Impact Assessment of Agricultural Value Chain Development – why it is difficult, rarely undertaken and what can be done about it
(Evidence based on Poverty Dynamics in rural Kenyan)

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Abstract

The development of agricultural value chains is assumed to support pro-poor rural development, especially where smallholder farmers participate. Therefore, development agencies, governments and private sector have invested to prevent the exclusion of smallholders from global markets and to integrate them in agricultural value chains over the past decade. But what are the social and economic impacts?
This research states that even though chain integration for African smallholder farmers has been subject to a vivid debate, a comprehensive analysis of poverty impacts of agricultural value chain development is hard to find. The author discusses the reasons why poverty impact assessments are so difficult, why they are rarely undertaken and what could be done about it. It is proposed to develop an innovative methodological approach by combining monitoring data from value chain development with poverty dynamics. Empirical evidence is provided with panel data from 1,275 rural households in Kenya. Standard quantitative panel analysis is combined with qualitative in-depth interviews following the q-squared paradigm.

Keywords: Agricultural value chains, Poverty Dynamics, Poverty Impact Assessment

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1. Background: Agricultural Value Chains in International Development Cooperation

1.1 International Market and Development Trends

Over the past 15 years, African economies are increasingly confronted with changing global food and commodity markets, due to globalisation and respective worldwide increase of demand for food products, due to domestic economic liberalisation and urbanisation. Subsequently, trade patterns, domestic market structures and consumer preferences have changed the face of African agriculture. This poses new opportunities but also challenges to small-scale producers, traders and processors along agricultural value chains. The integration of African farmers into agricultural value chains is increasingly seen as an important development framework, whereby rural economic development involves the transformation of agricultural based economies into more urban industrial and service-based economies. This changes the flow of resources and the trade of goods, services, knowledge and information whereby (globally) coordinated and integrated value chains will gain increasing importance (Humphrey, 2005). Particularly the increase in global demand for fresh vegetables and for fish has changed the export patterns for developing countries. Higher value fresh produce have substituted traditional tropical export crops – which provides African countries with new challenges and opportunities. Despite successful examples of integrating small-scale farmers into global value chains (a prominent one being Kenyan export horticulture producers, see for instance voor den Dag, 2003; Muendo et al. 2004), the share of developing country smallholder producers in global supply chains is still small and the potential exclusion of especially African producers from global agricultural value chains puts them in a general disadvantageous position (van der Meer et al. 2006).

Meanwhile, the international development debate has refocused some attention to agricultural and rural development, particularly in Africa during the past decade. There is broad consensus that for instance the UN Millennium Development Goals (MDGs) can only be reached if massive pro-poor rural growth is promoted. After two decades of almost neglecting the role of agriculture and rural development for overall economic performance in agriculture-based African economies, the MDG debate, as well as the emergence of Poverty Reduction Strategies (PRS) and subsequent re-focussing from economic growth only to poverty reduction in the late 1990ies, have contributed to a fresh look at promoting the agricultural sectors in developing countries. An additional factor might have been the economic success of export agriculture in some pioneer countries (such as Kenyan horticulture or South-East Asian Aquaculture). A certain enthusiasm developed around a combination of private sector promotion for economic growth and of fostering agricultural activities for rural development and reducing rural poverty. This change of perception of and attitude towards the agricultural sector by international aid institutions is manifested in many publications, perhaps most prominently in the World Development Report 2008 (World Bank 2007).

1.2 Institutional Failures of African Food Markets

In many African countries, agricultural value chains are facing numerous challenges namely: market failures (including monopolies, asymmetric information and inadequate infrastructure), policy failures (including lack of appropriate legal and regulatory frameworks, of incentive mechanisms and of favourable business environment) and more than often, massive capacity problems (of farmers and farmer organisations, the private and public sector actors) (Ruben et al., 2006). Whilst traditional cash crops in many countries seem to have established

fairly organized supply chains, many still suffer from excessive government intervention, (depending on the degree of market liberalisation). Newly emerging export crops on the other hand are often driven by foreign private companies and have managed to develop fairly integrated chain structures that sometimes tend to exclude poorer smallholder farmers (e.g. cut flowers). As for domestic food crops, they are yet to be taken seriously since they are projected to constitute the biggest future market for African agricultural producers due to increasing population and urbanisation (Ayieko et al., 2005).

But other problems abound: markets for farm inputs often fail and the further away a farm is from an urban centre, the less likely is adequate access, availability or affordability of farm inputs; scattered smallholder farms, limited storage facilities and poor infrastructure affect quality and marketable quantities of produce; the market value of most products is subject to very limited negotiation, given that many farmers limit themselves to price-takers while selling individually to middlemen at the farm gate; the absence of quality standards, regulation and competition for some products increases the potential for fraud and results in significant mistrust between farmers and traders; food marketplaces often turn out to be rather chaotic spot markets characterised by terrifying hygienic conditions, which account for significant post-harvest losses. In essence, competitiveness of many African agricultural value chain actors is low (Hoeffler 2006). However, integration into global chains has proven to deliver to some extent the necessary increase in chain efficiency.

1.3 Value Chain Promotion as Development Approach

Taking into account the above mentioned international trends and prevailing failures, the development of agricultural markets and the promotion of its involved actors (i.e. the predominantly rural and presumably poor producing farming population) is seen as a promising development path. In the line of rural economic development and poverty reduction, the development of agricultural value chains gained prominence as a development approach by many agencies in the beginning of the 21st century. Currently, most African countries and international donors apply a twofold approach to rural development: a) a strong promotion of private sector activities in agriculture to support production and marketing and ultimately rural growth and b) a rural livelihoods approach to take into account a set of rural cross-sectoral social factors and safety nets for poverty reduction. Experiences in a number of countries show that a key success factor lies in the re-definition of roles of public and private sector actors along the value chain. At a minimum, the public sector should provide an enabling rural business environment (legal, political, and economic) for the private sector to undertake (agri) business activities; whereas the private sector needs to improve its efficiency and competitiveness. Farmers need to strengthen their technical, organizational and collective action capacities so as to actively and profitably integrate into (domestic and global) agricultural value chains. To achieve rural growth, public, private and civil society actors need to jointly develop an economically efficient, socially equitable and environmentally sustainable agricultural sector. The value chain development concept provides one framework for facilitating this public-private-farmer (and others) collaboration or partnership (Ruben et al. 2006; Merlin, 2005).

Many development agencies such as the UK Department for International Development (DfiD), the United States Agency for International Development (USAID), German Agency for Technical Cooperation (GTZ), Swiss Development Cooperation (SDC), World Bank, International Fund for Agricultural Development (IFAD) have designed projects and programmes for value chain development, which was regarded as innovative by offering a more holistic development approach and its market-driven characteristics. These projects were of-

ten accompanied by national and international research to assess risks, benefits and impacts. All these development agencies as well as research institutions, such as the Institute for Development Studies, Sussex (IDS) and Wageningen University and Research Centre (WUR), have documented their experiences with value chain promotion in a number of agricultural and economic development projects. In Africa, Asia and Latin America value chain development projects are implemented, most of them dealing with food commodities. Many of the projects are organised in networks of researchers and practitioners and have entered a stage of intensive exchange of experiences with value chain promotion and capacity building[1]. Furthermore, a series of international conferences provided the room for international exchange of lessons learned and experiences made[2].

2. Problem: The Absence of Quantitative Poverty Impact Assessment

All international conferences and expert meetings mentioned above generally assess agricultural value chain promotion as a successful development approach. However, all meetings had the aspect of poverty impacts of chain development more or less explicitly on the agenda and most concept papers and handbooks on value chain promotion mention the "poverty orientation" of the approach. *"The value chain approach contributes to reducing poverty if it (…) concentrates on targeting the poverty problem. (…) Often, it is necessary to combine value chain promotion with a livelihoods perspective, with local economic development or with vocational training so as to enable the poor to enter (and stay in) commercial markets. However, we need much better monitoring tools to guide pro-poor value chain promotion."* GTZ (2007). This illustrates the existing unease among the community of practitioners, that economically successful agricultural value chain projects didn't seem to specifically target "the poor" (e.g. poor smallholder farmers). Remarkable little, close to nothing, has been published about how to identify the poor or how to measure their poverty, i.e. their moving out of poverty or lifting above the poverty line in the context of agricultural value chain integration in development projects. A common justification is given by a general increase in rural economic activities and trust in further trickle down effects such as rural employment creation. Yet interestingly, in projects where poorer rural target groups were involved, a number of similar difficulties seem to prevail, such as lack of horizontal coordination of farmers, mistrust among different chain actors and non-compliance with quality standards.

Direct impacts of agricultural value chain projects are usually monitored by the project implementers – yet, what exactly is regarded as an impact or outcome or result and how to measure success varies widely. Existing project monitoring data often focuses on participating actors only - and follows the logic of the objectives and the reporting line of the respective

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[1] see e.g. IDS Sussex' Global Value Chain Initiative (http://www.globalvaluechains.org), Agro-food Chains and Networks for Development of University of Wageningen (http://library.wur.nl/frontis/agro-food_chains/index.html), the Donor Committee for Enterprise Development (http://www.value-chains.org/dyn/valuechains/bdssearch.home?p_lang=en), Re-governing Markets Initiative (http://www.regoverningmarkets.org), GTZ sector networks (http://www.gtz.de/en/weltweit/afrika/fachliche-netzwerke/9850.htm), DfiD sponsored Making Markets Work for the Poor Initiative (MMW4P) http://www.mmw4p.org) and Swiss Community of Practice (http://www.sdc-valuechains.ch) – just to name a few of existing internet fora and platforms.

[2] see e.g. "Berlin June 2007: Value Chains for broad-based Development" (http://value-links.de), Cape town April 2007, "Making Markets work for the Poor in Eastern and Southern Africa" (see Johnson 2007 and http://www.commark.org/pages/Default.asp?SectionID=180) and Gerzensee, January 2007, "Making Value Chains Work for the Poor: Current thinking and future collaboration" (see Tanburn 2007 and http://www.deza.admin.ch/en/Home/Themes/Employment_and_the_economy/Employment_Income/E_I_Conference_and_Workshop_2008/SED_Workshop_2007?!)).

implementing agency. A lot of data can be typically found on how many farmers are involved in a given chain promotion, how much they produce, at what prices they sell to how many middlemen or transporters or processors or exporters and so on. Detailed breakdowns of margins for the product of choice are already harder to find – and almost absent are impacts on household income and welfare and more aggregated data on the performance of the product or sub-sector of choice and its strategic importance for the rural economy. Whereby many single projects seem to be quite successful in linking a number of smallholder farmers into rather complex supply chains even for export markets, very little is reported about effective poverty impacts or a more comprehensive assessments what actually changed for the respective regions or country in terms of pro-poor rural growth, rural poverty reduction, growth of investment or increase in competitiveness (see Illustration 1).

Illustration 1: What is typically monitored in Value Chain Projects (and what not)[3]
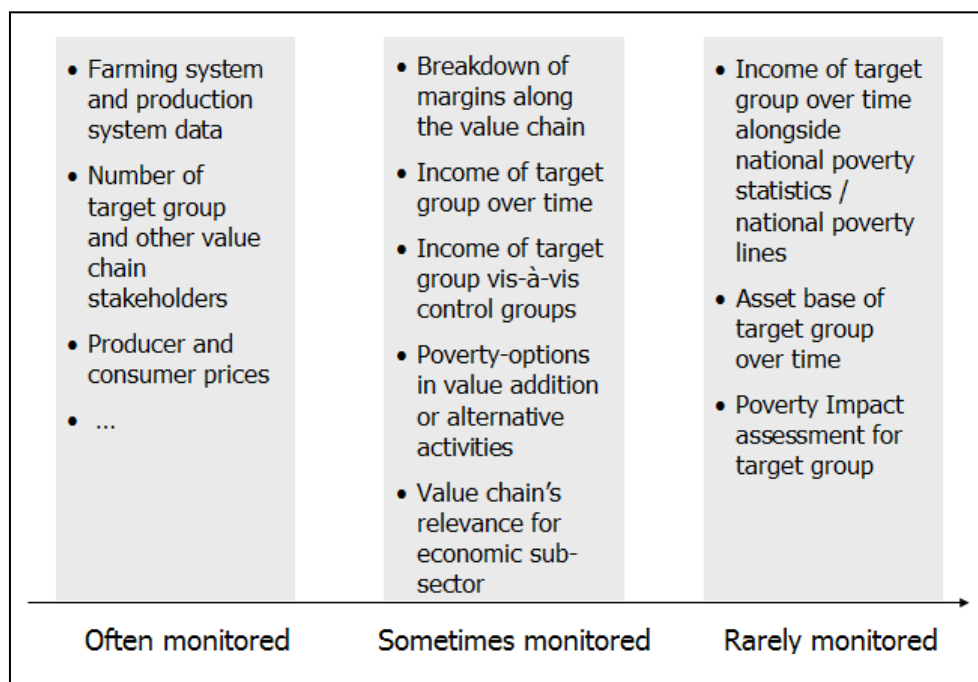
Source: own illustration

In most project monitoring systems, no reference at all is made to national poverty levels or similar quantitative measures of wellbeing. This lack of any aggregated poverty impact assessment of agricultural value chain integration of African smallholders is ever more surprising, since most practitioners are intuitively aware of its importance, since they have to report to agencies which are obliged to the overarching goal of poverty reduction in MDG 1. And these practitioners all know that engaging in a business activity such as e.g. an increase in export horticulture production in Central Kenya comes along with decision making, opportunity costs and changes in production patters and livelihoods. These changes are positive as well as negative, they occur naturally in the dynamics of development. Some are anticipated, some expectations fail and some impacts are totally unintended. Thus, monitoring results and im-

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[3] There is room for deeper analysis of that. One could think of a survey among projects and programmes organised in one or the other network (as mentioned in footnotes 1 and 2) in order to establish exactly what projects monitor. Alternatively, a sample of project documents could be screened to assess the monitoring data.

pacts is a very important and interesting, yet often neglected task. Why neglected? Because such monitoring requires resources, and even where financial resources are available, often the staff lacks the skills to undertake or commission such monitoring exercises. Whenever in-depths attempts are made, the observations seem to be fairly interesting, and worthwhile re-garding (see e.g. the surprising relation between expanding horticultural activities in Central Kenya and increasing witchcraft leading to mixed results for female household as described by Dolan 2001).

However, during the same time that the value chain approach became popular, particularly for agricultural development scene, macroeconomic development efforts greatly improved na-tional statistics in many developing countries, responding to the need of monitoring the PRSs. Furthermore, an entire new research field emerged in quantitative and qualitative poverty analysis amid the pro-poor growth debate (e.g. Klasen 2004, Lopez 2004). Most African countries, supported by the World Bank and others, have undertaken large welfare monitoring surveys and have produced rich national sets of poverty statistics. Yet, data and knowledge gained by national poverty assessments hasn't been used for measuring the poverty impact of sectoral development efforts like value chain integration of smallholder farmers.

Thus, the problem remains for practitioners in development cooperation: How to address the described unease about not reaching the poor or not reaching the poor in adequate numbers (outreach) by agricultural value chain integration? – and the only way out is not only to moni-tor in a narrow context the immediate results of support to a segment in a given chain, but to use more aggregated data for measuring welfare of stakeholders, performance and competi-tiveness of the respective sub-sector and industries, their growth and their trickle-down ef-fects. Ultimately, any development effort can only be named successful, if its direct and indi-rect impacts on poverty are eventually reflected in quantitative and qualitative poverty meas-ures, such as national poverty statistics or participatory poverty assessments.

3. Objective of Research

The objective of this research is threefold:
  a) to develop a clearer picture about poverty impacts of agricultural value chain develop-ment;
  b) to create a better understanding of how to use aggregated panel data for monitoring sec-toral growth performance and sectoral potential to reduce poverty and thereby to de-velop new ways of assessing more accurately the impacts of food chain integration on rural poverty; and
  c) to contribute to the theoretical debate about pro-poor rural growth by adding to the em-pirical evidence base.

This will be done by using rural household panel data from Kenya. Kenya has gained more than ten years of well-documented experiences in participating in the global value chain of export horticulture, as well as in developing domestic agricultural value chains such as dairy or maize. However, what is usually referred to as a success story has not yet been subject to analysis as to whether the participating households have either sustainably improved their household incomes or their asset base. More empirical research on poverty impacts of value chain promotion is needed to inform the debate on pro-poor rural growth in Africa.

Working Hypotheses are:

- Agricultural value Chain Development largely ignores modern poverty research by e.g. not taking poverty lines into account when targeting stakeholders.
- Agricultural value Chain Development doesn't measure its poverty impacts at aggregated level
- Agricultural value Chain Development promises pro-poorness, where it is highly unlikely to reach the poor directly or to achieve impacts that either over-proportionally benefit the poor or reduce the inequality gap (drastically speaking: the approach as a market-driven approach is not entitled to call itself "pro-poor").
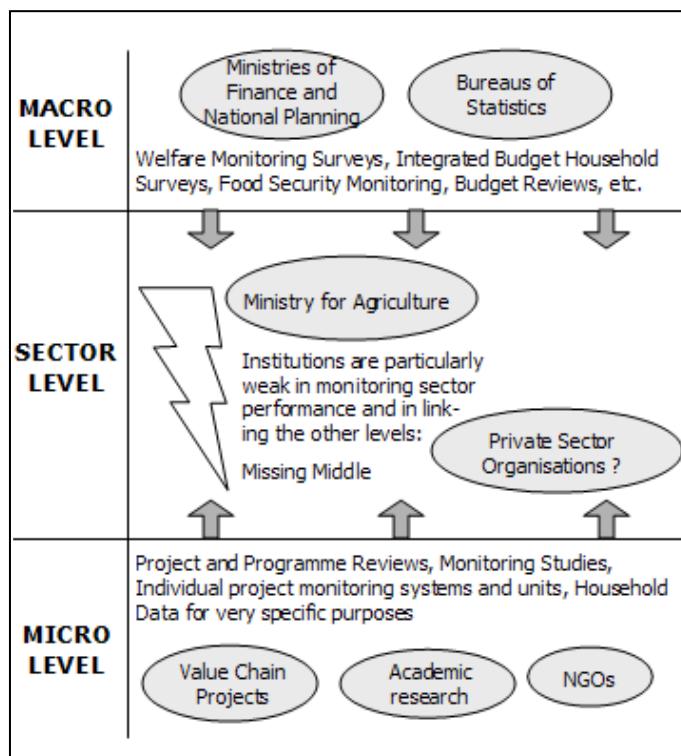
Results from the case study are expected to help answering the following questions:

a) What is it that agricultural value chain development realistically contributes to pro-poor rural growth?
b) How can this contribution be monitored?
c) How can agricultural value chain development become part of sustainable rural poverty reduction?

4. Theory: Poverty Analysis for Monitoring Agricultural Value Chain Development

The current debate on pro-poor rural growth and poverty reduction is dominated by isolated perspectives: the rather narrow focus of agricultural practitioners promoting selected agricultural value chains on micro level and the measurement of national poverty by large household surveys undertaken by macroeconomist at national (macro) level. Both levels and schools of thought could largely benefit from each other by consolidating and synthesising data for systematic sectoral impact assessment.

Illustration 2: The Missing Middle in Sector Monitoring

Source: own illustration

*H Hoeffler, Poverty Dynamics of Agricultural Value Chains in rural Kenya   June 2009 *work in progress**

However, the governmental and parastatal institutions dominating the sectoral (meso) level have a tendency to be weak in monitoring the sector performance and to lack the necessary skills in either disaggregating macro level data or in extrapolating/aggregating micro level data. Even though in some cases private sector organisations partially fulfil this function of sector performance via associations, think tanks or banks, we can still speak of a "missing middle" in terms of institutional failure to monitor sectoral poverty and growth trends (see illustration 2).Theories of impact assessment suggest that impacts can be monitored at different aggregation levels. To analyse whether the impact of venturing into an economic activity as a country has been favourable for rural growth or poverty reduction requires not only data of participating farm households, but also higher aggregated data encompassing the entire economic sub-sector. Theories of poverty analysis, economic growth and of asset-based poverty dynamics have a lot to offer for answering the impact question raised by agricultural value chain practitioners.

4.1 Expected Poverty Impacts of Agricultural Value Chain Integration

International attention will keep an even increased focus on the development of African rural areas, because of their high poverty levels. There is consensus that this needs to go along rural economic development. The importance of a vibrant private sector for rural development is widely acknowledged and is today an integral part of the development agenda. To foster rural economic growth, a mix of regional and commodity-based approaches is favoured: local economic development is used to strengthen the systemic competitiveness of rural areas whereby value chain promotion focuses on vertical and horizontal coordination of specific commodities, their production and up-and downstream linkages. Value chain development is viewed as an effective instrument to deliver the intended agribusiness development. Thus, development of agricultural value chains is currently a widely used approached in rural economic development for Africa.

The underlying hypotheses for the poverty impacts of agricultural value chain development can be categorised into four types (Asche et al. 2007):

1. *Integration of poor farmers into new agricultural value chains* (e.g. high-value agricultural products, horticulture, aquaculture, organic food products) and thereby creating production, income and employment opportunities for the rural poor.
2. *Broadening existing agricultural value chains* to include poorer and/or more poor producers and thereby increasing the outreach to the poor.
3. *Deepening existing agricultural value chains* by increasing poor producers' share in the overall income generated along the chain.
4. *Supporting the poor to move diagonally* to higher valued agricultural value chains, using knowledge gains for higher qualified production systems and thereby increasing income shares.

Agricultural value chain development as an approach of economic development comes along with a set of rather defined interventions such as value chain identification, market research, participatory mapping of the chain, the analysis of margins, relationships, costs driver, competitiveness, product and process quality standards, trade barriers, customer relations, marketing arrangements, etc.. This set of instruments is worldwide implemented with similar direct interventions, mostly facilitated by private, public and donors agents. So far, big opportunities are that a number of agricultural value commodities can be produced in smallholdings (i.e. fresh produce horticulture) and thus, fit into the livelihood system of poor small-scale farmers

in productive areas and can increase their income and employment opportunities. Secondly, many agricultural value industries are labour intensive and along the chain, value can be added within African countries. Thirdly, foreign direct investment consolidates existing agricultural value chains, knowledge transfers take place and local capacities are built while value chains upgrade over time. Big challenges exist in complying with ever increasing quality standards and decreasing comparative advantages of smallholder farms, as well as the general investment climate, low productivity and relatively high costs of production in rural Africa.

Monitoring the social and economic impacts of agricultural value integrations has mostly focussed on project-related indicators like numbers of producers integrated, product and process quality enhancement and economic chain efficiency (see also illustration 1). However, the impression remains that agricultural value chain development does not fulfil its promises on "pro-poorness" and that the expected poverty impacts (as described by the four hypotheses above) are not achieved. Despite being successful in many country cases, a subconscious feeling of "being biased" is growing among practitioners. They experience that commercially or market-oriented approaches such as agricultural value chain integration (by tendency) rather target "winners" than "losers" in rural economies (problem of adverse selection); or they target the poor but keep the feeling that the business will not be sustainable (problem of subsidised business promotion). Another point of concern is that chain integration typically orientates its interventions along formal market structures – yet the majority of the poor tends to act on informal markets, which are rarely targeted directly (and only indirectly targeted by upgrading of a chain). This all leads to the impression of not reaching the poor at all or not in adequate numbers (thus not achieving the outreach to the poor)[4].

4.2 Measuring Poverty and Poverty Dynamics

Development cooperation in the late 1990ies moved from project type aid towards broader concepts of programme-based / sector-wide approaches. Two major developments came out of these institutional changes for "the way of doing (aid) business": the emergence of Poverty Reduction Strategy Papers (PRSPs) as a bargain for debt relief in the HIPC initiative (G8 summit in Cologne 1999) and, in 2000, the international agreement to support the MDGs with its prominent first goal to halve poverty by half by 2015. Poverty Reduction became the overall credo for bi- and multilateral institutions[5]. These two development concepts, PRSPs and MDGs revived the entire debate about the impact of economic growth on poverty and, more recently, on distribution of incomes and equality. In order to operationalise poverty reduction combined with economic growth, the entire theory of "pro-poor growth" evolved ALTENBURG (2005). In order to quantify the set development targets, the World Bank started a fresh debate on how to measure poverty, which was based on the conventional measures of poverty such as the Foster-Greer-Thorbecke poverty indices RAVALLION & CHEN (2003), Ravallion 2004, Kraay 2004 and HAUGHTON (2007)). Despite a vivid and ongoing debate about how to define and ultimately achieve pro-poor growth[6], the new international poverty focus demanded more accurate methods of measuring poverty. Four reasons are frequently mentioned when arguing for accurate poverty measurement: "*First, to keep the poor on the agenda; if poverty were not*

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[4] This was discussed and mentioned by many participants of the International Conference "Value Chains for Broad-based Development" 30 May – 1 June 2007, in Berlin, see also GTZ 2007.

[5] This was also strongly supported by the World Development Report 2000/2001 (World Bank 2001) and preceding work under the series "Voices of the Poor" (World Bank 2002).

[6] This refers to two different definitions of what type of income growth qualifies as "pro-poor"; either the absolute growth in income of the poor or the relative growth in income of the poor compared to richer segments of the society (see also Kakwani et al. 2000, Krakowski 2004, or Besley et al. 2007).

measured, it would be easy to forget the poor. Second, one needs to be able to identify the poor if one is to be able to target interventions that aim to reduce or alleviate poverty. Third, to monitor and evaluate projects and policy interventions that are geared towards the poor. And finally, to evaluate the effectiveness of institutions whose goal is to help the poor." (Houghton 2007).

Led by the World Bank, applied quantitative and qualitative poverty research was initiated and supported in many African countries. Poverty is defined as pronounced deprivation in well-being. To measure it, national indicators of welfare such as income or consumption per capita need to be established. Information on welfare is then derived from stratified random sampling household survey data, e.g. the World Bank standardised Living Standards Measurement Surveys (LSMS), which are used worldwide. A standard overview on using household surveys for poverty measurement is given by Deaton (1997). The conceptual key feature of poverty measurement is the construction of national poverty lines based on the *cost of basic needs approach*. The poor are those whose expenditure (or income) falls below a poverty line. A number of numeric indices are usually calculated around the poverty line, e.g. the *headcount index,* which measures the proportion of the population that is poor and the *poverty gap index, which* measures the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty line[7]. The theory of poverty dynamics describes the development of poverty over time and has further developed quantitative poverty measurements, mainly driven by leading World Bank researchers and universities in the US, UK and Germany (see e.g. Carter et al. 2006, Haughton 2007, or Krakowski (2004)). This research is rich in quantitative monitoring instruments for the so-far unanswered or not sufficiently answered questions of poverty impacts in development cooperation, for example in tracking individual households over time.

Based on these tools for poverty measurement, poverty (or wellbeing) at household level has been measured in national surveys. To assess the development of welfare over time, such surveys are repeated and highly expressive time-series panel data is used for the analysis of *poverty dynamics*. Only such panel data allows measuring how many households move into poverty or out of poverty over time as illustrated below.

**Illustration 3: Conceptual Classification of Poverty Dynamics**
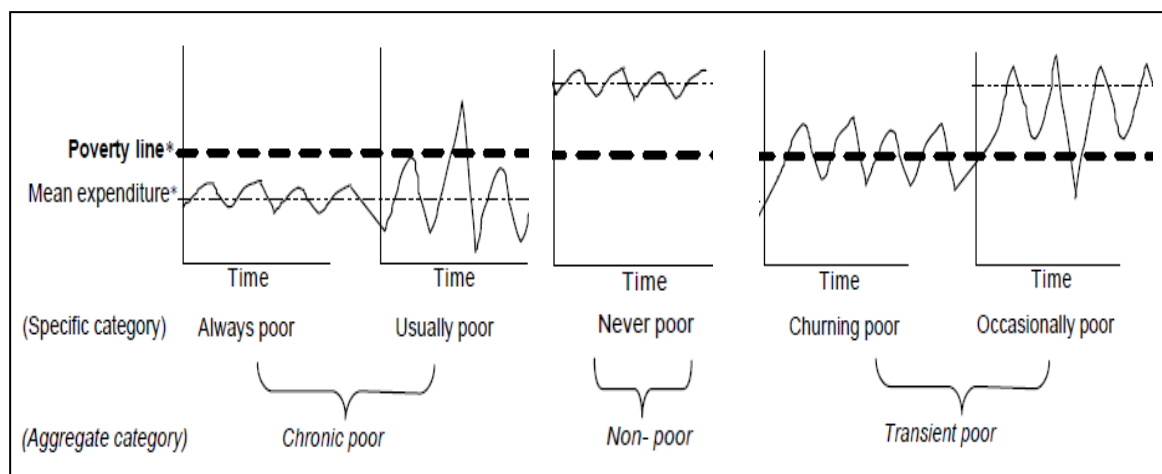
Source: Hulme et al. (2001)

[7] Many more indices are used, they are usually referred to as the Foster-Greer-Thorbecke (FGT) class of poverty measures (based on Foster et al. 1984).

This type of analysis of household dynamics deepens the understanding on who the poor, the non-poor, and the transient poor are. These three classifications can be further specified, depending on the number of rounds of interviews in "usually poor" (who are poor on average, but occasionally escape poverty for a point in time), "chuming" or "oscillating" poor (who oscillate around the poverty line) or "occasionally poor" (who are most of the times non-poor, but occasionally slip below the poverty line).

Thus, methodological approaches to measure poverty underwent a certain evolution, which is depicted in illustration 4. According to Carter & Barrett (2006), poverty measurement moved from static analysis with one point in time cross sectional data (first generation) overt dynamic income panel data analysis (second generation) to further developing the analysis of other poverty-determining variables and other poverty lines to measure poverty instead of income or expenditure only; such as households assets and asset poverty lines (third and fourth generation according to Carter & Barrett (2006) (see e.g. also Moser & Felton (2009)).Furthermore, this evolution enabled a much better analysis of the existence of "poverty traps"; see e.g. Adato et al. (2006).

Illustration 4: Evolution of Approaches to Poverty Measurement
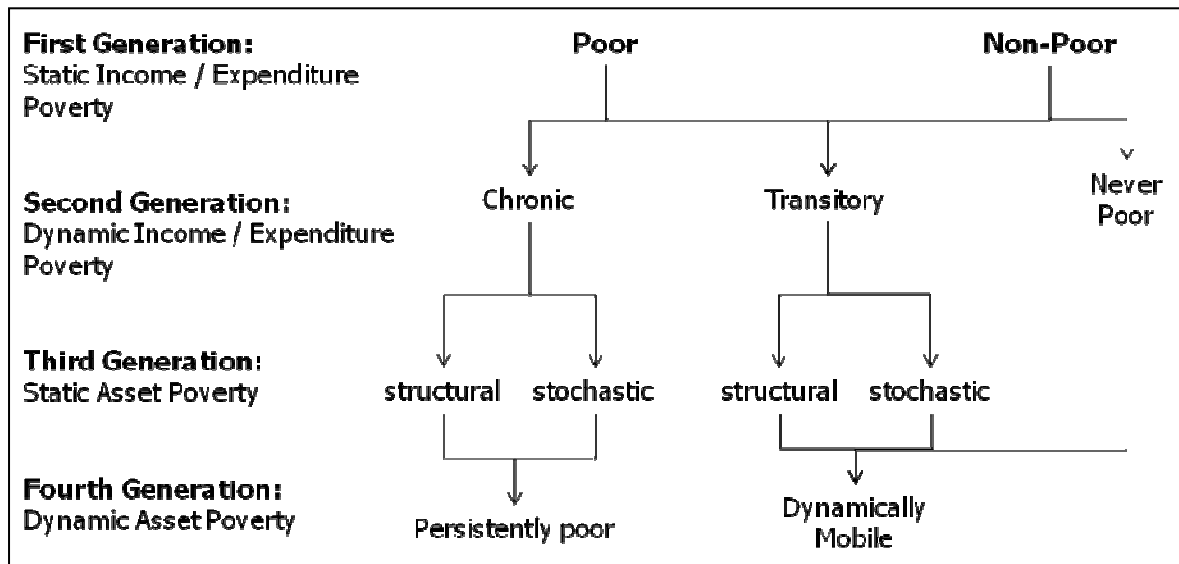
Source: Carter & Barrett (2006)

Once the poverty dynamics are established, many other variables can be analysed and related to the households level of wellbeing over time, e.g. what socio-economic characteristics they have, where they are and what economic activities they pursue. Despite problems of survey design and statistical biases (see e.g. Thorbecke (2004) or Grimm & Klasen (2007) for an overview), these instruments provide numerous opportunities for deepening the understanding of poverty.

4.3 Combining Value Chain Analysis and Poverty Dynamics for Impact Assessment

Depending on the survey and questionnaire design, the applicability of the method for poverty impact monitoring is potentially very high, yet, rarely undertaken other than on national aggregated level. In fact, poverty researchers don't comprehensively consider sectoral applica-

tion of the methods yet – thus they are not enabling research linkages between macro and micro level:

"*Feedback flows both from micro-to-macro and from macro-to-micro levels, with critical intermediation by meso-level institutions ranging from local governments to community groups to resource user associations to markets. (…) Efforts to capture the multi-scale spillover effects within systems – how macro-level phenomena affect meso-level institutions and thereby micro-level incentives and behaviours, as well as these linkages in reverse – remain in their infancy. (…). The popular rhetoric of poverty traps has gotten well ahead of the scientific understanding of the phenomenon.*" (Barrett (2006).

One might add that this holds true also for the rhetoric of "pro-poor" or "broad-based" agricultural value chain integration in development cooperation.

This research proposes an innovative methodological approach to overcome the identified gaps in poverty impact monitoring of agricultural value chain integration by correlating poverty data with value chain activities of farm households for a country case study. Representative national budget household survey data can be applied and operationalised for rural growth assessment by employing the theory of poverty dynamics. For a more accurate assessment of farming system changes, national socio-economic data can be disaggregated over time by using panel data. National welfare data sets offer a so far untapped research potential. Assuming that a sequence of representative national welfare studies have taken place, regional sample clusters can be grouped where a particular crop is grown, or where many producers were involved in an activity linked to the agricultural value chain of concern. It is relatively easy to sub-sample control groups of similar rural households out of the entire survey sampling frame to compare the development of poverty from chain participants to their control group. By doing this, poverty trends for chain participating farmers (or other actors) can be analysed.

Given the level of detail that standard questionnaires typically cover, a lot of econometric analysis can be undertaken to find out, which factors correlate with "*poverty trends*". Furthermore, *poverty maps* can be drawn to depict rural poverty geographically, which might guide the selection of agricultural value chains to be promoted according to where the poor are and which agro-climatic zone they live. Recent work on "*Spatial poverty trends and traps*" (see e.g. Jalan & Ravallion (2002), Ayeertey & McKay (2007), Burke & Jayne (2008), or Gräb & Grimm (2009).

A more in-depth study and understanding of national welfare surveys by agricultural practitioners could already help them to identify and target the poor better. Yet, many agricultural practitioners lack the skills to apply poverty research results. On the other hand, macroeconomists from national bureaus of statistics haven't bothered yet to "sell" their wealth in data and to provide sector specialists with useful and relevant applications of poverty assessment methods. Therefore, more user-friendly public user files need to be created from national surveys and sector specialists trained in using them for sector relevant poverty assessments. At least, existing monitoring instruments for agricultural value chain projects could be enriched by such kind of aggregated data. Furthermore, specific agricultural surveys can even be designed and given they are repeatedly undertaken, can be used to answer poverty impact questions from many agricultural development interventions and rural economic activities, as well as policy reforms.

4.4 Combining Quantitative and Qualitative Poverty Approaches (Q-squared Methods)

A wealth of empirical poverty analysis has fine-tuned the quantitative methods of poverty measurement mentioned in section 4.2 (see for an overview the Chronic Poverty Reports by the Chronic Poverty Research Centre CPRC (2005), CPRC (2009), Kakwani & Silber (2008)a and Kakwani & Silber (2008)b. However, most research groups that were working on the topic in the first decade of the new millennium reached points where they felt that quantitative analysis only wouldn't give enough satisfactory explanations for a number of poverty phenomena. This coincided with a more side-spread recognition of the "*muti-dimensionality of poverty*" as it was first prominently addressed by Sen (1999) and conceptually followed up by the World Bank with its double feature "Voices of the Poor" (Narayan et al. (2000) and Narayan & Petesch (2000)).

Since then, many development researchers and practitioners have enrich the quantitative poverty analysis "mainstream" by various qualitative methods and instruments. Within developing countries, this is often realised by participatory poverty appraisals (PPA); focus group discussions with respondents of household surveys; or instruments of individual assessment of public services, such as citizen report cards. More and more statistical offices or Ministries of Planning and Development resort to complementing quantitative surveys with participatory methods; e.g. the Kenya Integrated Budget Household Survey (KNBS (2007)) or Barahona & Levy (2005).

Within the research arena, mainly the group around Ravi Kanbur, the Centre for Chronic Poverty Research in Manchester and the Centre for International Studies of the University of Toronto with their working paper series "Q^2" triggered a lively debate tried to combine quantitative approaches with qualitative methods. A good overview of this debate is provided by Kanbur (2003) and subsequently Addison et al. (2009).

The design of this research very much follows the "q-squared" philosophy and aims at combing "the best of both worlds" as well as contributing to the third area mentioned by Addison et al. That would still require applied research to further deepen the understanding of poverty dynamics.

"There are three main fronts on which future research progress must be made if we are to dramatically deepen the understanding of why poverty occurs, and significantly improve the effectiveness of poverty reduction policies; (1) Poverty Dynamics over life course and across generations; (2) Multidimensional concepts of poverty measurement and (3) Cross-disciplinary research along the Q-squared methodologies".
Addison et al. (1999), Preface.

## 5. First Results from Kenyan Case study

5.1 Description of Data

During the past 15 years, integration in global export production and national (urban) income growth has changed food production and consumption patterns in Kenya. Increasing incomes stimulate the demand for higher value food items, such as dairy products, meat, fresh fruit and vegetables (Ayieko et al. 2005). Yet, many agricultural value chains are still fragmented, characterized by little cooperation and integration, cartels, high transaction costs, deep mis-

trust, price inefficiencies and quality losses. Weak rural-urban linkages and poor rural infra-structure additionally contribute to the low competitiveness (Hoeffler et al. 2005). Therefore, agricultural value chain promotion has been high on the agenda of many development agencies and the Kenyan government. Many projects, programmes and research work are currently implemented to integrate poor farmers into agricultural value chains[8]. In Kenya, the development of the export horticulture, the dairy or the maize value chain have often been cited as successful examples for rural growth and pro-poor poverty reduction. Numerous interesting studies have been undertaken to analyse income, employment, environmental and gender impacts. However, all these surveys tend to zoom into particular groups of farmers at one point in time. There doesn't seem to exist a comprehensive analysis that links specific agricultural activities to either rural economic growth or rural poverty dynamics. Little evidence is produced that could justify or contradict the generally assumed impacts (as described in 4.1).

As for national poverty statistics, Kenya is relatively "data-rich". Welfare Monitoring surveys started to be undertaken in the 1970ies and were conducted in 1975, 1982, 1992, 1994, 1997 and 2000[9]. To improve the evidence base for the agricultural sector, the Tegemeo Institute for Agricultural Economic Research of Egerton University (Kenya), started undertaking a thorough rural welfare survey by using a sub-sample of the Welfare Monitoring Survey 1997. This survey sample of 1275 rural households has been repeatedly interviewed in 2000, 2004 and 2007. It was partly funded by USAID und the "Tegemeo Agricultural Monitoring and Policy Analysis Project" (TAMPA) and scientifically accompanied by Michigan State University (USA). Illustration 5 depicts the regional distribution of the TAMPA households.

Illustration 5: Geographical Distribution of the TAMPA Panel Households in Kenya
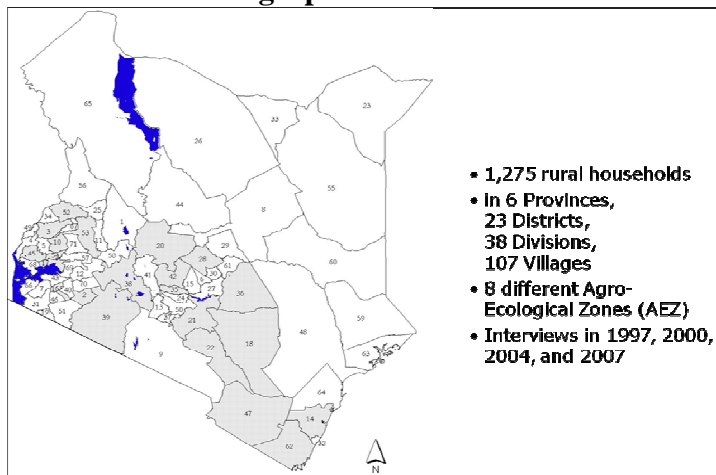
Source: own illustration

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[8] e.g. DFID-Business Services and Market Development Project, GTZ- Promotion of Private Sector in Agriculture, USAID Kenya BDS Programme, EU Livestock Support Programme, IFAD Mount Kenya Horticultural Smallholder Support Programme and Domestic Dairy Market Support Programme, Danida Agricultural Sector Support Project and SIDA National Agricultural and Livestock Extension Project - just to name a few.

[9] Unfortunately, the direct comparability of these surveys and data sets is very low due to different timing of survey administration, questionnaire content, sampling/non-sampling errors, general improvement of the survey instruments and geographical coverage (Gamba et al. 2004). In the 1990ies, the National Sample Survey and Evaluation Programme (NASSEP-III Frame) was developed to standardise the surveys. In 2003, the Kenyan Participatory Poverty Impact Monitoring started, which uses qualitative interviews to assess poverty from a different perspective. Finally, a newly sampled Integrated Budget Household Survey has been undertaken in 2005/06, interviewing more than 10,000 households (KNBS 2007). However, not many publications were produced from this wealth of data (the most prominent being the so-called "Inequality Report" (SID 2004) and the recent World Bank "Kenya Poverty Assessment Volume I" World Bank (2008).

Whereby single year survey results were used for different research projects and policy analyses, the full panel is now ready to analyse rural poverty trends. First analyses (Gamba et al 2004) revealed unexpected results on the relationship between geography, natural resource endowment and poverty. Surprisingly, there seems to be very little evidence that poverty levels depend on agro-ecological zones – revealing that the rural poor the rural non-poor live geographically closer together than expected (Gamba et al. 2004). These spatial aspects were further analysed by Burke & Jayne (2008).

Since the main focus of analysis for Tegemeo lies in agricultural productivity variables, not much as been done in poverty and income statistics of the panel[10]. Table 1 below summarises some key poverty statistics of the data set.

Table 1: Summary Statistics on Household Income (TAMPA Panel 1997-2007)

|	**1997**	**2000**	**2004**	**2007**
mean monthly income / hh (KSh)	108,687	159,590	170,613	186,241
mean monthly income / ae[11] (KSh)	1,561	1,952	3,285	3,881
mean percentage of ag income / income	57 %	77 %	62 %	60 %
Poverty Headcount Index	0,59	0,5	0,4	0,35
Poverty Gap	0,34	0,24	0,18	0,14
Poverty Squared Gap	0,24	0,15	0,11	0,07

Source: own calculations

5.2 Research Outline and first Results

First results on the poverty dynamics in the panel were presented in September 2008 by Suri et al. (2008). A new look at the panel from different value chain perspectives is currently under way with further disaggregating groups of households and their poverty dynamics in accordance with agricultural activities of the households are undertaken by myself, together with D. Kariuki and R. Gitau (forthcoming). Since the survey households can be grouped according to their main economic activity, households engaged in certain value chain activities can be singled out in the data set and their household welfare analysed over time, including changes in their asset base. It is even possible to attribute households to some of the main value chain promotion projects – and to compare their development to a control group from the overall sample. This will allow for a more aggregated analysis of specific value chain producers' poverty dynamics compared to all other rural households

In line with the findings of Lay et al. (2007) we can confirm that off-farm income plays an important role as a source of income, even for purely rural households (on average 36 % of the total household income, as depicted in illustration 6.

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[10] Various Agricultural production aspects have been researched intensively with the data; i.e. fertiliser use, access to land and credit, and the importance of off-farm activities for household welfare. For an overview of ongoing research activities, please visit the website www.tegemeo.org and check for the Tegemeo conference in Nairobi in September 2008.

[11] ae=adult equivalent

Illustration 6: Trends in Sources of Income for Total Household Incomes
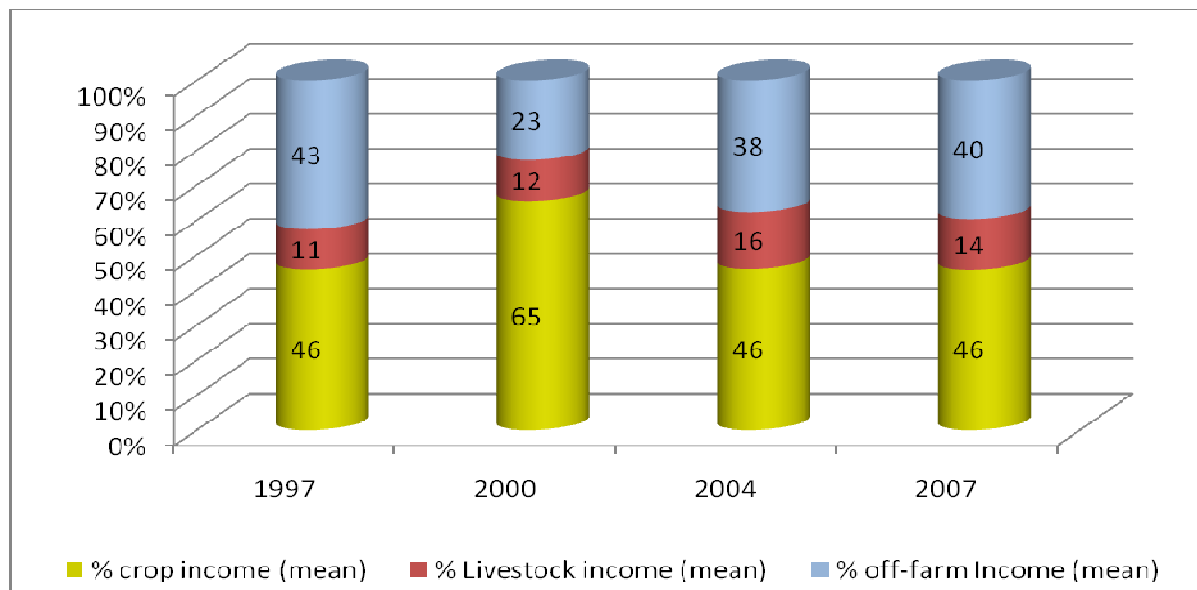
Source: own calculations

However, we didn't observe so far a clear decreasing importance of aggregated agricultural sources of income; percentages of crop and livestock incomes have remained pretty stable over the last two panel waves. However, to pay tribute to other research results on household livelihood strategies in rural Kenya (see e.g. Brown et al. (2006) or Barrett et al. (2006)), divided the panel into agricultural and non-agricultural households; depending on which source of income had the higher contribution to overall income and compared their poverty dynamics (see table 2 below).

Table 2: Poverty Dynamics in Relation to Sources of Household Income (1997-2007)

	all hh	%	ag hh	%	non-ag hh	%
persistent poor	190	14,9	154	16,0	36	11,6
never poor	307	24,1	225	23,3	82	26,4
poverty exiters	353	27,7	273	28,3	80	25,7
descending poor	37	2,9	27	2,8	10	3,2
oscillators	388	30,4	285	29,6	103	33,1
Total number of hh	**1275**	**100**	**964**	**100**	**311**	**100**

Source: own calculations

From the descriptive results, almost one quarter of the sample is never poor; for ag households and for non-ag households alike. The largest group of dynamics are the oscillators (30,4%) and the poverty exiters (27,7%); the by far smallest group are the descending poor (2,9%) which is generally good news and goes in line with overall national statistics for Kenya during that time period. In essence, poverty reduction has taken place, but there are strong suspicions on the existence of poverty traps for the persistent poor and the oscillators.

The percentage of the persistent poor is higher among the ag households (16%) than for the non-ag households (11,6%), therefore we disaggregated the agricutlrual households further into crop households (predominant source of income: crop production); livestock households (predominant source of income: livestock production) or mixed households (with crop and livestock production contributing almost equally to the total household income.

Table 3: Poverty Dynamics of Various Agricultural Households (1997-2007)

	all ag hh	%	crop hh	(%)	livest hh	(%)	mixed hh	(%)
persistent poor	154	16,0	131	16,9	9	15,0	14	10,9
never poor	225	23,3	183	23,6	12	20,0	30	23,3
poverty exiters	273	28,3	217	28,0	16	26,7	40	31,0
descending poor	27	2,8	20	2,6	2	3,3	5	3,9
oscillators	285	29,6	224	28,9	21	35,0	40	31,0
Total number of hh	**964**	**100**	**775**	**100**	**60**	**100**	**129**	**100**

Source: own calculations

The results in table 3 suggest that mixed households are less often persistent poor and slightly more often exiting poverty than the average ag household – which goes in line with general observations of risk minimisation and strategies of diversification. Livestock households seem to be more often oscillating around the poverty line than others.

The future research strategy is to further disaggregate households into their specific crop-livestock components and to compare their poverty dynamics over time. A number of econometric analysis instruments are planned to be applied – from *multivariate regression analysis* of overall income contributing characteristics to *correlation analysis* with value chain activities.

Since the TAMPA set contains data on household and agricultural assets, *asset-based poverty lines and asset-based poverty indices* are planned to be calculated. The households are intended to be disaggregated the same way as under the income dynamics analysis and compared to them in order to identify similarities or divergences of results for specific crop-livestock activities.

An additional quantitative analysis planned is *propensity score matching* by using a sub-sample from three USAID value chain projects which were used for project monitoring purposes, but asked the same TAMPA questionnaires in 2004 and 2007. Thus, we have a treated group of households, whereby the 2004 and 2007 wave of TAMPA will be used as control group of non-treated households.

Furthermore, poverty-exiting households will be identified and grouped according to their crop-livestock activities (as depicted in illustration 4). An exercise of re-sampling them is envisaged in order to undertake qualitative follow-up interviews and focus group discussions with household members. The reason for interviewing the households again in 2009 is to con-

front the households with the results from the quantitative analysis and to check for plausibility as to whether their improved welfare situation can is plausible attributed to value chain activities (or other reasons). The techniques used will borrow from life-history approaches and open-ended interviews. It is envisaged to follow-up on about 50 poverty exiting households – i.e. 20% of all poverty-exiting agricultural households and 5% of all panel households.

Illustration 4: Possible Grouping for Comparison of Poverty Trends
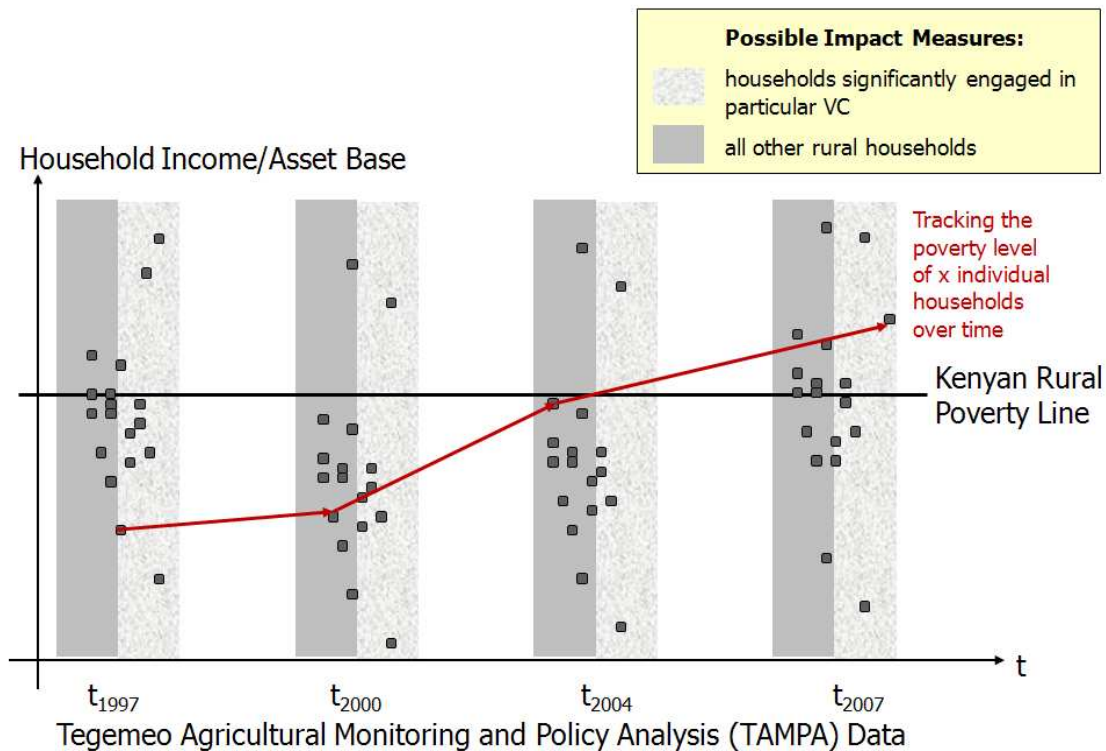
Source: own illustration

Both, the quantitative and the qualitative analysis are expected to deliver at least proxies of ex-post poverty impact assessments for the Kenyan agricultural value chain projects. Results from the quantitative analysis will be ready by October 2009, qualitative follow-up interviews are scheduled for November 2009.

6. Conclusions and further Research

This research states that even though the risks and benefits of global chain integration for African smallholder farmers have been subject to a vivid research debate, a comprehensive analysis of social and economic impacts of agricultural value chain integration is rarely undertaken. Reasons are the scarce availability of panel data and lack of skills to analyse it for impact assessment on agricultural value chain level. Even where chain projects are monitored closely, the scope is often on only a handful of participating farm households which makes it difficult to extrapolate for farming systems or regions. Furthermore, time series on farming systems are almost absent; and where existent rarely used for sub-sectoral or food chain purposes. Due to these shortcomings in data and methods used, systematic empirical research is

still missing. Hence, often articulated statements about either the "pro-poorness of value chain integration" or "risks of excluding and further impoverishing smallholders" should be evaluated with caution due to the lack of empirical evidence.

Since national poverty and welfare household surveys have improved in many countries, there exist untapped potential to use poverty analysis as a key instrument for impact monitoring. To further develop this case study methodology, joint efforts between academia, government, development agencies and industries are necessary. Macro-economist (who conduct national household data from statistical institutions or Ministries of Finance or National Planning) and sector specialists (such as agricultural analysts from academia or administration) need to collaborate much more in order to operationalise aggregated national panel data for systematic poverty impact assessment of agricultural value chain development over time.

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