must exist, e.g. the option to develop a whole sector or region, integrate more producers in the value chain, improve the gains of poor members in the value chain, etc., in other words, the outcome of the intervention is in the public interest.
(2) A qualitative (and if possible quantitative) appreciation of the benefits and costs (advantages and disadvantages) that occur to all actors involved must be the basis of the intervention decision. This appreciation, usually conducted in the form of a value chain analysis, must be as holistic as possible and take into consideration the gains that will be made in one field at the expense of a loss in another field.
(3) It must be made sure that alternative development approaches do not provide better or more cost-efficient results than value chain development.

4. BASIC CONCEPTS AND DIMENSIONS OF VALUE CHAIN ANALYSIS

Section 2 has provided information on the different disciplines and schools of thoughts that engage in value chain analysis and in section three we have seen what different types of public and private organizations want to achieve with value chain analysis. Now it remains to be discussed how value chain analysis actually is carried out. We hence provide in this section some basic concepts and building blocks of value chain analysis before moving on to section 5 where we discuss common practices.

4.1 BASIC CONCEPTS

In the following we mention a number of basic concepts that are commonly applied in value chain analyses across different schools of thought.

4.1.1 ACTORS IN VALUE CHAIN DEVELOPMENT

Many scholars distinguish between two main types of value chain actors: those who take an active market position in the chain and those who support value chain development without actively engaging in business relationships in the chain. The latter can further be divided into service providers and value chain development support agents. Also, it is useful to consider the policy and institutional framework conditions that enable or impede value chain development. Figure 4.1 illustrates a generic value chain in which four main types of stakeholders can be found:

- *Value chain actors:* The actors who directly deal with the products, engaging directly in production, processing, and trading. Usually they own the product and/or take market positions.
- *Public and private providers of services:* They support the functioning of the chain including transportation, packing and handling, certification, financial support, etc. (as far as it is not carried out by the value chain actors themselves).
- *Value chain promoting agents:* Government bodies, aid agencies and international organizations that undertake support activities and interventions to foster value chain development. The actions can include for example capacity strengthening, provision of market information, advice on business planning or the initiation of partnering arrangements.
- The *framework conditions:* These influence the development of value chains. They include the regulatory framework, policies, trade regimes, market interventions, infrastructures, etc. at the local, national and international levels and determine if there are national and global value chain enabling environments.

FIGURE 4.1: MAP OF GENERIC VALUE CHAIN

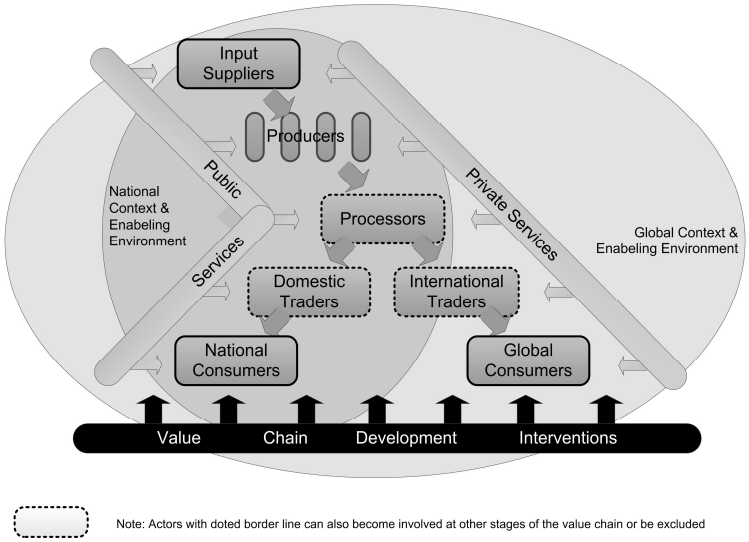


Figure 4.1 should be seen as a generic value chain that can include many types of actors operating at different levels of the chain. For example, in a fresh fruit value chain no first and second level processing may take place, but in the cotton, textile, and garment chain even more processing levels may occur, some in the domestic industry and some abroad. Also it is important to note that in a value chain there are parallel streams; while some products may go through second level processing and be exported, others may remain on the first processing level and be marketed to local consumers. In fact, for each specific value chain the picture would look different.

4.1.2 TYPES OF VALUE CHAINS

Value chains can be differentiated according to a number of criteria including the type of commodity, product or service they deal with, the degree of transformation they lead to, the types of actors involved and the degree of integration and coordination within the chain. Common types of value chains include for example:

- Minerals and fossil fuels value chains
- Agricultural and forestry product value chains (e.g. food, leather, fibre, wood and agro-machinery)
- Cotton, textile, garment and shoe value chains
- Automotive value chains
- Electronics and semiconductor value chains
- Telecommunications value chains
- Software development value chains
- Transport service value chains
- Banking and financial services value chains
- Ecological and fair trade product value chains (which are usually among the agricultural and forest product and garment value chains)

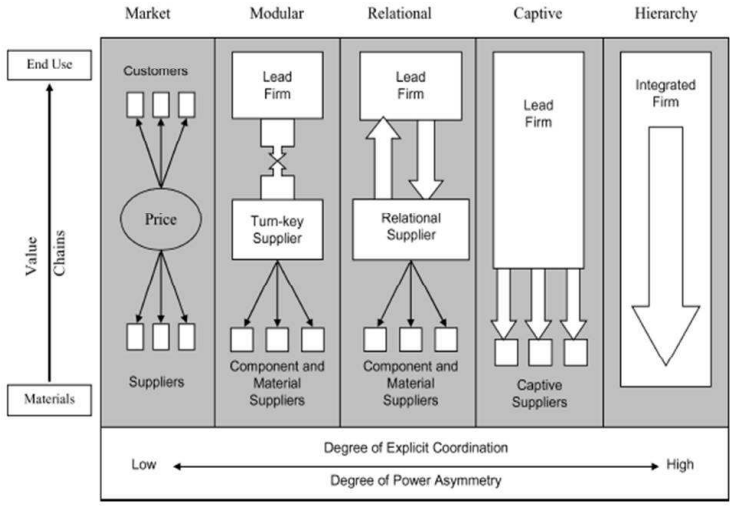
There are some general distinctions which can be made between certain types of value chains, e.g.:

1. Cross-border operations: One can distinguish here between *domestic value chains* where products are only marketed within the country and *global value chains* where the product is processed and/or marketed in a different country other than that from which its primary products originate.

2. Dominating actors and governance: The distinction between *buyer-driven* and *supplier-driven value chains* was already mentioned in section 2.3. One could further think of producer and trader-driven value chains. In terms of governance structures one can also distinguish between very *loosely coordinated*, market-based trading structures, and *intensely coordinated*, vertically integrated, value chains (Gereffi 1994).
3. Degree of transformation: Some products, such as fresh fruits, require only *few transformation steps*, e.g. packaging, in the preparation for final consumption. Other products, for example in the cotton value and textile chain, engage many different steps of processing. The degree of transformation is also closely related to the degree of sophistication of technology used: some chains only use traditional knowledge (this is the case with artisanal cheese production in Central America) whereas others use cutting edge technologies (e.g. the semi-conductor industry in South-East Asia).
4. Number of actors involved: Value chains, for example found in the automotive industry, require the *procurement of many different intermediary products* from a large amount of suppliers. In other chains, such as for example in the herbs and spices sector, there may be many different producers (or collectors) but all providing the same type of products. In the minerals sectors there are often few providers and few processors involved.

In terms of coordination and chain governance, traditionally a distinction is made between *market and hierarchy*: firms either buy goods and services from other firms on the market or they acquire capacities through mergers and take-overs leading to a hierarchical integration of activities. In a further development of this concept, Gereffi, Humphrey, and Sturgeon (2005) have distinguished five different governance patterns for global value chains focusing particularly on the prevalence of network forms of organization between the two extremes, market and hierarchy (see Figure 4.2). Their distinction includes: (1) markets where firms and individuals buy and sell products to one another with little interaction beyond exchanging goods and services for money, (2) modular value chains where suppliers make products or provide services according to customer specifications, (3) relational value chains where a relatively small set of co-located firms intensively interact and share knowledge in support of all value chain partners, (4) captive value chains where small suppliers tend to be dependent on larger, dominant buyers which in turn perform a high degree of monitoring and control, and (5) hierarchy which is characterized by vertical integration (i.e. "transactions" take place inside a single firm) and the dominant form of governance is managerial control.

FIGURE 4.2: TYPES OF GLOBAL VALUE CHAIN GOVERNANCE



SOURCE: GEREFFI, HUMPHREY AND STURGEON 2005

4.1.3 STAKEHOLDER PARTICIPATION

Participation of beneficiaries and other stakeholders in the analysis of value chains constitutes nowadays a large body of literature and many practical guidelines and tools have been developed to enable the participation of potential beneficiaries, particularly marginalized groups, in the planning and implementation of chain development planning activities. Deveaux et al (2009) for example, found that only with participation and collective action among small producers within Andean potato value chains could commercial, technological and institutional innovations be generated. The authors showed how via participatory market chain development and stakeholder platforms producers were brought together with market agents and agricultural service providers thus identifying common interests, sharing market knowledge and developing business opportunities. In the same vein, Bachmann (2007) criticizes those projects where expensive consultants spend many weeks interviewing key informants, reviewing statistics and writing lengthy reports of little practical use to decision-making and project implementation. He suggests an alternative approach which is based on consultations with lead firms and other chain participants, a value chain analysis in which some stakeholders actively participate, and the validation of the results and planning of value chain development interventions during workshops with broad participation of stakeholders.

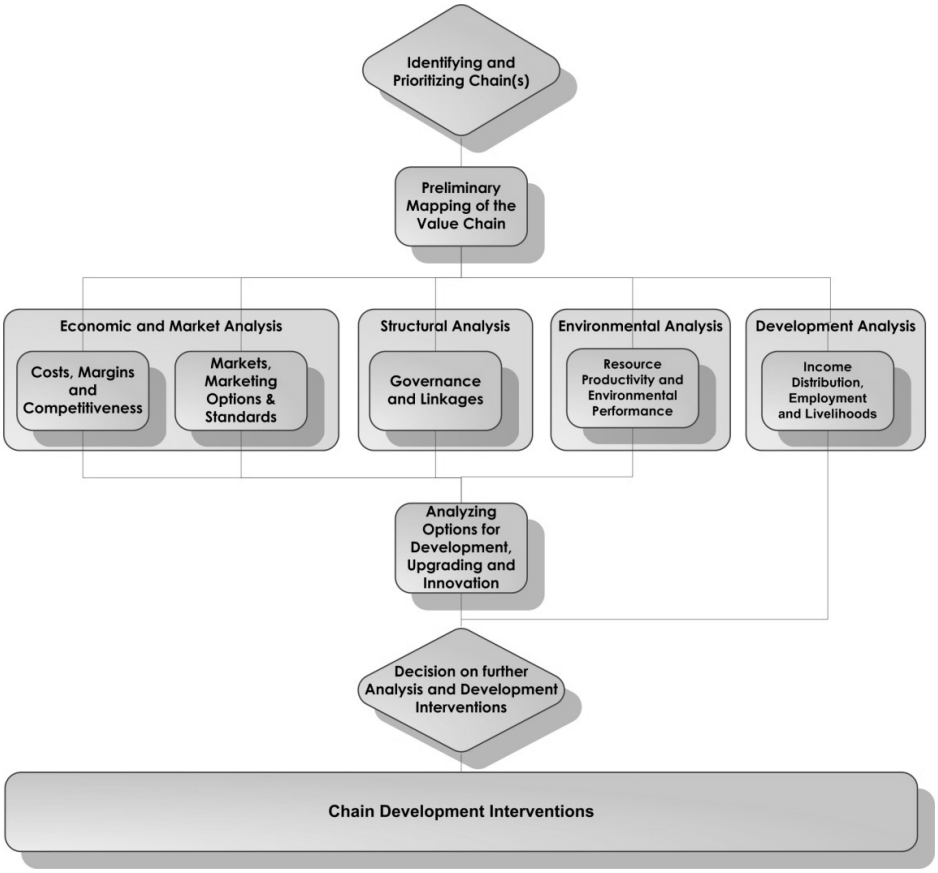
Vermeulen et al (2008) developed an approach to chain-wide learning for inclusive food market development emphasizing the importance of multi-stakeholder processes for influencing policies and institutions in dynamic food markets. They suggest a six-step process which goes beyond the analysis of value chains towards implementation and active participation of beneficiaries. It involves (1) mapping and understanding of the value chain, (2) mapping and understanding the institutional and policy environment, (3) analysing drivers, trends, issues and opportunities, (4) analysing future scenarios for markets and inclusion, (5) identifying options of greater inclusion, and (6) developing strategies for supporting change. Related to participatory value chain analysis is the participatory market chain approach such as promoted by Albu and Grifith (2006) and Bernet et al (2006), as well as Rapid Market Analysis such as promoted by Baker and De Souza Neto (2008). The latter approaches make the case for including stakeholders in the analysis as they become key in the implementation of the project.

4.2 BUILDING BLOCKS OF VALUE CHAIN ANALYSIS

It becomes obvious from the above — depending on the type of value chain, the approach/school of thought applied, and the objectives of the subsequent value chain development interventions — that there is a large number of options to analyse value chains. The World Bank, for example, often promotes logistics-based approaches. Subramanian, Yee and Paludett (2007), in their study of value chains in Nigeria, Mozambique, Kenya, Indonesia and Honduras, apply an approach that elaborates on four dimensions: (1) the activities performed during each stage of processing; (2) the value of inputs, processing time, outputs and value added; (3) the distance and logistics of the activities; and (4) the structure of economic agents, such as suppliers, the producer, and the wholesaler. Kaplinsky and Morris (2001) in their influential paper on "value chain research" suggest a range of analytical and methodological inroads into value chain analysis, among which the most important are: (a) product segments and critical success factors in final markets, (b) producers access to final markets, (c) governance of value chains, (d) upgrading opportunities and (e) the incorporation of knowledge.

Avoiding exhaustive discussion of the existing and often competing approaches, we present building blocks for value chain analysis from our own point of view below, drawing from common approaches and practices (see Figure 4.3).

FIGURE 4.3: FLOW CHART FOR GENERIC VALUE CHAIN ANALYSIS



In essence, we suggest the following procedure for value chain analysis: after the identification of the value chain to be analysed, a preliminary mapping of the chain shall be conducted providing information on the steps of transformation through which the product goes, and the actors involved. Then, an analysis of economic and market aspects shall be conducted drawing on information on costs, margins and parameters of competitiveness as well as existing and potential markets and the types of standards that need to be met for the commercialization of the product. Then, information on governance structures and existing linkages, partnerships and networks is collected in a kind of structural analysis of the chain. Further information needs to be gathered on environmental aspects such as cleaner production and other opportunities for more productive and sustainable use of natural resources and reduction of environmental impact. All this information is then reprocessed to analyse options for development, upgrading and innovation in the chain. Together with information on the wider impacts of the chain and its prospective development on income distribution, employment and livelihoods appropriate chain development interventions can be identified. Using all these building blocks leads to a value chain analysis that is holistic in nature in such a way that it includes almost all aspects relating to the development of value chains. The various building blocks are briefly described below. The emphasis, though, is not to provide an overall account on how to perform the different types of analyses — for this purpose the reader shall be referred to specific literature — but to put them in the context of a combined and holistic approach of value chain analysis. The main point of the scheme is to not choose from the blocks according to preference but take them all in consideration equally and make them part of an integrated diagnostic system.

(1) IDENTIFYING AND PRIORITIZING VALUE CHAINS

Prior to deciding on how to analyse a value chain and on further interventions for its development it is necessary to decide which sub-sectors, products or commodities should be prioritized for

analysis. Different tools of priority setting and ranking can be used which may differ in the way they use quantitative data and allow for the participation of potential beneficiaries. Most common is an approach where, in a first step, criteria are determined on which to base the selection of value chains to be analysed. Such criteria can be very diverse and depend on the strategic political priorities. Common criteria include for example the poverty alleviation potential of the chain, its potential to contribute to national or regional growth or to provide jobs and income, the domestic and/or international demand for a product, the market growth potential, the availability of subsidies and investment support, existing capacities, environmental sustainability, compliance to national strategies, positive gender effects, etc. Those criteria would then be weighted. Furthermore, a list of potential value chains would be developed. Finally, on the basis of scores that rate the compliance of the value chains with the established criteria and their weights the overall highest ranking value chains can be identified.

(2) Mapping Actors and Product Flows in the Value Chain

Chain mapping is a rather rapid technique that helps identify the various actors in the value chain, their functions and degree of power, and the interdependencies among them. In the mapping of value chains, visual depictions of basic structures are often used. A value chain map illustrates the way the product flows from raw material to end markets and shows the type of actors involved. Once the actors and relationships are drawn prices and margins at each level can be added to the map.

Value chain mapping is often used to locate actors in the chain, understand interactions and identify constraints and possible solutions at its different levels. "Chain mapping" is also undertaken to gain a better overview of the value chain to guide further full-fledged value chain analyses to be undertaken at a later stage. Through the mapping exercise it should become clear which actors and relations must be studied, what information needs to be assembled, and where fieldwork shall be undertaken.

The mapping exercise provides an opportunity for involving multiple stakeholders in discussions and may reveal opportunities and bottlenecks to be addressed in subsequent stages of value chain development. Mapping also helps reach a shared understanding among value chain stakeholders of the current situation of the industry.

Because extremely accurate maps require a lot of time and effort, the analysers may want to define a minimum level of acceptable error margins in order to get the task done on time. There are many potential dimensions of the value chain that could be included in an initial mapping exercise. Guiding questions to acquire the related information include for example the following:

- What is the nature of the product(s) that define(s) the chain?
- What are the core processes of transformation in the value chain?
- Which are the main actors involved in the chain and how can they be categorized?
- What are the volume of products and services that flow through the chain?
- What types of supplies and services feed into the value chain?

(3) Analysing Costs, Margins and Competitiveness

Comparisons of costs and margins of actors within value chains and beyond are at the core of most value chain analyses. The costs refer to the spending of a value chain actor, in other words, the contribution of the actor to the chain. The margins, also termed as rents, refer to the money an actor receives from the value chain, minus the costs. Actual costs and margins are considered by analysts when they investigate the levels of income of the various actors involved. Development of costs and margins across time and comparison of such costs between actors within and across value chains enable an analyst to see trends and options of growth and improving competitiveness.

Opportunity costs are useful in evaluating what alternative uses of resources could generate more income to value chain actors, quantifying costs of employing production resources (labour, capital, land) in a particular way, rather than pursuing alternative business options.

Competitiveness is a concept that compares the ability of firms to perform certain value adding activities. Here, often use is made of Porter's 5 Forces analysis (Porter 1979) which elaborates on forces that affect the firm's ability to generate customer value and income in a specific industry sector. The forces include: (1) the threat of substitute products, (2) the threat of established rivals, (3) the threat of new entrants, (4) the bargaining power of suppliers, and (5) the bargaining power of customers. Porter suggests applying the framework to individual firms within an industry, a change in any of the forces requires the firm to reassess its strategy. However, the approach has also been used to position groups of actors in value chains and entire value chains.

The concept of competitiveness can be extended to the level of sub-sectors, industries, value chains or entire countries. Some authors, however, dispute to which extent competitiveness can be attributed to aggregated levels beyond the firm (Krugman 1991). Other authors emphasize the emergent character of competitiveness, meaning that competiveness results from the interactions of the parts of the system (the actors) and does not exist in the parts themselves (Mason-Jones et al 1998). In relation to this argument, it may well be possible to establish costs and margins on the firm level but more complex parameters of systemic competitiveness must be qualitatively established on a more aggregate level.

Most common in the analysis of competitiveness is SWOT Analysis (SWOT stands for Strengths, Weakness, Opportunities and Threats), a strategic planning tool originally used in business administration which assesses strategy options by focusing on existing internal strengths and weaknesses and potential external opportunities and threats (Andrews 1971). A somewhat different branch of approaches to competitiveness focuses on the division of labour (Kaplinsky and Morris 2001). PEST analysis — the acronym stands for the Political, Economic, Social and Technological — is concerned with the external influences on a business that could affect its strategic development. Its newest derivativee, STEER, systematically considers Socio-cultural, Technological, Economic, Ecological, and Regulatory factors to reveal information about the competitiveness of firms and industries. Other authors have analysed the competitiveness of value chains with means of total quality management measures (Christopher 2005) or Delphi Study methods (Seuringer and Müller 2008).

The following questions can guide the analyst when dealing with the complex issues of cost, margins, and competitiveness:

- What are the actual costs, revenues and (profit) margins that different types of actors in the chain deal with? Which actors have the best ratios and which the worst? How have those figures changed over time?
- How high are the related opportunity costs and financial costs of operating?
- What kind of risks do certain actors deal with?
- How do financial metrics, such as cash-flow, net-present value, capital intensity or rates of return compare with those of similar actors in competing countries and value chains?
- How important are economies of scale for the successful operation in the chain?
- What are the costs of entry into the chain, e.g. operating and investment costs for starting up businesses?
- Beyond quantitative analysis: which sources of individual and systemic competitiveness exist in the chain?

(4) IDENTIFYING MARKETING OPTIONS AND RESPONSES TO MARKET REQUIREMENTS AND STANDARDS

A prospective market analysis helps in the development of strategic visions with regard to marketing options that can be pursued by various chain actors as well as the chain as a whole in the short, mid, and long term. One way to carry out this type of market analysis is to set forth the possible development pathways on existing markets and in relation to existing products as well as the opportunities arising from new markets and the possibilities of developing new and/or diversified products. The Product-Market Growth Matrix (Ansoff 1957) is a frequently used instrument to identify business and marketing options for actors in value chains. After enumerating the different product and market development opportunities, the analyst would rate the interesting options and characterize the existing and potential markets for each of the products. In a subsequent step, the upgrading needs would be identified.

Another commonly used tool in prospective market analysis is the Boston Consultancy Group Growth-Share Matrix (Henderson 1979) in which firms as well as entire value chains can rank businesses and products on the basis of their actual relative market shares and growth rates.

A more complex approach to market analysis including aspects of (3) costs and margins (and in parts, systemic competitiveness) as well as (5) governance and structure is applied by USAID in the application of the Structure-Conduct-Performance (S-C-P) framework (Kisito 2008). The framework suggests studying how the structure of the market and the behaviour of sellers of different commodities and services affect the performance of markets, and consequently the performance of the value chain. Market structure consists of the relatively stable features of the market that influence the rivalry among the buyers and sellers operating in a market. Market conduct refers to the patterns of behaviour among traders and other market participants including price setting behaviour, and buying and selling practices. Market performance refers to the extent to which markets result in outcomes that relate to certain social and private objectives such as price stability, profits, costs, etc.

Discovering marketing opportunities is one aspect; it is also important to respond to the types of demands that the market requires. Access to markets depends on the prevalent standards, rules and trade regulations. ISO norms, good production practices (e.g. EurepGAP and nowadays GLOBAL G.A.P.), traceability and food safety (e.g. HACCP[4]), certified ecological and fair trade production, life cycle assessment and many more have become important elements in value chain management. Some of them are set up by state regulations or they result from the demands of consumers; others have been self-imposed by leading buyers or retailers in the chain. In any case, they constitute entry barriers for many producers and processors in developing countries. A careful analysis of how these regulations and standards work and how they can be successfully implemented among chain actors in developing countries therefore constitutes an important element in value chain analysis.

The following questions can guide the analyst when dealing with marketing options and market requirements in a value chain context:

With regard to marketing opportunities:

- What are the existing and potential market and licensing requirements as well as marketing practices? Which options exist to respond to those?
- Which niche markets do exist and what are the costs of accessing these markets?
- What are the marketing exploration strategies of important competitors?

4 Hazard Analysis and Critical Control Points (HACCP) is commonly utilized to assess the quality of the procedures of a given production system, usually with regard to food safety and traceability issues.

With regard to market requirements and standards:

- What are the main characteristics of value chain products with regard to perishability, quality requirements and differentiation?
- What rules and regulations prevail on existing markets? Are they difficult to fulfil? Who must respond to them?
- What is the current product quality in the chain?
- Which roles do accreditation authorities play and how efficient are they?
- What are common standard setting and metrology practices?
- What is the prevailing awareness about rules, norms and standards, and related key gaps among chain actors?
- Benchmarking: who applies best practices in market compliance with standards?
- What are costs and benefits of quality control and traceability measures?
- What options for implementation of quality management, standards and conformity assessment do exist?

(5) Analysing Governance and Linkages

Here the aim is to investigate how the value chain operates and who is contributing to its operation as well as the system of coordination, regulation and control in which value is generated along a chain. *Governance* relates to the formal and informal arrangements between participants; it implies that interactions in the chain are frequently organized in such a way that actors can meet specific requirements in terms of production, processing and logistics. Governance structures are constantly evolving so that firms are able to comply with market requirements and standards and become more profitable. The instruments of governance range from contracts between value chain participants to government regulatory frameworks to unwritten norms that determine who can participate in a market.

Value chain *structure* consists of features that relate to the current situation with regard to the number of buyers and sellers operating in the chain, input and end markets, barriers to entry into the market and the nature of trading and alliance relations among value chain participants. *Interactions* in value chains can be classified into vertical linkages and horizontal linkages. The vertical linkages are the relationships between actors along the chain; horizontal linkages exist among the actors in the same stage of the value chain. Linkages within a value chain are mostly business linkages, e.g. contracts between sellers and buyers, and can be of formal and informal character. Linkages also exist with regard to the exchange of information and governance. Often actors in the value chain maintain very close linkages with a few other actors. Such partnerships can help in the development of products and services as well as developing new knowledge and innovations. When interactions for knowledge exchange and innovation turn out to be of loose character the term "innovation network" is often used. The analysis of interactions among value chain actors not only identifies how actors are linked with one another, but also the reasons for those linkages and whether the linkages are beneficial or not. Strengthening the linkages between the different actors in the value chain lays the foundation for improvements in coordination, cost reduction, product quality and marketing. An identification of the benefits (or lack thereof) of interaction helps identify the constraints to effective linkages and trust among value chain participants.

The level of collaboration can be analysed with means of transaction costs analysis (Williamson 1979). Other approaches that focus on strategic business development rather use an integrated set of measures that describe the performance and evolution of partnerships over time. Hartwich et al (2008), for example, suggest analysing the way partnerships distribute benefits among the partners and generate synergy in learning and technology development, the relation between costs and

benefits, and the evolution of the partnership arrangement over time. More complex interactions beyond a small number of core actors in the value chain can be analysed by means of Social Network Analysis (SNA) (Rowley, Behrens and Krackhardt 2000; Cantner and Graf 2006, Monge, Hartwich and Halgin 2008).

The following guiding questions are useful when analysing governance and linkages in value chain context:

With regard to governance:

- What rules and regulations exist determining the functioning of the value chain? What is the impact of these rules and regulations on members in the chain and its overall performance?
- Which barriers to entry exist (e.g. required capacities and investments, economies of scale, membership in cartels, licenses etc.)?
- Who are the dominant agents and which type of power relationships exist?

With regard to linkages:

- What is the nature of the contractual relationships between the various actors in the chain (vertical coordination)? With what frequency and quality are those interactions performed? Are they short or long term? What are the dominant coordination arrangements?
- What are the common practices of communication and information exchange in the chain?
- What type of clusters and networks of industrial agglomeration and specialization operate in the chain?
- What types of horizontal coordination mechanisms exist between actors with similar roles in the value chain (partnerships, joint-ventures, cooperation agreements, associations, cartels, etc.)?
- What is the level of trust among the actors within and across the various stages of the value chain?

(6) Analysing Resource Productivity and Environmental Performance

Cleaner production and environmental sustainability have become main challenges in modern supply chain management. On the one hand this is because bodies of national legislation and international standards require chain actors expanding from local producers to global retailers and wholesalers to comply with them; on the other hand, modern consumers show increased awareness of environmental and social processes as they become more and more concerned about the origin of the products and the way they are transformed. Environmental standards have become increasingly important in more developed countries often constituting barriers of entry for many small and medium-sized enterprises from developing countries.

Meanwhile many value chain development efforts in developing countries focus on activities in marginal areas where the natural resources and environments are fragile or already partly depleted. Value chain development work in these contexts needs to build up and protect natural resources rather than deplete them. Therefore the likely impacts of value chain development on resource use such as soil, water, air, human well-being, etc., need to be considered.

Assistance by development agencies has often focused on building capacities to comply with environmental standards thus leveraging inclusion of these firms into value chains. While traditionally many have seen environmental aspects just from the cost and risk side, there is a

growing consciousness that environmental issues also provide opportunities for cost saving as well as for the development of whole new businesses.

Meanwhile, outside the value chain analysis framework, the field of environmental management has developed an extensive catalogue of tools and methods for environmental assessment, including the ecological Footprint (useful for raising awareness among politicians and consumers), most prominently Life Cycle Assessment (LCA) and many others such as Environmental Impact Assessment (EIA), Eco-Management and Audit Scheme (EMAS), and Material Input Per Service Unit (MIPS). Environmental assessments usually refer to either a product or service unit (e.g. in LCA) or a company, production site or process (e.g. in EMAS).

One option in value chain analysis is to use indicators from OECD's Driving Forces Framework including the dimensions Driving Force, Pressure, State, Response and Impact (DPSIR). The framework has been developed for reporting on the state of the environment; it is a dynamic model, based in systems theory, suggesting that social and economic developments exert pressure on the environment and, as a consequence, the state of the environment changes leading to impacts on, for example, human health, ecosystems and products (OECD 1991). By their nature, indicators take a snapshot picture of a constantly changing system, while the assessments that accompany the indicators can highlight the dynamic relations. However, DPSIR and related approaches such as DPR have often been criticized for assuming direct, linear cause-effect relationships. Applying the framework to indicator development gets complicated when there are multi-cause or multi-effect relations, or phenomena that cannot be clearly classified.

Interestingly, the scientific discussion on how to best conduct environmental assessments and sustainability analysis has moved towards more systemic approaches that foster sustainability from an environmental, social and economic point of view. In this regard, "sustainability analysis" can be seen as associated with a more holistic view on production, possibly but not necessarily in the context of a value chain.

In any case, environmental issues have not prominently featured in most value chain analyses conducted. Conventional value chain analysis may or may not include environmental indicators that relate for example to pollution or energy and water use. Common questions in the analysis of environmental issues in value chain development relate to the following aspects:

- Land used for production and processing, effects on soil-fertility, erosion, biodiversity.
- Sources of energy being used and efficiency of energy use at different levels of the chain.
- Water use (quantity/quality) and contamination at different levels of the chain.
- Quantity and quality of chemicals used at different levels of the chain.
- Waste production and management at different levels of the chain.
- Possible effects of extended production and processing and value chain development on ecosystems.
- Pollution potentials such as acidification, euthrophication and others.
- Greenhouse gas balances.

(7) Analysing Options for Development, Innovation and Upgrading

Once information on actors, costs, margins and economic competitiveness, markets and marketing opportunities, governance and linkages, as well as resource use are all identified, options for value chain development through innovation and upgrading can be identified. Much of the work in this step deals with analysing options to remove development bottlenecks identified in steps 3 to 6. The starting point is often the analysis of gaps to leading actors in the chain as well as in other chains. These gaps may relate to cost structures, margins, product quality, skills and capacities, technology

used and markets served. Another important aspect of the analysis of development options is the analysis of the political and institutional environment that enables or hinders chain development. Sometimes it may be beneficial to first remove some of the legislative hurdles so that subsequent development measures can actually be effective. Common parameters in the analysis of upgrading and innovation options include:

- Institutional and policy environment including legislations for production, transformation and trade.
- Appropriateness of knowledge, skills and technology at different levels and needs and opportunities for upgrading (efficiency, effectiveness, affordability, suitability, compliance with standards, accessibility, replicability and exchangeability).
- Innovative capacities of various actors to search for and use new knowledge and technologies. Public and private R&D and advisory services that support knowledge and technology development and use.
- Adaptive capacities of the chain and among chain actors to deal with new situations and unexpected shocks depending on the mobilization and flow of knowledge among the actors.
- Past attempts to improve skills, knowledge and technologies and their impact on identifying constraints and opportunities for the future.

(8) Analysing Actual and Future Income Distribution, Employment and Livelihood Impacts

Value chains have far-reaching implications for those who get involved in them and those who are excluded from them. From a policy perspective value chain development cannot be seen as a means
per se (as it may be the case of supply chain management that takes an individual actor's perspective) but as a means to an end such as regional development, economic growth, improved incomes for marginalized groups or meeting the Millennium Development Goals or other livelihood improvement criteria. It is therefore important, in any value chain analysis exercise, to monitor potential socio-economic impacts on all the stakeholders. However, it is important to take into consideration that value chain analysis is not a means to poverty alleviation and livelihood improvement per se as there are too many aspects of livelihoods that are not touched by value chain development. But likewise it is important to consider that value chain development can contribute to improved livelihoods and that it affects livelihoods.

Important in the analysis of impacts is to distinguish the actual situation of the value chain and the scenario after it has been further developed. While the current situation is relevant for proper diagnostics, analysts should also take into consideration the results of the analysis of development, innovation and upgrading opportunities (section (6) above) and project the future impacts under these conditions. In this sense impact analysis is situational and prospective.

Analysing incomes within the value chain is central to understanding how the participation of marginalized groups and less developed regions are affected through the operation of the chain and how, in the future, they may become affected by any value chain development interventions. Income analysis usually starts with the costs and margins of actors in the different stages of the value chain. It then goes further to extrapolate the individual incomes to whole groups of the society (Kaplinsky 2000). The analysis may not stop at income distribution among chain actors but may also emphasize other income opportunities of the groups that are involved in the value chain. Often, in fact, producers are also involved in alternative value chains.

As with income distribution, analysing the distribution of employment within the value chain is central to understanding how different groups of actors are affected through the operation of the

chain and its possible further development. It also provides a start to determine opportunities for employment generation which by itself can constitute a goal in value chain development. Livelihood analysis, finally, goes towards the wide range of factors that affect people's livelihoods.

The main parameters of the analysis of value chains in relation to the wider impacts on people and society include:

- Target populations that are to benefit from the value chain promotion.
- Net income at each level of a chain and different groups of actors (small, medium, large), also as percentage of total added value.
- Employment at each level of the chain and its variability over time.
- Strengthened resilience and a reduction of vulnerability to shocks with regard to health, education, housing, etc..
- Participation of women and other vulnerable groups in activities on various levels of the value chain. Effect of participation and non-participation in the chain on livelihoods (e.g. health, education, communication, access to water, etc.).

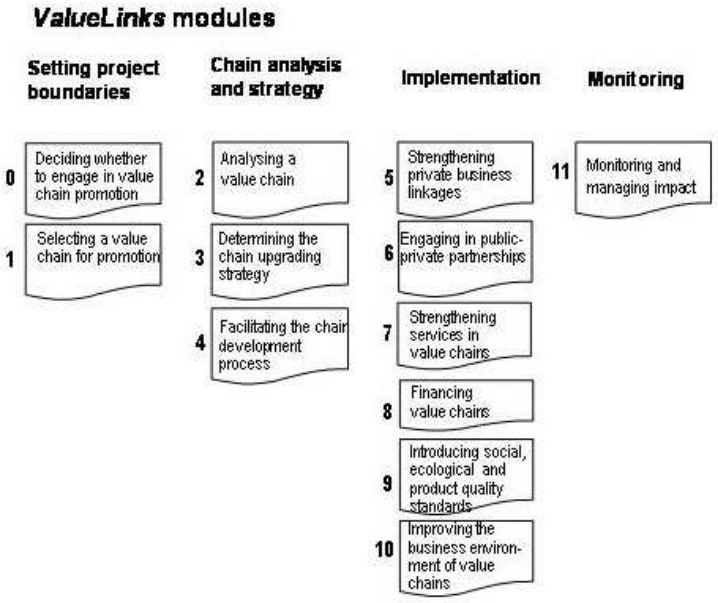
5. COMMON PRACTICES AND EXPERIENCES IN VALUE CHAIN ANALYSIS AND DEVELOPMENT

In the previous section we discussed basic concepts and building blocks of value chain analysis. In this section we switch to the issue of how those building blocks of value chain analysis are combined and actually carried out in practice and with which level of success this has been done.

5.1 COMMON PRACTICES AND EXPERIENCES AMONG GOVERNMENTS AND INTERNATIONAL DEVELOPMENT AGENCIES

There are many approaches to value chain analysis; in this document we only focus on a few, well-documented cases. GTZ, for example, developed an approach towards value chain development labelled "Value Links" (GTZ 2007). The approach constitutes a set of action-oriented and participatory methods for value chain promotion in developing countries. It is not specific to any sector but emphasizes production that offers market access for micro, small and medium-sized enterprises and farmers providing, among other things, job opportunities for the poor. In line with project cycle management concepts, the approach foresees proceeding through 12 steps (Figure 5.1) starting with the decision on whether to engage in value chain promotion at all, and how to combine it with other development approaches (step 0), continuing with the identification of a value chain to promote (step 1), followed by value chain analysis (step 2) and the formulation of a chain upgrading strategy (step 3). The following steps are concerned with the implementation of projects such as setting up business linkages (steps 5-6), assuring the procurement of services (steps 7-8) and setting the business environment including standards (steps 9-10). Finally, step 11 closes the cycle gathering know-how on the results and impacts.

FIGURE 5.1: OVERVIEW ON GTZ'S VALUE CHAIN PROMOTION SCHEME "VALUE LINKS"



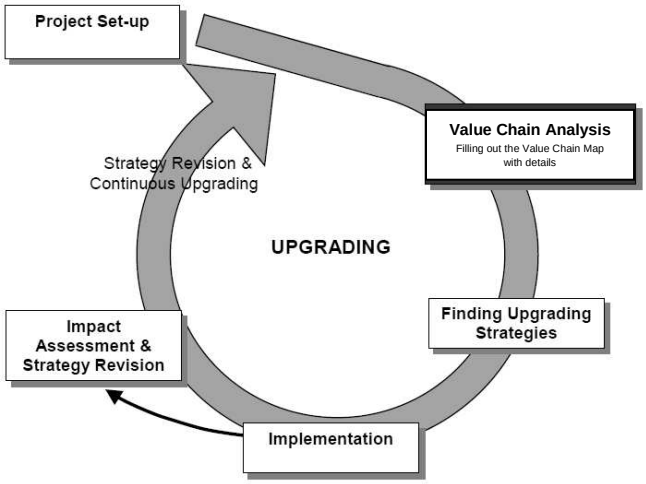
Source: GTZ 2007

In GTZ's value links approach, value chain analysis is an integral part (Step 2) of the cycle of value chain development. Market research is not included as a task in this type of analysis, but treated separately in step 1 of the approach. GTZ also suggests that any of the mapping exercises can be extended to an in-depth value chain analysis if required. The main types of analyses in GTZ's approach are:

(1) Value chain mapping where a visual representation of the value chain system is drawn and business operations (functions), governance structures, chain operators and their linkages, as well as the chain supporters within the value chain are identified.
(2) Quantifying and describing value chains in detail through attaching numbers to the basic chain map, e.g. numbers of actors, the volume of produce or the market shares of particular segments in the chain.
(3) Economic analysis of value chains in which the economic efficiency of the chain is assessed, e.g. through determining the value added along the stages of the value chain, the cost of production and, to the extent possible, the income and margins of operators. GTZ also suggests using benchmarks in the analysis of economic performance, meaning the comparison of important parameters in the chain with those of competing chains in other countries or similar industries.

The International Labour Organization (ILO) promotes a value chain analysis tool that puts value chain analysis in the context of "Upgrading", understood as increasing the economic competitiveness of enterprises and occupying new positions in a global value chain or delivering to new markets and buyers (see Figure 5.2). In this context ILO, given its mandate, emphasizes good working conditions, job and employment security, a clean environment, a well-educated youth etc., as important means by which to upgrade. ILO's guide for Value Chain Analysis and Upgrading is directed towards enterprise specialists at ILO and other organizations and consultants who work in developing countries and are engaged in upgrading projects. ILO foresees five steps in the value chain analysis: (1) Defining areas of interest, (2) identifying the entry points for value chain analysis, (3) planning detailed maps of particular parts of the chain, (4) carrying out the field surveys on three levels: global buyers, local producers, and suppliers and (5) evaluating the findings.

FIGURE 5.2: VALUE CHAIN ANALYSIS IN THE CONTEXT OF "UPGRADING" AT ILO

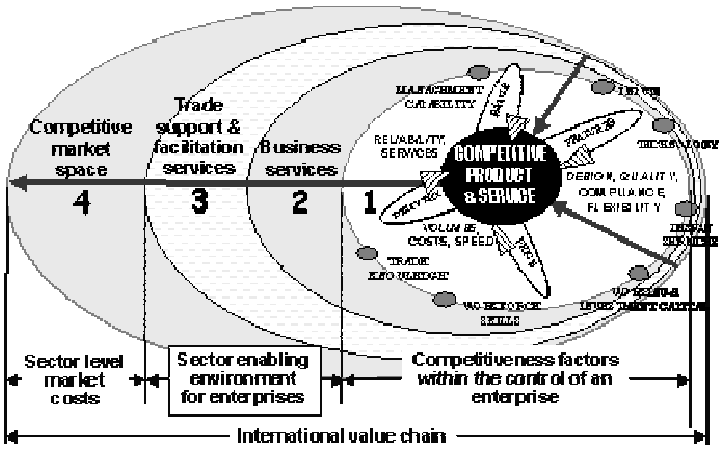


Source: ILO 2006

The International Trade Center (ITC) of the United Nations employs a set of participatory tools for value chain diagnostics, trade strategy development, and implementation (see ITC no date a and b). It suggests analysing the market and business environment of an exporter and identifies areas of trade support. The ITC tools are designed to help sector stakeholders or small groups of exporters identify opportunities, diagnose trade performance issues, develop strategies to improve competitiveness and organize their implementation (see figure 5.3). The ITC tools comprise three modules: (1) SHAPE which fosters the development of comprehensive trade strategies and organize their implementation. Its outputs include: value chain performance diagnoses, strategic vision, market options, objectives, implementation plans, progress indicators, resource

requirements and evaluation criteria; (2) DISCOVER which is a value chain diagnostic tool and training package provided to business and trade support organizations for the purpose of analysing processes, sector issues and planning response activities. Outputs include an evaluation of market requirements, a diagnosis of sector value chain performance and an action plan; and (3) COMPETE which is used to help groups of enterprises in the same sector to identify market success factors, plan approaches to new markets, develop optimum value chains, create business plans and organize their implementation.

FIGURE 5.3: VALUE CHAIN ANALYSIS PARAMETERS AT ITC



Source: ITC (no date a)

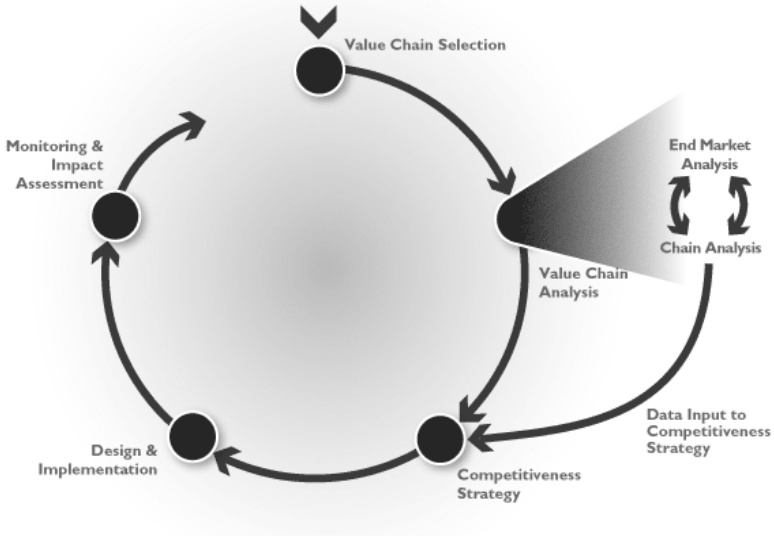
Value chain analysts at the Swiss resource and capacity building organization for professionals working in rural and agricultural development (AGRIDEA) and the Swiss Development Cooperation (SDC) have propagated participatory approaches in the conduct of value chain diagnostics (Roduner 2005). Emphasizing the challenges of availability and reliability of information as well as costs and time they also make a distinction between rapid and in-depth analyses. Any value chain analysis can therefore be placed in a continuum reaching from external and rapid to participatory and in-depth approaches. This also relates to newer approaches promoted by SDC and DFID-coined Market Development for the Poor (M4P), emphasizing the development of capacities among poor producers in developing countries to be able to react to market conditions and marketing opportunities.

The Dutch development organization SNV applies an income and employment oriented approach to value chain analysis emphasizing pro-poor development. The approach foresees six steps: (1) participatory selection of the value chain, (2) pro-poor value chain analysis, (3) identification of market-based solutions, (4) assessment of solutions, and (5) identification and selection of interventions and capacity-building of clients. The main building blocks of this type of value chain analysis are the identification of leveraging linkages, the identification of services that can support value chain development, and enhancement of the enabling environment. In a publication on the use of the approach in Asia (Viet Nam, Laos, Nepal and Bhutan) it came up with a number of principles for successful value chain analysis, including a pro-poor focus to concentrate on the needs of the poor and their opportunities and an emphasis on putting markets first starting with an assessment of opportunities to sell products.

USAID uses value chain analysis as a tool for "understanding the systemic factors and conditions under which a value chain and its firms can achieve higher levels of performance responding to end-market opportunities". The focus is clearly on business development and marketing. Growth and reducing poverty are expected to be achieved when value chains become more competitive and

a large number of small firms are included. The results of the analysis are expected to offer industry stakeholders a vision for value chain competitiveness and become the basis for a competitiveness strategy. The analysis of the value chain is embedded in a process of value chain development which consists of five steps, value chain selection (step 1), value chain analysis (step 2), the development of a competitiveness strategy (step 3), design and implementation (step 4), and monitoring and impact assessment (step 5) (see Figure 5.4).

FIGURE 5.4: USAID'S APPROACH TO VALUE CHAIN DEVELOPMENT AND ANALYSIS



Source: USAID Micro Links WIKI: Value Chain Analysis
http://apps.develebridge.net/amap/index.php/Value_Chain_Analysis

Value chain analysis at USAID is expected to draw from two types of analytical tools, (i) end market analysis to identify what type of market opportunities exist, where they can be found and the type of upgrading needed to exploit market opportunities and (ii) chain analysis to understand who will benefit in what way from upgrading, who has the resources, skills and incentives to drive upgrading, and why upgrading has not happened to date. Such value chain analysis, USAID suggests, should be conducted in four stages.

(1) Data collection and research
(1) Value chain mapping
(2) Analysis of opportunities and constraints
(3) Vetting of findings with stakeholders and recommendations for future actions

The above is just a small selection of the existing value chain analysis practices. Reviewing the vast literature, however, we could find few critical reflections on the success and failure of the various value chain analysis practices. Among the exception is GTZ, which in 2008 has been outspoken about its failure to develop a common approach in its value chain development activities in Asia. Another agency, the Swiss Development Cooperation (SDC), in 2004 organized a "community of practice" on the topic of value chains in rural development. The discussion was spread over two years and led to certain conclusions on how and when donor agencies should be involved in value chain analysis and promotion. One important finding was that development planners should first get the whole picture of the sub-sector before deciding on specific value chain development interventions. Other suggestions were that analysts should not only focus on linkages and relationships in the chain, but also on the framework conditions of business development.

USAID (no date) is rather positive about the success of the value chain approach and argues that value chain analysis is a powerful tool to create wealth in poor communities and for promoting poverty-reducing economic growth. However it is cautious enough to argue that the approach does not fit every project or country context. It emphasizes that "*prerequisites for taking a value chain approach include a minimum level of good governance and stability in the enabling environment, the existence of at least some market activity and a project goal of economic recovery, growth or poverty reduction.*"

5.2 Common Practices and Experiences at UNIDO

UNIDO, for many years, has been actively involved in value chain analysis. In fact, many industry and subsector development operations within the eight service modules at UNIDO correspond to aspects of value chain analysis even if the term "value chain" has only recently become used to label those operations.

In *trade capacity-building*, UNIDO has operationalized the value chain approach in a variety of ways, for example (a) to help countries to respond to changes in market requirement and regulations -- examples here are the sugar industry in a variety of ACP (African, Caribbean and Pacific) countries complying with EU regulations or the Egyptian food sector responding to new regulations for traceability, (b) to foster the inclusion of the poor such as the case in the cinnamon value chain in Sri Lanka, (c) to increase value addition among developing country processors, for example in the cotton value chain in a variety of African countries, and (d) to foster cluster and sector development to help local actors to enter global value chains such as with the case of the meat industry in Argentina and the cotton industry in Africa.

In the field of *investment and technology promotion*, UNIDO fosters the mobilization of domestic and foreign investments as well as modern technologies for industry development in less developing and transition countries. In its analysis of investment and technology promotion opportunities it uses many tools to analyse costs and margins of best practices and opportunities to enter new markets. Within this framework, UNIDO's Industrial Subcontracting and Partnership Exchange (SPX)[5] Programme has actively promoted business linkages and matchmaking: in more than 30 different countries worldwide it promoted fair and efficient business contracting helping in the exchange of information and orders between buyers and sellers. Part of this exercise also is the benchmarking of supplier performance and practices vis-à-vis global best practices as the basis for focused and effective supplier development to upgrade suppliers to meet the stringent procurement requirements of large transnational corporations. The local SPX team can mobilize locally-available support organizations for enterprise development, investment promotion and finance, and respond to the needs identified by the benchmarking diagnosis. UNIDO is currently updating its guidelines for supplier matchmaking, supplier benchmarking and supplier upgrading on the basis of established methodologies which were successfully applied since the inception of the SPX Programme in the early 1980s (de Crombrugghe and Le Coq 2003). Much of this work is focused on supplier and subcontractor relationships in specific value chains, but can relate also to the national, industry and subsector level. The SPX Programme establishes a network of national SPX Centres, to be hosted by a private sector association. Working with major buyers and deploying a range of tools and expertise, each national Centre will assist local SMEs to develop their technical and managerial capabilities so that they become competitive suppliers and subcontractors to major buyers. UNIDO also runs an Investment and Technology Promotion Offices Network which helps build effective business partnerships across borders; it provides services that allow business partners in industries to find alliance partners and set up partnerships. Investment promotion at UNIDO also makes use of the advanced in-house investment decision software COMFAR

5 An SPX is a technical cooperation programme that links domestic enterprises in developing countries to the supply chains of large domestic or international companies. The aim of the UNIDO SPX Programme is to develop the capacities of local SMEs to meet buyer needs and to identify profitable business/investment opportunities for them.

(Computer Model for Feasibility Analysis and Reporting), which is able to operationalize financial and economic profitability of investments in industry products, technologies and markets.

Box 5.2: Infrastructure Supplier Benchmarking Programme for South Africa

Leveraging public sector infrastructure investment programmes to achieve industrial development and shared economic growth, both within South Africa and on the continent, is one of the policy objectives of the South African Government. Due to increased economic growth in South Africa, Eskom, South Africa's state owned electricity provider is in the initial stages of large-scale capital investment (capex) programmes. Eskom currently generates approximately 40,000 megawatts of electricity, but plans to double this generation capacity during the next twenty years in order to keep up with demand and maintain an acceptable reserve margin.
Eskom purchases its equipment from the foundry industry that, despite South Africa's rich mineral resources and well developed extraction facilities, has performed below par during the past two decades, attributable in part to competition from imported equipment. In January 2007, the Government launched a "Competitive Supplier Development Programme". Until now, foundry companies have lacked a yardstick against which to measure their performance. Under a new project entitled "Infrastructure Supplier Benchmarking Programme for South Africa", foundry companies will be able to assess themselves against their competitors by answering questions such as "Where are we in relation to other companies?" and "What quality do we have to achieve to become a supplier of large private or state-owned buyers?" The project is a joint initiative of the South African Government, in particular the Department of Public Enterprises, and the Department of Trade and Industry, Eskom, the Industrial Development Corporation of South Africa and UNIDO. With the help of UNIDO, companies will be able to address their weaknesses and become more competitive. The project has adopted a buyer-driven approach, whereby the requirements of buyers are the starting and reference point for focused and structured supplier development. The benchmarking platform itself consists of a customized information technology system that provides a central database for capturing the requirements of buyers. This constitutes the baseline for assessing the competitiveness and capabilities of suppliers in relation to the needs of buyers and pinpoints development gaps. At a later stage, the benchmarking methodology will be used in other industrial sectors in South Africa. The roll-out of the programme to five economies in Southern Africa is imminent and the rest of the African continent will eventually follow.

In *agribusiness development*, UNIDO uses the value chain approach to target the interface between agricultural production and agro-industries which often is where root causes of poor market integration can be found. Working with the food, leather, textile, wood and non-wood forest product as well as agro-machinery and rural engineering industries UNIDO reaches out to a comprehensive analysis of a range of economic parameters such as productivity in agricultural production, adequacy of technology and know-how used, the degree of post-harvest losses, access to roads, storage capacities and existing quality and safety control. Particular emphasis is also put on the intensive descriptions of the functional linkages between actors in the agribusiness chains. Examples of such studies are available for the herbs, spices and essential oils value chains. Other studies emphasize the description of generic post-harvest operations which are often the limiting factors in the establishment of a profitable production enterprise (Douglas, Heyes and Smallfield 2006).

With regard to *industrial policy and private sector development*, UNIDO recognizes the important role played by micro, small and medium-sized enterprises in development and employment in developing countries. It promotes a shift in developing countries from low-value, price-driven to higher-value, knowledge-based industries. In particular it tries to support private sector development through fostering an environment that facilitates growth, including easy access to business related information, technical support services, funding and national and international markets. In this, it often uses the value chain approach to assess the competitiveness of particular products by identifying demand- and supply-driven obstacles as well as niche markets. UNIDO has

developed a quasi-rapid value chain approach (see Box 1) and a training module that has been implemented successfully in several countries. The result of this has been the generation of studies, e.g. on pineapple (UTEPI 2006a), lime and lemon (UTEPI 2006b) and cocoa (UTEPI 2007) value chains in Ecuador and the leather value chain (UTEPI 2008) in Paraguay. The objective is to transfer the value chain analysis methodology to government agencies so that they can produce the studies on a cost-effective and sustainable basis. The approach puts emphasis on the use of export unit values to map value-addition throughout the chain. Methodologically, it suggests four levels of analysis (i) analysis of global and regional dynamics to assess demand; (ii) analysis of country role models and threats to identify best practice and competition; (iii) the assessment of the viability of value-added by-products within the chain (e.g. coffee essence in the coffee value chain) given a country's capabilities; and (iv) qualitative assessment of demand- and supply-driven aspects influencing a country's competitiveness performance in a value chain. The approach focuses less on aspects of global governance, environmental concerns, and equity and poverty alleviation potentials but is efficient in providing essential information to value chain development promoting agents in a short period of time at limited costs.

Box 5.4: UNIDO-UTEPI approach to value chain analysis

The approach has been developed by UNIDO in the frame of several competitiveness programmes in Latin America. The UTEPI units set up by UNIDO for that purpose have adopted the value chain analysis methodology and produced several studies. A typical analysis includes:

- History of the industry
- Forms of product use
- Production requirements
- Commercialization requirements
- Global and regional dynamics
- Competitiveness analysis: comparison with benchmarks of main competitors
- International best practice
- Competitive factors (demand and supply) for value chain development upgrading
- Prospective and future markets
- Strategic recommendations

In another approach, UNIDO promotes private sector development through capacity-building for business information networking among SMEs. In a business information service programme UNIDO, since 2002, helps SMEs bringing together relevant business information from different sources and transforming that information into solutions that enable SMEs to integrate in national and global value chains (UNIDO 2003). In this context UNIDO has also worked on improving linkages among producers in industrial clusters; the aim usually is on fostering collaboration with regard to logistics and information exchange.

With regard to *energy and climate change,* UNIDO deals with issues of soaring and volatile energy prices and disruptive and unreliable energy service provision in developing countries which hamper business operations of SMEs. Value chains need reliable and affordable sources of energy if they are to be competitive. The challenge for UNIDO is therefore to find an appropriate balance between energy needs, including its contribution to economic growth and competitiveness, and the growing need to protect the planet from climate change and other negative effects of energy use.

The main focus of UNIDO's work on renewable energy is on development of decentralized power supply options for rural areas in off-grid areas, with special emphasis on productive uses and industrial applications. In many cases, this opens up new opportunities for economic activities which result in new industries. Also, lower cost decentralized renewable power generation based

options have been developed and demonstrated. This reduces the need to import costly fossil fuels. Biomass gasifiers and solar systems for industrial process heat applications and introduction of biomass feed stocks create a new local cluster of agriculture and wood industries that supply fuel for energy-intensive SMEs. Centres of excellence have been set up for small scale hydropower, solar, biofuels and hydrogen. This has resulted in the development of new industry clusters around these centres. The core of UNIDO's work on energy efficiency and policy is on energy management systems that improve the chain linkages within the companies between the energy engineers and the management. The methodological cyclic EMS approach results in significant additional energy efficiency gains that help raise competitiveness. Energy indicators, energy benchmarking and energy audits are part of this approach. Companies that are certified for energy management (the future ISO 50 001 standards that will come into operation early 2011) will have more international credibility and easier access to international markets. Through energy efficiency measures and the deployment of renewable energy technologies for reliable energy supply value chains UNIDO supports SMEs enhancing their competitiveness in value chains. It can assist firms in energy audits to increase energy savings and hence strengthen the competitiveness. UNIDO also focuses on the analysis of energy value chains with regard to their environmental impacts. The Green Industry Initiative, for example, consists of several pillars such as inter alia renewable energy, energy efficiency and also cleaner production. More recently, UNIDO deals also with development issues in the newly emerging value chains in the bio-energy sector.

In general, UNIDO Units seem to move towards a more comprehensive analytical framework that picks up on various aspects of value chain analysis (see example in Box 5.5). UNIDO's Competitive Industrial Performance (CIP) Index is already an example of a rather holistic, multidimensional assessment of industrial performance; though the measure does not relate to the competitiveness of specific value chains but aggregated competiveness of whole industries on the national level.

Box 5.5: Developing the cotton-textile-garment value chain in sub-Saharan Africa

In the cotton-textile-garment sector UNIDO has launched comprehensive value chain development initiatives in a range of African countries (UNIDO 2005). The ratio of cotton processing in sub-Saharan Africa is currently very low. Hence UNIDO addresses, in particular, the vertical diversification of traditional agricultural products into further processes that capture a higher proportion of the value chain. Among others, this is expected to lead to increased income at various levels of the chain and avoids social shocks that typically occur with the promotion of ordinary product diversification. UNIDO promotes three steps of the development of the cotton value chain: (1) enhancing the competitiveness of the supply capacity of the cotton, textile and garment producers and processors, (2) helping develop local technical norms and standards in conformity with international standards and supporting the building of capacities to comply with such, and (3) helping African producers and processors integrate into multilateral trading and connect their products efficiently to national, regional and international markets.

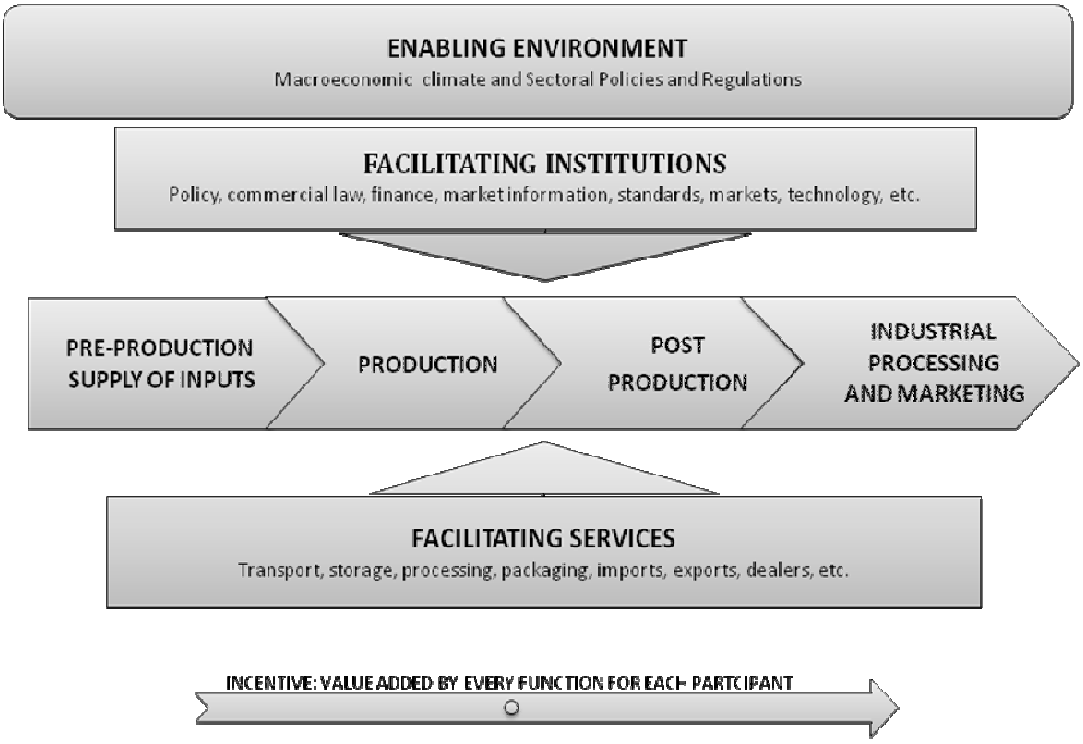
In its efforts to promote industrial and enterprise development in less developed countries, UNIDO has been going further in assembling a multidimensional analytical tool for industrial development. It suggests a five component framework of analysis (Dhaoui 2003) which in itself can be considered as a good part of a value chain analysis. The diagnostic components include: (1) the analysis of external sources of competitiveness, (2) financial diagnosis, (3) diagnosis of managerial skills and quality, (4) analysis of product markets and strategic positioning, and (5) diagnosis of the technical capacities.

For a number of years, UNIDO has made increasing efforts to put its various value chain related project and programme activities under a common framework with the ultimate goal to promote

value chain development in a comprehensive way. An in-house working group on "Business Linkages and Value Chains" was set up and tabled a draft position paper in March 2006. The paper emphasized the importance of "value addition" as a key concept in all value chain analyses and elaborated on Gereffi's work on governance of global value chains distinguishing between supplier-driven and buyer-driven value chains. The paper concluded that value chain analysis constitutes a promising tool for technical assistance and policy advice services at UNIDO and that an integrated framework for value chain analysis could enhance the effectiveness of UNIDO's existing technical assistance. This is consistent with some analysis of the usefulness of value chain analysis for example presented in Schmitz's (2006) work intended to raise the awareness of policymakers with regard to the importance of value chain analysis, Schmitz argues here that the value chain analysis is an important tool to also coordinate interventions among foreign donors and governments as well as within the government.

Latest efforts at UNIDO suggest a more holistic model to value chain analysis (UNIDO 2008) emphasizing the core chain activities of pre-production and input supply, production, post-production and industrial processing and marketing as well as a set of three value chain support functions: (1) the enabling environment (the macro-economic climate and sectoral policies and regulations), (2) the value chain facilitating institutions (such as policies, commercial law, finance, market information, standards, markets, technology, food safety, R&D, innovation, property rights, etc.), and (3) a range of facilitating services (such as transport, storage, processing, packaging, imports, exports, dealers, communication, etc.) (see Figure 5.5). The models suggest that incentives are provided through all actors in the chain through the addition of value at the different stages and functions of the chain.

FIGURE 5.5: PROPOSAL FOR A HOLISTIC APPROACH TO VALUE CHAIN ANALYSIS AT UNIDO



Source: UNIDO (2008) Value Chain and Pro-Poor Market Development.

6. PARAMETERS FOR GENERIC VALUE CHAIN ANALYSIS AT UNIDO

Overall, the review of theories and approaches presented in this working paper confirms the value that value chain approach adds to industrial development. There seems to be ample scope to use value chain analysis as a diagnostic tool in many of the project interventions UNIDO promotes in its Member States. Particular advantages to develop a common tool for value chain diagnostics at UNIDO include:

- It could lead to a systemic and holistic understanding of the value chain development contexts in partner countries identifying not only some but all development bottlenecks and opportunities.
- It would form a solid basis for identifying points of intervention and provide information on how to foster industrial development.
- By involving a broad range of development organizations and actors, it can contribute to consensus-building for solutions among stakeholders with very different interests and the possibility to implement such solutions will be increased.
- It would provide a common rationale for interventions not only of one UNIDO Unit but all UNIDO Units and would therefore increase intra-organizational coordination. It could also help identify areas where UNIDO could enter in strategic partnerships for value chain development.
- It could help in further identifying areas of high and low development impact thus providing a stronger rationale where to engage, partner and invest and where not. This would help UNIDO strengthen its orientation towards impact.

In conclusion, it appears promising to develop a generic approach to value chain analysis to be applied when UNIDO programmes are to analyse value chains and support value chain development in Member States. However, there are a large number of value chain analysis tools available and it would be important to identify a niche. The tool should focus on industrial development processes in developing countries where no unified approach seems to exist. Most likely the required tool for UNIDO should be rather holistic than selective, in order to be able to identify all existing value chain development opportunities. The tool would be comprehensive in the way it provides information on a wider array of parameters covering core aspects of value chain development with regard to structural, economic, and impact issues. Meanwhile the suggested tool may be rather rapid than intensive, because otherwise too much funding and time would be lost to get to the decision where to support value chain development. The industrial value chain diagnostic tool would be ex-ante in nature but must be followed by further in-depth analysis and feasibility studies leading eventually to concrete value chain development support actions. It should not be confused with ex-inter and ex-post evaluation methods which particularly focus on the results, outcome and wider impacts of value chain development projects during and after their implementation.

6.1 MAKING USE OF THE DIAGNOSTIC TOOL

The diagnostic dimensions and parameters to be included in such a tool are summarized in Figure 4.3 and discussed in the subsequent section. In the process of further developing the tool for value chain development indicators each of the building blocks would need to be defined and verified in further discussion with experts within and outside UNIDO and tested in the field.

Once the indicators are developed it would be important to develop a guideline that specifies the details of how the diagnostics shall be performed. In the development of the guideline UNIDO

Branches and Units must bring their particular knowledge and procedures to the table to ensure compliance of the tool with existing analytic procedures.

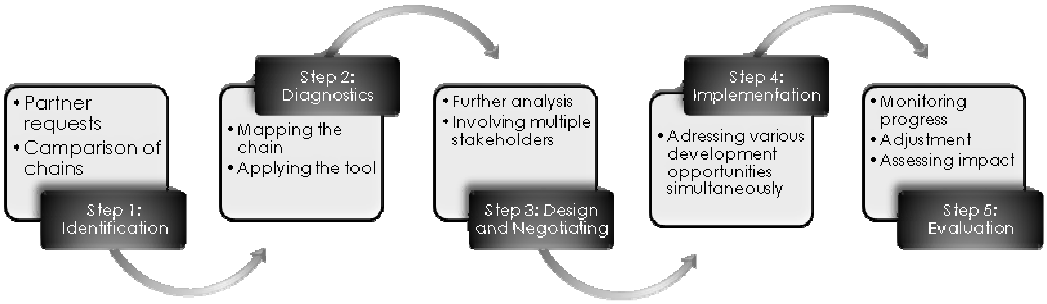
The question of who undertakes the analysis and how the results are utilized is no less important than the methodological aspects. The operation of the diagnostics that we suggest can be carried out by UNIDO Branches, country offices, consultants, partners in target countries or any organization that is interested in value chain development and promotion. Ideally, the diagnostics would be conducted in a short period of time and not exceed a certain budget level. The idea here is to gather qualitative and quantitative information to rapidly come to a judgment if it makes sense to support value chain promotion interventions and at which levels and functions to start with. Often, the need for in-depth analyses only arises as ideas for market development and upgrading emerge in the process. Overly ambitious chain studies at the outset can be quite counterproductive as they consume time and money and bear the risk of "analysis paralysis". The rapid diagnostic tool that we suggest, however, is not meant to replace more in-depth analysis of certain aspects of the value chain which may need to be carried out after the decision if and how to support the development of the value chain.

The information to be gathered for the diagnostics should draw from secondary data available (value chain analyses nowadays exist on almost all commodities and products) but also take into account national statistics, collection of sample data (e.g. on prices, costs and margins) and interviews with typical chain actors and stakeholders. Generating information and using it have to be conducted in iterative steps following the logic of the framework. If it is too difficult to get quantitative information on certain value chain dimensions a qualitative discussion of the risks and opportunities needs to be conducted, this may apply particularly to the dimensions of environmental and development analysis.

6.2 Putting Value Chain Diagnostics in the Context of Value Chain Promotion

Once developed and tested, the tool should be applied as part of an entire process of value chain promotion (see Figure 6.2). In this process, first the chain to be studied needs to be identified, a process which is usually led by UNIDO partner countries but in which the know-how and advice of UNIDO are also relevant. Second, the chain needs to be diagnosed according to the dimensions in the tool. Third, partner countries, potential beneficiaries, value chain actors and other potential development agencies need to be brought to the table to define how value chain development interventions should be financed and implemented. Eventually, further studies need to be conducted in areas prioritized by the diagnostics or where further information is required to judge the feasibility of implementation. Of paramount importance in the design is also to identify sources of investment. Finally, the value chain promotion interventions get implemented and subsequently, evaluation needs to be carried out to monitor progress, identify measures of adjustment and assess results and impact.

FIGURE 6.2: PROPOSED PROCEDURE FOR VALUE CHAIN DIAGNOSTICS



CONCLUSIONS

Value chain analysis provides important information for decision making in value chain development and support: it focuses on development options and allows identifying intervention opportunities. Value chain analysts, based on diverse approaches and preferences for development, have developed a wide variety of tools and methods to analyse value chains and have applied them in different developing country contexts.

However, the existing approaches are not particularly specific to industrial value chains in developing countries. Furthermore, the existing tools lack objectivity with regard to the subject of analysis and the solutions they can provide. Most tools are designed to promote value chain development of a certain type, e.g. employment and decent work conditions, small-farmer development, economic growth, competitiveness, market access or compliance with standards, just to name some examples. These tools come into play when decisions, if and how to develop the value chain are already made. Obviously, at this stage such tools only deliver what they are designed for but not a holistic picture over the entire range of value chain development potentials. Comprehensive industrial development, however, cannot allow itself to look into partial development solutions; there are all economic, social and environmental development objectives to be considered while poverty alleviation, economic growth, livelihood improvement and market development are all part of this.

The development of a tool for holistic but rapid value chain diagnostics for industrial development could change this situation. It could help develop quickly a rationale for overall chain development at the early stages of the value chain development effort and then provide insights on which critical aspects and opportunities the development efforts should focus on. Further analysis using the aforementioned existing tools is indispensible in the process. In fact, the value chain diagnostics would only constitute a brief intervention in a complex process of value chain development that engages an a-priori selection of the chain (usually a decision by governments or value chain actors themselves), the diagnostics, further analysis of development opportunities, project formulation, implementation, and monitoring, evaluation and adjustment.

Value chain diagnostics could become an important element in the rationalization and planning of industrial value chain development if certain principles are applied, such as:

- The diagnostics do not replace industry sector or country analyses but can be part of them.
- The diagnostics cannot be in-depth, further analysis is required to identify how to develop certain aspects of the chain.
- Stakeholders must be heard in value chain development. If it is not also during the diagnostics, stakeholders must be consulted before, during the identification phase, and after, in the further analysis and implementation phase.
- Value chain analysis should be taken as an opportunity to diagnose various development bottlenecks and opportunities simultaneously. It therefore helps coordinate and build partnerships for value chain development in which different organizations provide complementary services and functions.

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