STRUCTURAL DIMENSIONS OF LIBERALIZATION ON AGRICULTURE AND RURAL DEVELOPMENT

Synthesis Report

July 2009

Draft version

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Foreword

The synthesis report of the RuralStruc Program presents the main results achieved during this three-year cross-country Economic and Sector Work. It relies particularly on the information collected through rural household surveys implemented during the Second Phase and on the comprehensive analyses developed by the seven national case studies.

The Program has suffered delays related to the realization of the fieldwork in the 26 selected regions, which explain a six-month extension of the official completion date. However, due to operational difficulties encountered in Kenya and partly in Mexico, it appeared impossible to present all the existing regional results. Similarly, some result estimates for Morocco were not fully consolidated.

Nevertheless, the 6th Steering Committee of the donors held on May 20, 2009, decided to maintain the deadline for the Decision Meeting in order to respect the work schedule and to assess and discuss the Program results. Simultaneously, the Committee decided to engage in a "catch-up" process, which should allow the reintegration of the full results in an up-dated document to be fully achieved before the end of the multi-donor Trust Fund supporting the activity (February 2010).

Consequently, the current document does not present a final stage. It was drafted in a very short period of time, the aggregation of the databases being achieved mid-June 2009 and the last national reports being received on June 30, 2009.

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Acknowledgments and Authors

This synthesis report is one of the outputs of the RuralStruc Program on the *Structural Dimensions of Liberalization on Agriculture and Rural Development*. During three years, the Program has developed a collaboration with experts and researchers in the seven participating countries under the guidance of a coordination team made up of staff from the World Bank, Cirad, and the French Ministry of Foreign Affairs.

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Executive Summary

Global Positioning of the Program and its Evolving Context

The World Bank's World Development Report 2008 (WDR08) *Agriculture for Development* has been a strong reminder of agriculture's multiple roles in growth and poverty alleviation, employment, natural resources management, and as source of comparative advantage. It particularly highlighted the importance of adopting a regional approach by taking into account the role played by agriculture at different stages of developing economies' structural transformation.

This structural perspective was central to the general design of the RuralStruc Program on the *Structural Dimensions of Liberalization on Agriculture and Rural Development*. When the Program was initiated in 2005, its positioning referred to the international debate of that time, which largely focused on trade liberalization in agriculture and its expected gains for developing countries. Indeed, the main goal of the Program was to reignite the discussions on agriculture with a more global vision on the processes of change underway in the agricultural markets and the rural economy, and to look "under the waterline" and not only at the tip of the iceberg (which somewhat inspired the design of the Program's logo): beyond trade, what were the consequences of the global agrifood markets restructuring? What was the evolving role of agriculture in the rural economy? What did these processes mean for the "agriculture based countries"?

Of course, since the Program was launched, the international context has significantly evolved. The debates related to the World Trade Organization's Doha Round have faded, falling victim to negotiation fatigue, downgraded estimates on the expected gains of trade liberalization in agriculture and their uneven distribution among countries and, above all, because of new events that have deeply affected the international scene. The first new concern was the rapid emergence of the food price crisis (2007-08), which strongly reshaped the global picture and led to a renewed interest in food and agriculture issues. The second major event was the sudden global financial crisis, which has progressively affected the world economy since the end of 2008. Lastly, these two crises were embedded into growing concerns about the consequences of global climate change, which will affect the growth processes around the world, notably natural resources and agriculture, in a context of growing world population and the related increasing demand.

In spite of this very volatile – and somewhat disconcerting – global environment, the importance of agriculture in the international agenda has been confirmed. The international community is reengaging with coordinated efforts (United Nations High Level Task Force) and new commitments (pledge of the G8 countries at their last meeting

in July 2009) and at the government level, notably in Africa, the strategic role of agriculture has been permanently reaffirmed through the implementation of the CAADP framework (Comprehensive Africa Agricultural Development Programme).

However, even if food security and poverty alleviation are obviously indisputable core issues, one of the main results of the RuralStruc Program is to bring both structural transformation and the challenges of economic transition back on the agenda. One of the main findings of the Program is the perspective offered by new information on the current agricultural and rural realities with the long-standing, but often forgotten, debate on the alternatives to agriculture. The approach is particularly critical for the "agriculture-based countries" and notably for the Sub-Saharan Africa (SSA) countries, which have to deal simultaneously with an unachieved demographic transition, which puts additional pressure on the need for economic growth. This general positioning leads to the reaffirmation of the importance of development strategies and the necessary ownership of the policy making process.

General Design of the Program and Main Hypotheses

This report presents the main results of the RuralStruc Program, the objective of which was to learn from differentiated country experiences, in terms of agricultural and rural change with regard to various stages of economic integration and structural transformation. For this purpose, the Program was designed using a comparative framework including seven countries that are differently positioned on a gradient of integration, liberalization and economic transition with reference to specific macro-economic criteria. On the one side, Mexico was selected as a backdrop and an example of a country far engaged in its structural transformation and with a deep economic integration with reference to NAFTA and migration flows to the US. On the other side, SSA countries were selected to illustrate the initial transformation stages and more partial and unachieved restructuring processes. The four selected countries (Senegal, Mali, Kenya, and Madagascar) were chosen for their regional situation and various national trajectories. Morocco and Nicaragua were picked as illustrative of cases of more rapid integration processes due to their proximity with the European Union and the United States, the implementation of Free Trade Agreements and the role of international migrations. With reference to the WDR08, the selected countries represent the three worlds of agriculture: "agriculture-based" (Kenya, Madagascar, Mali), "transforming" (Senegal, Nicaragua and Morocco), "urbanized" (Mexico). The purpose was not, of course, to make comparisons between countries, but to illustrate processes of change related to liberalization and deeper economic integration so as to identify patterns and differences.

Three main articulated hypotheses underlie the work Program. The first hypothesis addressed the new patterns and trends of the agrifood markets resulting from the dismantling of the old public regulations, the technical progresses in information, finance, shipping, storage and processing, the new demand-driven markets and new diets resulting from growing incomes and urbanization (notably meat and dairy and fruits and vegetables). All these changes deeply modify the shape of the agrifood markets with new

players (global food suppliers, supermarkets) and new rules of the game characterized by increased international competition, new high-value market segments leading to new requirements linked to quality standards and the emergence of contractualization. The hypothesis was the development of differentiation processes related to this global restructuring among farm structures and local marketing systems, raising the questions of integration or possible marginalization or exclusion and the possible emergence of multiple-track agriculture.

The second hypothesis referred to the processes of adaptation within the rural economy as a response to this changing environment. It considered the emergence of new rural household strategies based on the growing importance of off-farm activities and transfers and the development of new multi-activity and multi-income systems as a way to adjust, leading to questions related to the possible convergence of these new configurations and their effectiveness for rural livelihood sustainability.

As a consequence of these multiple changes, the third hypothesis raised the possible difficulties of adaptation for the rural households, and more globally the rural economy, due to the weakness of economic alternatives, leading to potential risks in the structural transformation process. This questioning appeared to be particularly accurate in the case of the "agriculture-based" countries, where the weight of agriculture in the employment and activity structures and the limited economic diversification are facing simultaneously a strong demographic push, creating a unique challenge for development.

Implementation and Knowledge Base

The comparative work was implemented with local teams in each country in order to benefit from the national expertise and to strengthen the local debate on structural issues. Two phases were developed: a First Phase of general overview based on desktop studies on what was known about the processes of agricultural and rural change; and a Second Phase based on regional fieldwork in order to fill the knowledge gap on these issues. During this Second Phase rural household surveys were implemented in 26 regions selected in order to illustrate different situations in terms of economic integration, including regions well connected to markets, both internationally and nationally, and more lagging regions. In order to provide a comprehensive background, these household surveys were complemented by an overview of the characteristics of the chosen regions and of selected value chains

The household surveys targeted rural households, and not only farm households, in order to have a better appreciation of agriculture's role in the studied regions. The choice was to focus on rural incomes and their estimation with the objective of harvesting an up-dated vision on the reality of the diversification processes and their characteristics. The same framework and instruments, with necessary local adaptations, were used in the seven countries, as were the same methodology for the data analyses.

A total of 8,000 household surveys were implemented between November 2007 and May 2008. Due to the sampling methodology, they are representative at the locality level (random selection), but only indicative at the regional level and illustrative at the national

level. They provide up-dated information on the situation of rural households in the surveyed regions and a renewed vision of poverty and rural diversification. The surveys exclusively targeted households, which means that large-scale farming implemented by agribusinesses or managerial farms are not part of the picture provided. However, one must note that in the surveyed regions, this type of farming remains limited and can principally be found in the non-SSA countries.

Due to the selection of countries and regions, the sample does not include large peasant plantation economies of the humid tropical zone specialized in tropical commodities (with the exception of one region of Nicaragua). It is, consequently, more representative of rain-fed agriculture, where natural constraints are stronger, and of irrigated agriculture.

Main Results 1: Down to "Sobering" Rural Realities

When the Program was launched, one of the main expectations was to identify direct consequences of the on-going processes of restructuring within the global agrifood markets on developing countries' agriculture. This perspective was the founding rationale for the main hypotheses and it has justified the comparative approach of the Program's design.

The extensive fieldwork implemented in 26 regions selected to illustrate the diversity of situations in terms of wealth and market integration leads to strongly temper the vision of an upheaval and invites to get down to more "sobering" rural realities.

The first cross-region result – and perhaps the less expected with this amplitude - is the widespread rural poverty in all the surveyed regions, including regions a priori classified as "winning". Strong income differences between SSA and non-SSA countries exist. However, non-SSA countries also face high poverty levels, and the situation of their poorest households is also particularly worrisome: while 80 to 90% of the surveyed households in SSA earn less than $PPP 2 per person and per day, the proportion of households below the $2 poverty line remains high in Morocco and Nicaragua (respectively 35% and 45%). Critical circumstances of food insecurity persist with most of the 20% poorest households which barely reach the minimum calories requirement (2,450 Kcal per adult per day). This is the case for several regions of the three SSA countries under review, but also and more surprisingly in Nicaragua.

Contrary to expectations about the development of "new" agriculture and markets, which founded the Program's first hypothesis, very few changes in farm productions and marketing methods were observed. The selection of the surveyed regions certainly counts, although "winning" regions with new markets dynamics were specifically included. But the finding of limited presence of high-value chains and "modern" marketing methods based on formal contractual arrangements is a strong Program result. Integration is limited and localized; it mainly relies on private initiatives and activities initiated by agribusinesses: contract farming and out-grower schemes articulated with first processing and packaging for export or for domestic procurement systems.

In all the surveyed regions, including in the "winning" ones, staples continue to hold the large share of farm production, with a significant presence of livestock activities: staple food production varies between 60 and 80% of the farm production, except in Morocco and Senegal. Self-consumption remains high (between 20 and 40% of the farm production), especially for the poorest households, confirming the role of risk-management strategies. However, in spite of this prominent self-consumption, most of the households sell the majority of their production and are "market-oriented" (i.e. with more than 50% of farm production sold). "Subsistence strategies" (less than 10% of commercialized outputs) are an exception.

When they exist, productions for export are mainly "traditional", i.e. supplying bulk markets without sophisticated specifications. As a result, most of the products are commercialized through "traditional" marketing channels: direct sales to brokers or wholesaler agents at farm gate or in the local market, routine informal arrangements with middlemen, or buying agents of the monopsony-type local agro-industry. Products directly delivered by the farmers to the factory or to the collecting center generally follow the same pattern. This is explained by the fact that integration processes within value chains mainly occur in the downstream segment (after the first collection or process) and not at producer level. Consequently, when looking at broad picture, high value production and integration into new market segments concern an order of magnitude of tens of thousands of producers when hundreds of thousands or millions continue to rely on "old" production and marketing systems.

Off-farm diversification is widespread all over the surveyed regions with the development of wage labor, self-employment and migrations. However, and contrary to a common view broadly developed in literature, rural income diversification remains limited among the surveyed households and on-farm incomes keep the larger share. This situation is explained by the fact that activity diversification does not translate into income diversification, revealing limited, uneven, or part-time off-farm activities and, often, "catch-all strategies" instead of clear rural restructuring processes. A strong heterogeneity of income structure exists between households, including at the locality level. It expresses the high variability of the local context and its role in determining the range of opportunities, and also the differences in terms of assets' endowment among households. Indeed, generally, the poorest 20% of surveyed households tend to be less diversified in all countries because of their lack of assets to engage in diversification processes, showing the existence of poverty traps.

In the surveyed regions, the rural economy is evolving; rural households are struggling to adapt to a challenging context. However, globally, change remains very gradual; it reveals little opportunities and little drivers for a rapid evolution, and only very few exceptions are noticed (as illustrated by the groundnut region of Senegal).

Main Results 2: Back to the Transition(s) Challenges

The RuralStruc Program countries illustrate very different situations regarding demographic transition. While Mexico, Morocco, and Nicaragua are deeply engaged in their demographic change, with decreasing population growth rates, the SAA countries

face a booming evolution – the fastest in the world today – with a sub-continent population that could increase twofold between 2010 and 2050 (reaching 1.7 billion people in the mid-century).

This population growth should translate in a massive increase in the labor force: presently in Sub-Saharan Africa the yearly cohort of new economically active population is around 10 million people and should reach a peak near 20 million in the 2030s. For a median SSA country – e.g. 15 million people today – the yearly cohort is 250,000 in the 2000s and is expected to be 450,000 in the 2030s.

This predicted "demographic dividend" follows several decades of extremely low activity ratios (with around only one active person for one inactive), which appears to have been a heavy burden on Sub-Saharan Africa's growth, as the African economies were dealing concurrently with liberalization and structural adjustment processes. This demographic dividend can be a major opportunity, provided that the engines of growth are strong enough to absorb the expansion of the labor supply. It requires a strong economic diversification, while the economic structure of the Sub-Saharan economies has evolved very little over the last four decades. Indeed, the fast-growing urbanization of the continent has been characterized by very low industrialization, recurring unemployment and underemployment. Job creation is mainly concentrated in the informal sector, in both rural and urban areas, which is marked by low productivity and low-paid jobs that do not ease assets accumulation and consumption increase. 60 to 80% of the labor force remains in agriculture.

In the cases of Mexico, Morocco and Nicaragua, by contrast, international migrations appear to be – or to have been so far if one includes the possible consequences of the global financial crisis – a major alternative to the insufficient pace of job creation. Hence, they played, and still play, a major role in the transition process (not to mention significant industrialization dynamics in a country like Mexico). With around 10% of their population living abroad in better-off countries, these countries access a powerful additional alternative, which facilitates their economic transition (as the 60 million European migrants to the "new world" did in someway for the European transitions between the 1850s and 1930s). In the current context, this pattern appears difficult to reproduce at the same level for SSA countries.

A crucial question for SSA today is the effectiveness of pathways out of rural poverty – which concentrates the majority of the poor - using the exit of agriculture options. When analyzing the rural household strategies with reference to their income structures, the Program's fieldwork shows a recurring farming economy where opportunities outside agriculture are very limited. In that context, how can SSA countries face the unique challenge of dealing at the same time with the early stages of their economic transition and their on-going demographic transition, which translates in a big push of their labor supply? What are the alternatives for sustaining an inclusive growth under the very specific conditions of the period, where a global open economy offers new opportunities and additional challenges in terms of productivity and competitiveness, under growing constraints related to climate change, which will notably affect the sub-continent?

There is no single and simple answer to these very unique challenges. Many views strongly contest the ability of agriculture to be a real booster for African development and transition and, indeed, diversification paths are imperative, notably industrialization. However, due to the economic trajectory followed by Sub-Saharan Africa over the last forty years and to its current economic structures, this diversification will take time and there is no silver bullet to hasten the process while the demographic pressure will remain.

Due to the existing share of the labor force engaged in farming activities, agriculture must be part of the solution; and the future of agriculture – and the agricultural policies – must deal with this structural dimension, which is more than food supply and poverty alleviation *per se*. Governments of East and South-East Asia, where the last economic transitions did occur, dealt very carefully and seriously with this issue.

The prospects for the absorption capacity of agriculture in SSA today are obviously uneven and context-related. They depend on the endowment and availability of production factors and on the genuine dynamics of the agrarian systems. The viability of farm structures and their capacity of absorption of new "entrants" is the core issue. The answers will be locally-based and will rely on increases in productivity and profitability and on land management and land development. In all cases, accurate information on farm structures and availability of production factors will be critical for decision-making.

Policy Implications

One of the main results of the fieldwork implemented by the Program is the need to reinvest the policy making process. Indeed, the strong heterogeneity of the local situations calls for a careful design of the policy interventions.

Due to the natural factors of endowment, the characteristics of the agrarian systems and the related distribution of income and assets among households, and the type of connection to markets, this heterogeneity translates in different configurations of opportunities and constraints. In order to deal with the existing challenges in terms of poverty alleviation, productivity increase, rural diversification, this variability of situations requires targeted approaches and tailor-made policy design: because the most significant risk would be to consider that recipes exist, which is of course not the case. The main ingredients are known: public goods provision (infrastructure, research, information, and capacity building), improvement of imperfect markets (typically inputs and sometimes marketing), incentives for the development of missing markets (credit, technical support, assurance), and risk mitigation mechanisms; but solutions cannot rely on one-size-fits-all policy packages.

As a consequence, it is necessary to re-engage in policy-making processes, based on shared diagnoses, in order to identify the main policy objectives. The diagnosis must be engaged at various spatial scales in order to articulate the range of territorial challenges with the perspective of the global transition and development processes. It implies that particular attention is required in terms of coordination with other sector policies and consequently the rehabilitation of development strategies.

This type of approach is, of course, more than a selection of projects based on expectations relying on supposed elasticities in supply and demand. It implies careful drafting and strong support from governments and donors in terms of information, capacity building and consultation: it is critical for ownership, which is the core ingredient for commitment to shared visions and objectives.

In a context of restricted resources and the need for quick action with reference to the existing challenges, a first step is to identify the binding constraints and the obstructions, which must focus attention and action (e.g. infrastructure, input supply, etc.). Then, it is necessary to engage in a targeting and sequencing exercise in order to select priorities for action.

Based on the Program's results a few indications in terms of policy orientation can be suggested, particularly in addressing the situation of the SSA countries. Due to the importance of rural poverty and the challenge to absorb a growing labor force, agricultural policies must first target the "many" and address and support, as a priority, smallholder agriculture. There is presently a recurring debate about the role of large-scale farming, which could respond more efficiently to the global food demand. This vision is far from being verified in all conditions and, above all, completely ignores the challenges of the economic and demographic transitions. As clearly demonstrated by the CCAA study (Competitive Commercial Agriculture for Africa), African smallholders are most often competitive in domestic markets and regional markets, and could progress into international markets if logistical constraints were reduced. Large-scale farming can be a solution in low population-density areas and for specific products where economies of scale (in processing) or high quality requirements are necessary, but support to family agriculture must the rule.

However, the importance of rural poverty – with half of the SSA surveyed households below the absolute poverty line – is a dramatic challenge for development. It is a severe constraint and requires fine-tuning in terms of action. The same policy tools cannot be used for farm households that are below the poverty lines and consequently do not have any room for maneuver in terms of investment capacity, and for the better-off households that could react to an improved environment, in terms of credit or services. In the first case – which represents the majority in SSA countries – significant provision of public goods will be necessary, particularly in terms of infrastructure, water access, technical packages, or land management, and strong direct support will be required in order to facilitate productivity increases. Simultaneously, regional approaches will be necessary in order to foster rural diversification through investment facilitation for transformation of products or development of services, which could offer employment opportunities for the poorest farm households that can with difficulty sustain their livelihood with their small assets and low productivity.

Keeping in mind the challenge of addressing the "big numbers", efforts must focus on the value chains offering the largest opportunities in terms inclusive growth. There are, of course, no solitary solutions, and all opportunities must be taken. However, in this perspective, if high value chains or niche markets can be powerful drivers, they are also

limited by their high quality and safety requirements that limit their access only to the producers able to adapt to their rules. Traditional agricultural exports are more accessible and have been strong boosters for regional development. Although new international price trends create additional incentives, these international markets are also increasingly competitive and require dealing not only with production costs but also with quality and volume of supply. Thus, domestic and regional food markets clearly remain the most accessible for the majority of farmers, which are *de facto* broadly engaged in them, as illustrated by the RuralStruc fieldwork. Their potential development, due to population growth and urbanization, is huge. Indeed, domestic and regional markets do not face the same requirements as high-income demand driven markets do. Furthermore, they only compete with food imports on a segment of the local demand and transport cost increase trends act as protection. They can justify the development of local transformation. They have huge distribution effects with a direct impact on poverty alleviation and foster local consumption – a central determinant of rural diversification and other economic sectors' expansion. They reduce food vulnerability and farmers' risks and consequently release potential for diversification, which will be needed for low factor endowment households.

All these issues are broadly interlinked and it appears that the quality of the policy debate will be determinant in addressing the complexity and uniqueness of very challenging situations, particularly for the agriculture-based countries. The adoption of a broad perspective that positions the future of agriculture in the global picture will be essential to renew the existing debates at national, regional and continental levels in order to deal with the challenge of simultaneous economic and demographic transitions within globalization.

Part 1. Setting the Scene and Selecting the Tools

The RuralStruc (RS) Program on the "*Structural Dimensions of Liberalization on Agriculture and Rural Development*" is a three-year (2006-2009) cross-regional Economic and Sector Work (ESW) placed under the Sustainable Development Department of the World Bank and managed by the Agriculture and Rural Development Unit of the Africa Vice-Presidency (AFTAR). The Program officially started in October 2005 and was launched formally in April 2006 with a workshop in M'Bour, Senegal, after a preparation phase dedicated to the identification and selection of the contributing partners in the selected countries.

This document's objective is to provide the background and rationale of the Program and the main results of its two phases. It is based on two sets of national reports prepared by the contributing partners through desktop studies for the First Phase and fieldwork for the Second Phase, and on a cross-country analysis relying on aggregated data and additional literature review[1]. This document does not pretend to present a state of the art on all of the RS Program's core issues.

Chapter 1 Overview and Background of the Program

1 Overview of the RuralStruc Program

The RuralStruc Program is supported by a free-standing multi-donor trust fund and is sponsored by the World Bank, the French Cooperation (Ministry of Foreign and European Affairs, Ministry of Agriculture and Fisheries, *Agence Française de Développement* (AFD) and *Centre de Coopération Internationale en Recherche Agronomique pour le Développement* (CIRAD)), and the International Fund for Agricultural Development (IFAD), which joined the Program for its Second Phase. Additional donors in three implementation countries also locally support the Program: the Swiss Development Agency (DDC) in Senegal and Madagascar, and the Finnish Ministry of Foreign Affairs in Nicaragua.

Initiated in the context of intense international debates and negotiations on the liberalization of agricultural markets and their consequences, the RuralStruc Program's main objective is to provide a renewed perspective on agriculture and its role for development. It has three specific purposes: (i) contribute to the analytical knowledge base about the structural dimensions of liberalization and economic integration of

[1] The national reports are referenced in the document using the following: *RSI Country*, for the First Phase reports; *RSII Country*, for the Second Phase reports. The list of reports is provided at the beginning of the bibliography.

agriculture and rural development in developing countries, (ii) feed and improve the international and national debates by promoting these issues, and (iii) provide guidelines for policy making. Consequently, one of its original characteristics was the core methodological choice of developing activities through local partnerships – relying on local teams – in order to foster both local ownership and the public policy debate.

For these purposes, the Program has adopted a broad comparative approach, which is not limited to liberalization, and also includes a wide range of economic, social and political issues to facilitate a better understanding of the trajectories of structural change and to identify factors of convergence and divergence between countries through comparative analyses.

Box 1: "RuralStruc" – what's in a name?

The selection of the acronym used to name this Program on the structural dimensions of liberalization on agriculture and rural development clearly relates to the choice of bringing structural issues into a debate mainly focused on trade issues. Using the iceberg image, structural transformation refers to what is under the waterline, while trade liberalization is only the tip. The Program's logo draws on this image.

RuralStruc refers both to rural structures and to the implications of global structural change on agriculture and rural economies. The main objective of the Program is to reconnect the on-going processes within agriculture to more global restructuring processes related to globalization, and to address some recurring blind spots of the international debate like the growing productivity asymmetries between countries, the demographic challenges of several developing regions, and their consequences on each country's unique process of structural transformation.

Seven countries are involved in the Program, each of which corresponds with a different stage in the process of liberalization and economic integration:

- Mexico, on one side, serves as an example of a deep integration and liberalization process and provides a background picture with the experience of the North American Free Trade Agreement (NAFTA).

- Sub-Saharan Africa (SSA), on the other side, with Senegal, Mali, Kenya and Madagascar, provides an illustration of partial integration and liberalization processes, initiated through state reform, privatizations and lowering of tariffs, that are all still in progress (e.g. negotiations with the European Union of the Economic Partnership Programs - EPAs).

- Morocco and Nicaragua represent two additional case studies of rapid integration processes due to their proximity to powerful economic zones with which free trade agreements have been recently implemented (the European Union in the case of Morocco and the USA in the case of Nicaragua, which ratified the Central America Free Trade Agreement – CAFTA)[2].

[2] Morocco also signed a free trade agreement with the United States.

The selection of countries relied on a set of criteria which are presented in Chapter 3, as well as the general design of the Program and its methodological choices.

2 A Quickly Evolving and Disconcerting Global Context

When the RuralStruc Program was designed and launched three years ago, the international landscape and the international debate were significantly different than present. They have since evolved quickly, showing the volatility of the global issues, and it is important to keep track of these changes because they are the ever-changing context of the development processes and also the immediate reality to which policy makers refer.

2.1 *The "Starting Point"*

At the time of RuralStruc's preparation in 2005, two main frameworks structured the international debate about development: the United Nations' Millennium Development Goals (MDGs), and the World Trade Organization's (WTO) "Development cycle" or Doha Development Agenda (DDA), set at the Doha ministerial conference (2001). Agriculture was clearly part of these two main agendas, sometimes occupying a key position (case of the DDA), but was never the core issue.

The MDGs provided a global framework based on poverty alleviation. The first goal –"*to halve poverty and hunger before 2015*" – is clearly agriculture-related: 70% of the world's poor (45% of the world's population) live in rural areas and rural people rely mainly on agriculture as a livelihood; and improved food supply and availability is central for hunger alleviation. The decisive role of agriculture in "pro-poor growth" was also reaffirmed by broad cross-country analyses performed by the World Bank (2005a). However, poverty remained the central issue and agricultural development was only one of the means cited to fight poverty among many other thematic and non-sectoral issues.

The WTO negotiations logically focused on trade liberalization, where agriculture is one sector, among others, to be liberalized. However, agriculture progressively became the main stumbling block in the negotiation process, used by developing countries (DCs) as a core argument to engage with developed countries on the broader issue of the liberalization of industrial products and services. It led to the failure of the Cancún ministerial (2003), initiating a large debate on the costs and benefits of trade liberalization of agriculture. This overwhelming focus on agriculture and trade and its domination over the international debate was one of the main justifications of the RuralStruc initiative.

Since 2005, the MDGs remain a distant reminder of the international community's commitment to poverty alleviation and global development. They are still referenced in official statements, even if it has progressively be recognized that every goal would not be achieved. The WTO debate has faded for several overlapping and interlinked reasons. The first one is course the emergence of new issues which have occupied the forefront (see below). Another reason is probably the new depths of research on these topics,

which provided additional and downgraded estimations of the expected gains of trade liberalization. These new estimations also pointed out the specific situation of many developing countries, particularly in Africa, which could probably incur net losses rather than gains (Box 2). In this context, negotiations have become more acute on OECD countries' subsidies and market access. This contributed to strengthening the opposition and led to continuous impasses, particularly regarding agriculture, as seen at the Hong-Kong ministerial (2005) and the following unsuccessful Geneva meetings. This "negotiation fatigue" is most likely a third reason, which also explains why increasing attention was dedicated to bilateral or regional Free Trade Agreements (FTA), and why major stakeholders decided to carry on bilaterally what was impossible to achieve at the global level.

Box 2: Estimated gains of the further agricultural trade liberalization

Additional work on trade liberalization and its impacts has provided a more detailed picture, thus downgrading the projected gains of liberalization.

Initial gains were expected to be substantial. For instance, Anderson and Martin (2005) estimated that the elimination of agricultural subsidies and the liberalization of merchandise trade would lead to an increase in global income by $300 billion per year by 2015. But various authors such as Polaski (2006) or Bureau et al. (2006) have found that the actual gains from trade liberalization are less impressive. Polaski projects gains at the aggregate global level on the order of only $40 to $60 billion (an increase of less than 0.2% of current global gross domestic product (GDP).

Moreover, these modest overall gains would have varied economic effects on different countries and regions: there are both net winners and net losers and the poorest countries are among the net losers under all likely Doha scenarios. China is the country that stands to gain the most from global trade liberalization with overall projected gains ranging from 0.8 to 1.2% of GDP, whilst some Sub-Saharan African countries are expected to be the biggest losers with an overall reduction in income of just less than 1%.

However, particular assessments of agricultural trade liberalization itself show a global picture where the benefits are expected for the developed countries, while developing countries – on the whole – will experience slight losses. But, again, aggregated figures are the enemy in the debate and differences in impact among countries and regions are meaningful: while a few countries such as Brazil, Argentina and Thailand gain, more countries suffer small losses such as the Sub-Saharan Africa countries, Bangladesh, Middle Eastern and North African countries, as well as Vietnam, Mexico, and China (which should lose in agriculture when winning globally).

As part of the recent analysis, authors pointed out that the initially large gains for developing countries predicted by some models were largely driven by particular assumptions about market equilibrium (notably labor) and inaccurate tariff data (Polaski 2006), underestimation of the impacts of price instability (Boussard et al. 2005), and excessive country aggregation (explained by the limitations of the existing databases) that hide the varied outcomes experienced by different developing country groups (Bouët et al. 2005). This is particularly the case of the Sub-Saharan Africa countries, which are strongly aggregated in the Global Trade Analysis Project (GTAP) database – the data reference of most of the projections.

The current trend in this debate is that trade liberalization can help foster growth but needs careful design in the strategizing process of its implementation with specific accompanying domestic policies.

2.2 *The "New Events"*

Over the last three years, several major changes have occurred. They are related to the growing concern about the consequences of the global climate change, and to the eruption of two crises: the food price and the financial crises.

Global climate change is an "old issue" that has been firmly on the international agenda at least since Rio's Earth Summit (1992) and the Kyoto Conference (1997); however it became a growing concern over the last years due to two successive broad research works: the *Stern Review on the economics of climate change* (2006) and the Intergovernmental Panel on Climate Change (IPCC) report (Fourth Assessment, 2007). These in-depth analyses have heightened the awareness of the international community and have refocused the on-going negotiations. They emphasize the impact of climate change on natural resources – and agriculture – by showing that climate change is expected to have various adverse effects such as increased rainfall variability, long-term drying trends, a reduction in cultivable land and a reduction in the length of the growing season. Out of all the regions, Sub-Saharan Africa is expected to suffer the most: the IPCC projects annual agricultural losses of between 2 and 7% of GDP in the region by 2100; Cline (2007) projects a reduction of 28% in agricultural output by 2080. These reports stress the need for special mitigating measures to prevent 120 million additional people from suffering from hunger. They also stress the role of agriculture in resource management, resource degradation, and carbon sequestration.

Aside from this existing issue, the first new concern is the emergence of the food price crisis (2007-2008), which has modified the global picture and contributed to renewed interest in food and agriculture issues. Prices had been increasing progressively since 2006 and rose sharply at the beginning of 2008, leading to international mobilization. They then slowed down and remain below the 2008 peak but according to all forecasts relatively high prices in the medium-term and a greater instability are expected.

Different demand-side and supply-side factors led to these high food prices and there was a fervent debate on the role played by each of them (Box 3). Nevertheless, and whatever the contribution of each factor, one main conclusion is that there is no global food shortage in the medium-term: the core issue is the *cost* of food and not the *lack* of food, and the main concern is the access to food for low-income consumers. The challenge is to avoid an excessive focus on short-term issues and to focus simultaneously on helping farmers to reap the benefits of the current better prices, mitigate their impacts on the poorest consumers, increase food production to counter-act increasing prices, and also improve producers' income through higher yields.

The second major event is the unexpected and sudden development of the global financial crisis, which has dramatically changed the world economy since September 2008. The rapid transmission of the downturn in the US housing sector to the global financial system is deeply affecting both rich and poor countries, with a contraction and recession in several developed economies and a sharp slow-down of developing countries' growth rates. The consequences for the latter, particularly the weakest with fewer resources to

assist them rebound, will be severe with a risk of drastically reducing revenues: foreign direct investments (FDI), due to the lack of confidence in the financial system and possible systemic political instability affecting some countries; fiscal revenue, due to the contraction of world trade and the fall of commodity prices; foreign aid, due to budget constraints in the developed world; and finally remittances, following the contraction of business and mass lay-offs in developed countries.

Box 3: Food price increase: the main reasons

On the supply-side, weather-related production shortfalls, stock levels and increasing fuel costs have all contributed to booming prices. With regard to production shortfalls, the most important occurrence is a drop in output – by 4-7% in 2005 and 2006 respectively – in eight major exporting countries, which constitute nearly half of global production. High food prices are also influenced by a gradual reduction in the level of stocks, mainly of cereals, since the mid-1990s; since the previous high-price event in 1995, global stock levels have, on average, declined by 3.4% per year. The boost in fuel prices increases the costs of producing agricultural commodities as well as the costs of transportation.

On the demand-side, the changing structure of demand, the emergence of bio-fuels, and operations on financial markets are cited as contributory factors towards raising food prices. With regard to the changing structure of demand, it is widely accepted that economic development and income growth in important emerging countries are gradually changing the structure of demand for food commodities (especially in China and India). Diets are moving towards more meat and dairy products, away from starchy foods. Although cited as a factor, it must be noted that these changes are progressive. The emerging bio-fuels market is a new and significant source of demand for some agricultural commodities such as sugar, maize, cassava, oilseeds and palm oil, because crude oil price increase allow them to become viable substitutes in countries that have the capacity to produce (not to mention subsidize) them. The development of maize-based ethanol production in particular impacts by contagion effect the other cereal markets. On the subject of financial markets, derivatives markets offer an expanding range of financial instruments to increase portfolio diversification and reduce risk exposures. These derivatives markets can attract speculators and the resultant influx of liquidity is likely to influence the underlying spot markets. More likely, however, speculators contribute to raising spot price volatility rather than to long-term price trends.

When going back to the "starting point" of the RuralStruc Program, it appears clearly that the founding reference to trade liberalization – even if the core objective of the Program was to go beyond – has been overshadowed by these new events. The two crises generated different sets of disconnected discussions on remedies. However, both crises have somewhat triggered protectionist reactions ("the protectionist tide") strongly contradicting the long lasting international negotiations on trade liberalization.

The food price crisis led to a search for new production options based on quick investments or re-investments in inputs, infrastructure, irrigation and even large scale capital-intensive agricultural schemes, launching anew an old – and false – debate between smallholder and commercial agriculture. The financial crisis sparked tariffs increases and new non-tariff barriers and the return of quotas.

2.3 *Which Role for Agriculture?*

Fortunately, however, during these three years, the specific debate on agriculture has been boosted by the choice made by the World Bank to select agriculture for its flagship report on development: the World Development Report (WDR). Prepared in 2006 and 2007 and launched at the end of 2007, the WDR08 provided the necessary momentum for a new focus and a new perspective on agriculture. Named "*Agriculture for Development*", the WDR08 strongly reinforces the roles of agriculture as a main sector of economic activity in most developing countries (as a source of labor, growth and of comparative advantage), an important social sector due to the large share of the population involved, and an important user of natural resources.

The WDR08 also provides an insightful review of what is known about the mechanisms of agricultural development and how agriculture can leverage the development process. The latter is based on a regionalized vision of the world's agriculture, which depicts the specific roles and challenges of agriculture in the development process depending on its weight in the regional economy (Box 4).

Box 4: The WDR08 and its "three worlds"

The WDR08 proposes a regionalized approach of agriculture for development and identifies three distinct worlds of agriculture depending on its contribution to growth and on the rural share of global poverty: an *agriculture-based*, a *transforming*, and an *urbanized* world. In each world, the agriculture-for-development agenda differs in pursuit of sustainable growth and poverty reduction.

In the agriculture-based countries, which include most of Sub-Saharan Africa, agriculture and its associated industries are essential to growth and to reducing mass poverty and food insecurity. They provide jobs, activities, incomes, and food self-sufficiency. In transforming countries, which include most of South and East Asia and the Middle East and North Africa, rapidly rising rural-urban income disparities and persistent extreme rural poverty are major sources of social and political tensions; rural diversification and agricultural income growth are answers to these challenges. In urbanized countries, including most of Latin America, much of Europe and Central Asia, agriculture can help reduce the remaining rural poverty if smallholders become direct suppliers in modern food markets, good jobs are created in agriculture and agro-industry, and if markets for environmental services are introduced.

	Agriculture-based countries	Transforming countries	Urbanized countries
Rural population (millions), 2005	417	2,220	255
Share of population rural (%), 2005	68	63	26
GDP per capita (2000 US$), 2005	379	1,068	3,489
Share of agriculture in GDP (%), 2005	29	13	6
Annual agricultural GDP growth, 1993-2005, (%)	4.0	2.9	2.2
Annual nonagricultural GDP growth, 1993-2005 (%)	3.5	7.0	2.7
Rural poverty rate, 2002 (%)	51	28	13

Source: World Bank 2007, p. 31-32
Note: The poverty line is $1.08 a day in 1993 PPP.

The WDR08 suggests three pathways out of rural poverty in order to explain how agricultural growth can reduce rural poverty: (i) agricultural entrepreneurship, (ii) the rural labor market, and (iii) the rural non-farm economy and migration to towns, cities or other countries. Several pathways often operate simultaneously and the complementary effects of farm and non-farm activities can be strong. Although rural households engage in farming, labor and migration, one of these activities usually dominates as a source of income.

This targeted approach has strongly contributed to the success of the report and fostered its discussion at regional level. Its broad dissemination process has facilitated the comeback of agriculture in the international debate on development. Nevertheless, its momentum has somewhat been impeded by the hectic international agenda, knowing that only a few months later, different messages were disseminated. For instance, the last UNIDO's Industrial Development Report 2009, points out the role of industry as the main driver of change, particularly for the "Bottom Billion" countries.[3] And, with a different – though not necessarily contradictory – perspective, the new World Development Report 2009 (WDR09) on "Reshaping Economic Geography", stresses the need for higher demographic densities, shorter economic distances and fewer political divisions, all of which can be reached through increasing agglomeration and integration processes.

However, in spite of this very unstable environment, agriculture is now back on the agenda of development and its contribution to growth, trade, and poverty alleviation is no longer in question: donors and governments are reengaging. The United Nations Secretary-General's High Level Task Force on the Global Food Security Crisis, launched in April 2008, is coordinating the international efforts, and in July 2009 the Group of Eight (G8) industrialized countries made the pledge to mobilize $20 billion to boost food security.

Although food security is a narrower scope, this context provides an opportunity to broaden the debate and to propose a global perspective where agriculture is also the core activity for rural livelihoods, and a central driver for structural change.

[3] The "Bottom Billion" refers to Paul Collier's book (2007) which focuses on the group of fifty failing states stuck in poverty, 70% being in SSA. Collier is one of the two authors of UNIDO's report.

Chapter 2 Global Rationale and Main Hypotheses

1 Agriculture in the Process of Structural Transformation and the Challenges of Globalization

The structural transformation of economies and societies is a core issue in development studies. Historical records and statistical evidence (Timmer 2009) show a progressive switch from agriculture (the original "primary" activity of every sedentary population), to industry (the "secondary" activities) and then to services (the "tertiary" activities). The well-known underlying dynamics of this structural change – or "economic transition" from one configuration to the next – is productivity gains in agriculture, based on innovation that fosters technical change and allows labor and capital transfers towards other economic activities. This process is accompanied by progressive spatial restructuring from scattered activities (typically agriculture) to more concentrated ones (typically industry), with migration of labor and people from country to cities. Rural depopulation fosters cities' growth, which initially developed for defense and trade purposes.

Alongside the process of growing urbanization, this global economic transformation has induced increasing incomes and wealth, which translates into improved living conditions. This, in turn, initiated the process of demographic transition (progressive reduction of mortality and birth rates, the differences of which explain different population growth dynamics – see infra). Evidence of this global structural process of change can be found in various regions across the world, albeit with different paths and paces, starting with the closely related agricultural and industrial revolutions of Western Europe at the end of the 18th century, followed by the USA, other regions of Europe, the main part of Latin America and various regions of Asia.

One of the main challenges of the present period is the simultaneous acceleration of change and the growing asymmetries between regions of the world characterized by different stages in this process of economic transition. This situation is unique in world history. The current globalization process is too often trivialized as a "second globalization" with reference to a first period between the 1860s and the First World War, when increasing flows of goods, labor and capital connected Europe with its immediate periphery (Russia, Ottoman Empire) and most of all with the "New Worlds" – mainly the USA (Berger 2002). However, this globalization of the early 20th century was, first of all, a process of convergence in the North Atlantic economy, driven by migration flows (O'Rourke & Williamson 1999), with a significantly different geopolitical order (mainly European colonial empires and the American influence zone in Latin America).

In comparison, the globalization of today involves an increasing "global world" integration – facilitated by continuous technical progresses in transportation of goods, capital and, particularly, information – with new financial instruments, a greater concentration of assets among global firms and institutional investors, and the

development of intra-industry trade. The emerging result of this integration is a deeper interconnection of both markets and human societies, which impacts their structure. The consequence is a global confrontation between different stages of social and economic development resulting from specific development trajectories and from different modalities and sequences of integration in the world economy.

Box 5: Liberalization or globalization?

In the early definition of the RuralStruc Program, liberalization was understood in a broad sense as the global process of change engaged in the early 1980s, that included trade and domestic reform, state withdrawal from economic activities, privatization, and, in many developing countries, the reform of the state through decentralization and the development of democracy.

The aim of the RS Program was to focus on all of the structural dimensions of this new context, which explains the choice for the denomination of the Program. However, although the Program adopted a broad definition of liberalization, this "official positioning" of the Program's name quickly appeared inadequate:

- Firstly, because the understanding of the objectives was often restricted to the policy package dimension of the reform process associated with liberalization and, consequently, was perceived as a critical approach of the reforms – which was obviously not the purpose; and
- Secondly, this misinterpretation implicitly limited the scope of the processes at stake.

After engaging in debates with both the donor community and the national partners, it appears that "globalization" would have been more relevant than "liberalization" in the denomination of the Program.

Such a positioning could appear to be an excessive scope. Nevertheless, what the Program clearly addresses is the new international regime engaged in the early 1980s and its consequence for agriculture and rural economies. This new regime is characterized by new roles for the state and private actors, as well as by a broad and deep movement towards integration of the world economy.

Among the main structural dimensions of this new international regime, two key themes are targeted by the RuralStruc Program: (i) the consequences of the "confrontation" effect between different levels of productivity and competitiveness in an increasingly open economy, and (ii) the global agrifood system restructuring and its impacts at national levels. Simultaneously, a demographic perspective is adopted to confront these processes of economic structural change with the trends of evolution of the economically active population (EAP) to subsequently discuss the challenges of present structural transformation.

1.1 *The "Confrontation Effect"*

Presently, a large portion of the world's labor force (45% or approximately 1.3 billion people) is still engaged in agriculture.[4] Out of this agricultural EAP (AgEAP), 97% are in developing countries (14% in SSA, 78% in Asia, less than 4% in Latin America). Consequently, the agricultural population, i.e. all the persons depending on agriculture for their living, totals 2.6 billion people (41% of the world population). Differences among regions are remarkable, particularly if we refer to the "three worlds" of agriculture presented by the WRD08. Whereas agriculture still plays a major role in SSA, which is the core of the "agriculture-based countries" (where on average 64% of the EAP is engaged in agriculture), AgEAP counts for less than 20% in the "urbanized countries" of Latin America. The "transforming world" of Asia presents more contrasts with significant differences between China and India (with respective AgEAP of 64% and 57%) and other countries in the region (Indonesia 45%, and Malaysia with a mere 15%).

Behind these aggregates, critical differences in productivity exist. For instance, if we confront the cereal production of developing countries – characterized by manual labor, a lack of Green Revolution packages (industrial inputs) and a single agricultural cycle per year – with the most heavily mechanized, high input level (not to mention subsidized) farms of developed countries (and some specific regions of DCs), the commonly accepted world productivity gap is a minimum of 1 to 1000. This gap (see Table 1) is a durable obstacle to competitiveness in the context of increasing competition in a globalized open economy. This is a major issue because one must bear in mind that the three pillars of competitiveness are, of course, production costs, but also the response to the quality requirements, and the volume of supply. In the current context of increasing food demand and high prices, the most productive farming systems are the ones able to take advantage of the new market opportunities, as they will be able to provide additional supply quickly. For less productive and competitive agriculture the risk of progressive marginalization due to decreasing market shares seems a possible trend.

This progressive marginalization is a legitimate concern because it refers to the existing employment alternatives for the AgEAP, which continues to increase in relation to the demographic growth (see below).

Despite the issues raised by the different agricultural productivity and competitiveness levels between developed and developing countries, the confrontation effects remain a blind spot in the international debate that must be taken into account when analyzing the past and future role of agriculture in DCs.

[4] General figures on agriculture EAP come from FAOSTAT.

Table 1: World's Gross Productivity Gaps in Cereal Production

Number of workers		Green Revolution	Mechanization	Area per worker (ha)	Land productivity tons/ha	Labor productivity tons/worker
Millions	%					
30	2	Yes	Tractors	100	10	1000
410	32	Yes	Animal traction	5 or 2.5 (x 2 harvests)	10	50
410	32	Yes	Manual tools	1 or 0.5 (x 2 harvests)	10	10
450	35	No	Manual tools	1 0.5	1 (rainfed) 2 (irrigated)	1
1300	100					

Source: Adapted from Mazoyer (2001)

1.2 *The New Global Agrifood System*

The other driver of change (since the early 1980s) is the progressive restructuring of the global agrifood system, which has overtaken the slow and difficult progress made towards the liberalization of agricultural trade. The "agricultural exception", allowed since 1947 under the *General Agreement on Tariffs and Trade* (GATT) regime, only began to be addressed in the launch of the Uruguay Round in 1986. This exception formally ended with the Marrakech Agreement of 1994, but since then negotiations for further trade liberalization have stalled within the WTO framework.

At the same time, but at a different pace, the global characteristics and functioning of the agrifood markets have been deeply affected by the emergence of globalization.[5] The concurrence of market deregulation and privatization, on one side, and the emergence of demand-driven markets boosted by global income increase, on the other, has radically reconfigured the global pattern with new structural trends.

Firstly, foreign direct investment (FDI) flows have increased rapidly in reaction to new capital mobility fostered by deregulation, new financial instruments, firms' needs to find external sources of growth – through new markets and more efficient production costs – and by taking advantage of the opportunities created by privatization. This situation leads to market globalization and to concentration processes related to competition for market shares.

Secondly, an increasing demand for high-value food products, a consequence of new diets resulting from growing incomes (with a bigger share of fresh products – fruits and vegetables, meat and dairy), has introduced new quality requirements particularly those linked to sanitary issues and the specific needs of fresh product marketing (appearance, packaging, speed of distribution, etc.). Simultaneously, new high-value market segments have emerged related to the development of organic food, fair trade and other ethical concerns. These demand-driven trends, significantly different from the historical basic

[5] These processes of global restructuring of the agrifood system are developed in the Part II of the report (chapter 3).

food supply, have translated into new norms and standards for dealing with these more complex quality issues; the consequence of these new norms and standards is increasing transaction costs linked to the compliance with these new requirements.

Thirdly, improvements in communication and transportation facilitate long-distance transactions and the globalization of the food supply chains, for both the food industry and food distribution[6]. On both sides, the trend toward concentration – related to global competition fostered by increasing FDI –translates into vertical integration of the value chains and the development of new distribution systems with the rise of the supermarket model, which is a way to guarantee the supply in due time of the requested quality products.

This deep restructuring has radically changed the landscape of the agrifood system (Reardon & Timmer 2007). On the one hand, this evolution comes with a growing disconnect of local farmers from their national markets, which can now be supplied from abroad. On the other hand, it allows for the integration of some local producers into global chains and provides new opportunities for growth. However, the new rules resulting from this new context require adaptation by producers who must now observe the new quality requirements, which often imply capital and technical skills. Therefore, understanding the consequences of this new trend in terms of inclusion and/or exclusion of producers in these global value chains is a critical issue. Again, similar to the consequences of the confrontation effect, the risks of marginalization must be evaluated in the light of alternative activities for the people working in agriculture.

1.3 *The New Demographic Pattern and its Challenges*

The progressive restructuring of the global agrifood markets and the consequences of the confrontation between different types of farming systems and productivity levels have to be put into perspective with a rapidly evolving demographic context. Over the past few decades, the challenge of "nourishing the planet" has been of critical international concern, and is often exacerbated by circumstances such as natural disasters. This challenge has been reactivated by the interaction of the potential impacts of climate change on production and the rising new demands linked to evolving diets and bio-fuels; all these factors translated into the recent price increase and greater volatility (see Chapter 1). However, at the same time, one must consider that the global population continues to grow.

According to the last United Nations projections, the world population will reach 9.1 billion people in 2050 – nearly 2.5 billion more people than today (see Table 2). Although these statistics are widely acknowledged, a matter that receives less attention is the distribution of this population increase across regions and the consequences of this

[6] The sustainability of this trend will of course depend on the evolution of transport costs (see the recent oil price increase and the probable inclusion of externalities linked to carbon emissions).

distribution on the respective regional economic structures. This unequal distribution is a direct consequence of different stages in the process of demographic transition experienced regionally. Whilst Europe shows characteristics of the final stage of transition, with an ageing and declining population, Sub Saharan Africa or South-Central Asia are still booming, demonstrating different phases within the transition. However, SSA and South-Central Asia are booming at different rates: SSA's population should duplicate by 2050, reaching 1.7 billion people, while South-Central Asia should "only" grow by 40%. Thus, Sub-Saharan Africa should become the second most populated region of the world (after South Asia). Simultaneously, East Asia's population growth (mainly China) should come to a halt as a consequence of the radical birth policies in place since the 1970s, and East Asia should progressively face the same problems presently seen in Europe (i.e. the burden of an ageing population).

The main result of this differentiated evolution will be a new mapping of the world, which will inevitably influence the current balance of power. As Guengant (2007) reminds us, SSA should regain its former share of the world population – around 20% – and should overtake China in 2050 (interestingly, the two had a very close population around the 16th century). Europe and North America combined should represent fewer than 15% of the world's total population (see Table 2).

The main economic concern with the demographic transition relates to the evolution of the activity structure of the population, which reflects its age structure (Bloom et al. 2001). It translates into different dependency or activity ratios[7] summarizing the respective portions of active and inactive people in the economy. In the First Phase of demographic transition, the population is young with a high share of young, inactive people; during the second stage, these cohorts become active and could offer a bonus to the economy named the "demographic dividend". Finally, the third stage corresponds to the ageing of these cohorts, thus increasing the dependency ratio (or decreasing the activity ratio).

[7] The ratio commonly used is the dependency ratio, i.e. the inactive population: the active population.; however, because we examine activity and employment, we use the activity ratio (active : inactive) which is more illustrative for our purposes.

Table 2: World Population Increase in Selected Regions: 1960-2050 (millions)

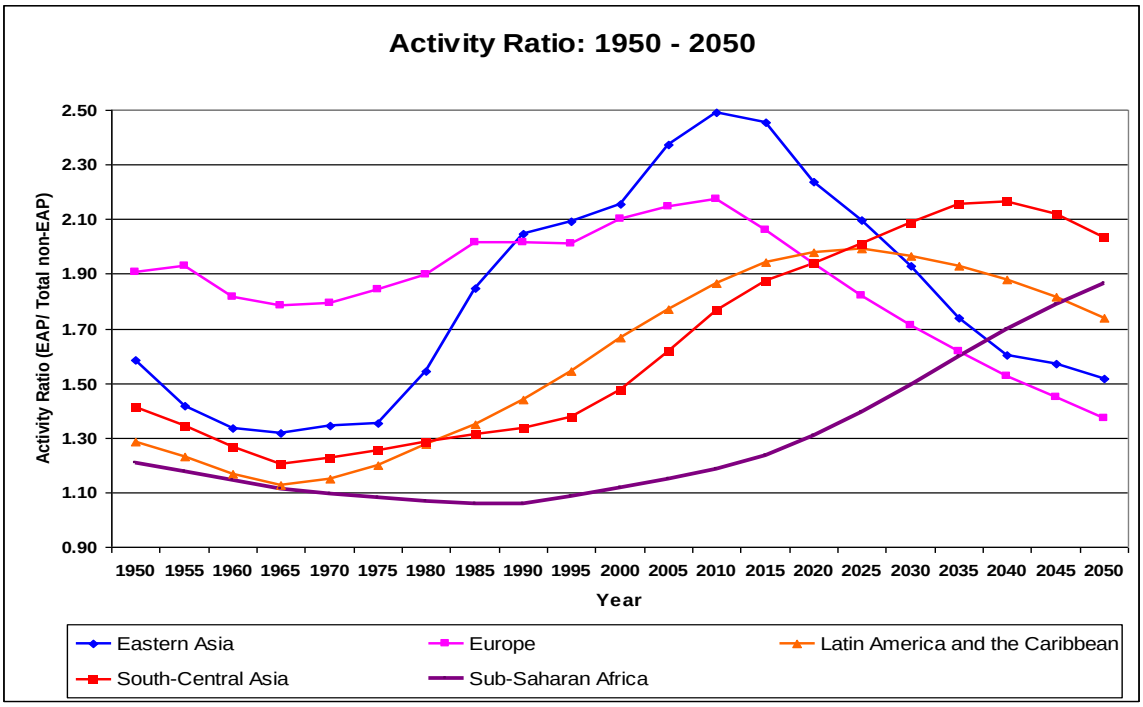
Region	1960		1990		2010		2050		2010-2050	
	MM	%	MM	%	MM	%	MM	%	Increase	%
Eastern Asia	792	26.1	1,344	25.4	1,563	22.6	1,591	17.3	29	2
South-Central Asia	622	20.5	1,243	23.5	1,777	25.7	2,536	27.6	759	43
Sub-Saharan Africa	226	7.5	519	9.8	867	12.6	1,761	19.2	894	103
North America	204	6.7	284	5.4	349	5.0	445	4.8	97	28
Latin America and Caribbean	220	7.3	444	8.4	594	8.6	769	8.4	176	30
Europe	605	20.0	721	13.6	730	10.6	664	7.2	-66	-9
WORLD	**3,032**	**100**	**5,295**	**100**	**6,907**	**100**	**9,191**	**100**	**2, 285**	**33**

Source: United Nations, World Population Prospects, 2006 Revision.
Note: for the definition of regions see: http://esa.un.org/unpp/index.asp?panel=5

Figure 1 illustrates the consequences of staggered and differentiated demographic transitions. Due to its high population growth rate since the 1960s (higher than 2.5% per year over 40 years, with a peak at 3% in the 1980s), Sub-Saharan Africa had to deal in the 1980s and 1990s with the weakest activity ratio ever recorded, with approximately only one active person per inactive person (and less than one active in some Sub-Saharan Africa countries). This heavy burden must be put into perspective with these two decades of economic crisis and structural adjustment, thus shedding new light on the SSA context. During the same period, East Asia benefited from an outstanding demographic dividend with 2.5 active persons for one inactive person, which certainly fuelled the economic growth of the region (Bloom et al. 2001). South Asia, which has a 30-year delayed transition, should only get this demographic windfall around 2035; SSA will have to wait after 2050 to potentially reap the benefits of a more favorable demographic structure.

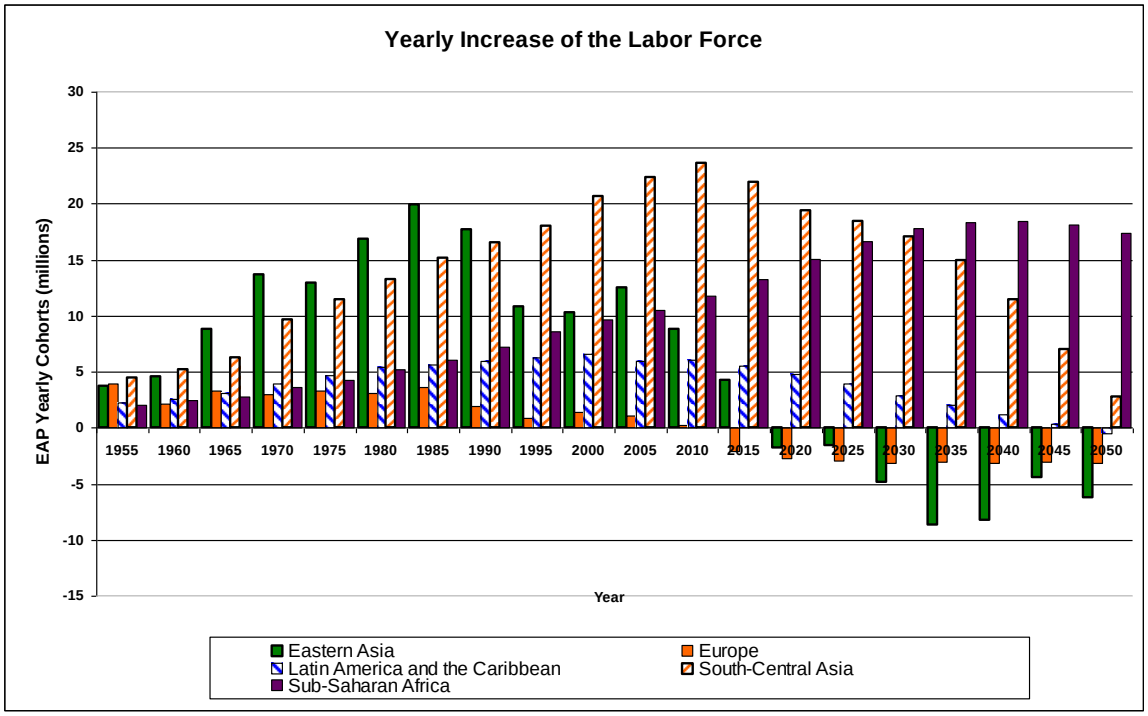
When we translate these different demographic trends not only into global population increase but into yearly cohorts of people, and particularly into yearly cohorts of labor force, we have a clear indicator of what the labor supply and demand for jobs should be in the coming decades. Figure 2 shows the same delayed trends between the main growing regions and provides an estimate of the needs for absorption by the various economies. In Sub-Saharan Africa today, the yearly cohort of new EAP is around 10 million people and should reach a peak near 20 million in the 2030s. For a median SSA country – e.g. 15 million people – the yearly cohort is 250,000 in the 2000s and is expected to be 400,000 in 2025.

Figure 1: Activity Ratio by Region: 1950-2050



Source: World Population Prospects, 2006 revision.

Figure 2: Yearly Increase in the Labor Force by Region: 1955-2050



Source: World Population Prospects, 2006 revision.

1.4 *Structural Transformation in an Open Global Economy*

As was previously discussed, the existing productivity and competitiveness gaps are consequences of the confrontation between staggered and delayed processes of economic transition in an open world economy. Delayed demographic transitions add another challenge when large cohorts entering the EAP increase pressure on employment. On one side, this push is a considerable market opportunity, as rising domestic markets will fuel economic growth. On the other side, national economies will have to absorb this population increase and provide labor opportunities – or sectors of activities for self-employment – to these new cohorts.

The degree of challenge presented by these trends depends heavily upon the stage in the structural transformation of every economy (i.e. share of the different economic sectors in GDP, intersectoral linkages, human capital, infrastructure and provision of public goods). Economic diversification opens up the range of alternatives for people who are no longer able to sustain their livelihood from agriculture and who must find an "exit option".

Annex 1 presents a statistical overview of the RS Program countries' economic characteristics comparing them with those of four emerging economies – Brazil, Chile, Thailand, and Indonesia. This comparison, based on the 1960-2005 period, exemplifies what economic transition is and the various charts strongly show the rapid decrease among the comparative countries of the share of agriculture in the various economic aggregates (GDP, EAP, and trade) and the very slow pace of change among the RS countries. Mexico, chosen as a background reference for its 20-year liberalization and integration process, clearly appears as an exception with characteristics close to the ones of the emerging economies. While Brazil, Chile and Mexico started their structural transformation in the 1940s and 1950s, prior to the period under review, Thailand and Indonesia amazingly illustrate the rapid change over 40 years.

One of the main questions is to explore the reproducibility of the historical sequence of structural change. Will developing countries follow the same pathway as demonstrated through history or will they be confronted with difficulties related to the simultaneous challenges of globalization and demographic transition? The common approach today is to consider that this pathway is an obvious fact, confirmed by history, and that there is no justification to dispute this approach. Timmer and Akkus (2008) show that if countries are lagging in the process of structural change it is mainly related to economic growth difficulties and not to the pattern of change alone[8]. However, it seems important to highlight the need for a historical perspective, which must be kept in mind to discuss the on-going process of structural change: the "moment" in world history when the transition occurs – or becomes possible – matters, because opportunities, constraints and balance of

[8] Timmer and Akkus have tested the evolution of the structural pattern in 86 countries. The results confirm the robustness of this historical process. The authors included the seven RS Program countries in the sample, which do not exhibit strong divergence from the general pattern.

power evolve and provide different room to maneuver within economies and societies engaged in the process of change (Gore 2003).

The case of the past economic transitions strongly illustrates this issue. The characteristics of the Western European and North American transitions over the 19th and the better part of the 20th centuries cannot be disconnected from European and American political hegemony which expressed openly through colonization, unequal treaties or, indirectly, through influence zones. This hegemony reduced or eliminated competition but also allowed very attractive situations of both supply and demand, with captive markets, which facilitated specialization and industrialization, and also increased accumulation through profitability of businesses. The European transition and "new worlds" development, which are totally intertwined, were also boosted by a unique flow of international migration (Hatton & Williamson 2005) made possible by Europe's hegemonic position. Between 1850 and 1930, nearly 60 million Europeans migrated to the Americas (35 million to the USA alone), Australia, New Zealand, and Africa. These migrations facilitated the adjustment of European economies and the management of the surpluses of labor resulting from rural depopulation and the insufficient pace of job creation in other sectors, despite a strong process of industrialization (Losch 2008).

The cases of the emerging economies of Latin America and Asia, which are frequently called into the debate to confirm the ineluctability of structural change, must also be discussed in the historical context of when their structural change happened. For all these countries, the transition occurred during a very specific period of national self-centered development, which characterized the world international regime between the 1929 crisis and the current new globalization era, starting at the end of the 1970s (see Giraud 1996). Everywhere in the world, nation-states implemented their own "development projects" (McMichael 1996) characterized by import-substitution, protection and strong state intervention. The role of public policies was determinant for both industrialization (Evans 1995) and agriculture modernization (Djurfeldt et al. 2005) and initiated the so-called "developmental state". The independent Latin American countries engaged in this process between the two World Wars; they were followed by many Asian countries that were decolonized in the early 1950s; and, in both cases, the Cold War period funding played a significant role. The results of this state-led development were uneven but they always deeply shaped the economic and institutional environments and prepared further changes.

Today, the situation of the developing countries that stay at the early stages of the economic transition, particularly in Sub-Saharan Africa, is more constrained by the characteristics of globalization. Indeed, if we refer to the three pathways out of rural poverty proposed by the WDR08, the third pathway – migration to cities or abroad – is critical for many developing countries.

Firstly, although international migration is a growing issue in development studies with reference to the impact of remittances, the main migration flows stay concentrated in the 'contact' regions peripheral to the EU and the USA. The options will likely depend on the demographic evolution of the industrialized countries and their reliance on foreign labor,

as the current geopolitical order does not allow the same process of mass-migration that occurred at the end of the 19th century.

Secondly, a major characteristic of developing world cities' growth is a process of urbanization without industrialization, illustrated by the dramatic expansion of slums (UN-Habitat 2003, Davis 2006). This "low regime urbanization" is particularly prevailing in Sub-Saharan Africa and is a main difference when compared with Europe and the USA during the 19th and 20th centuries, and with some regions of the developing world previously engaged in structural change (typically but partially China, India) where industrialization fueled rural depopulation based on labor demand. Today, migration to cities is not systematically related to job access, higher income and better life because the process of industrialization is constrained by international competition and does not initiate the same labor demand.

This observation serves as a reminder that productivity gaps are not limited to agriculture and concern other sectors of activity. For many DCs, although low labor costs are a clear comparative advantage, the differences in other factor costs (particularly capital), in labor skills, and in economic and institutional environments reinforce the asymmetry in competitiveness patterns. For countries that are less endowed, these differences are a real obstacle in the process of structural transformation when their infant sectors have to confront world champions on the global markets. This is the case for SSA and many other low-income and lower-middle-income countries versus developed or emerging economies.

In Sub-Saharan Africa, where agriculture still plays a large role, with on average 60% of the total EAP engaged in agriculture and a modest structural evolution over the last 40 years, the situation is extremely challenging and there are significant risks of transition impasses, reflecting the difficulty of alternative options (Giordano & Losch 2007).

2 Hypotheses of the Program

This discussion on the consequences of global changes on economic and social structures and on the agricultural and rural dynamics of developing countries directly shaped the rationale of the RuralStruc Program and its hypotheses. While the trade liberalization debate focused on the expected gains of the liberalization process and its consequences on poverty (see Box 1) and also engaged in its potential employment dimensions (Winters et al. 2004, Hoekman & Winters 2005), the Program objective was to investigate more particularly the characteristics of economic transition within globalization and to elaborate on possible structural difficulties and not only on transitional problems (which is the common view of the international debate).

Three embedded hypotheses were advanced. First, the global restructuring of the agrifood markets and the increasing asymmetry within the international competition lead to both the development of differentiation processes among farm structures, and also marketing, transformation and distribution structures. This hypothesis raises several questions: What is the balance between the potential integration of farmers in the new value chains and

their possible exclusion? What are the amplitude, rapidity, and characteristics of these processes? Do they induce a segmentation dynamic with concentration, marginalization and, sometimes, exclusion, within and from the farm sector leading to the emergence or consolidation of multiple-track agriculture?

The second hypothesis refers to the existing processes of adaptation among rural households as a response to the many changing factors in agriculture and their impact on farms' viability. Rural households engage in new configurations of activities and income characterized by a changing role of agriculture and a growing importance of off-farm activities and transfers (private transfers related to migration and, possibly, public transfers linked to specific support systems). Questions relevant to this hypothesis include: What are the characteristics of these new configurations? How do they differ between countries? Are they new dynamics or do they follow the historical paths of structural transformation? Are they effective answers for rural livelihoods sustainability?

Consequently, the differentiation dynamics within agriculture and the possible difficulties of rural households' adaptation constitute risks of transition impasses within the process of structural transformation. This is the third hypothesis, which refers to the characteristics of the "agriculture based" countries, where the weight of agriculture in the employment and activity structures, the low regime urbanization, the limited economic diversification in a context of growing international competition, and heavy demographic pressure, all create a unique challenge for development. Will some countries face impasses in escaping poverty due to a lack of alternatives (Kydd 2002), and what are the potential social, economic, and political consequences of such dead-ends in the economic transition?

Chapter 3 Design and Methodology

1 General Design of the Program

To assess the relevance of the hypotheses and to answer their related questions, a comparative approach seemed most appropriate for the RS Program. This approach took place in a set of developing countries with the objective of identifying the main similarities and differences in their processes of adaptation to the new context within their own trajectories of structural change. Simultaneously, it was necessary to implement the Program within a collaborative framework engaging local teams in an "inside process" of analysis with the dual objective of a "better understanding for a better policy making" (this statement is the sub-title of the Program).

To support the implementation of the program, two bodies were dedicated to its governance:

- A Steering Committee, including all the trust fund contributing donors, was responsible for the follow-up of the activities and budget execution; this Steering Committee met six times over the last three years, showing a real commitment and follow-up among the donors; and

- An Advisory Committee, consisting of academics and researchers from six countries, provided guidance on the orientation and development of the program and its members reviewed the progresses at the different stages of completion; three Advisory Committee meetings were hold: in Washington at the World Bank, at the end of the First Phase, in March 2006; in Paris at the AFD, at the end of the Second Phase's field work, in September 2008; and in Rome at IFAD, near the end of the Second Phase, in May 2009.

1.1 *A Comparative Approach*

Comparative approaches are a powerful tool for analytical work because they help to stress convergences and differences and to identify key explanatory factors. However, they are also risky and can lead to deep methodological errors. For the RS Program, the comparative perspective was, of course, not used to make comparisons between countries (for instance Mexico and Madagascar), as this would have made little sense and would have induced classical selection bias[9].

[9] Due to the selection process and the self-selection of the country cases, any conclusion from direct comparison to explain variables would suffer from systematic error (cf. Collier & Mahoney 1996).

Simultaneously, facing the classical challenge of ex-post analysis, the goal was not to evaluate "impacts" – the term was carefully avoided in the title of the program and "dimensions" was preferred – because it would have led to information difficulties (particularly the lack of years of reference for evaluation) and to a risky discussion on causalities of change.

On the contrary, the objective of the comparative approach was to illustrate processes of change in agriculture and the rural economy related to liberalization, economic integration and globalization so as to identify patterns and differences, the understanding of which can be useful for policy making. In its implementation, it endeavored to adopt a global multi-disciplinary and historical perspective of the dynamics of change, by giving attention to the national trajectories and their "critical junctures"[10], which can modify the nature of relationships between agriculture, the rural sector and the overall economy.

1.1.1 Country Selection

To engage in the comparative approach, it was decided to select a sample of countries corresponding to a spectrum of situations within the process of economic integration, including, on the one side, countries that are far ahead in this process and, on the other side, countries where the pace of integration into the world economy has been slow and / or unequal.

The process of selection of case studies for a comparative goal is always the result of a compromise between objective criteria related to research purposes and operational issues, which refer to local partnerships, conditions for implementation, and contributing partners' overall themes of interest. Thus, the country selection resulted from discussions between the contributing donors. It was decided that a specific focus on Sub-Saharan Africa was justified by the critical structural situation of the continent and the many commitments of both the international community and the African governments to revitalize the agricultural sector. On the donors' side, at the end of 2005, the UN Millennium Project's Task Force on Hunger, the Commission for Africa Report, the Africa–EU Partnership and the World Bank Africa Action Plan (AAP) were the main references. As seen previously, this commitment has increased over the last three years. On the African governments' side, the NEPAD's Comprehensive Africa Agriculture Development Program (CAADP) was the indisputable framework and has since become the African and international reference for action.

Further to the above-mentioned criteria of gradual and differentiated integration, the selection of countries was based on two specific macro-economic criteria: the GDP per capita and the agricultural economically active population (AgEAP), which are indicators

[10] The critical juncture refers to the concept of path dependence and designs a "key choice point" when a particular option is selected by governments, coalitions, or social forces among other alternatives and leads to the creation of recurring institutional patterns (see Mahoney 2001, Pierson 2000).

of the country's stage within the economic transition. As a consequence (with the exception of Mexico) the selected countries are low-income or lower-middle-income countries, with significant but different levels of their economically active population involved in agriculture (see annex 1): between 70 and 80% for the SSA countries, 35% in Morocco, and around 20% in Nicaragua and Mexico (the figure for Nicaragua is underestimated).

The demographic size was also part of the selection process in order to avoid extremes – particularly the most populated countries, which offer broader options regarding the process of structural transformation. This view is of course disputable because there is no direct correlation between economic transition and demographic size, and significant counter-examples exist on both sides. However, in the context of increasing competition linked to globalization, economies of scale related to large domestic markets offer additional room for maneuver. This is particularly the case for industrialization, as well as for research and / or capacity building, and regional economic integration is, of course, the main option for "small" countries. Again, the selected countries have a small to middle demographic size, between 5 and 35 million inhabitants (except, again, for Mexico)[11]. These criteria precluded the selection of any Asian countries, as many countries of the continent deal with bigger dimensions[12].

The choice among the SSA countries reflects the diversity of situations among low-income countries (Madagascar, Mali, and Senegal being in the Least Developed Countries group (LDCs)) with reference to their geographical situation (Southern, East and West Africa, including a land-locked country, Mali), their colonial history, their activity structure including the role of migrations, and the state of the national debate around agriculture and privatization.

The specific cases of Nicaragua[13] and Morocco, two lower-middle-income countries, are direct and powerful examples of countries facing the challenges of managing rapid transformation processes in a context of free trade agreements (with the European Union and / or the United States), where the weight of international migration plays a big role,

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[11] "Small" and "medium" are indeed relative values. Nevertheless, one must keep in mind that among the 192 members of the United Nations, only 25 countries count more than 50 million people, 50 count more than 20 million, but 80 have less than 5 million inhabitants.

[12] If we exclude the former USSR Republics and the conflict and post-conflict countries (Cambodia, Sri Lanka), the alternatives are limited. In that range of demographic size, Malaysia could have been an interesting case, even if already deeply engaged in its structural transformation.

[13] To illustrate the CAFTA countries and identify the possible country cases, support was provided to the coordination team by RUTA (*Unidad regional de asistencia técnica*), platform for sustainable development in Central America. Guatemala and Honduras were discussed alternative options. However, Nicaragua was selected for operational reasons.

and where agriculture – characterized by dualistic structures – is still a major political issue.

Despite being an exception to several selection criteria, including Mexico (an upper-middle-income country, OECD member and emerging economy) was justified by its anteriority in the integration process through the implementation of the NAFTA in 1993[14]. Indeed, Mexico provides a useful picture of the impacts of deep liberalization and integration processes with strong consequences for agriculture and the rural economy on the whole, though these impacts have been mitigated by significant public support targeting both the farm level and the rural poor. It is also a reference case for international migration, which plays a decisive role in the processes of adaptation to deeper integration.

With reference to the WDR08, the selected countries represent the three worlds of agriculture: "agriculture-based" (Kenya, Madagascar, Mali), "transforming" (Senegal, Nicaragua and Morocco), "urbanized" (Mexico).[15] There is no perfect sample, and this one could have probably benefited from a case illustrating powerful plantation-based agricultural economies that have been long-engaged in tropical commodity exports (coffee, cocoa, palm oil), like some countries of the Gulf of Guinea in West Africa[16]. However, with reference to the Program's hypotheses, the RuralStruc countries present a range of situations that cast light on the respective roles of value chains and their market orientation (domestic or international, staple or high-value), the degree of economic diversification, migrations, and the type of public policies.

[14] It is worth to mention here that Mexico holds also a specific status among developing countries due to its long-standing agricultural policy, initially based on a revolutionary-founded agrarian reform which ran from the 1920s to the 1970s. In spite of liberalization of the land market in 1992, this specific trajectory has deeply shaped the structure of the Mexican agriculture.

[15] Having Senegal, a country with 73% of its EAP in agriculture (2003), in the "transforming world" illustrates the ambiguity of using only "rural" (and rural poverty) as a category for the analysis. The definition of rural varies between countries (see below) and has a restrictive definition in Senegal. Nicaragua is not referred to in the WDR's "three worlds" analysis, which excludes countries below the 5 million inhabitants limit (even though Nicaragua passed this limit in 2000). However, using the same criteria, Nicaragua would be part of the "transforming countries" group.

[16] One can note that Kenya could have provided an example of deep involvement in tropical commodities. For many operational reasons, the tea and coffee regions were not selected for the field work. Among the selected country, the only example of tropical perennial crop is found in Nicaragua (coffee zone).

1.1.2 Operationalizing the Comparative Work

The RuralStruc Program was initially conceived with two main phases and several knowledge sharing workshops. The main objective of the First Phase was to generate broad country overviews based on desktop studies and gathering all the available information on the role of agriculture in the economy, on market structures and their evolution, on development and differentiation of farm structures, and on risks of impasses and possibilities for adaptation. Simultaneously, this First Phase was an opportunity to identify the missing information related to the processes of structural change within agriculture and to share views on the general approach of the program with the national partners.

In order to facilitate the comparative work, local teams based their contribution on the same terms of reference detailing the objectives and expectations of the overview. A common framework for the preparation of the First Phase reports was discussed and designed (table of contents).

The First Phase was launched in April 2006 and was supposed to be achieved by December 2006. Due to delays that are common in this type of work, particularly when several teams are involved, all but one of the seven national contributions were completed in March 2007.

The Second Phase was originally designed to produce specific information through more detailed case studies, both at the regional and value chain levels, based on qualitative fieldwork including interviews of smallholders, middlemen, and other economic agents, and targeting the relevant issues brought out by in the First Phase. However, one of the main results of the First Phase the importance of the "knowledge challenge", which revealed the weakness of the knowledge-base and the importance of information gaps regarding the processes of structural transformation of rural economies. In every country, national teams faced specific difficulties regarding data availability, data age, and a lack of available information to inform the issues raised by the RuralStruc Program, such as household activities and incomes (on-farm, off-farm, agricultural and non-agricultural employment), migration and remittances, connection to markets, integration and contractualization with global value chains, etc. On all these themes, information mainly relied on limited case studies, from which it was difficult to draw general conclusions or perspectives.

As a consequence, the first Advisory Committee meeting (March 2007) strongly suggested that the Second Phase should engage more directly in data collection at the household level. The objective of these household surveys was to provide new evidence on the processes underway in agriculture and the rural economy by generating new and updated information, as well as to improve the conceptualization of the new roles of agriculture within the households' activity nexus (types of income generation, combination of systems of income and activities, multi-purpose strategies, etc.). This upgrading of the Program's objectives and the choice to implement household surveys

was approved by the Second Steering Committee of the donors, and was supported by additional contributions.

The Second Phase consisted of rural household surveys implemented on a regional basis, after selection of relevant regions based on the Program's objectives. These household surveys were articulated with an overview of the characteristics of the chosen regions and a specific analysis of selected value chains, in order to provide a comprehensive background to the household surveys. Again, the same terms of reference were used and, above all, a deep consultation process on the survey instrument design was engaged. The same framework was used in the seven countries, with necessary local adaptations. A methodology for the data breakdown and definition of the core variables was shared; difficulties about the data analyses were discussed, as was the outline of the Second Phase report. Last, but not least, a common effort was engaged in order to build an aggregated mini-database. This operation was sensitive and revealed many technical issues which were time-consuming.

All these steps led to a rescheduling of the overall activities and also had deep operational consequences[17], the main one being the difficulty of the national teams maintaining a common implementation pace for many reasons: operational issues related to this type of large scale fieldwork, countless difficulties of engaging in data work (capture, cleaning, harmonization and analysis), adverse political situations like in Kenya (early 2008) and Madagascar (early 2009). This redefinition of the Second Phase and its huge related transaction costs also led to high pressure on a small coordination team.

The initial schedule of this upgraded Phase II was surprisingly optimistic, with a closing date in June 2008. The operational launching of the Second Phase occurred in September 2007 with the first country and regional workshops; however, the implementation of the household surveys was spread between November 2007 and May 2008. Consequently, it appeared that December 2008 would be more realistic for the end of the Second Phase, a decision that was validated by the 4th Steering Committee of the donors in April 2008. Nevertheless, the data collection work suffered many delays with significant consequences for the drafting of the national reports and a new postponement of the closing date until June 2009. The country reports were submitted between January and June 2009. Four reports were submitted in full, two reports were submitted as drafts, and, unfortunately, the work in Kenya – after many rescue attempts – was finally suspended due to too many delays and difficulties.

[17] This postponement was suggested by the Second Advisory Committee (September 2008) and accepted by the 5th Steering Committee (October 2008).

1.2 *A Knowledge Sharing Process*

Even if the Program is a donors' initiative, it was obviously implemented after presentation to, discussion with and acceptation of the different countries' official counterparts. In each country of the Program, its objectives and expected outputs were officially introduced by the World Bank between November 2005 and March 2006 (information missions and official correspondences).

The choice of implementing the Program through local teams was justified by the objective of fostering the ownership of the Program's core themes, the knowledge process (data gathering and data creation, analysis, results sharing, and dissemination), and the policy making process. This was not the easy way, however, due to the high transaction costs of such an option but, in spite of uneven results due to local context and team configuration, it is worth the results in the medium term with reference to the policy debate.

1.2.1 Local Partnership Framework

In each country of the Program, two types of partnership were identified, one at the institutional level and a second at the operational level.

The institutional counterparts are public bodies or policy dialogue platforms engaged in the policy debate, that are interested by the objectives of the RuralStruc Program and the dissemination of its results with the goal of feeding discussions about the future of agriculture and rural development. They are:

- Ministries in charge of agriculture in Kenya, Mali, Mexico, and Nicaragua;
- the *Conseil Général du Développement Agricole* (CGDA) in Morocco;
- the *Programme d'Action pour de Développement Rural* (PADR), hosted by the Prime Minister's cabinet, in Madagascar and;
- the *Initiative Prospective Agricole et Rurale* (I-PAR) in Senegal, a platform joining the agriculture research institute, rural producers' organizations, NGOs, and the Ministry of Agriculture.

The operational partners in charge of the implementation of the research work are locally based private consulting bodies, research institutions or universities, and sometimes, ad hoc teams specifically set up for the work program. The local partners are:

- in Kenya, the *Tegemeo Institute* (University of Egerton);
- in Madagascar, *APB Consulting*;
- in Mali, the Centre d'Expertises Politiques et Institutionnelles en Afrique (CEPIA) with the Institut d'Économie Rurale (IER) for the first phase, and a

Consortium led by the IER with Michigan State University (MSU) and Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) for the Second Phase;

- in Mexico, the Facultad Latinoamericana de Ciencias Sociales (FLACSO);

- in Morocco, the Institut Agronomique et Vétérinaire Hassan II (IAV) for the First Phase, and ICON2E (Ingénieurs Conseils en Economie et Environnement) with IAV consultants for the Second Phase;

- in Nicaragua, the *Instituto Nitlapán* (Universidad Centroamericana);

- in Senegal, the Association Sénégalaise pour la Promotion du Développement à la Base (ASPRODEB).

1.2.2 The Partnership at Work

Between the lauching worshop of the Program in April 2006 and June 2009, the national teams and the coordination team engaged in continuous exchanges intensified by the launching and ending stages of each phase and several collective events presented in Table 3. Three general workshops bringing together the seven national teams were held, as were specific country or regional workshops or meetings[18] for the preparation of the Second Phase.[19] These meetings were the opportunity to fine-tune the objectives, discuss difficulties and reach consensus on the expected outputs.

The coordination team visited every country several times during the two phases, particularly during the implementation of the Second Phase's fieldwork. In this time, 16 out of the 26 surveyed regions were visited between January and May 2008.

These events and missions were completed by regular information notes and by direct contacts with intensive back and forth through emails, phone calls and a few videoconferences. The preparation of the Second Phase is illustrative of this process. In November and December 2007, after the country and regional workshops, high email traffic between and with the teams allowed us to reach an agreement on the design of the household survey instrument (the adopted final version was the 15th). National teams adapted the standard instrument to take local specificities into account and the local

[18] In Morocco, due to operational difficulties for the launching of the Second Phase, there was no specific workshop but instead several meetings in order to prepare Second Phase implementation.

[19] In perspective with the closing of the Program, a preconference workshop will be organized on August 16, 2009, at the 27th International Conference of Agricultural Economists (IAAE) in Beijing. Results will be shared and discussed with the participation of the national teams which have fully completed their contribution. The option of a final workshop joining all the country teams, the contributing donors, the Advisory Committee and academics specialized in the Program's related themes is under discussion.

questonnaire was then validated by the coordination team as well as the general survey design.

Table 3: RuralStruc workshops (2006-2008)

	Dates	Location
General Workshops		
Program's launching	April 11-13, 2006	Senegal, M'Bour
End of phase 1	November 20-25, 2006	Morocco, Marrakech
End of phase 2 fieldwork	June 16-20, 2008	Senegal, Gorée
Phase 2 Launching Country & Regional Workshops		
Madagascar	September 16-17, 2008	Antananarivo
Kenya	October 9-10, 2008	Njoro - Nakuru
Mali - Senegal	October 13-16, 2007	Gorée
Nicaragua - Mexico	October 30-31, 2007	Mexico City
Morocco	November 12-13, 2007	Rabat

1.2.3 Dissemination of Results

As decided when the program was designed, and due to its objective of contributing to the local policy debate, the national teams organized different events throughout and after completing the first phase. These presentation meetings or one-day workshops targeted different audiences depending on the local configuration and the situation of the local debate.

Box 6 below provides a summary of the dissemination process. Kenya and Mexico's teams did not formally present their results. This situation is explained by different contexts. In Kenya this is, of course, related to the political situation (the period before the presidential election and the subsequent political events). In Mexico, this was a choice of both the national team and the World Bank. In this country, due to the number and standard of research institutions, universities, and NGOs, the local debate on agriculture and rural issues is fed by an abundant flow of surveys, studies, and research supported by year-round publications. As a consequence, and because the first phase was mainly an overview on the existing information, it appeared preferable to keep the dissemination for the presentation and discussion of the final results of the Program, which will provide new perspective based on specific field work. In Morocco, the presentation of First Phase results was limited to the institutional partner.

In addition to the presentation meetings, debates and roundtables, some national teams also took specific initiatives. In Senegal, the first phase report was posted on the I-PAR website to share information and also to open its results to discussion, see:

http://www.prospectiveagricole.org/actualite.html.

Box 6: Dissemination process of the first phase results in the RS countries

Madagascar

20 September 2006 - roundtable on the first results with ministries, donors, university and researchers

16 May 2007 - presentation of the first phase report to ministries, donors, university and researchers

Mali

08 November 2006 - roundtable on the first results with ministries, chamber of agriculture (APCAM), rural producers' organizations (AOPP), and consumers' association

07 December 2007 - Ministry in charge of agriculture, General Secretary – presentation of the first phase report and of the objectives of the second phase

Morocco

13 March 2007 - *Conseil Général du développement Agricole* (CGDA) – presentation of the first phase report

Nicaragua

20 September 2007 – workshop organized by the Ministry in charge of agriculture (MAGFOR) with the Finnish Cooperation and the World Bank

Senegal

23 March 2007 - *Initiative Prospective Agricole et Rurale* (I-PAR) – presentation of the first phase report

25 June 2007 - the seven rural producers' organizations platforms of Senegal

07 July 2007 - Mouvement social pour le Développement (MSD) Platform

27 July 2007 - debate at the University Cheikh Anta Diop of Dakar, co-organized with Editions *Clairafrique*

04 January 2008 - Ministry in charge agriculture, DAPS – presentation of the first phase results, of the dissemination process, and of the objectives of the second phase

In Morocco, the team chose to publish the first phase report to facilitate its dissemination[20]. In Madagascar and Kenya, the teams contributed to an academic article and a book chapter, in collaboration with other researchers[21].

[20] Akesbi N., D. Benatya and N. El Aoufi (Dir.), 2008. *L'agriculture marocaine à l'épreuve de la libéralisation*, Economie Critique Editions, Rabat, 175p.

[21] Dabat M.H., B. Gastineau, O. Jenn-Treyer, J.-P. Roland, C. Martignac and A. Pierre-Bernard, 2008. "L'agriculture malgache peut-elle sortir de l'impasse démo-économique ?", *Autrepart*, No. 46, p. 189-202 ; and Anseeuw W., S. Fréguin-Gresh and P. Gamba, 2008. "Une nouvelle politique agricole au Kenya: nécessaire mais suffisante?", in Devèze J.-C. (Dir.), *Défis agricoles africains*, Karthala-AFD, Paris, p. 209-229.

With regard to the dissemination of the final results, the principle of country-designed specific events, relying on policy briefs to be prepared by the national teams, has been validated by the 6th Steering Committee of the donors (May 2009). The format and date of these events, as well as their relevance, will depend of the donors' feedback on the national reports, the overall Program's results, and the discussion with the institutional partners as well as the political agenda.

2 The Second Phase Fieldwork

2.1 *Design of the Fieldwork*

The Second Phase of the RuralStruc Program aimed at improving the understanding of existing rural dynamics in the selected countries by the production of new information, based on regional surveys, and exploring relevant issues raised by the First Phase, notably: the differentiation processes among farm households explained by multiple diversification patterns; and the weakness of market integration processes in Sub-Saharan Africa, where contracts are rarely used.

2.1.1 Overall Configuration

The main operational choice of the Second Phase was to implement *rural* household surveys, and not only farm household surveys, in order to identify more precisely the agriculture's role with respect to other rural activities and sources of income. This option was not neutral, as it refers to analytical categories whose definition is more complicated than one may believe *a priori*. This is the case of the definition of what "rural" is, its characterization varying between countries (see Box 7); it is also the case of the limits of the "household" (see Annex 2).

This general orientation led the Program to focus on the core issue of income estimates, which, in rural areas, means dealing with farm incomes and all the difficulties of their approximation. However, the major drawback of the Second Phase fieldwork was its timeframe. Indeed, the overall duration of the Program, as well as its funding, did not allow an iterative process with successive rounds of data collection, the consequence of which were the impossibility of consistency checks and, of course, of a dynamic analysis.

A way to mitigate this severe restriction would have been to benchmark the surveys with regard to existing panels. However, this option quickly appeared to be a dead-end: firstly, because it was unrealistic to deal with several baselines and survey frameworks in the different countries and the selected regions; secondly, because the availability of and access to external data was an issue and; thirdly, because in developing countries, while surveys are well developed, notably for poverty estimation purposes, they mainly focus on expenditures.

Box 7: Rural versus Urban: What Definition for Each Country?

Mali: In Mali, "rural households" include all households living in "rural areas", which are defined as the opposite to towns. At least through one of the members, rural households are involved in agricultural activities (broadly defined) (RSII Mali, p.20).

Madagascar: Rural areas correspond to districts where the proportion of agricultural economically active population exceeds 50% (as defined for the Agricultural Census) (RSII Madagascar, p.26).

Senegal: The "rural" is defined in opposition to the "urban", which has an administrative definition: all "communes" are classified as urban, even if they have all the attributes of rural areas, particularly the importance of farming (RSII Senegal, p.39).

Morocco: There is no statistical definition of the rural population. The rural area is defined by default: is considered rural any area that is not included in the scope of an urban area. Urban areas change their boundaries over time due to the expansion of cities and the reclassification of rural localities to urban (MCP 1995; RSII Morocco, p.6).

Nicaragua: The official definition of rural areas in Nicaragua correspond to districts with less than 1,000 dwellers (INEC 2007; RSII Nicaragua, p.11).

Mexico: Although there is a common reference to the 5,000 inhabitants limit, a rural locality is defined as a place with less than 2,500 dwellers (RSII Mexico, p.13).

The clear limitation of implementing a "one shot" survey was somewhat balanced by the output of having a simultaneous comparative approach in all the surveyed regions based on the same positioning and questioning. Above all, the household surveys were complemented by additional fieldwork and desk reviews on selected value chains and on the characteristics of the surveyed regions. These articulated activities provided the overall background, which allowed for a fine-tuned analysis of the household surveys' results. Lastly, the implementation of the fieldwork by national teams provided valuable expertise and a safeguard in terms of consistency of the collected information and general understanding of the processes underway.

2.1.2 Selection of the Surveyed Regions and Value Chain Reviews

Due to the general objectives of the Program, the purpose of the household surveys was not to reach representatitiveness, but rather to provide a comprehensive picture of the rural realities. Consequently, the Program decided to focus on a selection of regions illustrative of different underlying trends that had been previously identified. Regions were chosen based on the First Phase results and the expertise of the local teams, who used different criteria depending on the local context, but all related to market access, the presence of integrated commodity chains, the level of public investments and public goods, and the situation of natural resources.

Three types of regions were qualified:

- "*winning regions*", where the existing dynamics of integration to markets, related to specific value chains, the proximity of urban centers or good infrastructure provide opportunities and are strong drivers of change;

- "*losing regions*", which are characterized by trends toward marginalization due to local constraints (low factors endowment, lack of public goods), poor connection to markets, high poverty rates, and where household sustainability appears to be increasingly difficult;

- "*intermediary regions*", where the trends appear to be more imprecise and will broadly depend on the evolution of the global economic and institutional contexts, which will either provide new opportunities and reduce the existing constraints, or not.

Based on this general typology, a minimum of three different regions (one per type) was selected in the seven study countries for the field work (see Table 6). The selection of regions was discussed and justified during the national and regional workshops.

In parallel, relevant value chains were also selected, in order to contextualize the survey results and to provide a broader historical perspective, in particular with respect to the restructuring of agricultural markets. The chain selection per country, which included both staples and commodities, is presented below in Table 4.

Table 4: Main Value Chains analyzed in the RS Countries

Country	Value Chains
KENYA	Maize, milk, sugar cane
MADAGASCAR	Rice, maize, potato, dairy, green bean
MALI	Meat and dairy, dry cereals, rice, onion, cotton
MOROCCO	Cereals, red meat, olive oil, tomato, citrus
MEXICO	Maize, dairy, fruit and vegetables
NICARAGUA	Basic Grains, vegetables, dairy, coffee, sesame
SENEGAL	Groundnut, cassava, rice, dairy, maize, tomato

Sources: RuralStruc Phase II reports and terms of references.

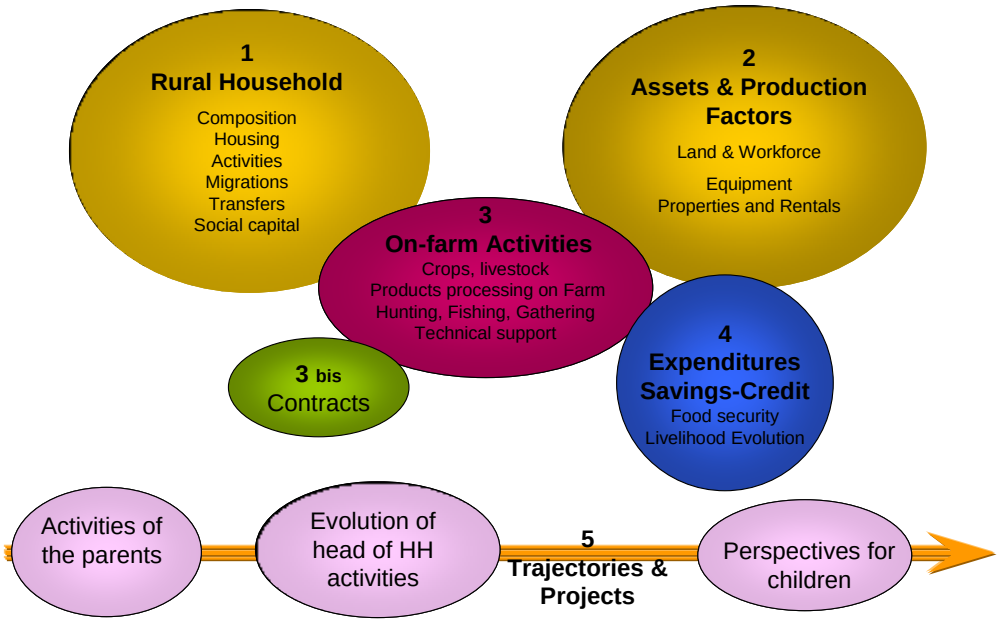
2.2 *Organization of the Household Surveys and Results' Management*

2.2.1 The Survey Instrument

Based on a collective preparation (see above), the survey instrument was organized in five modules presented in Figure 3 and Annex 3. Although the Program's design did not allow dynamic analysis, a few qualitative dynamic information were collected in module 5 in order to appreciate households' perceptions of past and future in terms of evolution of assets endowment, food security, livelihood and accommodation conditions, anticipated or desired activities and employment for their children, etc.

This common framework was completed at the national level by specific context-related questions such as public support programs in Mexico or more detailed questions about farming systems or livestock activities. In Mali, the household survey was implemented at the level of the head of the family farm but was completed by specific surveys targeting dependent households and women.

Figure 3: Design of the Common Design for the Households' Surveys



Sources: Authors.

In order to deal with the constraints of a "one shot" survey (only one interview preventing any double-checking), the impossibility of any type of measurement (only declarative data was obtained), and the absence of any benchmarking based on previous surveys, the Program designed a large survey instrument allowing for the crosscutting of the declared information. The size of the instrument was increased by the needs of agricultural incomes estimation, which led to the review of the production factor endowment and economic results. As a consequence, the time needed to administer the questionnaire was quite substantial (between 1 to 3 hours, depending on the size and the complexity of the household's demographic, activity and income structures).

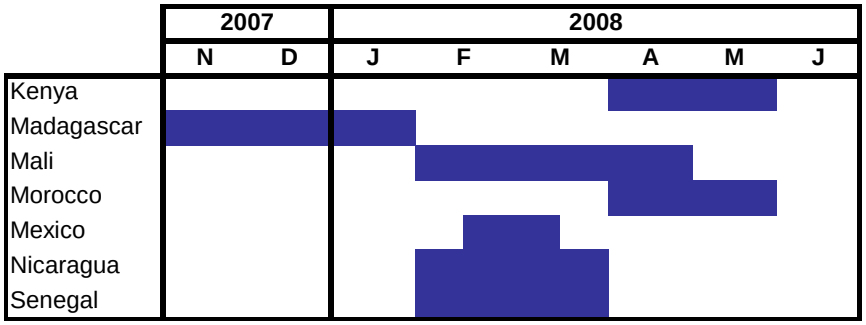
2.2.2 Implementation of the Rural Household Surveys

With the objective of 300 to 400 surveyed households per region (i.e. between 900 and 1,200 surveys per country), national teams engaged in the sampling process in two steps. The first step was the selection of the localities to be survey with reference to regions' characteristics and national team's expertise. The second step was the sampling itself based on existing census lists or locality households lists prepared on purpose. Then, households were selected at random, targeting a sufficient number of households per locality allowing representativeness at local level.

Due to the general configuration of the surveys and the sampling method, the Program's surveys are statistically representative at the locality (village or community) level only. They are indicative of the regional characteristics and illustrative of the diversity of the rural situations at the national level.

The different tasks of surveyors' selection, training, and instrument testing were undertaken based on national teams' own resources and survey capacity or through existing partnerships. In Senegal, Mali, Kenya, Morocco and Nicaragua, surveyors were specifically hired and trained (some surveyors were selected from well-known surveyor pools). In Madagascar, the survey was implemented under an agreement with the ROR (*Réseau des Observatoires Ruraux* – Rural Observatories Network), whereby the ROR surveyors administered the RuralStruc instrument during the annual ROR survey. In Mexico, the activity was externalized to a private consultancy specialized in rural surveys.

Table 5: Implementation Schedule of the Rural Household Surveys



In the seven RS countries, about 8,000 rural households surveys were conducted in 26 regions (see the main characteristics of the surveyed regions in annex 4) and 167 localities (depending on the settlement structure) (see Table 6). In Mali, the 627 household surveys were completed by 643 dependent household surveys and 749 women surveys.

Table 6: Number of Interviews per Region and Locality / Location Types in the RS Countries

Country	Region and Sub-region	Nb of interviewed HH	Nb of valid cases for analysis	Nb of HH members
Mali	Tominian	172	155	1,962
	Koutiala	157	153	2,328
	Diéma	150	148	3,147
	Macina	155	154	2,056
	Total	**627**	**610**	**9,493**
Senegal	Kolda (Casamance)	249	239	3,600
	Bassin Arachidier Nord (Mekhé)	255		
	Bassin Arachidier (BA Nord 1)		111	1,761
	Bassin Arachidier (BA Nord 2)		113	1,800
	Nioro Bassin Arachidier (BA Sud)	285	252	3,245
	Dagana (Delta du fleuve Senegal)	250		
	Haut Delta		61	770
	Bas Delta		121	1,349
	Total	**1,039**	**897**	**12,525**
Madagascar	Antsirabe (Région Vakinankaratra)	509		
	Antsirabe (Antsirabe 2)		303	1,882
	Antsirabe (Antsirabe 1)		206	1,288
	Alaotra	500		
	Alaotra (Alaotra 1)		385	2,253
	Alaotra (Alaotra 2)		115	800
	Morondava	526	506	3,197
	Itasy	503	503	2,974
	Total	**2,038**	**2,018**	**12,394**
Kenya	Nakuru North	299		1,470
	Nyando	303	in hold	1,856
	Bungoma	300		1,986
	Total	**902**		**5,312**
Morocco	Chaouia	302	228	1,792
	Saiss	300	261	1,976
	Souss	298	240	1,548
	Total	**900**	**729**	**5,316**
Nicaragua	Muy Muy	311	299	1,687
	Terrabona	313	281	1,481
	El Viejo	317	288	1,558
	La Libertad	305	290	1,616
	El Cuá	312	300	1,735
	Total	**1,558**	**1,458**	**8,077**
México	Tequisquiapan (Quéretaro)	364	in hold	1,358
	Ixmiquilpan (Hidalgo)	306		1,708
	Veracruz (Sotavento)	320		
	Sierra S.Marta		175	823
	Tierras Bajas		145	654
	Total	**990**	**320**	**4,543**
TOTAL		**8,054**	**6,032**	**57,660**

Source: RuralStruc National Reports and Core Databases

2.2.3 Preparation of the Databases

Every national team was in charge of the arduous process of data capture and data cleaning prior to analysis. For quality reasons (questionnaires poorly informed, inconsistencies, etc.), some questionnaire results were excluded from the databases. Table 6 displays the final number of surveys kept for the analyses.

In parallel, and in order to faciltate the cross-country analysis, a mini aggregated database was prepared based on a set of core variables extracted from the national databases. This mini database was used for the preparation of the Synthesis Report. However, due to delays in data cleaning and / or inconsistencies, it was decided at that stage not to include the Kenyan data and to keep only one out of the three Mexican regions. Consequently, 6,032 valid cases were maintained for the statistical analysis.The survey results for Morocco were included, despite the need in the end to consolidate two of the income sources (livestock and rents), which could lead to some slight adjustments.

In order to allow comparison between regions and countries, the monetary results were converted from local currency units (LCU) into international dollars (see Box 8 and Table 7). Similarly, in order to deal with heterogeneous demographic household structures, adult equivalent values (EqA) were used (see Box 9).

Box 8: Purchasing Power Parities and their Limitations

Purchasing Power Parities (PPPs) are currency conversion rates that convert local currencies to a common currency: the international dollar or $ PPP, in order to compare costs of living across countries. PPPs are needed because goods and services have widely varying prices across countries (notably the non-tradables) when converted into a common currency, using market exchange rates.

However, PPP conversion rates present limitations. First, they are based on a selection of consumable items' prices for all countries in the comparison. Consequently, the PPP estimates for developing countries are unduly influenced by the consumption baskets and spending habits of their developed counterparts. Second, PPPs are derived using national average expenditure weights. Therefore, goods that are important to the poor and comprise a large part of their expenditure carry proportionally less weight.

Source: World Development Indicators 2008, pp. 1-11.

Table 7: Average Conversion Rates between Local Currency Unit (LCU) and $PPP (period of reference January 2007 – April 2008)

	LCU	$ PPP
Mali	CFA Franc	239,6
Senegal	CFA Franc	258,6
Madagascar	Ariary	758,7
Kenya	Kenyan Shilling	34
Morocco	Dirham	4,8
Nicaragua	Cordoba	6,7
Mexico	Mexican Peso	7,3

Source: DDP (Development Data Platform), World Bank 2009

Box 9: Comparing Heterogeneous Household Structures

A common approach used to compare households is to use per capita measures. However, this basic method does not deal with different household sizes or composition and, consequently, presents serious drawbacks because it ignores household members' differentiated needs and contributions.

A possible option is to convert the household demographic structure by age and sex into adult-equivalents. Many sophisticated methods exist based on expenditure structures and economies of scale (Deaton & Zaldi 2002). However, the RS program chose to use a simple approach based on nutritional needs as defined by the World Health organization (WHO):

Age	Male Weight	Female Weight
0	0.33	0.33
1	0.46	0.46
2	0.54	0.54
3-4	0.62	0.62
5-6	0.74	0.70
7-9	0.84	0.72
10-11	0.88	0.78
12-13	0.96	0.84
14-15	1.06	0.86
16-17	1.14	0.86
18-29	1.04	0.80
30-59	1.00	0.82
60+	0.84	0.74

Source: World Health Organization. Cited in Dercon 1998

This choice is of course disputable: being based on nutrition criteria, the scale over-emphasizes the role of food consumption, and one could discuss the selected sex and age ratios. However, because food consumption is the main expenditure of poor households, this option is a good proxy to estimate and then compare the real household income balanced by the household structure.

2.3 *Difficulties and Limitations*

On-Farm Income

Estimate Farm Income is always a challenge because of the complexity of farming systems and the interannual variations of crop and livestock productions, among others. Due to time constraints, and in order to avoid an overly long and unmanageable questionnaire, the Program chose to approach the Farm Income through the estimate of crop and livestock production and global costs of the production.

Farm production was estimated for the last crop season prior to the survey. Unfortunately, the "one shot" survey does not allow to mitigate adverse situations, which are frequent under rain-fed conditions. As a consequence, due to bad weather conditions in Chaouia (Morocco), the *Bassin Arachidier* (Senegal) and Antsirabe (Madagascar), farm incomes presently reported are below the average for these regions.

In order to get the survey manageable, the Program decided to estimate the livestock production income based on a cash flow approach, i.e. considering sales and purchases of animals and livestock products, and the related costs (veterinary, food, shepherding, etc.) without including stock variations. This practical choice, which results from the survey conditions, has certainly induced an underestimation of the overall livestock results because it does not value the growing of the herd. However, on can note that in the surveyed regions very few households did really invest in cattle (except some cases in Nicaragua).

The value given to the on-farm production was based on the sale prices indicated by the farmers. Self-consumption value was estimated at the producer's price level with the exception of Madagascar where the team used the median market price.

Finally, due to the constraints of the survey instrument, the production costs were estimated at the global farm level for crop production on one side, and livestock production on the other, instead of a more detailed approach, which would have required data collection at the field level. Consequently, costs were possibly underestimated.

Off-farm Incomes

Even if the off-farm incomes were estimated based on the activities and incomes declared for each households' members, the survey instrument did not allow a detailed understanding of the time spent for each activity, knowing that in the case of the informal sector revenues are difficult to estimate. The off-farm icomes are thus approximate, therefore both underestimation and overestimation may have occurred. The risks were mitigated during the data cleaning processes by running consistency checks that allowed questionnaire verification and possbile adjustments.

Remittances are difficult to capture without a specific and dedicated survey. There is a frequent bias of under-declaration. Their estimation is also complicated by their nature because they are sent from time to time to the head of household – in money or in kind –

sometimes in small amounts. Conversely important amounts of money can also be sent in order to finance investments (construction), which leads to extreme values affecting the avearge results.

Contractualization

Finally, contractualization and its pay-offs are difficult to identify and estimate without very specific surveys. In spite of a detailed instrument on the topic, the information gathered by the Program showed the difficulty of identifying different types of contractual arrangements and the need for very detailed data collection in order to assess their impact (exact quantities and prices at the plot level for both inputs and outputs).

Part 2. A Remaining Rural Poverty with Few Escapes from Agriculture

Chapter 1 Rural Realities: Widespread Poverty, Even Among the Better-off Countries and Regions

In order to provide perspective on the regions surveyed for RuralStruc, this first chapter provides an overall picture in terms of their poverty and global incomes, with a specific focus on income distribution among the surveyed households. The income differences unsurprisingly reflect uneven absolute and comparative advantages between regions, in terms of agro-ecological conditions and also their agrarian history related to their demography, social structure, level and duration of integration into domestic and global markets and their institutional patterns. Tables in Annex 4 present a brief overview of each region's main characteristics.

This chapter focuses on a comparison of the estimated rural incomes to international and domestic poverty lines; it targets the situation of the lowest income regions in particular by assessing their food vulnerability.

1 Income Level and Distribution: Close to the Poverty Line

In this introduction, average regional rural income results are first presented, knowing that the objective is only to provide a general positioning of the sample, and that these estimates are only indicative of the regional level. Due to the heterogeneity of some surveyed regions, sub-regions have been identified to follow-up with the analysis.

In order to allow a global overview of the wealth levels of the surveyed households, regional rural incomes per capita of the six study countries were converted from local currencies into international dollars at purchasing power parity (PPP) for year 2007 (see methodology). The same conversion into international dollars was applied to GDP per capita and domestic poverty lines initially expressed in local currency units (LCU).

1.1 *Overall Presentation of the Surveyed Regions*

1.1.1 Fine-tuning the Definition of the Surveyed Regions

The *ex ante* classification of "winning", "losing" and "intermediary" regions, which was used by the national teams for the selection of the regional country cases, was based on several criteria (as mentioned in the methodology), with the assumption that global income would be a good proxy of these differences. The average regional rural incomes globally reflect well this *ex ante* estimate (Table 8); however, some regional results in Mali, Madagascar, and Nicaragua challenge this classification.

In Mali, Koutiala was chosen as a winning region because of cotton production, which has shaped the success of the "white revolution" in the Savannah zone. Cotton has been a core sector for rural development: it contributes significantly to the livelihoods of the rural population and is responsible for a high-level insertion of farmers into the market. Not surprisingly, the low-level of income reflects the unfavorable situation of international cotton prices and the subsequent response from farmers: a progressive reduction of the cotton cultivated area. This adverse evolution led to a decrease of the agricultural income, and hence of rural households' global income, reinforced by the family size in the cotton area, which translates into the level of the global income per capita. The situation of Koutiala illustrates the so-called "Paradox of Sikasso", the main other cotton growing area, which expresses the contradiction between the sector success story and the relatively low level of income per person (Box 10).

Madagascar's third city, Antsirabe (population 183,000), a highly diversified agricultural region (rice and temperate cereals, horticulture, dairy), well connected to markets with good infrastructure, was originally selected to illustrate a winning region. However, severe constraints, both climatic (bad weather conditions) and sanitary (potato disease), affected the crop season, which, in turn, had a strong impact on agricultural production and income.

In Nicaragua, two winning regions were selected: El Viejo, on the Pacific coast, because of its easy access to labor and agricultural markets, and good natural conditions; and El Cuá, the coffee zone. This selection was confirmed, with a clear advantage going to El Cuá because of the high coffee prices during the surveyed crop season. On the other hand, the two cattle areas – Muy Muy and La Libertad – have shown very contrasted results. While Muy Muy, a region located in the "milky way" (the intensive dairy zone), was originally chosen as an intermediary region because of the development of integrated dairy value-chains, the income estimates revealed a harsher reality mainly due to the fact that farmers are poorly integrated and do not benefit from higher milk prices. On the contrary La Libertad, selected as a losing region, because of several constraints (lack of government spending, remoteness and insufficient communication infrastructure), appeared better off partly due to larger land holdings and specific marketing networks.

A second issue led to the fine-tuning of the regions' definitions: the heterogeneity of income levels within some surveyed regions. This was the case in Senegal and Madagascar, where high-income variations between localities revealed a statistically significant heterogeneity. As a consequence, in order to take into account this intra-regional variability, some regions were split into separate zones, based on the activity structure of the households revealed by the income levels. This fine-tuning allowed a more accurate depiction, with some surveyed zones keeping their *a priori* winning status, while others were 'downgraded' into the losing category.

In Madagascar:

The supposedly intermediary region of Alaotra, the main rice basket of the country, was divided in two, with the average income increasing threefold from the poorest to the richest localities. The main difference between the two zones relates to the very specific presence of larger farms and rice mills in the richest localities (Alaotra 2), these features pulling the average income upwards, while the others localities showed more sobering results (Alaotra 1).

The *a priori* winning region of Antsirabe was also split in two zones: Antsirabe 1 is made of localities that are well connected to markets, with a highly diversified agricultural production, and that have significant marketing opportunities in the nearby cities of Antsirabe and the capital, Antananarivo. This translates into higher incomes than in Antsirabe 2, a more secluded zone, where outlets are scarce and incomes are lower. Hence, Antsirabe 1 confirms the expected winning profile, whereas Antsirabe 2 clearly becomes a losing zone.

In Senegal:

The Delta region of the Senegal river shows a high level of heterogeneity, leading to the division of the region in two zones, according to the features of agricultural production: the Bas Delta (Lower Delta) which has received heavy public investments in irrigation and generates the highest incomes; and the Haut Delta (Upper Delta), where a few integrated value chains (tomato) are developing alongside the long-standing rice production.

The Bassin Arachidier Nord (Northern Groundnut Belt) has also been split into two geographic zones, according to the type of income generating activities: the Bassin Arachidier Nord 1 (BA Nord 1) sub-region is a grain production zone (dry cereals: millet and sorghum), where farmers face very few alternatives within or outside agriculture and were particularly affected by a bad rainy season; whereas the *Bassin Arachidier* Nord 2 (BA Nord 2) sub-region registers higher incomes related to the lucrative production of cassava and a higher level of activity diversification.

In the case of Mexico, the Sotavento region in the Veracruz state, the only of the three surveyed regions from which data were kept for statistical analysis (see methodology), was divided in two sub-regions in order to take into account a clear geographical difference between households' asset endowments and in agrarian structures, reflected in

Box 10: "The Paradox of Sikasso"

In Mali, cotton is a strategic agricultural sector and is often considered as the driver of development of the rural south of the country. The cotton sector directly involves 275,000 producers and nearly 3 million people. Cotton fiber has been the first export of Mali for several decades. Considered as "the white gold of Mali", cotton has continuously grown since the 1960s, especially after the devaluation of the Franc CFA in 1994, with few exceptions related to crises in the value chain management (the most dramatic case is the "cotton hold-up" of 2001, when cotton production shrank by half as a consequence of a sowing strike by farmers dissatisfied with the new prices).

A public monopsony, the CMDT (*Compagnie Malienne de Développement des Textiles*), has been in charge of the development of the cotton sector (providing inputs, extension, collecting, ginning and marketing), but also of the broader rural development in the cotton area: roads, capacity building of producer organizations, rural credit, technical support, training and literacy programs, etc. The development of cotton allowed farmers to invest in equipment and livestock and to increasing assets. Therefore, cotton has been long considered as a powerful driver for poverty alleviation and regional development.

However, the Malian Poverty Assessment (EMEP) survey (DNSI, 2004) and other related studies showed that cotton production areas, such as Sikasso and Koulikoro, were regions where poverty was widely spread with one of the highest child malnutrition rates in the country. Without providing an exhaustive explanation, the main characteristics of this paradox, according to Wodon et al. (2005), and Mesplé-Somps et al. (2008), are the following:

(i) Poverty in the cotton-growing regions is globally less severe than in other regions; (ii) Differences at household consumption level are quite sensitive to cotton prices and volumes produced, and to other conditions affecting local agriculture, notably rainfall. As a result, the fact that the EMEP survey was implemented in 2001 – the year of a major strike by cotton producers – directly impacted the survey's results; (iii) The Malian cotton producers are clearly better equipped than farmers in other regions in durable goods (bicycles, motorcycles, radio, television). This equipment refers to the benefits of cotton production over the long term, regardless of the specific circumstances of a particular year. It also refers to the preferential access to credit provided within the cotton sector; (iv) The education level is generally better in cotton-growing areas, for both primary school frequentation and level of adult literacy; (v) Due to cotton's reputation in terms of monetary returns, Sikasso is the only region after the capital, Bamako, with a positive net migration flow. However, this evolution has impacted on the income per capita, making the region, in some ways, a victim of its success; (vi) As a consequence, it is possible to derive a slightly positive balance in favor of cotton areas from this analysis. This benefit, however, is far from overwhelming and is highly dependent on the conditions of income provided by the sector.

The RuralStruc Program's Second Phase results reinforce these findings. The dependency ratio in Koutiala is the highest of the four study regions, reducing the positive effects of cotton production in terms of average income. While the price of cotton was low during the reference period of the survey (crop season 2006/07), the level of income in the cotton-growing region of Koutiala is comparable to the Diéma region, a remote rain-fed area, which is characterized by a high level of international emigration. However, the cotton producers of Koutiala are better off than those of the Tominian zone, the poorest of the surveyed area. These disappointing income results are nevertheless masking an important issue: in the cotton areas, farmers are, on average, less vulnerable because they are better equipped and more capitalized, particularly in livestock which plays a clear buffer role.

Source: Communication with the RuralStruc Mali Team, 2009.

different income patterns: the low lands (Tierras Bajas) and the mountain (Sierra de Santa Marta).

1.1.2 Average Income and Poverty Level

Based on this new definition of zones, the first general comment is the low level of income when compared to the national GDP per capita: only the sub-region of Alaotra 2 (Madagascar) and El Cuá (Nicaragua) exceed this threshold (Table 8 and Figure 4). This average situation logically reflects the rural-urban divide, even for supposedly winning rural zones.

The largest disparities are recorded in the Mexican Sotavento, where regional incomes of the two zones are four to seven times below the GDP per capita, which amounts to $12,780 PPP. This situation is the result of both a very high level of income inequality within the country, and an uneven spatial distribution of poverty, which is highly concentrated in rural areas and affects the southern part of Mexico more broadly. It is also a consequence of the selection of regions, which addresses family agriculture areas in particular, typically the case of the Sotavento. This situation can finally be explained by the survey's methodology: the survey focused on localities defined as rural (i.e. below 5,000 dwellers), thereby excluding many of Mexico's better off rural families (including farm households), who prefer to live in large rural boroughs or small towns with better services (RSII Mexico, p 49.). In the poorest zones of Mali and Senegal, the average incomes amount to a mere one-third of the GDP per capita and, even one-fifth in the poorest zone of Mali.

A second category of baselines worth considering is the internationally-agreed absolute and relative poverty lines of $1 and $2 PPP. All the zones surveyed in the non-sub-Saharan Africa (SSA) countries exceed the relative poverty line more than twofold, except in the two poorest zones of Nicaragua. This is in contrast with the SSA countries where the richest zones in Senegal and Madagascar are the only ones above the line (+60%), while in Mali no zone surpasses the line. The absolute poverty line obviously worsens the picture and highlights the seriousness of the poverty situation in Mali, where only the richest zone barely goes beyond the line. The situation is hardly better in Senegal and Madagascar. These poverty lines will be further discussed when the distribution of households along the income ladder is considered for each zone.

Table 8: Global Income in the Zones Surveyed

				Global Annual income per capita in $ PPP						
		Ex Ante classification	*#HH*	Mean	Median	Minimum	Maximum	Percentile 05	Percentile 95	GINI
Mali	Tominian	losing	*155*	196	155	29	2 229	50	405	0,37
	Koutiala	winning	*153*	301	265	13	995	82	613	0,30
	Diéma	intermediary	*148*	303	205	33	5 568	60	727	0,47
	Macina	winning	*154*	422	350	31	1 595	64	942	0,37
Senegal	Casamance	losing	*239*	360	263	0	3 059	33	1 022	0,47
	BA Nord 1	intermediary	*111*	436	323	23	2 442	55	1 166	0,44
	BA Sud	intermediary	*252*	376	305	16	2 828	78	988	0,41
	Haut Delta	winning	*61*	443	268	26	2 238	78	1 106	0,47
	BA Nord 2	intermediary	*113*	641	511	38	2 996	125	1 578	0,39
	Bas Delta	winning	*121*	1 014	757	64	6 696	182	2 675	0,56
Madagascar	Antsirabe 2	winning	*303*	340	247	56	2 640	102	822	0,40
	Alaotra 1	intermediary	*385*	429	315	41	2 679	133	1 078	0,38
	Morondava	losing	*506*	493	384	39	2 440	132	1 255	0,38
	Itasy	intermediary	*503*	520	404	95	3 678	176	1 221	0,36
	Antsirabe 1	winning	*206*	626	440	65	6 272	130	1 456	0,43
	Alaotra 2	intermediary	*115*	1 181	788	125	7 521	180	3 309	0,53
Morocco	Chaouia	losing	*228*	1 960	882	11	25 833	77	9 832	0,63
	Saïss	intermediary	*261*	2 941	1 242	9	73 849	81	10 144	0,67
	Souss	winning	*240*	3 583	1 493	20	54 054	106	12 497	0,66
Nicaragua	Muy Muy	intermediary	*299*	1 140	543	24	38 466	64	3 783	0,63
	Terrabona	losing	*281*	1 136	560	4	20 616	71	3 663	0,60
	La Libertad	losing	*290*	1 908	1 006	7	50 864	132	5 919	0,60
	El Viejo	winning	*288*	2 038	895	12	106 712	75	3 179	0,68
	El Cuà	winning	*300*	2 835	1 166	27	32 946	179	11 246	0,65
Mexico	Sierra S. M.	intermediary	*175*	1 568	1 162	264	15 922	391	4 049	0,41
	Tierras Bajas	intermediary	*145*	2 718	2 019	216	16 907	548	8 146	0,41

Source: RuralStruc Surveys

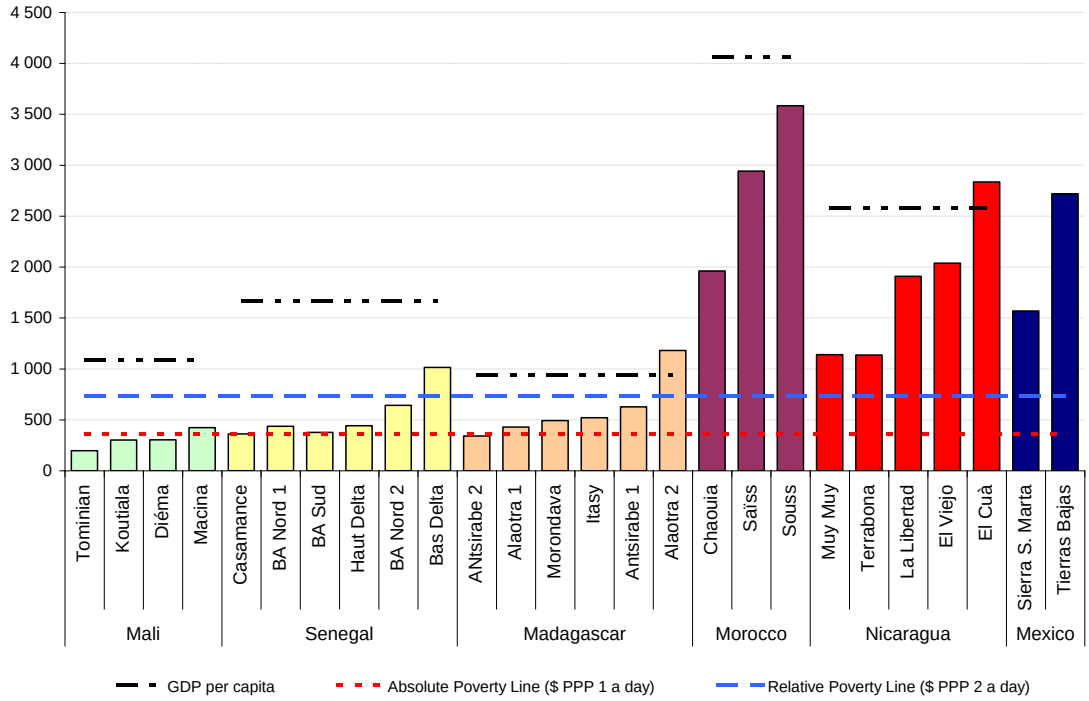
When focusing on the income differences among and within zones, that of income per capita between the poorest and the richest zone is an indicator of how differentiated regional economic development is. The smallest gap is found in Morocco, where the average income in the richest region is only 1.8 times higher than in the poorest one. In the other countries, the differences are more significant: 2.2, 2.5, 2.8 times higher in Mali, Nicaragua and Senegal, respectively, and 3.5 in Madagascar.[22]

The figure recorded in Morocco is striking, because this relative homogeneity among zones is in stark contrast with the huge heterogeneity within zones, the highest of the six countries as expressed by the standard deviation for each zone. As a consequence, the Gini index is very high in the three Moroccan zones (0.63 to 0.67). More broadly, the Gini indexes tend to be higher in the richest surveyed zones in every country, as

[22] The comparison between the two Sotavento zones in Mexico is irrelevant.

expected, with the exception of Mali where the richest region is also the most internally equal.[23]

Figure 4: Annual Income Per Capita in the Surveyed Regions ($ PPP, 2007)



Source: RuralStruc Surveys. GDP data come from the WDI database. Poverty lines are drawn from national reports referring to national sources for various years and adjusted to 2007 using annual national inflation rates (WDI database). The Mexican GDP per capita amounts to $12,780 PPP, and is not plotted on the figure.

[23] The low Gini in Macina reflects the homogeneity of land assets and production techniques in the irrigation scheme of *Office du Niger* where surveys were conducted.

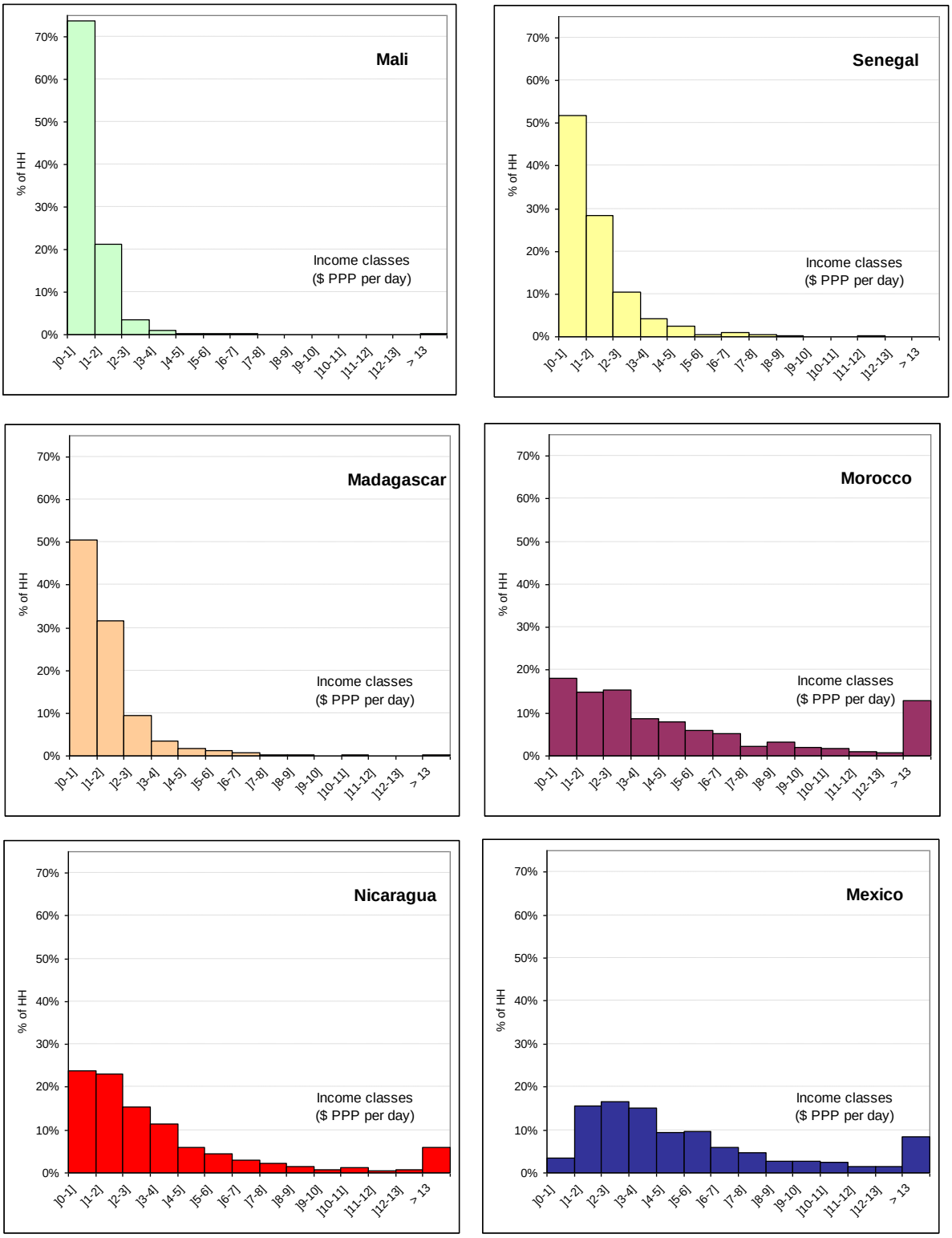
1.2 *Distribution of Rural Income*

1.2.1 Income Classes and International Poverty Lines

In order to better evaluate the poverty rates in each country according to international poverty thresholds, Figure 5 distributes each country's entire sample among income classes of $1 PPP per day (see methodology). Income classes range from one to more than 12 dollars a day at a one-dollar interval. The first income class comprises the households below the absolute poverty line, and the second class: those below the relative poverty line. Caution must be offered here: while regional data should not be aggregated since they are not at all representative at the national level, aggregation is used here solely to give a rough overview of the actual situation of the surveyed households, whichever region they belong to. Therefore, the discussion below is solely relevant for the sample, and must not be extrapolated to the country.

The weight of poverty, as suggested by the regional income levels outlined above, is strongly emphasized by the distribution of surveyed populations according to income classes. In the sample, absolute poverty ranges from 3% in the two Mexican zones to 74% for the four Malian regions. Beyond these two extremes, poverty rates are in line with countries' development levels, with two distinct groups: the Senegalese and Malagasy regions record 52% and 50% of absolute poverty respectively, while the Moroccan and Nicaraguan regions stand at 18% and 24%.

Figure 5: Distribution of Households by Income Classes ($ PPP 2007, per person, per day)



Source: RuralStruc Surveys

The distribution of households in the RuralStruc samples is correlated with the level of economic development: in the three SSA countries, a steep decrease is recorded within the first three to four income classes, featuring high concentration of poverty, and very few households able to go beyond the $4 PPP per day. In Morocco and Nicaragua, the decline is much more gradual, and a small share of households manages to overcome the $12 PPP, some of them easily. The distribution of the Mexican sample is peculiar with a very low proportion of households in the first income class, yet lower shares for the following classes than in Nicaragua and Morocco; this is probably a result of the Mexican public policies (poverty reduction programs). But beyond this one-dollar line, the Mexican distribution remains very similar to that seen in Morocco.

As Ravallion et al. (1991) demonstrated, absolute poverty ($1 a day) is a more relevant measurement of poverty in poor countries, whereas relative poverty ($2 a day) is more salient in rich countries. Therefore, relative poverty could be of somewhat greater relevance for the Mexican, Moroccan, and Nicaraguan regions, where relative poverty amounts to 19, 33 and 47%, respectively. For illustrative purposes, in the SSA regions, it rises to 80, 82 and 95% in Senegalese, Malagasy and Malian regions.

Consequently, whether relative or absolute poverty is considered, one of the most striking results of this fieldwork is the persistently high share of households living with less than one or two dollars per day. Of course, the highest figures feature the SSA countries, where half of the surveyed rural households (even three-quarters in Malian zones) are below absolute poverty according to international standards, which is a clear and dramatic challenge for development.

1.2.2 Household Quintiles and Domestic Poverty Lines

So as to better characterize the regions, the panel has been split into household quintiles, each consisting of 20% of the household sample (Figure 6). The domestic absolute poverty line is plotted on each figure in addition to the commonly used international standard of absolute and relative poverty. Therefore, when used, this domestic line provides slightly different results, and it makes poverty even more acute than when international poverty lines are used (Table 9).

The absolute poverty line of $688 PPP in Mali shows that only two quintiles out of 20 – the fifth quintile in Diéma and Macina – are above the line. The situation is slightly better in Madagascar and Senegal than in Mali, where one-third of the quintiles exceed the absolute poverty line, including the last three quintiles in the winning zone of the Senegalese Bas Delta, and the Malagasy sub-regions of Antsirabe 1 and Alaotra 2. More surprisingly, the same proportion is recorded in Mexico; this stresses the huge rural-urban divide in this country. In the two remaining non-SSA countries, the situation is reversed: a majority of quintiles is above the domestic poverty line: nine out of 15 in Morocco, and 14 out of 25 in Nicaragua.

Table 9: Domestic Poverty lines for Each RuralStruc Country (in $ PPP)

	Mali	Senegal	Madagascar	Morocco	Nicaragua	Mexico
Poverty Threshold	688	763	490		1,201	
Absolute Poverty threshold					626	
Food Poverty Line	472					1,095
Capacity Poverty Line						1,295
Capital Poverty Line						1,987
Poverty Threshold in urban areas				813		
Poverty Threshold in rural areas				730		
Consumption expenses				1,630		

Source: RuralStruc Reports, phase I and II.

The levels of income in the first quintiles remain very dire. The worst incomes per capita are recorded in the poorest regions of Mali and Senegal, with an average of $64 PPP (Tominian) and $54 PPP (Casamance) respectively, i.e. only 9% of the value of the domestic poverty line. Less dramatic, but still very low, levels of income per capita are recorded in the poorest regions of Nicaragua (Muy Muy and Terrabona) and in Madagascar (Antsirabe 2), with the first quintile hardly meeting $110 PPP. Whatever the country, quintile 1 accounts for no more than 40% of the value of the poverty line, at best.

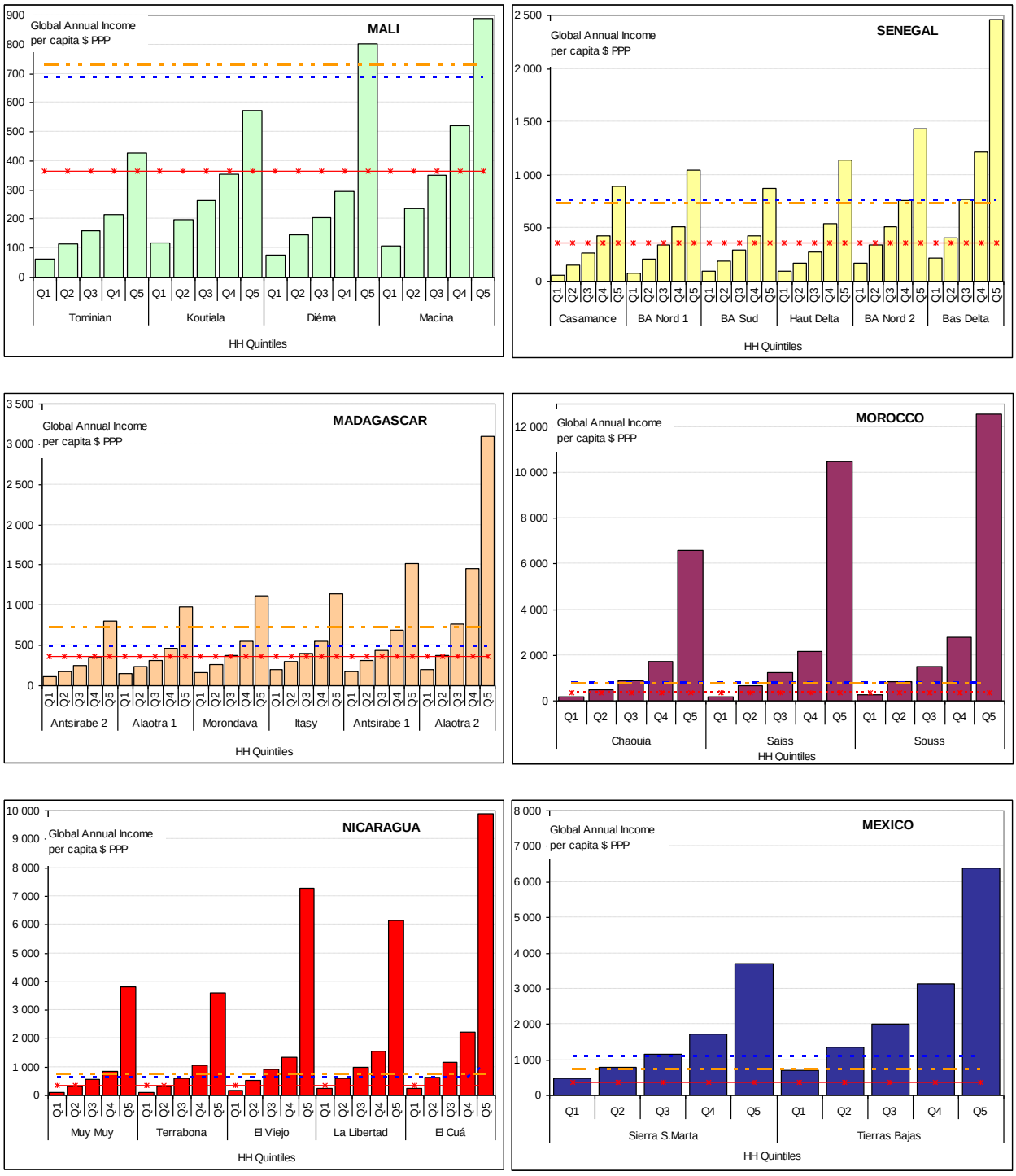
Keeping in mind these poverty-related considerations, and so as to put the rest of the analysis into perspective, two different features can be noted:

The increase of the average global income per person from quintile 1 to 4 is relatively linear (the income of quintile n being from 1.3 to 2 times the income of quintile n-1), while a sharper jump is recorded for quintile 5 (the income of Q5 ranging from 2.7 to 5.4 times the income of Q4, in Diéma, Mali, and El Viejo, Nicaragua, respectively).

High differences between the average global incomes per capita are recorded between the first and the second quintiles. While the amount involved is always low, the relative difference is always the highest: quintile 2's average income is between 1.5 (in Itasy and Antsirabe 2, Madagascar) to 3.5 times higher (in Souss and Saïss, Morocco) than the first's average.

The profile of the fifth quintile increases is rather different from region to region. In Mali, the steepest jumps of the fifth quintile appear in the two regions recording the highest average income. In Diéma, the regional average income is mostly drawn up by the fifth quintile, while in Macina the regional average comes from a more homogeneous distribution when compared to the other regions. The descriptive statistics shed light on the reason for these pattern differences (Table 10). In Diéma, one household, recording an income per person slightly above $5,500 PPP, bolsters quintile 5; this household received a once-off remittance in the year of the survey. Because Diéma is an emigration zone, this is a common occurrence.

Figure 6: Quintiles of Households by Zone ($ PPP 2007, per person)



Source: RuralStruc Surveys. The dotted lines are respectively the $1 PPP poverty line (red), the $2 PPP poverty line (orange), and the domestic poverty line (blue).

The descriptive statistics of the fifth quintile (Table 10) clearly point out the same kind of phenomenon: a high average of the global income of the fifth quintile is pulled up by a handful of better off households. Indeed, in Alaotra 2, the richest region of Madagascar, few large rice producers differentiate themselves from the other households. They pull the average income of the fifth quintile up to $3,101 PPP, while the median income stands well below at $2,391 PPP. Still in Madagascar, the fifth quintile of Antsirabe 1 shows a high variation related to the small number of households, specialized in agriculture, that have moved away from rice to focus on potatoes and dairy products, which are sold rather than self-consumed. These results are confirmed by the value of the percentile 95, which is always much lower than the maximum.

Table 10: Descriptive Statistics for the Fifth Households Quintile in Each Zone

		Q5 Global Annual Income **per capita** in $PPP					
		Mean	Median	Minimum	Maximum	Percentile 05	Percentile 95
Mali	Tominian	428	350	248	2 229	267	646
	Koutiala	575	544	442	995	444	937
	Diéma	802	497	374	5 568	375	2 186
	Macina	888	785	658	1 595	660	1 446
Senegal	Casamance	897	821	555	3 059	557	1 547
	BA Nord 1	1 050	998	699	2 442	719	1 438
	BA Sud	874	733	503	2 828	511	2 268
	Haut Delta	1 144	1 057	672	2 238	672	2 238
	BA Nord 2	1 433	1 253	973	2 996	984	2 260
	Bas Delta	2 467	1 962	1 511	6 696	1 516	4 148
Madagascar	Antsirabe 2	808	633	449	2 640	456	1 860
	Alaotra 1	977	826	580	2 679	589	2 136
	Morondava	1 113	936	667	2 440	684	2 022
	Itasy	1 147	923	676	3 678	692	2 684
	Antsirabe 1	1 518	1 159	912	6 272	916	3 185
	Alaotra 2	3 101	2 391	1 871	7 521	1 920	6 262
Morocco	Chaouia	6 577	3 769	2 346	25 833	2 402	18 550
	Saïss	10 461	5 596	3 158	73 849	3 253	33 460
	Souss	12 551	9 245	4 229	54 054	4 250	36 126
Nicaragua	Muy Muy	3 833	2 175	1 159	38 466	1 210	9 002
	Terrabona	3 621	2 325	1 393	20 616	1 459	12 502
	La Libertad	6 133	3 146	2 114	50 864	2 125	15 142
	El Viejo	7 269	2 397	1 679	106 712	1 757	61 433
	El Cuà	9 895	7 922	3 325	32 946	3 638	25 109
Mexico	Sierra S. M.	3 697	2 790	2 159	15 922	2 188	8 032
	Tierras Bajas	6 392	5 879	3 868	16 907	4 083	8 759

Source: RuralStruc Surveys.

In Senegal, the biggest gaps between average and median of the richest quintiles are recorded in the Bas Delta where some households cultivate large irrigated areas, which give them a significant rice production capacity. A few households of BA Nord 2 generate high income from cassava production and trade and, in BA Sud, some households are responsible for these differences owing to their trading activities across the Gambian border, which are sometimes part of the underground economy.

In Morocco, because of the previously mentioned high intra-regional heterogeneity, the gaps are very important in the three zones, the highest being in Saïss and Souss where differences are high between the plain and mountain localities.

In Nicaragua, gaps are marked in all the surveyed regions, particularly in the Pacific region of El Viejo, and illustrate the duality in farm structures (a few large managerial farms mixing with a majority of poor small-scale family farms), while the Mexican region of Sotavento appears less heterogeneous.

Therefore, in all the RS countries, most of the fifth quintiles of the richest regions are characterized by a handful of better-off households, benefiting from very specific social and economic conditions (a one-off high amount of received remittances, an unusually good endowment in land and capital, the uncommon setting-up of an agrifood industry, or good commodity prices, which increase the crop results).

2 Viability of the Low Levels of Income and Food Vulnerability

To shed some light on how the poorest households actually live with such low levels of global income, this section examines their ability to fulfill their dietary requirements and to deal with food vulnerability.

2.1 *Income Conversion into Kilocalories*

Based on the $ PPP results, the previous section highlighted the very low income per capita levels of the poorest quintiles, raising questions on how the poorest rural households manage to live, or survive. To start answering this question, an approach using kilocalories (Kcal) as a unit for income measurement was employed. Households' incomes are transformed into kilocalories in order to compare them with the average individual's daily energetic needs, estimated by the World Health Organization (WHO) at 2,450 Kcal per adult person and per day (Box 9).

Box 11: Methodology Used to Convert Monetary Income into Kilocalories

In all the studied zones, diets rely primarily on cereals, at least in terms of energy. Thus, the basic cereal (or basket of cereals in the case of Mali) of each zone is used as a reference. The conversion rates between Kg of cereals and Kcal are those provided by the FAO's Food Balance Sheets (FAO 2001) (see Table 11), while the prices of cereals are those used by the RuralStruc national teams to estimate the value of self-consumption; they correspond with the average producer sale prices (or the median in the case of Madagascar) for the surveyed year. One will note that, in general, the farm income for the poorest households largely consists of self-consumption of cereals, which are valued, therefore, at the producer sale price.

By using the price of households' main food staple, the "monetary disparities" are rectified by referring to the value of the daily energetic needs. First, it should be noted that the price of the calorie varies strongly from one country to the next, and among zones within the same country (Table 11): from \$0.10 PPP for corn in Sotavento, Mexico, to \$0.25 PPP for rice in Itasy, Madagascar. The prices, of course, depend on the type of cereal cultivated. In Mali's rain-fed areas, the kilocalories of the most cultivated and consumed cereals are notably less expensive. In Senegal, the price of the rice calorie is relatively low, less expensive than in the other countries (\$0.15 to 0.16 PPP) and with little regional variation, which can be explained by strong market competition between the imported broken rice and local rice. Mexico has the least expensive calorie: the government supports the widespread production of corn through credit mechanisms and technical assistance for the acquisition and use of technical packages. Productivity is relatively good, and on the national market local corn is subjected to a strong competition with imported corn. Thus, in Mexico, calories from maize can be acquired at a very low price.

Table 11: Estimation of the Average Calorie Price in the Surveyed Regions (main cereals consumed)

Country	Region	Main Cereals	Price of Main Cereals (Mean in Local Currency per Kg)	Exchange Rate in \$PPP	Conversion in Kcal Ratio	Price of Kcal in \$PPP
Mali	Tominian	Millet, Sorghum	100	240	3400	0.12
	Koutiala	Millet, Sorghum, Maize	88		3480	0.11
	Diéma	Millet, Sorghum	94		3400	0.12
	Macina	Rice	129		2800	0.19
Senegal	Casamance	Rice	111	259	2800	0.15
	BA Nord 1		116			0.16
	BA Sud		110			0.15
	Haut Delta		116			0.16
	BA Nord 2		108			0.15
	Bas Delta		108			0.15
Madagascar	Antsirabe 2	Rice	498	759	2800	0.23
	Alaotra 1		449			0.21
	Morondava		415			0.20
	Itasy		522			0.25
	Antsirabe 1		498			0.23
	Alaotra 2		449			0.21
Morocco	Chaouia	Wheat	2.94	4.80	3340	0.18
	Saiss		2.64			0.16
	Souss		3.36			0.21
Nicaragua	Muy Muy	Maize	4.30	6.70	3560	0.18
	Terrabona		4.70			0.20
	El Viejo		4.70			0.20
	La Libertad		4.60			0.19
	El Cuá		4.20			0.18
México	Sierra S.Marta	Maize	2.50	7.30	3560	0.10
	Tierras Bajas		2.50			0.10

Sources: FAO, 2001, Food Balance Sheets, Annex, p.60 and RuralStruc Surveys.

Moreover, to take into account the significant differences that can exist between households, regions and countries due to the variation in households' size and/or composition (differences of social organizations in a given country, in particular in SAA), global incomes are converted into adult-equivalents (see methodology).

This approach makes it possible to appreciate whether households are able or not, with their incomes, to sustain their minimum food requirements. It also makes it possible to refine the comparison among the zones, in particular for the poorest households.

Using Tominian, the poorest region of the RS sample, as a baseline, it is possible to calculate the income gaps between Tominian and all the other regions, and then to record the influence of the conversion in Kcal on the differences between the surveyed regions (Table 12). The gaps between the average income of the richest and poorest regions are softened: from 10 to 1[24] instead of 18 to 1. The situation of the Malian regions appears comparable with most of the zones of Madagascar or Senegal. On the contrary, the situation in Madagascar is less favorable due to the relatively expensive rice kilocalorie and significant differences between zones.

Table 12: Average Global Income per EqA and per Day (in $ PPP and Kcal)

		Global income in $PPP		Global Income in KiloCalories	
		Mean	Tominian Index = 100	Mean	Tominian Index = 100
Mali	Tominian	234	100	5 225	100
	Koutiala	368	157	9 530	182
	Diéma	368	157	8 762	168
	Macina	516	220	7 374	141
Senegal	Casamance	439	187	7 844	150
	BA Nord 1	527	225	9 011	172
	BA Sud	484	207	8 733	167
	Haut Delta	524	224	8 954	171
	BA Nord 2	769	328	14 125	270
	Bas Delta	1 205	515	22 138	424
Madagascar	Antsirabe 2	409	175	4 781	92
	Alaotra 1	506	216	6 564	126
	Morondava	597	255	8 373	160
	Itasy	622	266	6 935	133
	Antsirabe 1	744	318	8 694	166
	Alaotra 2	1 346	575	17 444	334
Morocco	Chaouia	2 271	970	33 921	649
	Saiss	3 406	1 455	56 664	1 085
	Souss	4 131	1 765	54 005	1 034
Nicaragua	Muy Muy	1 417	605	21 532	412
	Terrabona	1 463	625	20 344	389
	El Viejo	2 575	1 100	35 802	685
	La Libertad	2 329	995	33 089	633
	El Cuá	3 610	1 542	56 168	1 075
Mexico	Sierra S.M.	1 830	782	52 106	997
	Tierras Bajas	3 133	1 338	89 221	1 708

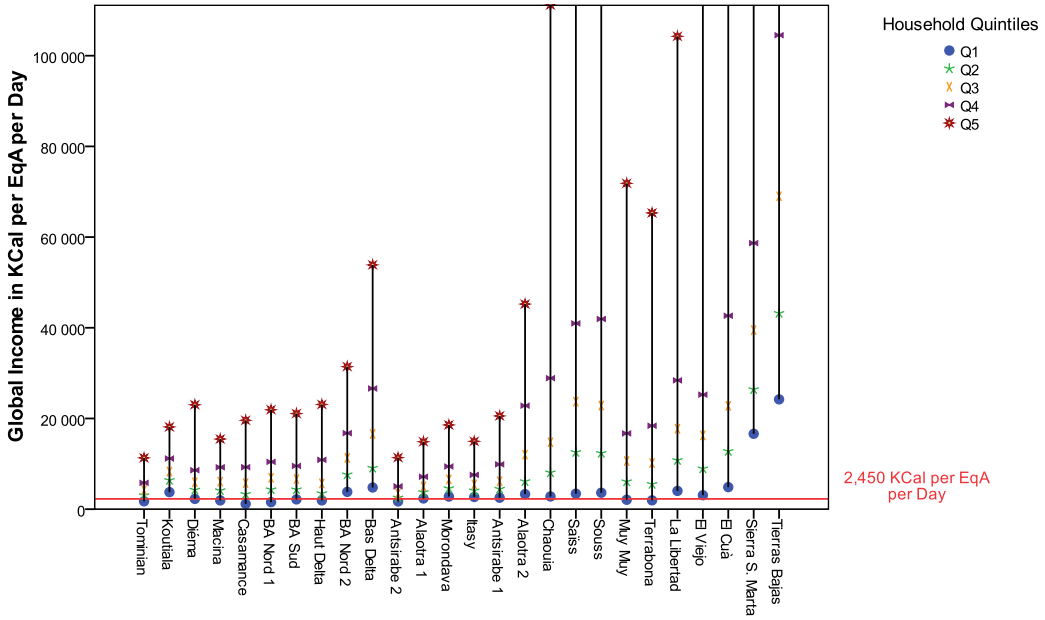
Source: RuralStruc Surveys.

[24] When excluding the Mexican zones because of the very low cost of calories from corn.

This conversion of income into kilocalories per adult equivalent translates into a relative improvement of the situation of the poorest households, particularly in SSA. Figure 7, which only shows the poorest zones of Mali, Senegal, Madagascar, Morocco and Nicaragua, shows that most of the household quintiles have average global incomes expressed in Kcal notably higher than the required 2,450 Kcal threshold per adult and per day.

This result helps to understand how poor rural households can deal with such low global income levels in $ PPP. However, Figure 7 also shows huge disparities since part of the households are unable to cover their basic kilocalorie needs: the households from the first and the second quintiles often generate a global income per EqA in Kcal lower than the minimum basic needs.

Figure 7: Average Incomes in the Poorest Zones in Kcal and per Quintiles (per EqA and per Day)



Source: RuralStruc Surveys

2.2 *Beyond Average Income: Food Insecurity Remains a Crucial Issue*

A relatively high portion of the surveyed households are unable to generate sufficient incomes in order to meet their minimum daily caloric needs with reference to the zone's main cereal (Table 13). These poorest households are thus in situation of food insecurity and are highly vulnerable.

Indeed, in three poor regions surveyed in SSA (Tominian, Casamance, and Antsirabe 2), about one-fourth of the households are unable to fulfill their basic energetic needs. In Antsirabe 2, the situation appears the most critical where 29% of the households do not have a sufficient income to cover their basic caloric needs. In 11 surveyed zones, between

10 and 20% of the households have incomes below or just equal to their energetic needs, including two regions in Nicaragua. Only the two Sotavento zones fully escape this critical situation.

In the Malian region of Koutiala, despite a low average income (notably linked to poor outputs and a very low price of cotton), few households are experiencing food insecurity (only 5%) (Table 13), which means a weak concentration of incomes while the cost of calories remains relatively low because of the significant role of maize. This situation reinforces the "paradox" of the cotton-growing regions of Mali (see Box 10).

Table 13: Household Distribution According to Levels of Income Expressed in Kilocalories (%)

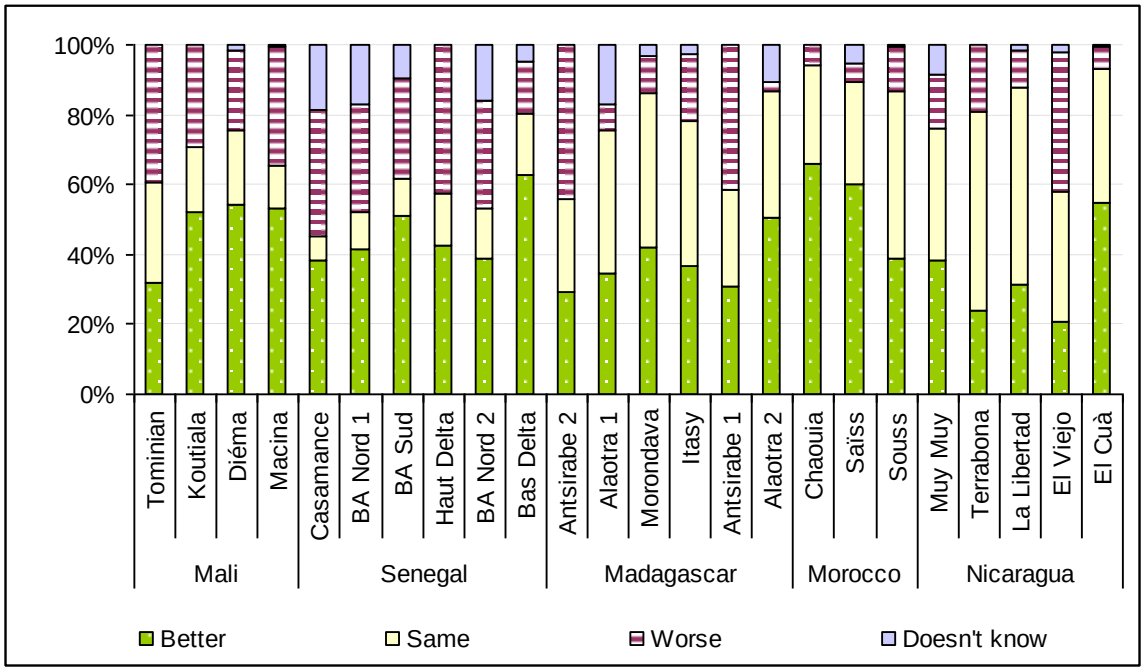
		Level of Annual Global Income in Kcal per EqA per day		
		<= 2450 KCal per EqA per day	2451 - 4900 KCal per EqA per day	>= 4900 KCal per EqA per day
		%		
Mali	Tominian	19	41	40
	Koutiala	5	10	86
	Diéma	12	24	64
	Macina	14	25	60
Senegal	Casamance	22	22	56
	BA Nord 1	17	15	68
	BA Sud	12	25	63
	Haut Delta	13	31	56
	BA Nord 2	4	9	87
	Bas Delta	4	4	92
Madagascar	Antsirabe 2	29	41	31
	Alaotra 1	11	38	51
	Morondava	6	28	65
	Itasy	6	38	56
	Antsirabe 1	8	27	65
	Alaotra 2	3	19	77
Morocco	Chaouia	7	7	86
	Saiss	8	4	87
	Souss	8	5	87
Nicaragua	La Libertad	12	13	75
	Terrabona	13	13	74
	El Viejo	8	6	85
	La Libertad	5	8	88
	El Cua	3	8	89
Mexico	Sierra S. M.	0	0	100
	Tierras Bajas	0	0	100

Source: RuralStruc Surveys.

In conclusion, based on the average global incomes of the surveyed households, food insecurity persists in several regions. It can be put in perspective with the evolution of food security as perceived by the heads of households. Indeed, a significant share of households considers that their food security, in terms of quantity as well as in quality, has deteriorated over the last five years (Figure 8): 23 to 40% of the households in Mali, 15 to 43% in Senegal, over 40% in some regions in Madagascar (Antsirabe) and Nicaragua (El Viejo). This adverse evolution is one of the characteristics of the high

vulnerability of the households. This perception may have been exacerbated by the food price crisis during the surveyed year (end of 2007, early 2008).

Figure 8: Perceived Evolution of Food Security in the Surveyed Zones (% of households)



Source: RuralStruc Surveys.

The analysis in kilocalorie effectively complements the comparison using $ PPP, while making it possible to temper the low level of income of some regions – or even countries – in comparison to the others. It also heightens one's appreciation of the portion of households in highly vulnerable situations because of their inability to meet their daily energetic needs with their current incomes.

Box 12: Analysis of Food Vulnerability and Insecurity in Mali

In Mali, the implementation of the Annual Cereal Balance uses the annual cereal standard of 214 kg per capita to assess the demand for grain for human consumption. To obtain the consumable production form harvested production, two rates are used, taking into account losses and seed processing (respectively 85% of the harvested production and 62%, which corresponds to the consumable production).

In the RS sample, the average grain production by household is 497 kg per person per year, with significant variations by zone but generally close to or higher than the standards: for Diéma 301 kg, 208 kg for Tominian, 990 kg for Macina, and 482 kg for Koutiala.

The data collected through the households' surveys can assess available amounts of grains per family from the harvested production after payment of expenses in kind, donations (*zakat*) or sales. Cereals are available in the following amounts (kg) per person in each region : 157 kg/person in Tominian, 216 kg in Diéma, 232 kg in Macina and 314 kg in Koutiala, which is the only region reaching a surplus on average. The other regions are either close to the standard (Macina and Diéma), or clearly deficient (Tominian). Moreover, these averages hide a high variability within regions with coefficients of variation of 97% in Tominian and Diéma, 79% to 81% in Macina and 59% in Koutiala.

These findings do not mean that households cannot obtain their adequate food level, but that they must purchase additional food to satisfy their needs. Unfortunately, there is a low probability that low-income households manage to buy these supplements. If we take the case of Tominian, using the quintiles calculated for this zone, the available quantity of cereals for the first quintile households is estimated around only 81 kg/capita. To purchase the additional 133 kg per person needed to reach the standard, a household should pay from 13,300 FCFA to 15,300 FCFA per person per year to buy millet in 2007. The average global income for this quintile being 18,600 FCFA/EqA, the cost for the extra grain needed represents 72 to 82% out of the global income, in which 81 kg of grain are already self-consumed.

This example shows that food vulnerability and insecurity in the RS study regions are severe. To cope with the cereal deficit, households develop and combine different strategies, including breading small livestock (high reproductive rate), migrating, gathering natural resources, but also reducing their consumption and food rations.

Source: RSII Mali, p.160-163.

Chapter 2 Agriculture's Continued Leading Role in Both Activity and Income Structures

The configuration of rural economies has changed worldwide over the last decades. As a consequence of the increased mobility of people and ideas, directly linked to technical progresses in transport and communication, the old urban-rural divide is fading and we need to rethink our vision of rural economies' defining characteristics. However, despite the fervent debate that has emerged between the academic and the donor communities, little is known about the facts. The recurring issue is the lack of data about these processes of rural transformation, which are not captured by the existing information and statistical systems.

Thus, filling this information gap is a primary objective of the RuralStruc Program, particularly in the Second Phase, which aims to provide updated information on the processes reshaping rural economies. The global design of the Second Phase's work targets this objective; the results obtained provide a rather nuanced picture wherein agriculture still plays a leading role.

1 The Existing Debate on Diversification: A Brief Overview

Over the last decade, discussions and research have focused on an understanding of the new and more complex systems of activities and incomes leading to new patterns of livelihood diversification (Ellis 1998; Barrett & Reardon 2000). These evolutions are supposed to progressively replace the "old" agricultural production system where historically the core activities and income of rural households were principally drawn from agriculture.

This process of change has accelerated since the early 1980s when liberalization policies and globalization resulted in a plethora of changes for the rural households. Because of the importance of market imperfections and market failures, these changes often increased, rather than reduced, uncertainty. In many regions, particularly those less connected to markets, vulnerability and fragility increased due to difficulties in marketing and supply, price instability, the removal of subsidies (particularly for inputs), the withdrawal of technical support, etc. Meanwhile, cutbacks in public funding for hospitals, schools and other social services, as well as consumer price inflation, have led to an increased need for accessible cash. As a consequence, an increasing number of rural households have engaged in "coping strategies",[25] seeking additional and more remunerative activities outside agriculture (Bryceson 1999; 2002), which is a condition for the sustainability of their livelihoods. Technical progress in transportation and

[25] See Ellis (1998) for discussion on the different meanings of "coping strategies".

communication (particularly cell phones and cash transfer systems) facilitates this diversification.

As such, for many households, literature indicates that farming is now one of several activities and income sources. This situation leads to two main trends in the debate, which is characterized by the importance of case studies and the limited number of global approaches.[26] The first refers to the diversification of income through rural non-farm activities; whereas the second deals with diversification of income through the migration of rural household members to cities, other regions, or outside the home country, and the related impact of remittances on rural households' livelihoods. This second diversification strategy relies on multiple locations and connects members of the household working in different places (the market town, the regional city or the national capital, and sometimes foreign locations). These new composite systems contribute to the emergence of archipelago models[27] that clearly redefine the country-to-city linkages.

In recent years, there has been increasing emphasis in the rural development literature on livelihood diversification, i.e. the multiple income-generating activities undertaken by rural households. According to Barrett and Reardon, "*Diversification is the norm. Very few people collect all their income from any one source, hold all their wealth in the form of any single asset, or use their assets in just one activity*". They remind that,

There are several reasons for this: risk reduction, realization of economies of scope, diminishing returns to factor use in any given application, response to crisis, liquidity constraints, etc. At the more aggregate level of households or communities or regions, scarcity of productive resources and specialization according to comparative advantage accorded by superior technologies or skills or by greater endowments leads to considerable inter-individual diversity in activities and incomes. So no matter the unit of analysis, diversification is ubiquitous. This is especially true in rural areas of low-income countries, where high transactions costs induce many residents to self-provision in several goods and services, where increasing population pressures often result in landholdings too small to absorb all of a household's labor supply, and where limited risk-bearing capacity and weak financial institutions create strong incentives to select a portfolio of activities in order to stabilize income flows so as to stabilize consumption and minimize the risk of entitlements failure (Barrett & Reardon 2000, p. 1-2).

The discussion on diversification of income sources and activities is sometimes difficult because there are no static categories established in the literature; thus, it remains useful to clarify the picture. Following Davis et al. (2007), rural activities can be divided into six

[26] On this topic see, among others: for general discussion Ellis (2000; 2004), Wiggins and Davis (2003), and Haggblade et al. (2005); for regional approaches on Latin America Reardon et al. (2001), and Barrett et al. (2001, 2005) on Africa.

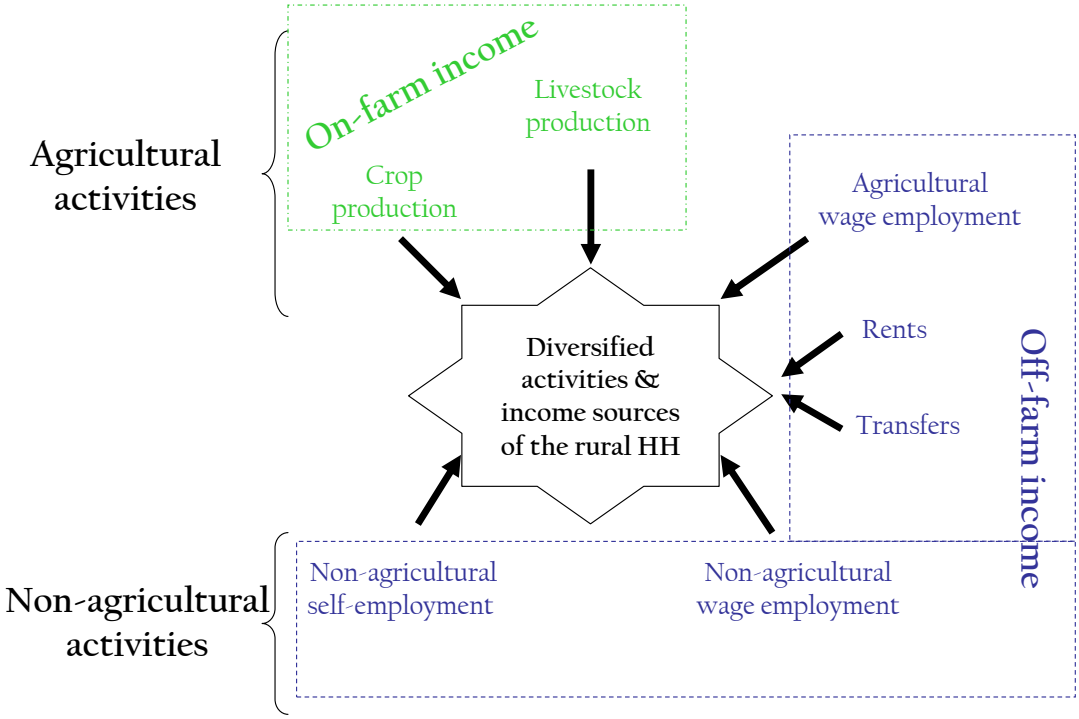
[27] On these new configurations see, among others: Gastellu and Marchal (1997); Léonard et al. (2004).

categories: (i) crop production, (ii) livestock production, (iii) agricultural wage employment, (iv) non-agricultural wage employment, (v) non-agricultural self-employment, and (vi) transfers (private and public). The first three categories (crop, livestock and agricultural wage) make up "agricultural activities", while the last three (non-agricultural wage, non-agriculture self employment and transfers) represent "non-agricultural activities". The first two categories (crop and livestock production) are "on-farm activities", and categories four and five (non-agricultural wage and self employment) are "non-farm activities". Agricultural wage employment and transfers are separate categories. The concept of "off farm activities" includes all "non-agricultural activities" plus "agricultural wage labor" (Barrett & Reardon 2000; Winters et al. 2001; Davis et al. 2007).

As with every classification, the latter proposal is disputable and it is possible to continue feeding the debate on definitions and concepts shapes interminably. For instance one could argue that: (i) transfers are not an activity but an income source and can foster activities or increase consumption or savings; (ii) private transfers can also result from agricultural activities or agricultural wages; (iii) agricultural activities cannot be restricted to crops and livestock production but must also include on-farm processing of raw products (added-value at the farm level); or (iv) occasional hunting, fishing and gathering are not agricultural activities but as common rural practices based on the utilization of natural resources, they can be included in the on-farm income.

Considering the discussion above, the RuralStruc Program made the following choices in terms of income structure, as they are presented in Figure 9, adapted from Davis et al. (2007) and uses the perspective of the household rather than that of the activity because the Program's purpose and objectives are to facilitate the identification of activity and income systems that express the complex livelihood strategies adopted by rural households.

Figure 9: Diversification of Activities and Income Sources of Rural Households in Developing Countries



Source: Authors, adapted from Davis et al. 2007.

Over the past years, the need to understand the processes of change and the development of rural diversification has led to an effort to systematize the available information with the objective of providing a new vision of rural realities. This effort translated in initiatives such as the RIGA (Rural Income Generating Activities) project, a joint initiative of the World Bank and the FAO, which aimed at helping the development community to build rigorous and empirically based generalizations about the Rural Non-Farm (RNF) economy and to identify policy instruments that could be used to promote RNF activities alongside agriculture to facilitate rural poverty alleviation.

Even though the RIGA results are based on largely heterogeneous data (particularly in years during which a national survey was conducted), the RIGA project remains quite unique. It was used extensively by the WDR08 and directly participated in the development of one of the core issues of the report: the role of the diversification of rural activities and sources of income as a way out of poverty:

Many rural households move out of poverty through agricultural entrepreneurship; others through the rural labor market and the rural non-farm economy; and others by migrating to towns, cities, or other countries. The three pathways are complementary: non-farm incomes can enhance the potential of farming as a pathway out of poverty, and agriculture can facilitate the labor and migration pathways (World Bank 2007, p.72).

Box 13: The Rural Income Generating Activities (RIGA) Project

The RIGA project analyzes sources of rural household income in 15 countries from 23 household surveys: Ghana 1992 & 1998; Madagascar 1993-94; Malawi 2004-05; Nigeria 2004; Bangladesh 2000; Indonesia 1992 & 2000; Nepal 1995-96; Pakistan 1991 & 2001; Vietnam 1992-93 & 1997-98; Albania 2002 & 2005; Bulgaria 1995 & 2001; Ecuador 1995 & 1998; Guatemala 2000; Nicaragua 2001; Panama 1997 & 2003.

RIGA uses a database constructed from a pool of Living Standards Measurement Study (LSMS) and other multi-purpose household surveys made available by the World Bank and the FAO. From this pool of existing data, a panel of countries is selected with the objective of ensuring geographic coverage, as well as adequate quality and sufficient comparability in codification and nomenclatures. The specific objective of this work is (i) to conduct a systematic analysis of income-generating activities in rural areas of the selected countries; (ii) to identify the relative importance of different activities; and (iii) to analyze the determinants of participation and intensity of involvement.

To this end, basic analysis is conducted to (i) evaluate the participation in and income received from RIGA, (ii) analyze the role of household assets in participation in each activity, (iii) analyze the role of household assets in the income received from each activity, and (iv) disaggregate rural non-farm activities by industry.

Indeed, a major component of the RIGA project is to construct comparable income measures. The aim of the exercise is to provide annualized benchmark aggregates spanning four continents, which, despite pervasive differences in the quality and level of information available in each survey, is suitable for cross-country analysis. Although consumption-based money metric measures are more commonly used in welfare analysis because they are considered to be more accurate and easier to measure in a typical household survey, the RIGA study uses income-based measures and their components, whose definitions closely follow those given by the International Labor Organization (ILO).

Some of the results of the RIGA project are that schooling is an important determinant for participation in many activities, but that its magnitude varies with respect to Rural Non-Farm wage employment, agricultural wage and RNF self-employment. As a consequence, this study puts forward that schooling leads to a shift to RNF wage employment and, thus, higher income. This work also underlines that services are the most important RNF wage employment activity followed by manufacturing, construction and commerce, the latter being the most important RNF self-employment activity.

Source: Carletto et al. 2007

As explained above, diversification of rural activities and sources of income does not necessarily mean complete abandonment of on-farm crop and livestock activities, as most rural households in all countries maintain on-farm activities despite participation in other off-farm activities. Indeed, the evolution of the agricultural sector has led many rural households to develop new strategies based on different income generating activities, which allow adaptation and risk management in an uncertain and changing environment. As a consequence, available land, labor and capital can be reallocated to more certain and sustainable activities – when alternatives exist. Thus, the core issue remains that of existing diversification alternatives and the potential of each to provide a pathway out of rural poverty. Furthermore, the discussion remains rather elusive on the "quality" or the concrete content of these alternatives, i.e. do they allow rural households to actually increase their level of living and accumulate assets, or do they merely contribute to their

survival? In other words, to what extent can these diversification strategies actually contribute to the structural transformation process of developing countries?

The following section aims to shed some light on rural realities in the regions surveyed during the second stage of the Program.

2 Diversification of Rural Activities and Income Sources in the Surveyed Regions

As established above, rural households are engaged in a range of income-generating activities. The present section first reviews the patterns of rural activities and incomes of the surveyed households in each region. It then provides an overview of the diversification structure of activities and income sources depending on the income level. It concludes with a discussion of the trends towards diversification and / or specialization.

2.1 *Households' Patterns of Diversification*

As previously discussed, we distinguish between "on-farm" and "off-farm" activities and income in order to reflect the spatial distribution of activities, as off-farm income sources are generally generated away from the farm (Barrett and Reardon 2000):

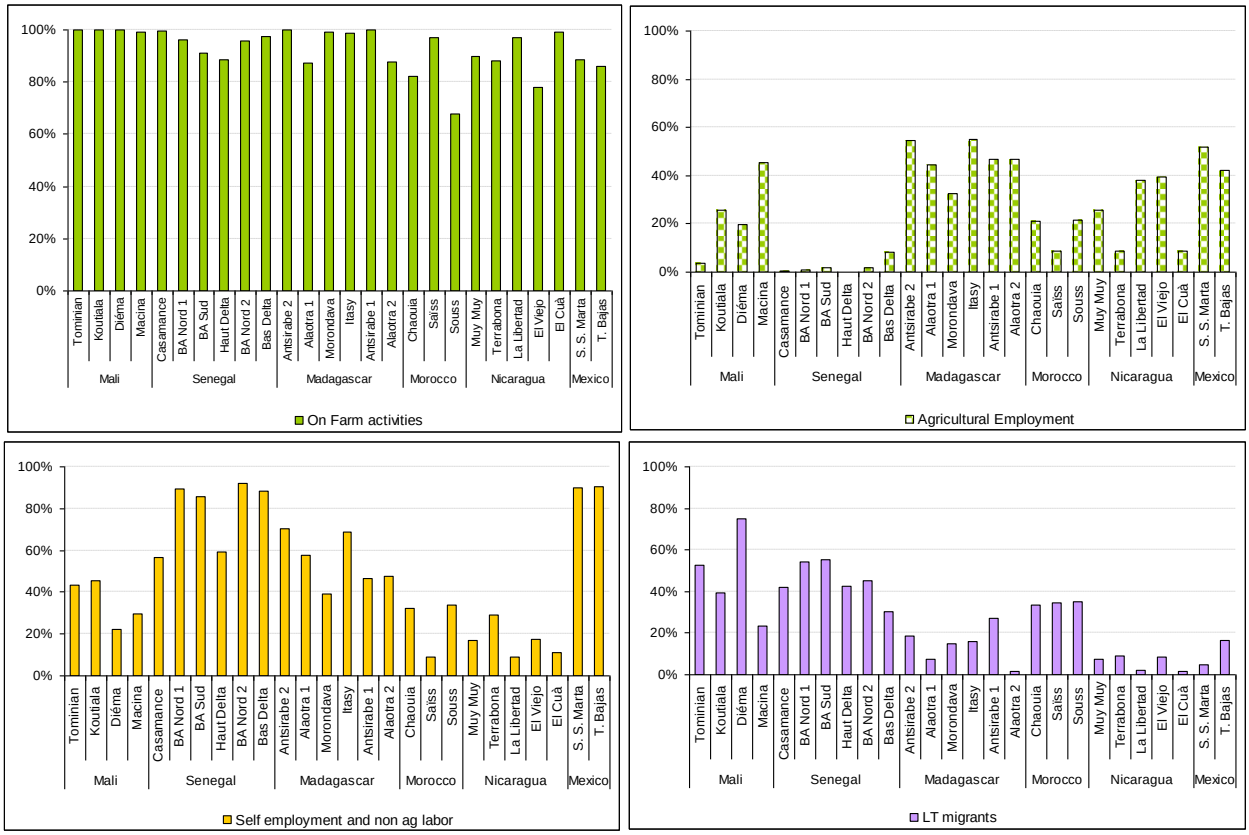
Within the on-farm income, we distinguish four sources of generating income activities: crop production, livestock production, fishing, hunting, gathering etc., and on-farm processing of farm products. One can note that crop and livestock production include self-consumption.

The off-farm income is divided into six sources: agricultural wage employment, non-agricultural wage employment, self-employment, public transfers, private transfers (including remittances), and rents.

2.1.1 Diversification of Activities

Not surprisingly, the share of households engaged in on-farm activities remains very significant in all regions (Figure 10): 15 out of 26 regions have 100% or near 100% of the surveyed households as farm owners; eight regions have around 90%; and only three regions have 80% or slightly less. These high rates confirm the dramatic role of farming in the rural economy of the surveyed regions and establish households without on-farm activities as the exception. The most probable determinant for this exception is the presence of opportunities outside agriculture, which normally relates to a well-established connection with or the proximity to cities, as in Souss (Agadir) or Chaouia (Casablanca) in Morocco, and El Viejo or Terrabona (respectively Chinandega, León and Managua) in Nicaragua. In SSA, even when cities are accessible (Antsirabe and Antananarivo in Madagascar, Dakar and Thiès for the *Bassin Arachidier* in Senegal), the family farms remain the pillar of the household.

Figure 10: Participation in On-Farm and Off-Farm Activities (% of households)



Source: RuralStruc Surveys.

Agricultural wage employment is a common feature in the surveyed regions and is a common option for households seeking additional income sources; however this activity is limited by the hiring capacity of other farms, which depends on the degree of economic differentiation within the region: globally, this differentiation is low in SSA, higher in Morocco or Mexico where agri-businesses is more developed, and even higher in Nicaragua where large managerial farms (*latifundios*) exist. Agricultural wage employment is also the main source of income for landless peasants, notably in Nicaragua, but also in Madagascar where land access is a pressing issue (as shown by the many existing land conflicts).

One can note that agricultural wage employment often relies on seasonal agricultural activities with significant labor requirements that characterize specific crops like in:

- the rice-growing regions in Madagascar (Alaotra, Itasy, Morondava) and Mali (Macina), where rice cropping is manual and requires intensive labor for transplanting or harvest;

- the horticulture regions: Itasy and Antsirabe (Madagascar), Souss (Morocco), mainly for harvesting; and

- other regions with specific productions: cotton in Koutiala (Mali), livestock in La Libertad and sugar cane in El Viejo (Nicaragua), etc.

Non-agricultural activities (self-employment and non-agricultural wages) are widespread throughout the surveyed rural areas, particularly in Senegal and Mexico (with 60 to 80% of the households engaged in these activities), but also in Mali, Madagascar and Morocco. Self-employment is mainly related to petty trade, handicraft, construction and services in the informal sector. Few non-agricultural wage employment opportunities exist in the formal sector, particularly in SSA. Opportunities are scarce in the surveyed regions, the main exceptions being the *maquilas* (manufacturing) industry in industrial free zones in Terrabona, Nicaragua, and the easy access to nearby urban jobs noted in Agadir and Casablanca, Morocco.

The remaining alternative is, of course, domestic or international migration over the long- and / or short-term,[28] which concerns between 15 and 40% of the surveyed households, the few exceptions being Alaotra in Madagascar, La Libertad and El Cuà in Nicaragua, and the Sierra zone of the Sotavento region in Mexico[29] (Figure 10). Migration patterns differ from one country and one region to another. Where long-term migration is more developed, short-term migration – usually within the country – is also well established, notably in several regions of Mali and Nicaragua (above 20% of the households) and, to a lesser extent, in Senegal (

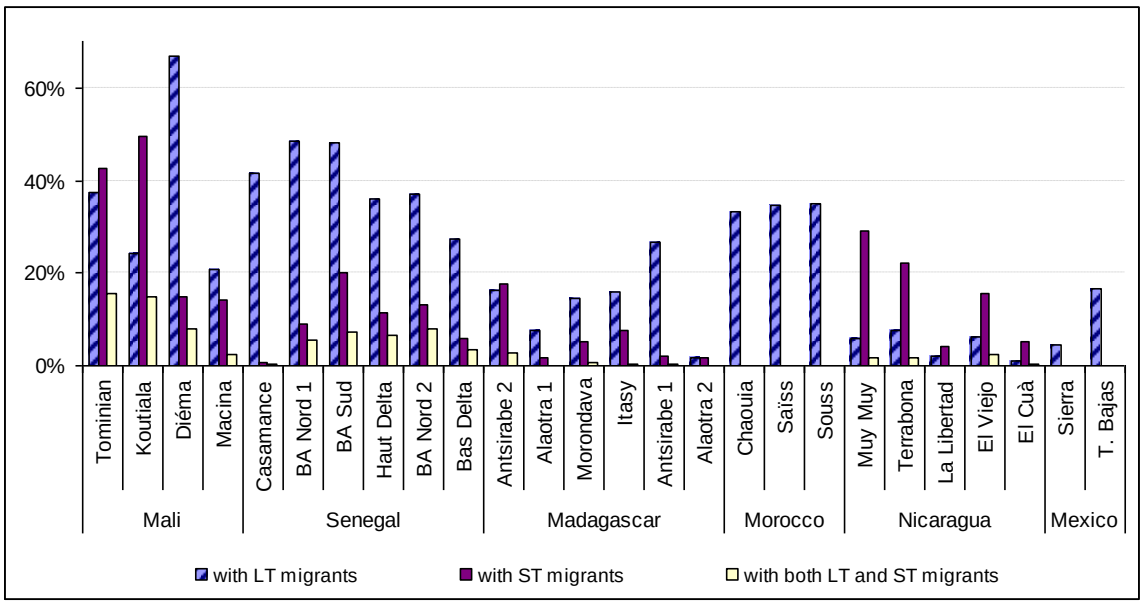
Figure 11). These migrations are most often related to seasonal activities (harvesting in other regions or, on the contrary, "small jobs" in cities between cropping seasons).

Migrants' destination choices are strikingly different depending on the regions and countries (Figure 12). International migration patterns are very differentiated, yet allow three groups of regions to be distinguished based on the destination of the migrants of the surveyed households: regions with 50% or more of international migrants (the five Nicaraguan regions and Diéma in Mali); regions with 10 to 40% of migration abroad (Senegal, Morocco, Sotavento); and the unique case of Madagascar, where no international migration was recorded. In Nicaragua, due to the short distance, migrants go mainly to neighboring countries (Costa Rica, El Salvador), even for short-term periods (for instance agricultural laborers or service sector workers, such as security guards (men) or maids (women)). In Mali and Senegal, a significant portion of international migrants remains within West Africa, the long-standing exception being Diéma where migrations to Europe are the rule.

[28] During the survey, long-term migrants were persons who are geographically distant from the household for at least 12 months and still sending remittances, whatever the amount.

[29] As explained in the methodology, the implementation of the survey in Mexico has probably led to an underestimation of the migration flow, particularly for the short-term migrations, even if the Sotavento region is not a long-standing emigration zone.

Figure 11: Households Engaged in Migration (by duration in %)

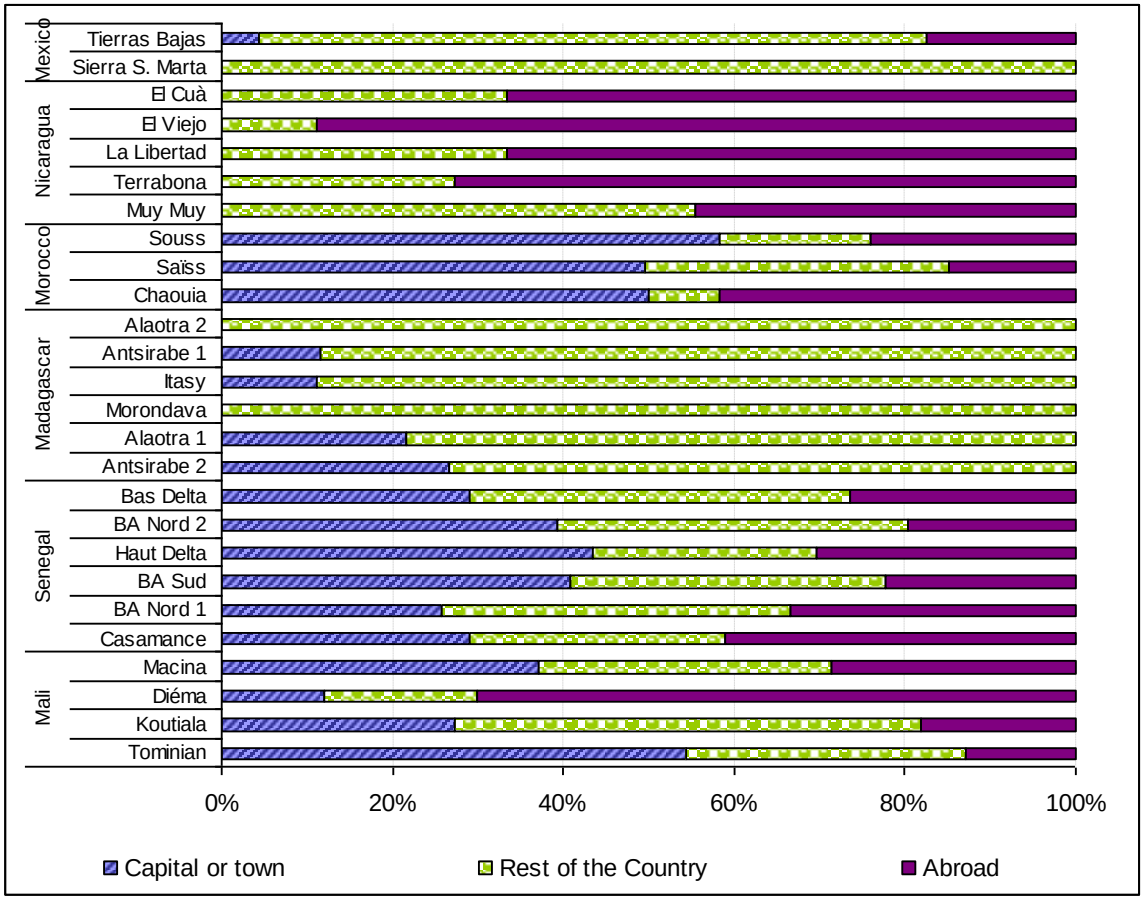


Source: RuralStruc Surveys.

Migration to cities (the capital or major towns in the country) is an important characteristic of the three surveyed regions of Morocco and of Tominian (Mali), where 50% and more of the migration flows toward urban areas where mainly informal employment is sought. This is also a common feature in Senegal where the cities of St Louis and, above all, Dakar offer short-term opportunities (*petits boulots*).

Madagascar and the two Mexican zones are quite specific, in that migrants often leave for other rural areas, searching for new agricultural land in the case of Madagascar or, in Sotavento, for seasonal agricultural activities in the horticulture sector of the Pacific Coast states or in the sugar cane industry of Veracruz.

Figure 12: Destination of Migrants in the RS Countries (% of migrants)



Source: RuralStruc Surveys.

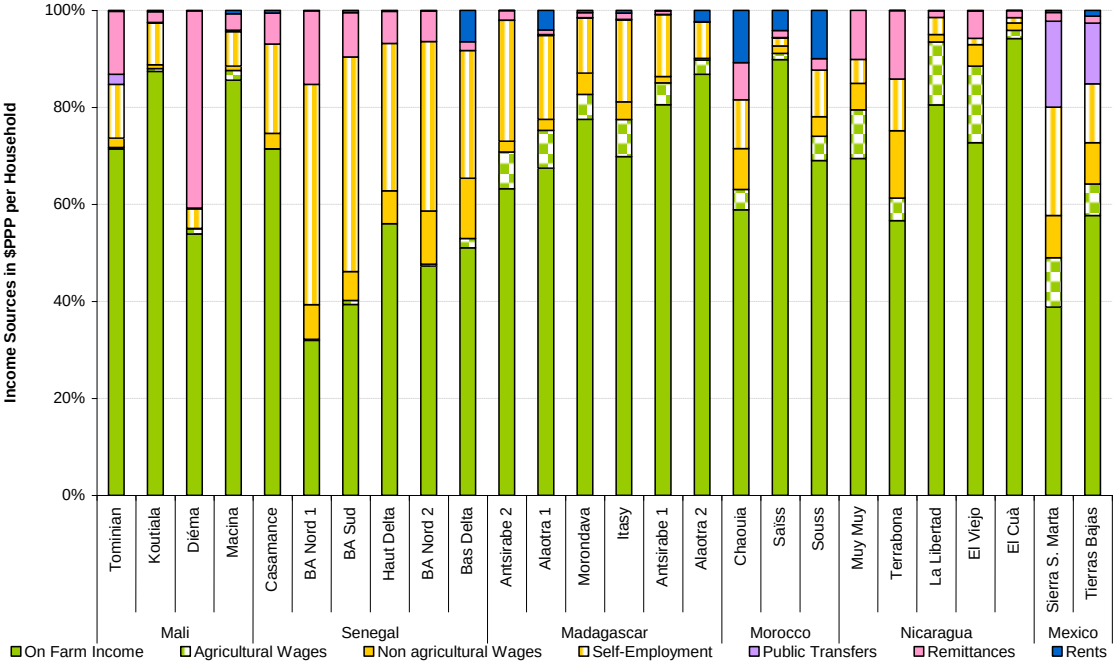
2.1.2 Diversification of Household Incomes

Although off-farm activities concern the large majority of the surveyed households, indicating a high degree of diversification, the overall picture drastically changes when these activities are translated into incomes, as in Figure 13, which shows the share of households' global income, by income source at regional level.[30] This income structure breakdown reveals the continuing and recurring importance of on-farm sources which account for more than 50% of global income in the majority of the surveyed regions (22 out of 26), the exceptions being the three zones of the *Bassin Arachidier* in Senegal and one zone in the Sotavento (Sierra de Santa Marta). For 16 regions, on-farm income reaches 75% of the total income and seven regions pass the 80% mark: the cotton zone

[30] The mean of shares of households' income sources was computed first, and then aggregated by region or regional quintiles

(Koutiala) and the irrigated rice area of Macina in Mali, the dairy and horticulture belt of Antsirabe and the rice basket of Alaotra in Madagascar, the dairy and fruits region of Saïss in Morocco, and the coffee and the remote livestock zones of El Cuà and La Libertad in Nicaragua.

Figure 13: Structure of Households' Global Income by Sources (in %)



Source: RuralStruc Surveys.

Overall, off-farm incomes account for around 25% of global income and their structure is characterized by significant heterogeneity. Remittances only record a high share of income in Diéma, Mali (40% on average), whereas the other regions engaged in migrations range around 10%. It is worth remarking that although migration exists everywhere, its returns can be very low, like in Madagascar. Although agricultural wages are significant (around 10% of global households' income) in non-SSA countries, self-employment appears as the main generalized off-farm income source in SSA countries, with the exception of Madagascar, where the extensive rice production requires waged labor.

Public transfers only exist in Mexico, with 86% of the surveyed rural households benefiting from at least one public program.[31] These public transfers are significant because they account for 20% of the global income.

Finally, rents are limited and are only noticeable in Bas Delta (Senegal), Alaotra in Madagascar – two irrigated rice-growing zones with land pressure – and Morocco. They mainly concern renting out of land and housing.

The most striking result of Figure 13 is the very specific case of Senegal, where all the surveyed zones – with the exception of the remote Casamance – present a very different profile than the other SSA regions. In the *Bassin Arachidier* zones, on-farm incomes only represent between 32% and 47% of global income. This surprising result is the consequence of combined factors: the groundnut value chain crisis, which started in the 1980s; the high degradation of soils due to intensive groundnut production; the continued degradation of the climatic conditions (negative trend of rainfall and the low level of precipitation for the reference year of the survey). The deteriorating natural and economic environment has led to the development of "catch all" strategies wherein households try to capture every opportunity, the main result being the development of self-employment and small jobs facilitated by an easy access to cities.

However, these regional average results must be balanced by the strong heterogeneity of income structure among households, which is an indicator stressed by many studies related to rural diversification. This variation relates to asset differences among households and to the local characteristics (labor opportunities, connection to markets, existing infrastructure and services, etc.), which shape the portfolio of possible non-farm activities. These characteristics sharply vary within regions and are virtually non-existent when aggregating at regional level. Figure 14 displays the distribution of households per zone according to the share of off-farm income in the global income,[32] which confirm this strong heterogeneity. Several regions show an important variation among households with inter-quartile ranges above 80%. This is the case of the Haut Delta in Senegal, El Viejo, Terrabona, Muy Muy in Nicaragua, and Chaouia and Souss in Morocco, the latter being an situation of highly important heterogeneity in terms of dispersion of the share of off-farm income. Koutiala and Macina in Mali and Saïss in Morocco present a more homogeneous distribution (inter-quartile range below 20%); however, they all display many outliers (extreme observations).

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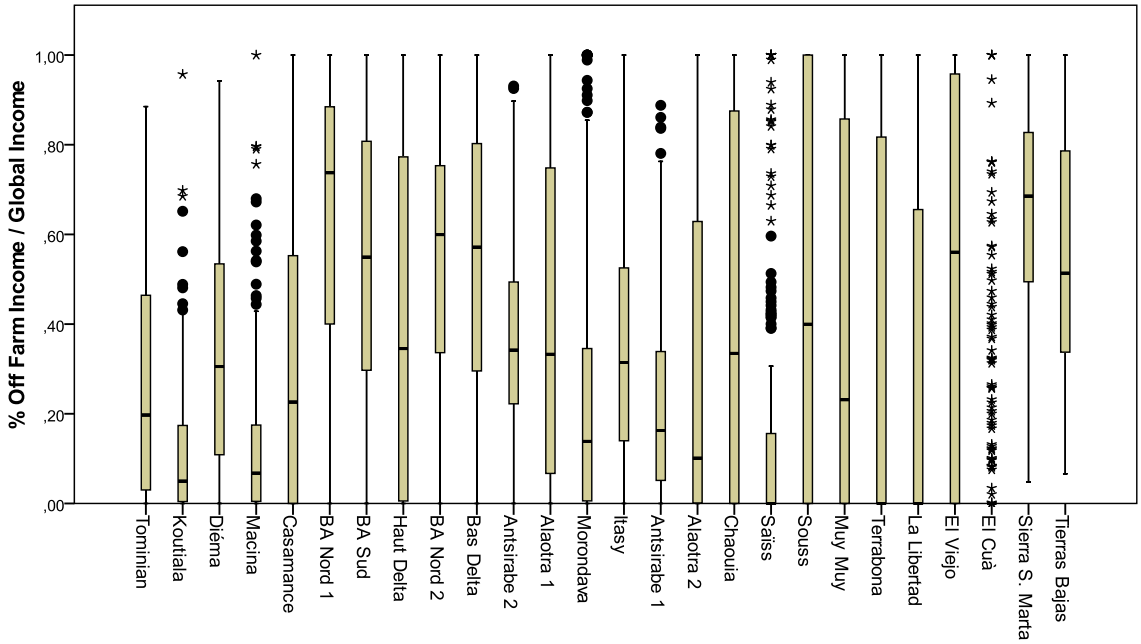
[31] In Mexico, more than ten public programs exist. In the Sotavento region, 79% of the households receive subsidies from *Oportunidades* (poverty alleviation program) and 24.5% from *Procampo* (agricultural support based on the size of the cultivated area). The only other case of public transfer is in Mali (Tominan) where a government backed NGO provides assistance to rural dwellers.

[32] Figure 14 displays box plots that depict the distributions of the regional samples. The bottom of the box gives the first quartile, the top of the box the third quartile, and the horizontal line within the box is the median.

Figure 14: Distribution of Households according to the Share of Off-farm Income in the Global Income (in %)



Sources: RuralStruc Surveys.

2.2 *Income Diversification according to Income Levels*

The previous section paints a picture in which on-farm activities still play a major income-generating role (50% or more of the global income) and where off-farm incomes have expanded (around 25% of the total); however, very different combinations in terms of types and number of activities are detected. Along with the heterogeneity in the types of off-farm activities, there are also significant variations in the returns of the different rural activities between the surveyed regions. Overall, the heterogeneity between household income structures is high. Consequently, it is necessary to further the analysis in order to break this average picture by taking into account the different types of households revealed by their wealth level, which is probably both influencing, and influenced by, the income and activity structure.

Indeed, there are many studies that indicate the close relationship between activity type and income level. They mainly distinguish, on the one hand, activities generating the highest incomes, which are mostly confined to better-endowed groups in high potential areas. For these activities, there are usually significant barriers to entry in terms of volume and quality requirements of products. In remote areas and for less-endowed households a combination of lack of capacity to accumulate and make investments in key productive assets related to land size and human and financial capital are strong barriers to access these opportunities (Reardon et al. 2000). On the other hand, there are usually

other types of activities that generate lower incomes and serve as the only options for the vast majority of the rural poor. These activities include on-farm production for self-consumption, seasonal agricultural wage labor and various forms of self-employment (Davies et al. 2007). To explore the relationship between rural activities and level of return on income, we examine the activity structure by household quintiles,[33] which are displayed in both relative and absolute values in Figure 15.

Beyond the main on-farm / off-farm divide, much dissimilarity exists between the surveyed regions when the structure of the off-farm income is broken down into the different sources. It reveals diverse situations and income strategies, and stresses the importance of local configurations.

In Mali, agriculture is the basis of every quintile's income structure and explains the increase of global income. Off-farm income remains limited in Koutiala and Macina where, respectively, an integrated value chain (cotton) and infrastructure (irrigation) are important assets. Self-employment appears slightly in all zones. The more difficult natural and economic environment in Tominian induces stronger off-farm diversification in self-employment and local migration (as seen above), which make the difference for the Q5. In Diéma, where international migrations exist, remittances are responsible for the jump of the fifth quintile.

As previously noted, Senegal shows an unusual picture when compared to the other SSA regions surveyed. Self-employment – completed by non-agricultural labor in the Delta region and remittances in the *Bassin Arachidier* – dominate. These off-farm incomes explain the soaring of the fifth quintile in the four zones of the *Bassin Arachidier*, while on-farm income remains a stronger driver for income increase in the Delta where some land-related rents appear. This atypical income structure must be put into perspective with the unfavorable crop season, which affected on-farm income, particularly in the *Bassin Arachidier*. More globally this shows the impact of the slow, but decisive, settling of the groundnut production, the former flag crop of the country, and deteriorating natural conditions. But it also expresses the larger opportunities presented by off-farm activities in regions that are well connected to cities with a big metropolis, Dakar, and three regional capitals (St Louis, Thiès and Touba); the remote Casamance, which is separated by the Gambia, is the exception.

In Madagascar, on-farm income is massive and fully explains the quintile structure. Agricultural wages and self-employment constitute the main sources of income diversification, with distinct patterns along quintiles. Agricultural wages are the main feature of the poorest households: in all zones, they decrease steadily from the poorest to the richest quintiles. Contrary to the Macina rice producing region in Mali, the importance of wages results from the small size of family farms, which must rely on external labor for the most labor intensive tasks (transplanting and harvest). Conversely,

[33] Households quintiles are computed on Global Income per Adult Equivalent

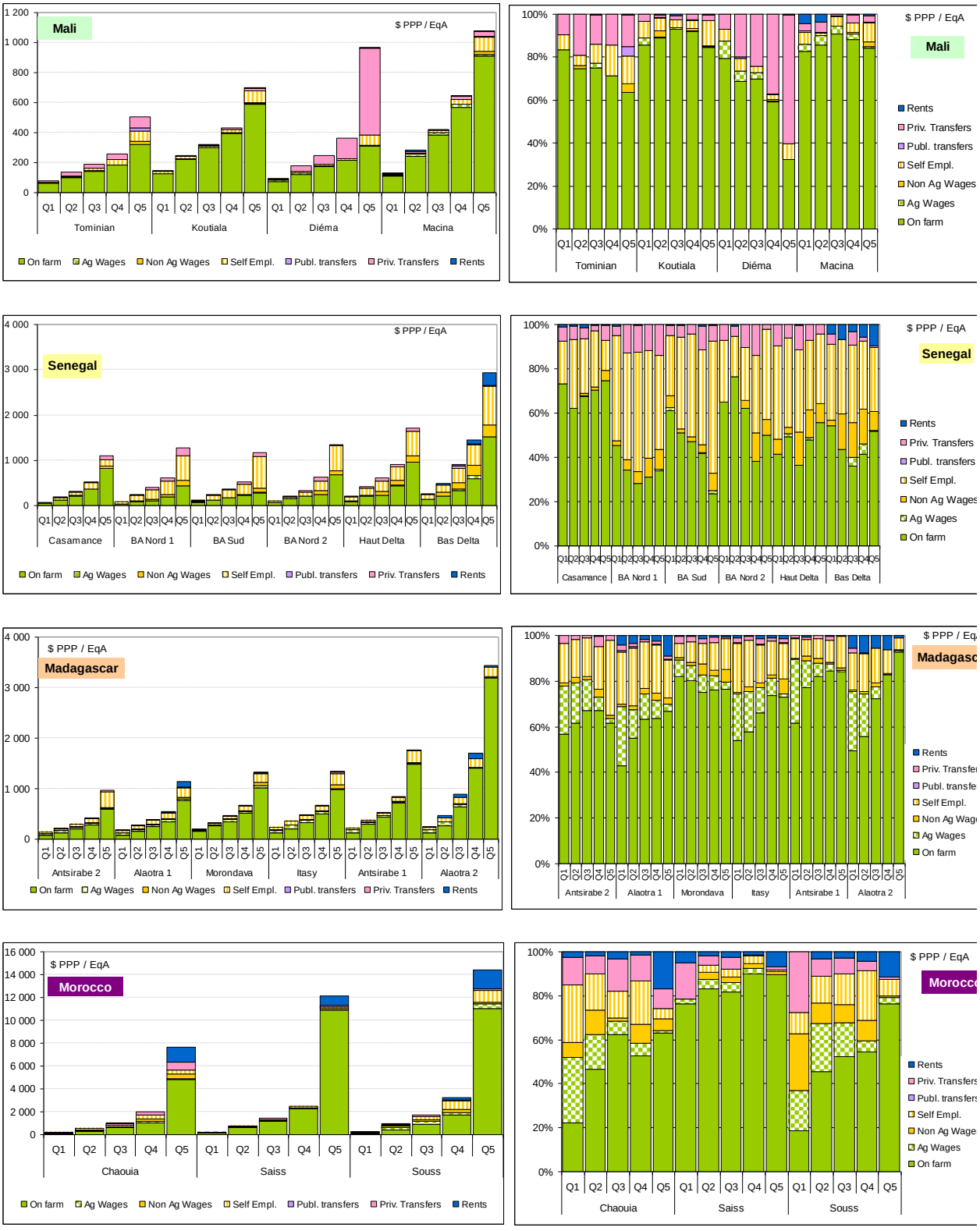
the share of self-employment tends to increase with the wealth of the households, except in Alaotra 2 where households are very specialized and make their living from rice production.

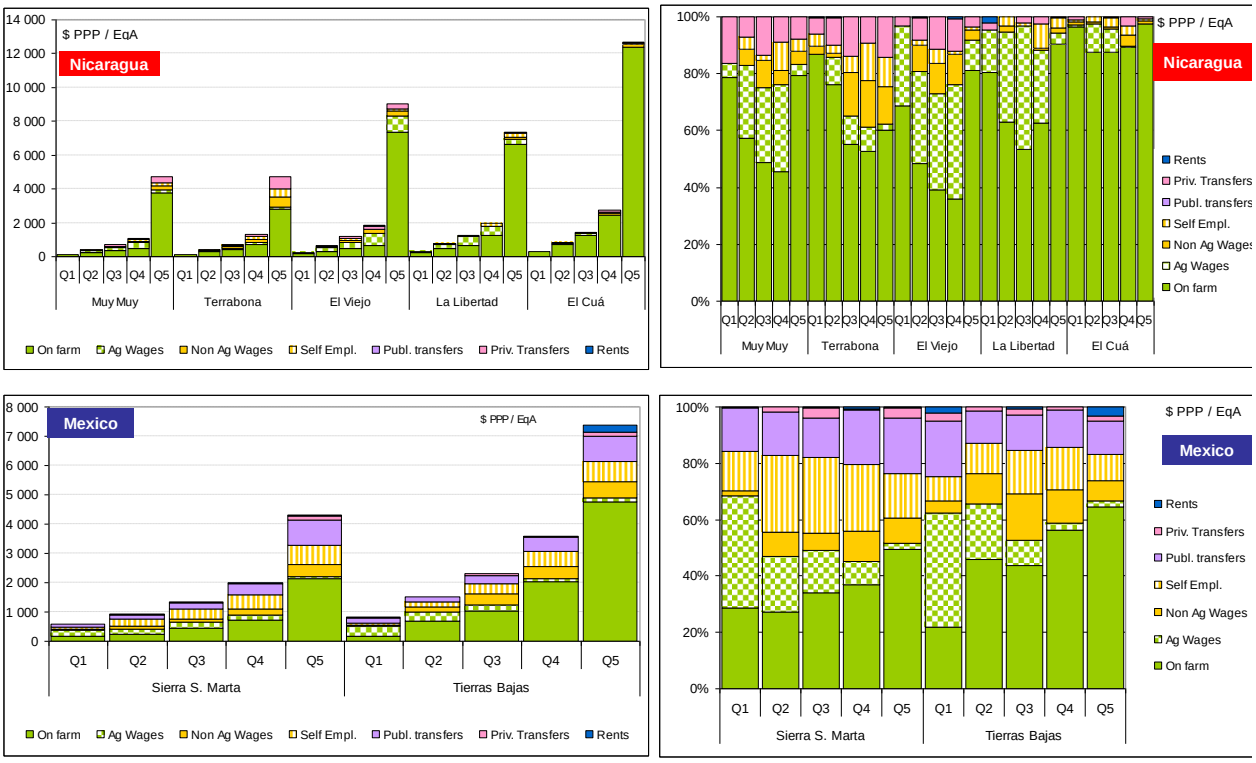
Although on-farm income strongly dominates and plays a major role in their incomes, Moroccan households in the three surveyed regions generate the most diversified off-farm sources: no specific source prevails and a balance of self-employment, agricultural and non-agricultural wages, private transfers, and rents exists in each region. However, off-farm diversification is overwhelmingly found in the poorest quintiles and clearly decreases as incomes grow. This is particularly clear in Chaouia and Souss, while Saïss shows a larger role for on-farm, even for the lowest quintiles. Just like in Madagascar and Mexico, agricultural wages are relatively more important in the poorest quintiles and their frequency significantly decreases as incomes decrease. The extremely low income level of the first quintiles and their strong diversification reveals survival strategies made of multiple off-farm sources, while the highest quintiles show a clear specialization in on-farm activities.

These survival strategies also exist in Nicaragua; however, the "quintile effect" is not as strong and the first four quintiles are more homogeneous with a mix of agricultural wages, non-agricultural wages and remittances. Self-employment is less developed. El Cuá, the coffee zone, is an exception and shows a clear specialization in on-farm activities. Agricultural wages are relatively important in Muy Muy, El Viejo and La Libertad. Non-agricultural wages are significant in Terrabona, where manufacturing (*maquila* industry) is developed, especially for the richest quintiles. Remittances related to international migrations account for 10 to 20% of households' global income in Muy Muy, Terrabona and El Viejo. However, on-farm activities clearly remain the main booster of the fifth quintile.

In Mexico's Sotavento region, the income structure is strongly diversified and reveals the lowest share of on-farm income of all the surveyed regions. It also shows the country's very specific situation wherein public transfers play a major role: representing between 15 and 20% of the family income in all quintiles. On-farm income holds the biggest share of the highest quintiles (Q5), while the poorest households mainly rely on agricultural wages. The other off-farm sources (self-employment and non-agricultural wages) are well balanced among the quintiles and the only exception or anomaly is the very low level of remittances.

Figure 15: Income Structure: Levels and Shares by Category (in $ PPP / EqA)





Source: RuralStruc Surveys.

As an initial conclusion, this review of the income structure per quintile and surveyed region shows that off-farm income sources vary widely, and no clear household diversification pattern is evident. Local and national environments (natural, economic and institutional) mostly determine the range of opportunities and shape the global income patterns, but households adapt according to their own assets and individual opportunities. The lowest quintiles tend to be more diversified in Morocco, Mexico and Madagascar where agricultural wages play a significant role for the lower quintiles. Agricultural wage employment shows a clear association with wealth status across countries. Poorer rural households are more likely to participate in agricultural wage labor, except in Mali and Senegal, where the large demographic structure of rural families limits agricultural labor markets (see section 4). On the contrary, in Mali, Senegal and Nicaragua diversification of income seems to be a characteristic of the highest quintiles, which is the common result found in the literature about rural income diversification. Even if few regions show significant correlations (9 out of 26), this pattern is confirmed (Table 14) by positive correlation between the share of off-farm income and the global income in Mali, Senegal and Nicaragua, and a negative correlation in Madagascar, Morocco and Mexico, where agricultural wages are the only exit option of the poorest households[34].

[34] In Diéma, Mali, the positive correlation shows the specific role of remittances, as well as in Terrabona, Nicaragua, where non-agricultural wages in the *maquila* industry are also significant.

Table 14: Correlation Between the Share of Off-farm Income and the Level of the Global Income

	Mali				Senegal						Madagascar						Morocco			Nicaragua					Mexico	
	Tominian	Koutiala	Diéma	Macina	Casamance	BA Nord 1	BA Sud	Haut Delta	BA Nord 2	Bas Delta	Antsirabe 2	Alaotra 1	Morondava	Itasy	Antsirabe 1	Alaotra 2	Chaouia	Saiss	Souss	Muy Muy	Terrabona	El Viejo	La Libertad	El Cuá	Sierra S. Marta	Tierras Bajas
Pearson Correlation	0,14	0,09	0,32	-0,01	-0,50	0,15	0,26	0,09	-0,04	-0,13	0,03	-0,30	0,03	-0,25	-0,13	-0,44	-0,06	-0,08	-0,24	-0,08	0,13	-0,11	-0,11	-0,09	-0,27	-0,43

* Significant at the 0.01 level
** Significant at the 0.05 level

Source: RuralStruc Surveys.

2.3 *Income Source Diversification versus Specialization: No Universal Pattern*

In order to deepen the understanding of the diversification and specialization patterns, indicators were computed from the seven income categories and for each household using concentration indexes (C1 and C2) and a diversification index[35]:

- C1: The share of the first source of income in percentage of the global income of the household;

- C2: The share of the first two sources of income in percentage of the global income;

- (1-HHI): A diversification index defined as the opposite of the Herfindahl-Hirschman Index (HHI).36 Contrary to the two other indicators, this index takes heed of every source of income. It ranges from zero (entirely specialized) to one (highly diversified).

Because no strong diversification pattern can be identified due to the high variability among households, it is not surprising to find that the first income source (C1) is generally quite high, with variations between regions and countries. However, surprisingly, differences remain limited: the C1 ranges from 61% of the global income in

[35] In order to deal with existing negative on-farm incomes, these indexes were computed using the on-farm gross product and the off-farm incomes. This bias was preferred to the exclusion of households with negative on-farm incomes.

[36] The definition of the index is the following: $1-IHH = 1-\frac{\sqrt{\sum_{i=1}^{n} P_i^2}-\sqrt{\frac{1}{n}}}{1-\sqrt{\frac{1}{n}}}$, where i represents the different income sources (on-farm, agricultural wages, non-agricultural wages, self-employment, public transfers, private transfers, rents), n the number of income sources, and P the percentage of every income source. Because the HHI squares the shares (i.e. the shares of income sources), it strengthens the main pattern of the household.

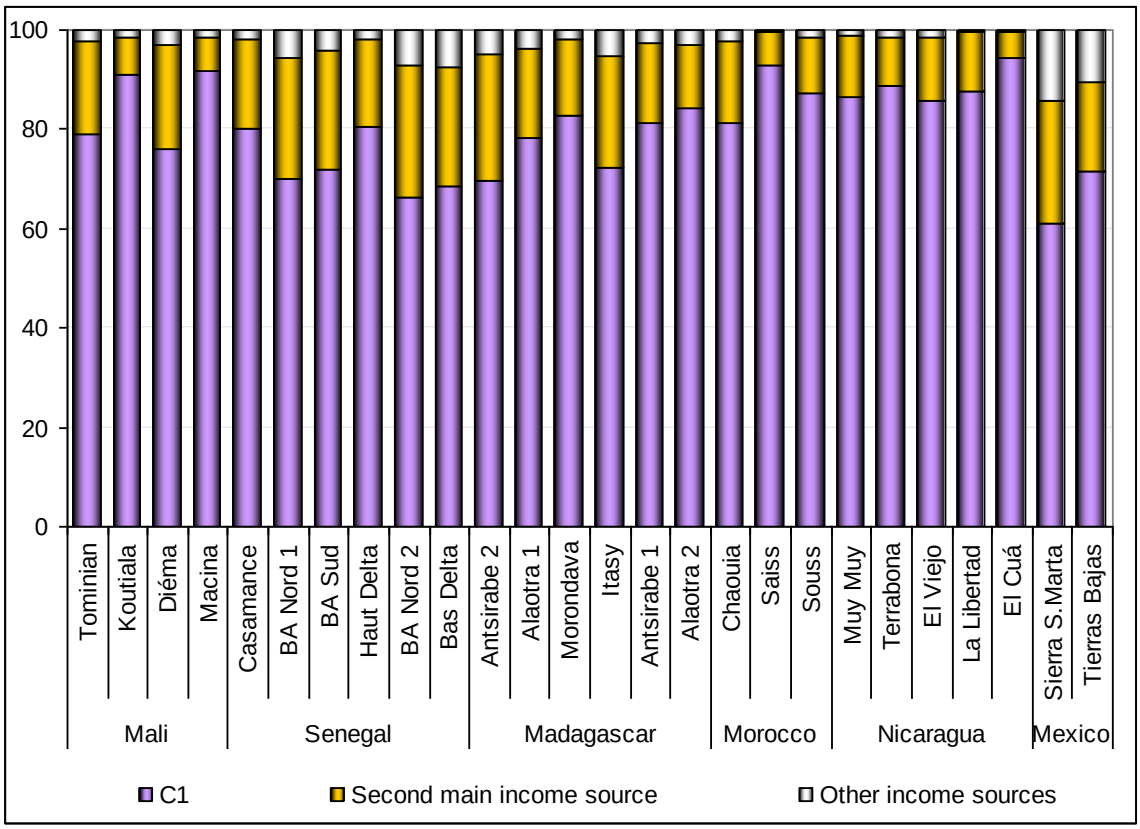
the Mexico's Sierra Santa Marta, to 94% in El Cuá, Nicaragua (Figure 16). Nevertheless, intra-zone variations are very important in all zones and show a range of configurations from entirely specialized to much more diversified households.

The regional variation of C2 is lower: the average C2 stands above 97%, if the two Mexican zones are excluded. One can note that the C2 almost captures the total income in all regions. This means that once the heterogeneities related to the first and second sources of income are aggregated, the income source diversification process is almost entirely captured: it is mainly limited to two sources of income.

As stated in the previous sections, a huge share of households has agricultural activities and the C1 indicator recalls how important agriculture remains as the first source of income (Table 15). In almost every zone and every quintile in Mali and Madagascar, on average, more than 72% of the households get their first source of income from agriculture, whichever quintile is considered. In Mali, the fifth quintile of Diéma is clearly an exception because remittances downplay the role of agricultural activities for a few households. For the Moroccan, Nicaraguan and Mexican zones, the situation is very similar with a few quintiles below 60 or 70%.

The highest shares of households with agriculture (on-farm income or agricultural wages) as their first source of income are recorded in two different types of zones: those that are rather secluded, where few opportunities exist beyond agriculture (Morondava and Antsirabe 2 in Madagascar, and La Libertad in Nicaragua); and those where agricultural specialization exists, whether inherited from old production patterns (Koutiala and Macina in Mali, El Cuá in Nicaragua), or the result of newly developed activities (Antsirabe1 in Madagascar, Saïss in Morocco, Muy Muy in Nicaragua). Furthermore, the poorest households continue to rely on agriculture as a first source of income, as the high shares for the first and second quintiles show, except in the *Bassin Arachidier* of Senegal, as previously explained.

Figure 16: Income Concentration of the Surveyed Households (C1 and C2, in % of Global Income)



Source: RuralStruc Surveys.

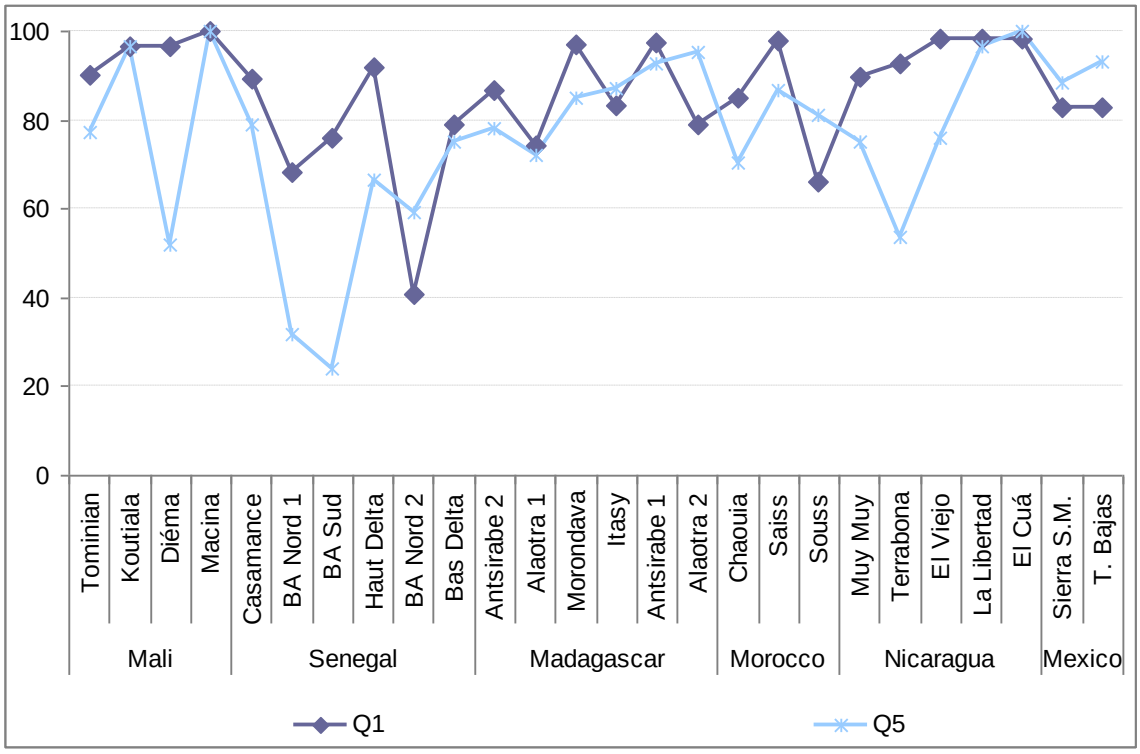
Table 15: Households with Agriculture (*) as the First Source (C1) of Income (in %)

		Quintiles				
		1	2	3	4	5
Mali	Tominian	90	81	81	81	77
	Koutiala	97	97	100	100	97
	Diéma	97	87	83	73	52
	Macina	100	100	100	100	100
Senegal	Casamance	89	67	77	73	79
	BA Nord 1	68	27	30	36	32
	BA Sud	76	65	60	47	24
	Haut Delta	92	92	85	42	67
	BA Nord 2	41	57	57	52	59
	Bas Delta	79	75	52	67	75
Madagascar	Antsirabe 2	87	95	97	84	78
	Alaotra 1	74	74	79	74	72
	Morondava	97	95	91	89	85
	Itasy	83	85	83	93	87
	Antsirabe 1	98	95	93	95	93
	Alaotra 2	79	74	75	86	95
Morocco	Chaouia	85	70	87	74	70
	Saiss	98	91	94	96	87
	Souss	66	75	76	65	81
Nicaragua	Muy Muy	90	87	83	78	75
	Terrabona	93	89	66	58	54
	El Viejo	98	86	73	81	76
	La Libertad	98	95	98	90	97
	El Cuá	98	100	97	95	100
México	Sierra S.Marta	83	63	77	74	89
	Tierras Bajas	83	90	79	93	93

*Source: RuralStruc Surveys, (*): On-farm Income **or** Agricultural Wages*

What is remarkable is the insignificant difference between the patterns of the poorest and the richest households (Figure 17). Agricultural activities rank first quite similarly for quintiles 1 and 5 in a range of 70 to 95%. The exceptions are Diéma, two zones of the *Bassin Arachidier*, Terrabona and El Viejo where the fifth quintile is oriented to non-agricultural activities. On the contrary, Q5 is more engaged on agricultural activities in Alaotra, Souss and the Sotavento.

Figure 17: First and Fifth Quintiles Households with Agriculture as the First Source (C1) of Income (in %)



Source: RuralStruc Surveys.

Given the analysis provided above, what is the second source of income that can also be considered as the first source of diversification? Table 16 complements and fine-tunes the previous income structure analysis. Characteristics of countries and regions are major determinants of this second main source of income:

- Remittances play a significant role in Mali – not only in Diéma, the traditional zone of emigration – in Morocco (Chaouia and Souss), in Terrabona, and Muy Muy, Nicaragua, as well as in the Haut Delta, Senegal.

- Self-employment contributes significantly to the diversification of income, especially in Senegal, Mali, Madagascar and Mexico.

- Public transfers are of the utmost importance in Mexico (mainly *Procampo* and *Oportunidades* programs).

Table 16: Distribution of Households according to their Second Source of Income (in %)*

		Onfarm	Ag. Wage	Non Ag. Wage	Self Employment	Public Transfers	Remittances	Rents
Mali	Tominian	23	3	3	32	2	38	1
	Koutiala	3	11	3	50	3	25	5
	Diéma	24	10	1	8	3	55	0
	Macina	0	30	4	26	10	24	6
Senegal	Casamance	31	1	1	41	0	18	9
	BA Nord 1	44	0	8	31	0	16	0
	BA Sud	38	1	4	43	0	10	3
	Haut Delta	24	0	7	39	0	28	2
	BA Nord 2	35	2	7	45	0	10	1
	Bas Delta	23	1	12	48	0	3	12
Madagascar	Antsirabe 2	17	29	4	43	1	6	0
	Alaotra 1	17	27	5	34	5	5	6
	Morondava	11	33	4	32	3	13	3
	Itasy	17	29	5	38	5	4	2
	Antsirabe 1	12	37	5	35	0	9	2
	Alaotra 2	15	31	4	29	6	6	10
Morocco	Chaouia	29	19	9	14	0	25	4
	Saiss	21	21	9	7	1	25	16
	Souss	18	16	14	14	0	26	10
Nicaragua	Muy Muy	49	8	5	7	0	30	0
	Terrabona	43	6	7	13	0	25	6
	El Viejo	55	13	8	3	0	13	7
	La Libertad	59	26	3	8	0	5	0
	El Cuá	24	19	16	25	0	13	3
México	Sierra S.Marta	13	17	5	32	31	2	0
	Tierras Bajas	5	18	11	30	32	3	1

Source: RuralStruc Surveys (*) % of households which have a second income source.

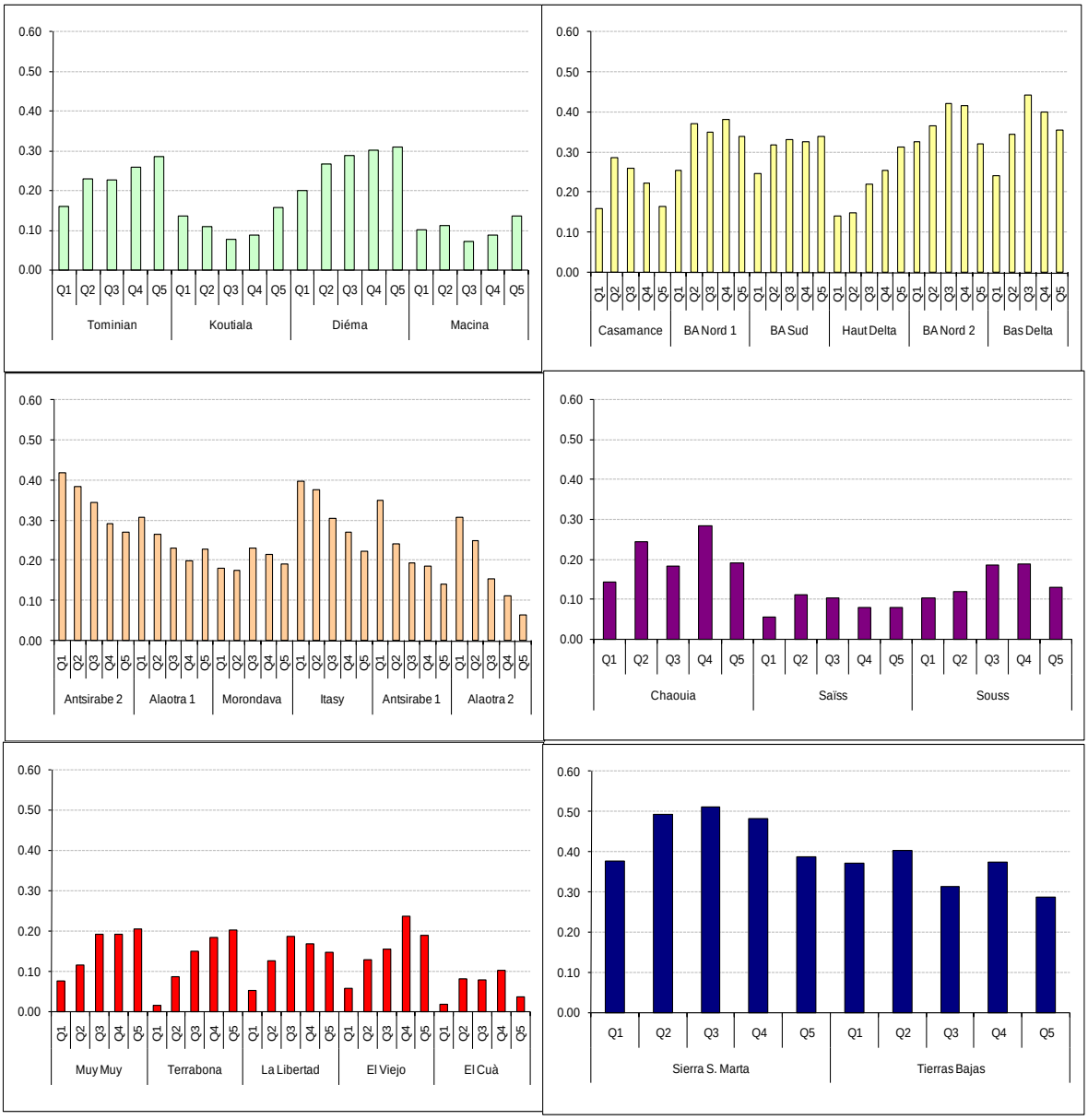
So as to go a step further, and try to identify a relationship between income and diversification, the (1- HHI) is used. The average diversification index by zone is weak in SSA countries, ranging from 0.07 to 0.49 (Figure 18). The highest levels are recorded in Mexico (Sierra Santa Marta), and the lowest in Nicaragua (El Cuà); it rarely exceeds 0.20-0.25, emphasizing the range of households' diversification strategies across studied countries. In Nicaragua, this is due to the higher weight of agricultural activities in the coffee region, and to larger opportunities of diversification in Mexico.

As far as the non-SSA countries are concerned, there are two different types of diversification that are consistent with the respective weight of agricultural activities in the household. Nicaragua tends to feature rather specialized households, with (1- HHI) between 0.07 (the lowest in our sample) and 0.17. The two Mexican zones show more diversified households, with an index between 0.38 and 0.49, the highest in the sample. This situation is mostly linked to the public transfers that do not exist in the other countries and which could automatically be responsible for an increase of the index. However, in SSA as well as in non-SSA countries, it is very difficult to identify any universal pattern. Nevertheless, two main comments can be advanced.

First, except in Madagascar (and Mexico, though to a lesser extent), the poorest quintiles seem to be somewhat less diversified, which is in contradiction with all-out survival strategies but confirms the existence of "poverty traps'" (Barrett & Swallow 2005). A possible explanation for this is households' lack of room for maneuver to engage in diversification (assets) and their concentration on producing the main staple food in order to deal first with their food security. When this first goal can be reached, which means higher revenues, households try to engage in other activities when they are accessible and available. This situation would be coherent in Madagascar, where the poor families have the greatest difficulties in satisfying their minimum food requirements because of the insufficient size of farms and the proportion of households without land. Consequently they have no alternatives and are obliged to find other income-generating activities, the main one being agricultural wage labor.

Secondly, differences in the diversification pattern can occur *among* zones rather than *within* them, as well as among quintiles, and they relate to the specific characteristics of the geographic areas surveyed. For instance, in Mali, where all households are involved in agriculture, the (1-HHI) by quintile and region are consistent with the agricultural pattern of the region: in the rice producing region of Macina (Office du Niger) and in the cotton production area, Koutiala, households are much more specialized than in the two other regions. The same occurs in Casamance and Haut Delta in Senegal, in the coffee zone of Nicaragua, and in Saïss, Morocco.

Figure 18: Diversification Index per Region and Quintile (1-IHH)



Source: RuralStruc Surveys.

3 Rural Income Diversification and Livelihood Strategies

How can one translate the previously explained uneven processes of specialization and diversification into emerging strategies, which could inform alternatives and options, or what the WDR08 calls "exit pathways out of rural poverty"?

The WDR08 provides a helpful framework for discussion of the results of the RuralStruc Program. Based on the results developed by the RIGA project (see Box 13and Davis et. al. 2007), the report distinguishes four types of livelihood strategies among rural households (World Bank 2007, p.75): (i) *farm-oriented* households deriving most of their income from farming activities[37]; (ii) *labor-oriented* households which sustain their livelihoods from wage labor in agriculture, in the rural non-farm economy, or from non-agricultural self-employment; (iii) *migration-oriented* households choosing to leave the rural sector entirely, or depending on transfers from members who have migrated; and (iv) *diversified* households which combine income from the previous options (farming, off-farm activities and migration).

3.1 *Revisiting the WDR08's Livelihood Strategies*

3.1.1 A Global Overview

In order to discuss these strategies, the Program chose to present and compare its survey results with the WDR08's four categories using the same definitions[38] (World Bank 2007). Table 17 presents how the rural households of the surveyed regions are distributed among the four livelihood strategies groups.

Based on this comparison, some major comments can be made. Firstly, and as previously noted, the large majority of rural households is part of the farm-oriented category. In 17 out of 26 surveyed regions, farm income represents the major source of livelihood, and for 12 out of these 17 regions farm orientation counts for more than 50% of the interviewed households. This share reaches more than 80% in two surveyed regions in Mali (Koutiala and Macina), one in Morocco (Saïss) and one in Nicaragua (El Cuá), where strong connections to markets through major value chains are determinant. Mexico

[37] In fact, the WDR08 refers to five strategies, the *farm-oriented* category being split in two: subsistence farming and market-oriented farming. This discussion on the farm-oriented group is engaged further in Chapter 3 with the presentation of the Program's results on market insertion.

[38] The threshold for each group is 75% of the total income: farm-oriented household rely on farm production (all types); labor-oriented households are based on wages (all types) and non-farm self-employment; migration-oriented households earn their income from transfers (public and private) and other non-labor sources (rents, etc.); diversified household have neither farming, labor, nor transfer income sources contributing to more than 75% of total income.

and Senegal are the only two countries in the RS sample where farm orientation does not appear as the dominant pattern.

Secondly, a maximum of 35% of the total households interviewed is off-farm oriented and deriving more than 75% of their income from labor, self-employment or transfers. Senegal is the main exception here, where – for a variety of previously stated reasons – four out of five surveyed zones present around 20% of labor-oriented HH, notably in the *Bassin Arachidier* (up to 35% in BA Nord 1). Similarly, very few households are migration-oriented: less than 9% in all the surveyed regions, including countries like Morocco, Nicaragua and Mexico, where many households are "traditionally" engaged in migrations.[39]

Thirdly, household specialization only occurs for farming, except in Senegal. The diversification category is represented in all the surveyed zones and leads in nine regions, with a maximum of 78% in Sotavento (Mexico). Of the regional samples, 12 to 78% of the households are "diversified". This diversification pattern is generalized at the regional level. However, the diversified category is, of course, highly sensitive to the threshold effect, which is quite high and would rather qualify specialized households. Besides, Davis et al. (2007) consider this 75% threshold as a specialization level rather than an "orientation". To test and confirm the sensitivity of the threshold, the sample was broken down based on the 60% limit. This 15% change strongly modifies the global pattern: the share of the diversified group is halved everywhere, except in the Sotavento, attesting to the resilience of its diversified orientation; in some regions the category is divided by nearly three (Muy Muy, Antsirabe 1, Alaotra 2); the diversification category only leads in the two Mexican zones; and the transfer of households mainly benefit the farm-oriented group.

If the Program's results are compared with those of the RIGA project for Nicaragua and Madagascar – the only two common case studies but with different years of reference (respectively 2001 and 1993) – significant differences emerge, notably in Nicaragua (see Table 17), where the share of labor-oriented households according to RIGA is 48%, instead of a maximum of 32% found in the RS study. On the contrary, the share of farm-oriented household is much lower (RIGA shows 19%, whereas the RuralStruc surveys find from 43 to 85%). The results are not so markedly different in the case of Madagascar, even though the years of reference span over more time: 15 years). One probable explanation for these differences is that RIGA's findings are based on aggregated national results, whereas RuralStruc data illustrate regional situations.

However, even if the survey methodologies, level of analysis and years of reference differ, these gaps illustrate the difficulty of establishing comparable measurements of income across countries, which is clearly indicated by the WDR08 (World Bank 2007, cf. box 3.2, p.76).

[39] See the methodology regarding the difficulties of capturing remittances.

Table 17: Livelihood Strategies in the Surveyed Regions (WDR08's Typology)

			Farm-oriented HH	Labor-oriented HH	Migration-oriented HH	Diversified HH
		N	% of of rural HH in each group per surveyed region			
Mali	Tominian	155	55.5	0.6	1.3	42.6
	Koutiala	153	85.6	0.0	0.7	13.7
	Diéma	148	44.6	1.4	8.1	45.9
	Macina	154	81.2	1.9	0.6	16.2
Senegal	Casamance	239	51.5	9.2	0.0	39.3
	BA Nord 1	111	15.3	35.1	0.0	49.5
	BA Sud	252	21.0	22.6	2.0	54.4
	Haut Delta	61	41.0	18.0	1.6	39.3
	BA Nord 2	113	17.7	16.8	1.8	63.7
	Bas Delta	121	21.5	19.8	0.8	57.9
Madagascar	Antsirabe 2	303	29.7	3.3	0.3	66.7
	Alaotra 1	385	41.8	19.5	0.5	38.2
	Morondava	506	63.2	3.2	0.6	33.0
	Itasy	503	40.2	5.0	0.4	54.5
	Antsirabe 1	206	65.0	2.9	0.0	32.0
	Alaotra 2	115	60.9	11.3	0.0	27.8
Morocco	Chaouia	228	44.3	20.6	7.0	28.1
	Saïss	261	80.5	2.7	3.8	13.0
	Souss	240	44.6	24.6	8.8	22.1
Nicaragua	Muy Muy	299	51.2	22.7	7.0	19.1
	Terrabona	281	57.3	16.7	6.8	19.2
	El Viejo	288	43.1	31.9	4.9	20.1
	La Libertad	290	57.2	18.6	0.3	23.8
	El Cuá	300	85.3	2.7	0.0	12.0
Mexico	Sierra S.M.	175	8.0	12.6	1.1	78.3
	Tierras Bajas	145	20.0	16.6	2.8	60.7
		6032				
Madagascar	*1993 (*)*	*2653*	*59.4*	*9.5*	*1.4*	*29.6*
Nicaragua	*2001 (*)*	*1839*	*18.9*	*48.2*	*0.9*	*32.0*

Source: RuralStruc Surveys, adapted from WDR08, p.76 (World Bank 2007); (*) RIGA results in Davis et al. 2007, p. 162 .
NB: Losses for some activities (mainly farm activities generating negative incomes) are not included.[40]

3.1.2 "Fine-tuning" the WDR08's Livelihood Strategies

In order to better identify the existing trends, if any exist, and to illustrate differences between surveyed regions and countries, the RS Program attempted to "fine-tune" the livelihood strategies proposed and developed by the WDR08. Taking advantage of the RS panel data, the two off-farm livelihood strategies are further detailed by proposing sub-groups and by investigating the diversified type.

[40] Negative on-farm incomes concern 3% of the surveyed households. They are mainly due to low harvests due to bad climatic conditions and to the methodology used to estimate livestock incomes.

Firstly, the labor-oriented category is differentiated in order to discuss the options out of poverty and the development of opportunities out of the agricultural sector. Three sub-groups are identified as maintaining the 75% of global income threshold: wages, non-agricultural wages and self-employment. Then, the migration-oriented category is renamed to better reflect its content (public and private transfers) in "transfer-oriented" and divided into two sub-groups: remittances sent by migrant members and rents, and income from public transfers.

These additional categories do not radically change the global configuration of the sample (Table 18); however, they allow a better understanding of the on-going trends.

Table 18: "Fine-tuned" Rural Household Livelihood Strategies in the RS Countries

				Labor-oriented HH			Transfer-oriented HH		
			Farm-oriented HH	Ag. wages	Non ag. wages	Self-empl.	Remitt. and rents	Public transfers	Diversified HH
		N	%of rural HH in each group per surveyed region						
Mali	Tominian	155	55.5	0.0	0.0	0.6	1.3	0.0	42.6
	Koutiala	153	85.6	0.0	0.0	0.0	0.7	0.0	13.7
	Diéma	148	44.6	0.0	0.0	1.4	8.1	0.0	45.9
	Macina	154	81.2	0.6	0.0	0.0	0.6	0.0	17.5
Senegal	Casamance	239	51.5	0.0	0.8	8.4	0.0	0.0	39.3
	BA Nord 1	111	15.3	0.0	0.0	27.0	0.0	0.0	57.7
	BA Sud	252	21.0	0.0	1.2	17.9	2.0	0.0	57.9
	Haut Delta	61	41.0	0.0	3.3	14.8	1.6	0.0	39.3
	BA Nord 2	113	17.7	0.0	0.9	9.7	1.8	0.0	69.9
	Bas Delta	121	21.5	0.0	2.5	6.6	0.8	0.0	68.6
Madagascar	Antsirabe 2	303	29.7	0.3	0.3	1.7	0.3	0.0	67.7
	Alaotra 1	385	41.8	4.4	0.5	8.8	0.5	0.0	43.9
	Morondava	506	63.2	0.4	0.8	1.4	0.6	0.0	33.6
	Itasy	503	40.2	0.6	0.4	2.0	0.4	0.0	56.5
	Antsirabe 1	206	65.0	1.5	0.0	1.0	0.0	0.0	32.5
	Alaotra 2	115	60.9	4.3	0.0	3.5	0.0	0.0	31.3
Morocco	Chaouia	228	44.3	5.7	4.4	7.0	7.0	0.0	31.6
	Saïss	261	80.5	0.4	0.4	1.5	3.8	0.0	13.4
	Souss	240	44.6	9.2	5.0	8.3	8.8	0.0	24.2
Nicaragua	Muy Muy	299	51.2	14.4	3.7	2.7	7.0	0.0	21.1
	Terrabona	281	57.3	3.9	8.2	3.9	6.8	0.0	19.9
	El Viejo	288	43.1	22.9	5.2	1.4	4.9	0.0	22.6
	La Libertad	290	57.2	15.9	0.3	2.4	0.3	0.0	23.8
	El Cuá	300	85.3	2.0	0.0	0.7	0.0	0.0	12.0
Mexico	Sierra S.M.	175	8.0	4.0	3.4	0.0	0.6	0.0	84.0
	Tierras Bajas	145	20.0	6.9	6.2	0.0	1.4	0.7	64.8

Source: RuralStruc Surveys.

The analysis of the "fine tuned" livelihood strategies indicates that:

Agricultural wages are far from being an option for sustaining livelihoods as a main source of income. It confirms the "last resort" status of this activity, which often concerns the poorest. A significant share of agricultural labor-oriented households only exists in Nicaragua and Morocco (Souss, Chaouia) and, to a lesser extent, in Mexico (Tierras Bajas) and Madagascar (Alaotra). These regions are characterized by landless households for whom selling their labor is the only option, and by farming systems that require an abundant workforce, especially for harvesting (fruits, vegetables, rice, etc.).

Non-agricultural wages are only significant – to a certain extent – in Nicaragua, Morocco and Mexico. It confirms the scarcity of this type of alternative in the surveyed regions

and the importance of regional characteristics (e.g. the presence of *maquilas* in Nicaragua, agrifood processing or services (tourism) in Souss).

Self-employment sustains the livelihoods of a small share (around 2-5%) of the households everywhere, except in a few regions, such as Souss, Alaotra and, above all, Senegal. Self-employment mainly relies on informal activities and particularly petty trade, construction and services.

With all the difficulties related to their accurate estimation, remittances remain clearly limited as a structural basis of livelihood. They appear occasionally in Nicaragua, Morocco and Mali, in the regions previously identified as high emigration areas.

Predictably, public transfers never appear as an option to sustain a living. In Mexico, the only country where they exist, they complement other activities, which means that no households entirely depend on public assistance.

3.2 *Livelihood Strategies and Pathways Out of Poverty*

This typology of livelihood strategies helps to better identify the configuration of the studied regional economies. So far, it confirms the domination of farm-oriented strategies and the limited role of alternative strategies based on off-farm activities, knowing that this picture is accentuated by the selected threshold. It also reminds that the alternative options to farming are quite restricted and illustrates the few existing local opportunities as well as the elusive windfalls of migrations, both at national and international levels.

What is more difficult to ascertain is the effectiveness of these livelihood strategies as exit options out of poverty. The lack of dynamic data is a major limitation of the Program; additional limitations include the high heterogeneity between the households of the sample, and the small number of households per category of strategy at regional level.[41] These obstacles prevent any discussion on income levels per livelihood strategy knowing that the variability of situations is a main recurrent difficulty, as it was well stated by the WDR08, which asserts the same issue:

A household's income structure does not tell whether it is engaged in a successful income strategy. Each of the strategies can become pathways out of poverty, but many households do not manage to improve their situation over time, reflecting the marked heterogeneity in each of the activities and the fact that income varies widely for each of the strategies (World Bank 2007, p.77).

However, in order to discuss which of these strategies is the most successful in terms of a pathway out of poverty, trying to overcome some of the limitations presented above, the distribution of the surveyed households below or above the poverty line of $2 PPP per day is displayed (Table 19).

[41] See in Annex 5 the statistical breakdown of the global income per region and type of strategy.

The data breakdown provides a rough indication that logically echoes the global income levels of the surveyed regions and, more particularly, the weakness of incomes in the SSA countries (see Chapter 1). The percentage of households above the $2 PPP poverty line is generally low and reflects the differences between regions. On the other hand, the higher incomes of the non-SSA countries give more room for interpretation.

Though the share of households out of poverty is globally similar in Mexico and Morocco, whatever the strategy, Nicaragua shows a more contrasted situation where the farm-oriented strategy is overtaken by the three others.

Beyond these few results, this discussion raises, above all, the decisive role of the global environment, which shapes the range of opportunities and the possibilities of exit options.

Table 19: Households Above the Relative Poverty Line ($2 PPP per capita) per Livelihood Strategy

		Farm-oriented HH			Labor-oriented HH			Transfer-oriented HH			Diversified HH		
			≥ 2 $ / day			≥ 2 $ / day			≥ 2 $ / day			≥ 2 $ / day	
		N	n	%	N	n	%	N	n	%	N	n	%
Mali	Tominian	86	0	.	1	0	.	2	0	.	66	1	1.5
	Koutiala	131	2	1.5	0	0	.	1	0	.	21	1	4.8
	Diéma	66	0	.	2	0	.	12	6	50.0	68	1	1.5
	Macina	125	13	10.4	3	0	.	1	0	.	25	7	28.0
Senegal	Casamance	123	15	12.2	22	4	18.2	0	0	.	94	8	8.5
	BA Nord 1	17	3	17.6	39	7	17.9	0	0	.	55	8	14.5
	BA Sud	53	1	1.9	57	13	22.8	5	1	20.0	137	10	7.3
	Haut Delta	25	3	12.0	11	2	18.2	1	0	.	24	4	16.7
	BA Nord 2	20	9	45.0	19	4	21.1	2	0	.	72	20	27.8
	Bas Detla	26	11	42.3	24	14	58.3	1	0	.	70	40	57.1
Madagascar	Antsirabe 2	90	12	13.3	10	4	40.0	1	0	.	202	8	4.0
	Alaotra 1	161	25	15.5	75	7	9.3	2	0	.	147	22	15.0
	Morondava	320	55	17.2	16	5	31.3	3	0		167	25	15.0
	Itasy	202	48	23.8	25	4	16.0	2	0	.	274	32	11.7
	Antsirabe 1	134	42	31.3	6	1	16.7	0	0	.	66	11	16.7
	Alaotra 2	70	46	65.7	13	2	15.4	0	0		32	10	31.3
Morocco	Chaouia	101	61	60.4	47	14	29.8	16	11	68.8	64	45	70.3
	Saïss	210	146	69.5	7	4	57.1	10	5	50.0	34	23	67.6
	Souss	107	83	77.6	59	40	67.8	21	10	47.6	53	48	90.6
Nicaragua	Muy Muy	153	47	30.7	68	27	39.7	21	8	38.1	57	28	49.1
	Terrabona	161	40	24.8	47	34	72.3	19	9	47.4	54	34	63.0
	El Viejo	124	56	45.2	92	63	68.5	14	11	78.6	58	44	75.9
	La Libertad	166	93	56.0	54	34	63.0	1	1	.	69	52	75.4
	El Cua	256	165	64.5	8	5	62.5	0	0	.	36	24	66.7
Mexico	Sierra S. M.	14	10	71.4	22	13	59.1	2	1	.	137	104	75.9
	Tierras Bajas	29	28	96.6	24	16	66.7	4	3	75.0	88	84	95.5

Source: RuralStruc Surveys.

4 Assets and Main Determinants of Rural Income

The previous sections provide an understanding of the income differences between the surveyed regions, with specific reference to their natural and economic environments, which shape the range of opportunities and constraints for the rural households. However, while the environment has an important impact on the above, it is also necessary to investigate the household assets in order to identify the main determinants of income levels.

4.1 *Selection of Significant Variables*

Whatever the type of activity, the production function is basically a mix of labor and capital variables that can be disaggregated into more precise assets: land and equipment, financial resources, skills, social networks, etc.

Due to the specific objectives, configuration and implementation of the household surveys, and their limitations in terms of existing data availability and quality,[42] the present focus is on some basic factors that significantly shape the households' characteristics. Among the many possible combinations and after several tests, two sets of factors were taken into account to feed a simple econometric linear model (OLS) that was computed by region using the survey data:[43]

- The demographic characteristics of the household

The *number of household present members* (Nb_PersonPres_hh) – i.e. a household's total number of members excluding the long-term migrants – is a major structural variable that impacts the activity and income structure, as well as the consumption pattern. It is particularly selected to estimate the labor force instead of the Economically Active Person (EAP) number, following the assumption that most family members tend to participate in household activities. This proxy appears to be more realistic than the standard definition of EAP (15-64 years old persons) because in rural areas in most developing countries, notably on family farms, children under 15 and seniors above 64 are all engaged in domestic and agricultural tasks of all types, even if on a part-time basis.

The *head of household's education level* (c_Edu_Head_hh) is assumed to approximate the management ability of the household, as most decisions related to productive activities are made by the head of household.

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[42] As presented in the methodology, the survey design did not allow a detailed estimation of the households' labor force structure, distinguishing permanent and temporary, domestic and waged workforce; nor did it allow for a specific investigation of the productive assets related to the off-farm activities.

[43] In the case of Mexico, the model was not applied to the only region under review for the statistical work.

- The productive assets

Three main assets were selected: land, equipment and cattle.

The *total cultivated land* (Ha_CultivatedLand_hh) and, when relevant, the *total irrigated land* (Ha_LandIrrig_hh), were chosen to capture land endowment which is a core factor of production. Total available land would have been useful for households (and regions) specialized in livestock production (in particular in Nicaraguan breeding regions such as Muy Muy and La Libertad); however, serial correlation with cultivated land was too strong. Consequently, cultivated land was considered as the most relevant variable.

A household's equipment is captured through an *equipment index* (Index_eqh_hh) computed from the weighted list of equipment for a household.[44] This index is a proxy for the capital intensity of the household's production.

Finally, the *total number of cattle heads* (Nb_CattleTot_hh) was included, the herd being simultaneously a production factor (draft force), an input (manure), an output (breeding) and a type of investment.

All these factors were selected as explanatory variables to compute a reduced form of income determination function, with the global income as the dependant variable of the household.

- Additional variables

After checking the validity of this model, using this set of six variables, additional explanatory variables were added into a second regression to include the hypotheses put forward by the Program and related to diversification of activity and income sources and migrations.[45] These additional variables include:

the role of income diversification in the global income was included with the *income diversification* index (1-IHH) presented above, which is based on the on-farm and the six off-farms incomes; and

the specific role of migrations as an option to sustain the rural livelihoods was added with two variables: the *number of long-term migrants* (Nb_MigrLT_hh) and the *number of short-term migrants* (Nb_MigrST_hh).

[44] Every country team defined the index based on a relevant equipment selection, with every item scored according to its scarcity.

[45] The results of these regressions are presented for 24 surveyed regions in Annex 6.

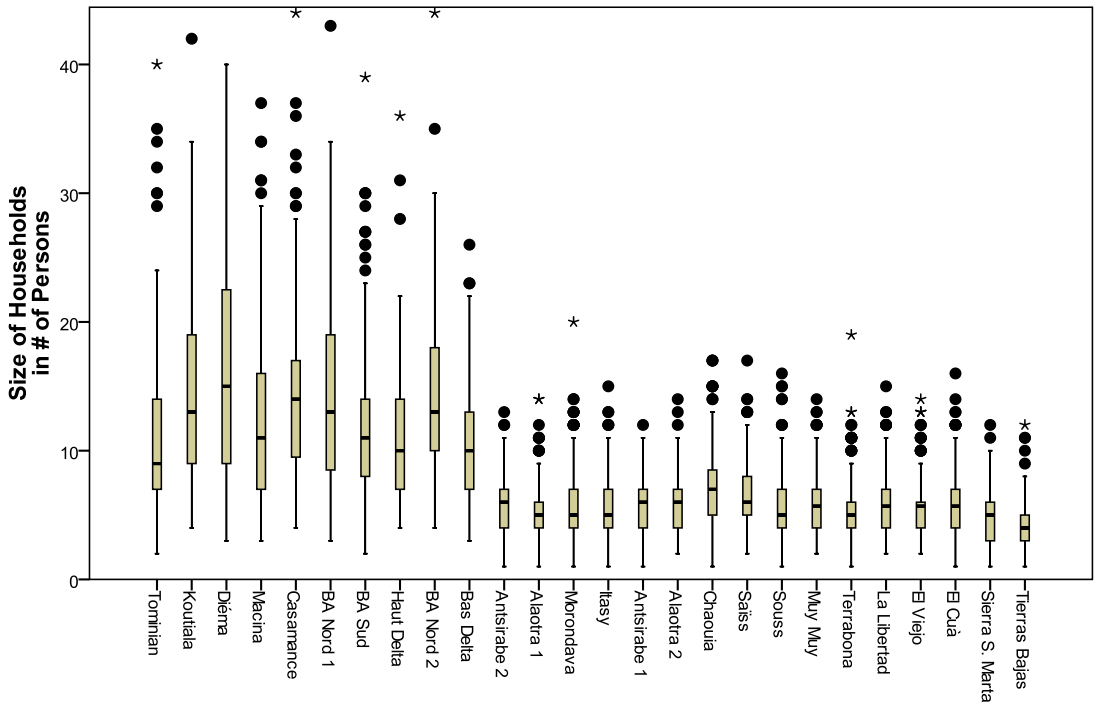
4.2 *Presentation of the Variables Under Review*

Because the migrations results and the diversification index were presented in section 2, the present section will only focus on the demographic characteristics and the productive assets.

- Size of the Households

The sample presents huge differences in terms of demographic structures of the rural households, and shows a clear divide between West African countries (Mali and Senegal) and the other studied countries (Figure 19). Thus, Malian and Senegalese rural households are characterized by their large size (14 and 13 members on average per household, respectively, with sharp variations within regions) – very large families coexist with more "classic" nuclear households; conversely, in the other countries, including Madagascar, the distribution is more homogeneous and the size smaller (between 4.5 and 6.5 households' members). The average household size quite accurately reflects the national situation and is an appropriate indicator of the differences between countries, confirmed by the knowledge base.

Figure 19: Size of Households



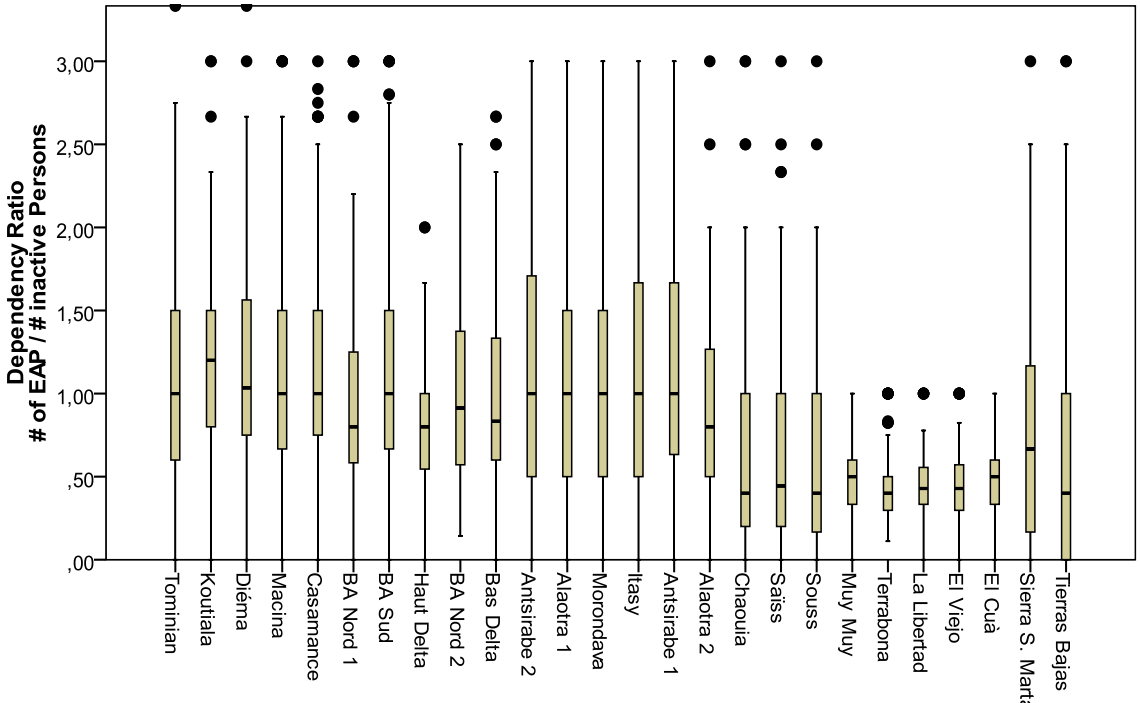
Source: RuralStruc Surveys. NB: extreme values are excluded from the present figure.

The large traditional family structures of Mali and Senegal, which aggregate several nuclear households under the authority of an elder – most often the head of lineage, and

land lord – still play a central economic role. They also influence the distribution of rural population: the households with more than 20 members represent 19% and 12% of the sample in the two countries, but they respectively account for 39% and 24% of the surveyed population. The size of the household shows a strong positive simple correlation (significant at 0.01 level) with the global household income for all the SSA countries: from 0.4 to 0.6 in Mali, 0.3 to 0.5 in Senegal, and also 0.25 to 0.3 in Madagascar.

The role of the demographic structure also translates into higher dependency ratios (non-EAP / EAP population) found in the SSA countries (Figure 20); it confirms the weight of young people and illustrates the unachieved demographic transition of the continent (see Part I). On average for the surveyed households, the ratio is 1.17 in Mali, 1.16 in Madagascar and 1.08 in Senegal, while it is between 0.4 (Nicaragua)[46] and 0.6 (Morocco) in the non-SSA countries. These differences are important in terms of present productive capacity but also indicate the looming challenges related to an increasing labor force.

Figure 20: Dependency Ratio



Source: RuralStruc Surveys.
NB: extreme values are excluded from the present figure.

[46] The very low ratio in Nicaragua shows the impact of the civil war and the large share of single-parent families.

- Head of household's education level

In each country the head of household's education level was dispatched along the five modes presented in Table 20, which shows remarkable results with huge differences expressing the significant gaps existing between the countries' education systems.

Table 20: Head of Household's Education Level

	No education	Primary School started	Primary School completed	High School started	High School completed or University Level
Mali	84%	10%	2%	4%	0%
Senegal	79%	16%	3%	2%	0%
Madagascar	18%	56%	7%	18%	1%
Morocco	50%	15%	22%	10%	3%
Nicaragua	39%	4%	52%	5%	1%
Mexico	29%	46%	15%	2%	8%

Sources: RuralStruc Surveys.

The deficit of formal education is overwhelming in Mali and Senegal, while Madagascar shows a better record with one-quarter of household heads having completed primary school. The best results are found in Nicaragua. Regional differences also exist, and are noteworthy: in Senegal, the education level is higher in the Delta region, which confirms a greater provision of public goods by the state, while on the contrary Morondava in Madagascar confirms its status as a remote area marked by weak state presence, which translates into the low education record.

- Land assets

Average figures at the regional level have little significance because extremes are important, as a result of the different agrarian and family structures, and translate into high standard deviations. This is why data are displayed in EqA in order to balance households' sizes, notably in West Africa.

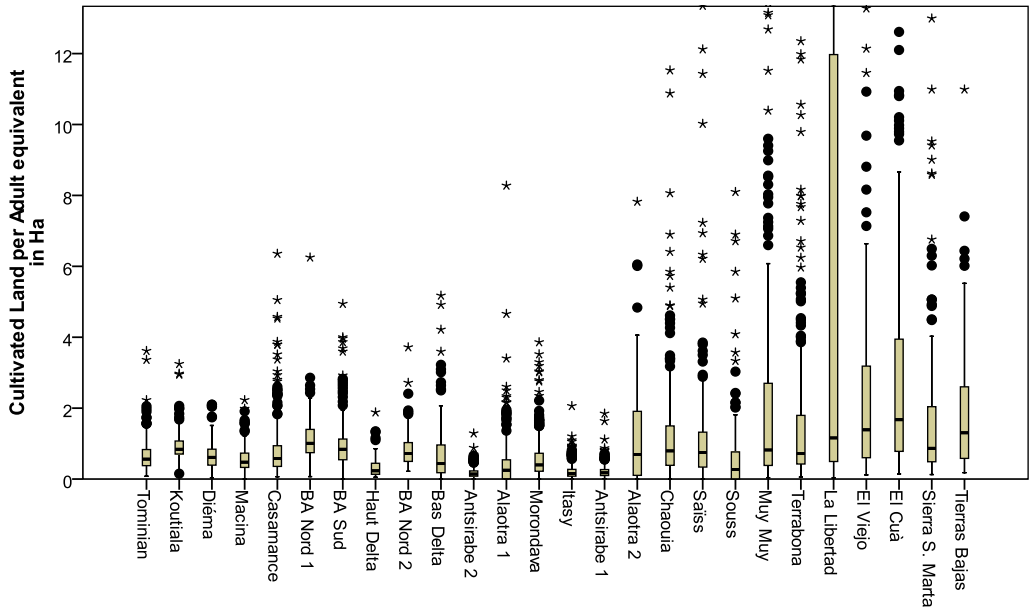
As previously mentioned, Latin American countries differ from African countries in terms of agrarian structure. On the one hand, large managerial farms mix with small family holdings: thus, in Nicaragua, the agrarian census (2005) indicates that 58 % of the households are family smallholders whereas 21% are small emerging farmers and 18% are managerial farms. In our sample, in La Libertad for instance, 20% of the richest households owned managerial farms and concentrate 53% of the total land in property. On the other hand, due to the difficulties of land access, landless households exist; the family members are obliged to sell their labor to farms, if no other opportunities exist out of agriculture. In Muy Muy and El Viejo, Nicaragua, from 1 to 6% of the surveyed households are landless, respectively, while in Sotavento landless households represent 7 and 8% of the sample (in the Sierra and in the Tierras Bajas).

This situation is not common in SSA where land access is mainly based on customary usufruct rights. However, migrants can be confronted with difficulties in accessing land when land occupation is high. The specific case is the Madagascar highlands, where high population densities led to a decrease in the average farm size.[47] Also, it is increasingly difficult for young people to access land in this context of dense occupation. In the RS sample, almost 80% of the households involved in agricultural wage employment in Ambatondrazaka (Alaotra) do not have land access.

In Morocco, land access is also an issue due to the importance of state-owned land, notably in the many agricultural development schemes. In irrigated areas where commercial agriculture has developed, smallholders can be obliged to rent their own land and become agricultural workers due to lack of financial capital and access to credit. In Souss region 10% of the households our sample are landless households.

As a consequence, cultivated land per adult equivalent presented in Figure 21 depicts extremes, with the Nicaraguan regions like La Libertad, El Cuá Muy Muy or El Viejo, the two zones of Sotavento, and the Moroccan zones such as Chaouia and Saïss where the average areas are above 1.4 ha per EqA at one end of the spectrum, and Madagascar's tiny 0.25 ha / EqA plots at the other.

Figure 21: Cultivated Land per Adult Equivalent



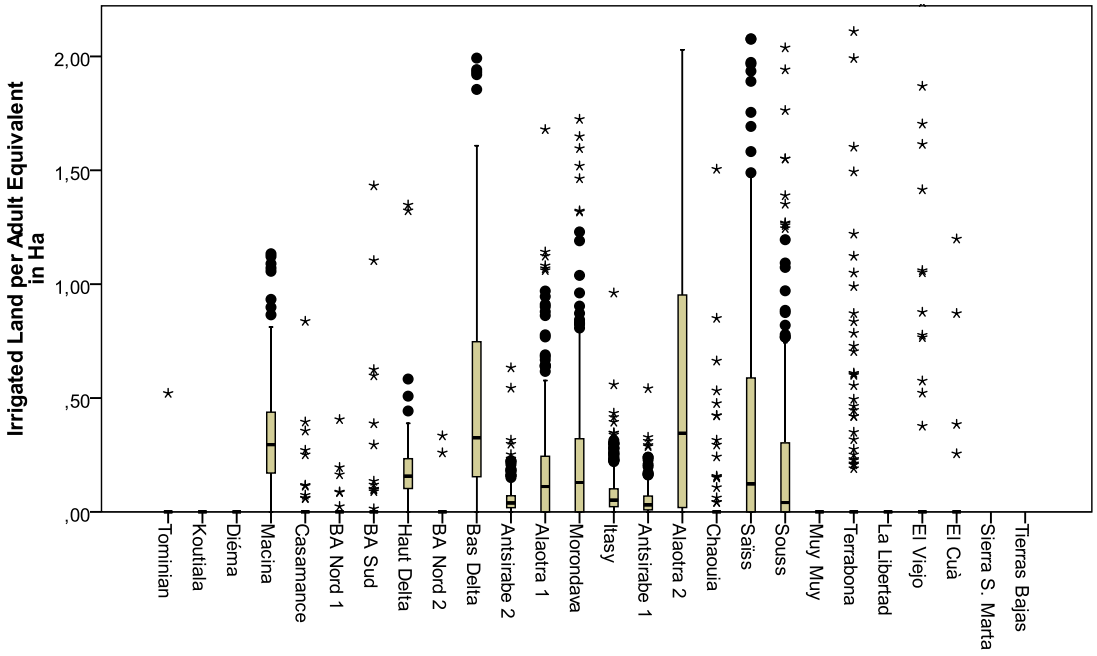
Source: RuralStruc Surveys. *NB: extreme values are excluded from the present figure.*

[47] Between the last two censuses (1985 and 2005), the average size of farms dropped from 1.2 Ha to 0.86 Ha.

As shown by Figure 22, irrigated land exists in several regions. In Mali (Macina), Senegal (Delta) and Madagascar (Alaotra), and in Morocco (Saïss and Souss), irrigation is the result of state interventions that initially developed large irrigation schemes, which were sometimes furthered by private initiatives. In Nicaragua (Terrabona) or Casamance (Senegal), there is no irrigation scheme, and irrigation is related to the specific assets of individual farms. On the contrary, in the other Malagasy zones than Alaotra, irrigation is the result of rural community initiatives which have implemented small traditional irrigation schemes down the valleys. Average surfaces by EqA are significant where large irrigation schemes exist: in Alaotra, the Delta and Saïss (0.6 to 0.7 ha), in Macina and Souss (0.3 to 0.4 ha), but also in small irrigation schemes like in the other zones of Madagascar (where the available irrigated land is logically more limited).

Simple correlations between cultivated and irrigated land and global income are significant in most of the surveyed regions.

Figure 22: Irrigated Land in Adult Equivalent (in Ha)



Source: RuralStruc Surveys. *NB: extreme values are excluded from the present figure.*

Variability of results due the mode of calculation of the equipment index does not allow a generalized or simplified breakdown and comparison of results. Similarly, the different status of cattle in the agrarian systems does not allow for a brief presentation.

4.3 *Regional Results*

The proposed model captures a rather large share of the determinants of households' global incomes in most of the countries and regions (see Annex 6). The coefficient of determination (R^2) remains low in regions where the share of off-farm income is important, especially non-agricultural wages and self-employment (like in Muy Muy, Terrabona, and La Libertad in Nicaragua, or *Bassin Arachidier* in Senegal). This is not really surprising, as most of the explanatory variables are linked to on-farm activities.

The results confirm the previous analysis on the structure of income by region, while adding some interesting complements. Table 21 shows the significant variables by region emanating from OLS estimates and corroborates the importance of cultivated land in most of regions. It also highlights the role of irrigation, where it exists, and the contribution of a household's demography and cattle holding in the aggregated results. The diversification index is significant to the analysis of many regions.

Table 21: OLS Estimates of Households' Global Income in Six Countries

	Mali				Senegal						Madagascar						Morocco			Nicaragua					Score /24
	Tominian	Koutiala	Diéma	Macina	Casamance	BA Nord 1	BA Sud	Haut Delta	BA Nord 2	Bas Delta	Antsirabe 2	Alaotra 1	Morondava	Itasy	Antsirabe 1	Alaotra 2	Chaouia	Saiss	Souss	Muy Muy	Terrabona	El Viejo	La Libertad	El Cuá	
Nb_PersonPres_hh																									10,5
c_Educ_Head_hh																									7,5
Nb_CattleTot_hh																									12
Index_Eqh_hh																									7
Ha_CultivatedLand_hh																									16,5
Ha_LandIrrig_hh																									11
1-IHH																									10
Nb_MigrLT_hh																									8
NB_MigrST_hh																									1,5

** Significant at the 0.10 level
* Significant at the 0.05 level

Source: RuralStruc Surveys

In Mali, the first result is the strong correlation between global income and cultivated areas, which is consistent with agriculture as the main activity in the four surveyed regions. This is the only common variable across the region, beyond which only specific characteristics emerge. Hence, the rice-producing region of Macina features irrigated land and equipment as the main determinants of income; it is likely that because rice production allows households to secure their food, some of them can start diversifying their income. In Koutiala, the extensive cotton production system points out the importance of the labor force, expressed here by the size of the household, leading to a negative correlation between migrations and income. Surprisingly, the number of cattle does not demonstrate a significant contribution, even if the animal draft force is a major asset in the development of the farm output (both cotton and cereals). In Koutiala, but also in Tominian, income diversification is correlated to the global income, which is consistent with the difficult climatic and economic conditions (price of cotton) that make

agricultural activities rather risky; therefore, income diversification is an important variable, which contributes to the sustainability of livelihoods. As expected, the number of long-term migrants is significant Diéma, a well-known region of migration. This could explain the lack of relationship between livestock and global income: either opportunities are too limited to allow for a higher degree of diversification, or remittances are sufficient to secure livelihoods without the need for households to multiply economic activities.

In Senegal, as previously mentioned, the model cannot adequately account for regions where off-farm activities are important, notably the *Bassin Arachidier*.[48] It is surprising that the diversification index is more significantly correlated to the global income level (except in BA Sud) with regard to the income structure presented in the previous section; the most probable explanation is the generalized diversification of income and the low return of these activities. Diversification is not a criterion for differentiation. A second important result is the positive correlation with the size of the household: one explanation could come from the pattern of the diversification process, which mainly relies on the addition of the many activities involving the different members of the household. As a consequence of this low level of farm income, land and irrigated land are only significant in Casamance, where agriculture still plays an important role due to the lack of infrastructure and the remoteness of the region; in Haut Delta where tomato production is well established; and in the rice producing region of Bas Delta. In these three regions, as well as in BA Nord, the importance of livestock is noteworthy.

In Madagascar, as in Mali, all regions display a major positive correlation between land and income owing to their high agriculture-oriented rural economies. The importance of agriculture, notably rice, is clearly featured: irrigated land and the size of the households as a proxy of the labor force are always significant, except in Antsirabe where the production pattern is much more horticulture-oriented. In Itasy, Morondava and Antsirabe 1, the diversification index explains part of the income level, without clearly indicating whether diversification is responsible for higher income or whether wealthier households tend to diversify their activities once their food security requirements are met. In Antsirabe 1, due to high population density, rural-rural migration exists and seems to contribute to livelihood sustainability.

In Morocco, once again, cultivated and irrigated land is important in the three regions. More surprising is the insignificance of the diversification index, notably in Chaouia and Souss, in spite of highly diversified income structures. The extensive diversification, as well as the poor economic results of the first quintiles, can explain this situation. The education index is positively correlated to global income in Chaouia, a region directly connected to the big metropolis of Casablanca. However, higher opportunities of wage labor do not translate in higher incomes and do not show any specific link with possible higher skills.

[48] In the case of Haut Delta, the low score of R^2 is probably related to the small dimension of the sample.

In Nicaragua, the econometric model has a very poor explanatory power in all regions except El Cuà, a traditional coffee production zone. Two elements could explain these results. The first is the importance of livestock, especially in Muy Muy and La Libertad, and the lack of adequate explanatory variables, such as the total available land instead of the cultivated land. This last variable only dominates where cattle production does not (in El Viejo and El Cuà). The other element probably relates to the importance of off-farm income, notably in Muy Muy and Terrabona, a dimension that the RS model does not adequately address. Nevertheless, several variables are significant, like the number of cattle in these regions, which probably captures a part of this production system. El Viejo seems to illustrate the importance of the diversification of income structures for poor households to sustain their livelihood: because the diversification index is negatively correlated to income, one can assume a subsistence diversification pattern. But this does not preclude migration from being positively correlated to global income. These results confirm the dual rural economy that prevails in this region.

Chapter 3 Subsistence Agriculture versus Integration to Markets?

Insertion of farms into markets is a main feature of economic development. For centuries, this structural trend has characterized the world's rural economies. Its pace has accelerated since the early 19th century in relation to the dynamics of urbanization, the development of transportation and the progressive emergence of a fully integrated world economy; however, this process is far from complete. Although many countries – including their rural areas – are widely and fully inserted, many others still face unequal levels of market connection, which can affect large portions of the country.

While the donor agencies and academia emphasize strong integration processes related to global market restructuring – the consequences of which RuralStruc's first hypothesis sets out to explore – the rural household surveys' results show a more diversified picture, which helps to qualify various configurations of rural realities. In many regions, particularly in SSA, physical remoteness remains a fundamental obstacle to market access. As asserted by the World Development Report 2009 (WDR09), low demographic densities, which complicate the emergence of new activities in the absence of economies of scale, and distance to urban areas,[49] due to the lack or the poor quality of infrastructure, are significant obstacles to rural families' improved integration into the global economy. More globally, overwhelming rural poverty, characterized by low incomes, clearly depicted in Chapter 1, low human capital, as well as insufficient production factors, appear to be significant barriers to farm households' participation in "new markets", shaped by the new rules these markets impose. The characteristics of market insertion are, of course, directly related to a country's general level of development, which impacts the density of its infrastructure, economic networks and services, the skills of its labor force, the "institutional thickness" (Amin & Thrift 1993) of its governance structures, and the diversity of its economic activities.

This chapter will deal first with a general overview of the global processes of change in agrifood markets. There is an abundance of literature on the subject, and the main objective of the first section is not to provide a deep review of this literature, but to set the scene to later analyze the results of the surveys implemented during the Second Phase of the Program. The chapter will then present the concrete situation encountered in the surveyed regions. It will show how the farmers of the survey sample are connected to markets through the analysis of their on-farm productions and their level of insertion into markets, discussing the importance and the permanence of self-consumption. It will discuss, in conclusion, the types of market integration through a review of the few modes of commercialization and existing processes of contractualization.

[49] The WDR09 emphasizes the central role of three main dimensions for economic development: density, distance and division (i.e. borders, currencies, regulations, etc.) (World Bank 2008, p. 7).

1 General Background: the 'Big Restructuring'

1.1 *The Main Processes of Change Underway*

1.1.1 Market Liberalization

a) Context Prior to Liberalization

In all of the RS countries, as in many developing countries, the agricultural markets prior to liberalization were similarly characterized by an asymmetric dual system with strong state intervention. On the one hand, most staple domestic markets and commodity exports were controlled and highly regulated via marketing boards, state-run industries, administrative commodity pricing, and, often, fixed wholesale and retail prices for many basic food products. Most of the time, these public bodies were monopsonies, especially for major export products and sometimes for staples (with some cases of associated monopolies). These structures were initially created to i) promote sector growth, with agriculture being perceived as the first sector of accumulation; ii) stabilize producer prices (and incomes) within a single season and reduce variability between seasons, with the objective of reducing risks; iii) increase prices and improve incentives by reducing the number of intermediaries along the commodity chains; and iv) facilitate the insertion of exports into international markets through management of the national supply.

On the other hand, few traditional non-staple markets (fresh products, such as fruit and vegetables, dairy, etc.) were almost free, with little or no state intervention or price regulation. Spot transactions with many small, non-specialized and unorganized buyers and sellers characterized those markets, where few – if any – grades or standards existed, poor market information systems prevail and mostly informal contracts, largely enforced through social networks, were the norm (Fafchamps 2004).

Due to the weakness of the private sector, states also intervened in processing, mainly through parastatals (see Box 14), with key industries in the traditional export sector such as groundnut, palm oil, tea, coffee, cocoa, sugar, etc. Many of the industrial crops were produced by public vertically integrated firms aiming at economies of scale (processing, transportation), and / or justified by the need for quick processing, in particular because of perishability and quality requirements of the products (like palm oil or tea).

Box 14: State Intervention in some RS Countries' Food Markets Prior to Liberalization

Mali: The Malian agricultural economy was based on an administered system that lasted 25 years after Independence and was transformed very gradually. The state controlled main staples and export markets (cereals, cotton, etc.) through parastatals or semi-public companies, which intervened in marketing and, in some cases, in production, storage and distribution also. Through the *Office des Produits Agricoles du Mali* (OPAM), created in 1964, the Malian state controlled marketing structure of agricultural products – particularly for grains. OPAM had the monopoly of the collection of grains from producers at fixed prices and was then in charge of the distribution of cereals in the country (RSI Mali, p. 51).

Mexico: Direct state intervention in agricultural markets was a major component of Mexico's development policy until the beginning of the 1990s. The state supported the commercialization and the storage of major products, creating state-run structures responsible for the supply of the domestic market in staples (dealing with local production and imports), and also for the supervision of exports such as coffee and tobacco. For instance, in 1958, the INMECAFE (*Instituto Mexicano del Café*) in charge of the promotion and the modernization of the coffee production (among other things) was created. The CEIMSA (*Compania Exportadora e Importadora Mexicana SA*) was created in the 1950s, replaced in the mid-1960 by the CONASUPO (*Compania Nacional de Subsitencias Populares*). These public institutions played a key role by supporting prices of staples for the producers, by processing, storing, and distributing the crops and by regulating trade through direct imports (RSI Mexico, p. 24; Losch et al. 1997,;Yunes Naude 2003).

b) Withdrawal of the State and Fading Regulation

In the 1980s and 1990s, market-oriented agricultural policy reforms were a centerpiece of liberalization in developing countries, within the context of structural adjustment programs designed to restore fiscal and current account balance, to reduce or eliminate price distortions, and to facilitate efficient price transmission, so as to stimulate investment and production (Akiyama et al. 2003, Barrett & Mutambatsere 2005). These reforms were justified by the fact that the original objectives of the state-run structures, such as marketing boards, development agencies and public enterprises, were most widely diverted, especially during the second half of 1970s agricultural price boom. These public structures, which had controlled marketing and regulated prices of agricultural products in most DCs, became the target of the liberalization process and the symbols of the state inefficiency. Thus, the first steps in reforming agricultural markets were the dismantling and the privatization of the state-run structures, and the reduction of tariffs and export taxes, consumer subsidies, and producer price controls.

The following table (Table 22) presents some examples of the dismantling of former public bodies in the RS countries. These processes of restructuring all occurred over an extended period of time (from the end of the 1970s to the end of the 1990s). As discussed previously, depending on countries' historical trajectories, the starting point, the scope, and the pace of liberalization were all country specific and explain large variations among countries.

Table 22: Scope of Market Reforms in RS Countries

	Marketing at producer level BEFORE liberalization	AFTER liberalization
Mali		
OPAM Office des Produits Agricoles du Mali	State marketing board which had the monopoly of the commercialization of grains	1986: removal of the monopoly 1989: liberalization of imports and commercialization of grains
Office du Niger	Parastatal which managed water, land and irrigation infrastructure, production, marketing, and processing of rice	1994: objectives restricted to land management, infrastructures maintenance, and extension
CMDT Compagnie Malienne de Développement des Textiles	Semi public company (40% of the capital belong to the French DAGRIS, now Geocoton) in charge of inputs supply, extension, marketing, and processing of cotton seed, supply of cotton fiber to the Malian public textile industry COMATEX and exports	On-going liberalization since 2004
Senegal		
ONCAD Office national de commercialisation et d'assistance au développement	State marketing board which had the monopoly of the commercialization of domestic agricultural products (groundnut, grains) and imports, and supervised the cooperatives of producers	1979: liquidation 1991: liberalization of local market and imports of rice
SONACOS Société nationale de commercialisation des oléagineux du Sénégal	State-run processor for groundnut oil	2006: privatization
Madagascar		
BCSR Bureau de Commercialisation et de Stabilisation du Riz	State marketing board which had the monopoly of collect and commercialization of rice	1986: total removal of the monopoly of the commercialization of rice in domestic market 1990: privatization of imports 1991: removal of the buffer stock 2005: removal of import taxes
HASYMA Hasy Malagasy	Semi public company (36% of the capital belong to the French DAGRIS) which ensured collection and commercialization of cotton seed, and trade of cotton fiber to local textile industry and exports	2004: privatization (90% of the capital bought by DAGRIS, now Geocoton)
Morocco		
ONICL Office National Interprofessionnel des Céréales et Légumineuses	State marketing board which fully controlled marketing of grains through fixed prices (especially wheat), and strictly controlled imports	1988 - 96: progressive liberalization of the grain market Quotas subsist for the "national flour"
OCE Office de Commercialisation et d'Exportation	State marketing board which had the monopoly of exports such as citrus, horticultural products, canned foods etc.	1985: removal of the monopoly and liberalization of exports
Nicaragua		
ENABAS Empresa Nacional de Alimentos Basicos	State marketing agency which had the monopoly for the commercialization of staples and export crops such as peanuts, sesame and soy	1984: elimination of price differential for basic grains 1990: full liberalization of staples commercialization
Mexico		
CONASUPO Compania Nacional de Subsitencias Populares	State-run enterprise that had the monopoly for the supply of the domestic market in staples (marketing of national production and imports management), and supervision of exports	1989: removal of the marketing monopoly of national products and imports and limitation of its intervention to maize and beans
INMECAFE Instituto Mexicano del café	State marketing board which supported farm production and handled processing and marketing of coffee	1993: dismantling of the board and liberalization

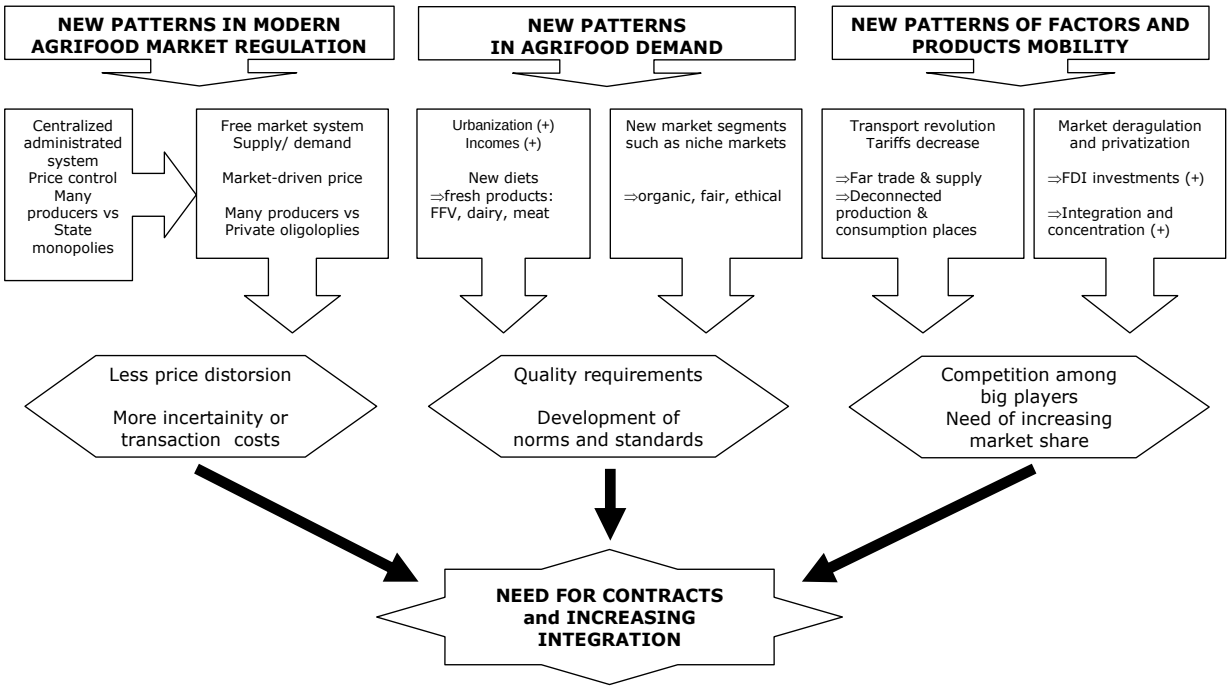
Source: RuralStruc Country Reports, Phases 1 and 2.

State withdrawal from agricultural markets and the dismantling of parastatals and regulation systems have generated a new economic and institutional environment at the national level. However, this change has to be put in perspective with other major processes of restructuring within the international agrifood markets.

1.1.2 The New of Agrifood Markets

The new agrifood markets are the result of the liberalization process but also of more specific developments related to new patterns in food demand, which have been boosted by the increasing mobility of factors resulting from globalization (see Figure 23). The main consequence of this evolution, which started in the 1980s, is a trend towards increasing integration processes the main attributes of which are the development of standards and closer relations between producers and buyers. These processes are, of course, developing at very different paces among countries. The aim of the following section is to provide a framework of reference for understanding what is underway, in order to better position the discussion on the RS countries.

Figure 23: New Patterns and Trends in the Agrifood System Resulting from Liberalization and Globalization



Source: Authors, diverse inspiration.

a) New Patterns in Agrifood Markets Regulation

The dismantling of the public regulation structures and of the centralized supply management systems had several consequences that can be summarized by two main features.

First, value chains rapidly became market-driven and dependent on supply and demand variations. Many new private actors emerged but were often eliminated later because of intense competition. In many situations, one of the conditions for survival was increasing alliances with foreign capital. This phenomenon exacerbated an asymmetrical situation: whereas markets still incorporated many fragmented producers, larger but fewer marketing agents have progressively controlled the value chains.

Second, due to the removal of administrated regulation and price management, uncertainty and transaction costs increased for those emerging private actors engaged in the new competitive environment. Faced with this context, the main trend among trade and processing companies was to implement strategies to secure their supplies through the implementation of contract arrangements with producers. Some of them engaged in closer integration by buying local subsidiaries, organizing supply networks with specific support to producers, etc. At the same time, increasing competition over the international and national markets fostered processes of concentration, the result of which was the emergence of many "big players" that deeply transformed market dynamics.

b) New Patterns of the Food System

In the meantime, the food system is evolving quickly, although the pace of change varies considerably from region to region. There are several major trends behind these changes: i) the world's population is becoming increasingly urban; ii) growing incomes result in quickly evolving diets with more proteins and high-valued foods (meat and dairy, fruits and vegetables) instead of staples; iii) until the current period of growing food prices, structurally decreasing prices have stimulated the agrifood market dynamics; and iv) an increasingly integrated world trade environment and improved transportation systems have spurred the convergence of dietary patterns and food preferences (FAO 2004).

As a consequence of these combining factors, consumer-driven value chains, such as fruits, vegetables, meat, dairy products, fish and seafood products, have rapidly grown. Telecommunications allow long-range commerce, and changes in shipping and storage technologies in the mid-late 1980s allowed fresh produce (apples, strawberries and asparagus, for example) to be shipped from the Southern Hemisphere producers to Northern Hemisphere consumers. This expanding demand and trade of perishable products and high-value foods brought about a need for more standards for food safety and animal and plant health; this need is demonstrated by the growing attention on the risks associated with microbial pathogens, residues from pesticides, veterinary medicines or other agricultural inputs, for example. New international rules were introduced such as the Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures. The implementation of stricter food safety and quality standards has had strong impacts on the evolution of supply chains; in particular, exporters and retailers employ new forms of

production and marketing contracts, while technical and / or financial assistance is often provided to strengthen these new networks.

In parallel, the shift of the market drivers from supply to demand, in a context of increasing incomes (at the aggregate level) has also transformed the focus and relationships among the commodity chain stakeholders. Today, more careful consumption has grown among consumers who are increasingly looking for safety and for information on the way products are grown and traded, to ensure socially fair and sustainable conditions. This growth in consumer awareness has progressively supported a range of new alternative initiatives in international, national, and local agrifood systems, and has fueled changes in retail patterns as fair trade, organic, and other "alternative foods", which have entered the mainstream venues. With the emergence of these niche markets, new types of standards and specific controls have been extended, parallel to the implementation of certification structures. For instance, efforts are made to protect the integrity of organic standards to further differentiate organic foods by accurate labels and to promote different forms of short supply chains for local community development. Beyond these standards, the International Federation of Organic Agriculture Movements (IFOAM) has been created, basing certification on several issues such as the principles of health, ecology, fairness and the principle of precaution. As for fresh products, contractualization is growing between producers and exporters / retailers as the best means to guarantee standards and requirements.

Contracts, in their various forms and with varying degrees of obligations, usually reduce risks for the buyer and seller and have appeared in response to the removal of the formerly controlled marketing systems as a possible way to guarantee standards and requirements for the purchaser. For the producer, selling under contract arrangements is less risky when the requirements for the product are high and its characteristics are complex. Also, it is often the only way to access specific markets. For this reason, contracts have progressively spread to both emerging fresh product chains and niche markets, where product attributes are clearly defined in terms of norms and standards, and where the final value of production allows for the coverage of specific costs of contracts (selection, negotiation, monitoring, and enforcement).

c) New Patterns of Factor Mobility and Trade, and Rising New Actors

Since the 1980s, growing long-distance trade and increasing FDI have broadly modified the scope of agricultural production and marketing. They are the consequence of both a more open international economy resulting from economic liberalization and also of progress in technology (the Internet for finance and information on the software side; shipping, storage, processing on the hardware side). These factors all greatly increase the efficiency of international trade and domestic marketing, and have paved the way for major investments by new players everywhere, particularly in processing, and retailing since the 1990s (Barrett & Mutambatsere 2005). Consequently, a handful of vertically integrated transnational corporations have gained growing control over global trade, processing and retailing of food products (Vorley 2003). The tremendous development of

these processes in the case of the distribution of products has resulted in the so-called "supermarket revolution" (Box 15).

The differences between countries can be explained by socio-economic factors related to consumers' demand for supermarket services, product diversity and quality. Among these factors one can cite as examples: income level and urbanization, correlated with the opportunity cost of time (in particular that of women), and reductions in transaction costs through improvements in roads and transport and ownership of refrigerators. These demand-side factors are necessary, but not sufficient, to explain the very rapid spread of supermarkets in the 1990s and 2000s in developing countries, most of which had a very small supermarket sector before 1990. Supply-side factors, combined with the overall objective of governments throughout the developing world to modernize the retail sector, were also of extreme importance, especially the influx of retail foreign investment as countries liberalized FDI, and improvements in procurement systems arose.

Box 15: The World Spread of the Supermarket Revolution

The penetration of modern food retailing varies among developing countries. Reardon and Timmer (2007, p. 2840) write: "Experiencing supermarket-sector "takeoff" in developing countries in the early to mid 1990s, the first-wave include much of South America, East Asia outside China, and South Africa – a set of areas where the average share of supermarkets in food retail went from roughly only 10-20% circa 1990 to 50-60% on average by the early 2000s. The second-wave include parts of Southeast Asia, Central America and Mexico where the share went from circa 5-10% in 1990 to 30-50% by the early 2000s, with the take-off occurring in the mid to late 1990s. The third-wave include countries where the supermarket revolution take-off started only in the late 1990s or early 2000s, reaching about 10-20% of national food retail by circa 2003; they include some of Africa and some countries in Central and South America (such as Nicaragua, Peru and Bolivia), Southeast Asia, and China and India and Russia. Sub-Saharan Africa presents a very diverse picture, with only South Africa firmly in the first wave of supermarket penetration, but the rest either in the early phase of the "third wave" take-off of diffusion - or in what may be a pending – but not yet started – take-off of supermarket diffusion".

1.2 *Consequences of Restructuring for Farming*

All these changes in the global agrifood markets, and their continuation at the country level, predictably have upstream consequences at the producers' level. However, the main questions are the strength, the amplitude and the pace of this global restructuring for farming.

In theory, global markets present an opportunity for the suppliers – new 'valuable' consumers and new products year round – as far as they are able to connect. Contractualization is often seen as a tool for fostering smallholder integration in these new markets, increasing and stabilizing their incomes. The WDR08 strengthens this view and argues that contractualization and development of agricultural entrepreneurship is

one of the ways for smallholders in developing countries to escape from poverty (World Bank 2007, p. 127). Indeed, smallholders are considered to be very efficient producers in terms of labor intensity and labor-related transaction costs, although they are constrained by capital and liquidity difficulties, as well as by a lack of access and / or capacity to adopt technological innovations. Contract farming with supermarkets or processors can precisely help them overcome those constraints.

However, as previously mentioned and as reiterated by Reardon and Timmer (2007), among others, contractualization implies increasing requirements in terms of norms and standards, sometimes including specifications on how the product should be grown, harvested, transported, processed and stored. Consequently, contracts and the new markets they connect with are a real opportunity for the producers who are able to respond to their requirements, but they also present a substantial risk of marginalization for those who are not. This evolution could be decisive for the development of many value chains with a clear impact on farm structures. The core issue here is to identify how developed these processes of differentiation are, so as to be able to anticipate their impacts, both positive and negative.

These questions have been dealt with by the recent *Regoverning Markets* research program (Box 18), which shows that a main trend is an initial growth in the participation of smallholders in new modern value chains, frequently followed by their progressive marginalization as larger producers enter the market and are able to provide more supply with the required quality (Huang & Reardon 2008). This progressive differentiation among producers is exacerbated by the practices of major retailers or by the supermarkets' procurement systems. Indeed, as they try to facilitate the adoption of their specifications and to reduce their transaction costs, supermarkets and major retailers often chose to work with a reduced number of suppliers able to provide high volumes and high quality in due course.

Box 16: Regoverning Markets

Regoverning Markets is a multi-partner collaborative research program (2005-2007) analyzing the growing concentration in the processing and retail sectors of national and regional agrifood systems and its impacts on rural livelihoods and communities in middle and low-income countries. The aim of the program was to provide strategic advice and guidance to the public sector, agrifood chain actors, civil society organizations and development agencies on approaches that can anticipate and manage the impacts of changes in local and regional markets.

Regoverning Markets focused on agrifood market restructuring in order to assess its upstream impacts on the various segments of the value chain: retail (particularly supermarkets), processing, whole sale and farming. To respond to this purpose, the Program compared country / product pairs, each at different stages of restructuring, using farm household surveys and commodity chain analyses. Household surveys were conducted with a focus on the selected products among high-value chains, mainly fresh products such as fresh fruit and vegetables and dairy.

Source: http://www.regoverningmarkets.org/

Nevertheless, it appears that these evolutions remain poorly informed. More is known about the characteristics and modalities of value chain integration and contractualization development, particularly thanks to the *Regoverning Markets* Program, but little is known about the extent of these processes. How far and how deep did they trickle down in the different developing countries for which we know that the pace of change has been different? What numbers are at stake? How many farmers are engaged in these new chains?

2 An Elusive New Agriculture?

The previous section provides a global overview of the processes of change underway in the agrifood systems and their consequences in terms of increasing the integration of agriculture. These processes obviously occur at different paces, depending on local and national characteristics. The RS countries are no exception and the regions surveyed by the Program illustrate a large diversity of situations.

However, the striking result of the fieldwork is the high share of staple crops in the farm production of the surveyed households and the particularly important share of self-consumption, indicating both very uneven access to markets and producers' risk management practices. This result must be put into perspective with the Program's selection of countries and regions, which *de facto* does not include long-standing exporting areas, such as the regions of plantation economy, specialized in coffee, cocoa, sugar cane or palm oil,[50] where the connection to markets has deeply affected the pattern of the rural economy over a long period of time. Nevertheless, when selecting the winning regions in each country for the implementation of the fieldwork, one could have expected more deeply marked results in terms of crop diversification and connection to markets. This is not the case and the pattern of these most integrated regions of the sample remains relatively strongly "domestic oriented".

This section will first review the patterns of agricultural production and will then discuss the conditions of market access.

[50] We refer here to the large peasant plantation economies of the Gulf of Guinea in SSA, for example. The coffee region of El Cuà in Nicaragua is relatively near to this pattern. On the contrary, El Viejo, an old cotton export zone, which redeveloped in sugar cane, sesame and groundnut for export in the 1970s, is part of the more common dual Latin American system: the smallholders in this region's surveyed localities are not integrated into these value chains mainly controlled by large managerial farms.

2.1 *The Resilience of Old Production Patterns*

2.1.1 A Brief Overview of New Agricultural Developments in the RS Countries

With regard to the processes of global restructuring presented in section 1, the RuralStruc countries correspond to a wide range of situations. The history of their connection to the world markets, their agricultural specialization and leading exports, their public policies, the size of their domestic markets gave rise to very different interests from both local and foreign investors. This led to different patterns and paces of change.

High-value chains have developed in relation to new export opportunities and growing modern retail systems; however, the figures are uneven and often very low. Taking as an indicator the participation of each country in the newly integrated value chains, it appears that the penetration of modern food retailing in the overall retail system is highly contrasted. Based on the updated data from the *Regoverning Markets* Program (Reardon & Huang 2008) and its classification related to the share of modern food retail versus total food retail, the RuralStruc countries are dispatched across the three stages of development of the modern food industry: Mexico is in the *advanced stage* (more than 40% of overall food sold in supermarkets); Nicaragua, Kenya, and Morocco are in the *intermediate stage* (between 10 and 40%); Senegal, Madagascar, and Mali are in the *initial stage* (<10%).

This gradient of penetration of the supermarkets in the food-retailing sector is broadly related to the average level of income per capita, which generally corresponds to more diversified and urbanized economies. This is relevant with the situation among the RS countries, with the initial stage corresponding to the lower income countries, Kenya being an exception at the Sub-Saharan Africa level.

Table 23: Modern Food Retail, Urbanization and Income per capita in the RS Countries

	Kenya	Madagascar	Mali	Mexico	Morocco	Nicaragua	Senegal
GDP per capita 2007 ($US)	645	375	556	9,715	2,434	1,022	900
GDP per capita 2007 ($PPP)	1,542	932	1,083	14,104	4,108	2,57	1,666
Urbanization in 2007 (%)	21	29	32	77	56	56	42
Modern food retail (%)	18	ns	ns	55	5	20	ns

Sources: World Development Indicators,2009; Regoverning Markets Program
ns: non significant

However, what is the impact upstream on producers? *Regoverning Markets* tells us: firstly that there is a large difference between the overall penetration of supermarkets and their penetration of the high-value segments of the food chain (in Mexico, which holds the highest share, supermarkets only sell 25% of the fresh produce retail); and secondly that supermarkets source the majority of their products from wholesale markets and

sometimes from large scale companies under contracts. Consequently, especially in the case of SSA, it is clear that these processes are marginal (except in parts of Kenya).

In the case of high-value products, the information is very scarce and it is difficult to estimate the number of farms engaged in these chains, especially those under contractual agreements. The statistical systems focus on farm structures and production by estimating surfaces and quantities produced rather than the number of producers involved per type of production and commercialization system. Only partial information coming from specific case studies gives clues about the processes underway; however, it is often anecdotal and contradictory. It is very difficult to systematically collect reliable information on the size of value chains in terms of participating farmers. Table 24 provides figures about the number of farmers involved in different types of productions in the RS countries, focusing on staple food and high-value products which are, for some of them, produced under contractual agreements.

Table 24: Relative Size of Value Chains in the RS Countries (number of farms and % of total)

	Census	# of farms	Main staples in (Thds of farms) and %	High value products in (Thds of farms) and %
Kenya	1994	3 440 000		Dairy (15) 0.4% Horticulture (20) 1%
Madagascar	2005	2 428 500	Rice (2,000) 82% - maize (1,000) 42% - Potato (250) 10%	Green beans (10) 0.4% - Dairy (2) ns
Mali	2004	805 200	Millet & sorghum (700) 87% - rice (170) 21%	Onions (17.4) 2.1%
Senegal	1998	437 000		Tomato (12) 3% - Eatable Groundnut (32) 7%
Morocco	1996	1 496 000	Wheat (1,200) 80%	Citrus (13) 0.8%
Nicaragua	2001	199 500	Maize (141) 71% - beans (115) 67%	Tomato, onion (8) 4%
Mexico	2000	3 400 000	Maize (3,150) 92%	

Source: RuralStruc Country Reports, Phases 1 and 2;

One of the main conclusions of the RS Program and its country reports is that the integration and contractualization processes that result from the restructuring of agricultural markets remain limited and contrasted. They are mainly concentrated in horticulture in a broad sense (Senegal, Madagascar, Kenya, Mexico and Nicaragua), with more specific specialization in dairy (Nicaragua, Madagascar) and fruits and vegetables (Morocco). Opportunities in niche markets (organic, fair trade, early vegetables) exist, but they are limited, with only a small number of farms involved in each country. Agribusiness plays a direct role in the organization of these new chains, as is the case for the dairy products in Nicaragua or horticulture in Madagascar and Mexico (see Box 17).

The size of these modern and new value chains appears stunted when compared to the total number of producers nationwide: tens of thousands versus hundreds of thousands farmers. They are also spatially limited with specific locations related to the collection areas of agro-industries or wholesalers' and exporters' packaging centers. As a consequence, a vast majority of farmers does not participate in these new markets: they rely on the "old" productions, mainly staples and traditional export crops. However, it is

Box 17: The Development of High Value Chains, Standards, and Contractualization in RS Countries

Madagascar: The development of the green beans chain in Madagascar is closely linked to one firm – LECOFRUIT (*Légumes, Condiments et Fruits de Madagascar*) –, which operates through regular contracts with European supermarkets (*Leclerc, Intermarché, Auchan, Casino*). Malagasy green beans for export are mainly extra-fine, canned with the annotation "picked and placed by hand". Approximately 10,000 farmers are under contract, adding up 500 ha in 2004/05. A share of the production of green beans is outside the scope of the contracts and then sold by farmers on local markets via traditional marketing channels (RSI Madagascar, p. 74-75). See also Box 18

Mexico: Fresh horticultural markets are well-known important and dynamic components of the Mexican agricultural sector, and more than 2 million producers are involved in this production. The NAFTA, signed in the early 1990s, is often cited as the primary contributor to the recent growth in US imports of fresh vegetables (Malaga et al. 2001). Mexican horticultural exports to US increased from 61 to about 86% of the total agricultural exports earnings between 1991 and 2004, reinforcing Mexico as the first supplier of those products to the North American market (RSI Mexico p. 54-55). However, export products are mainly produced by large farms under contract with agro-industrial companies – such as *BirdsEye, Green Giant, Campbell's* or *Del Monte* – which rapidly became key actors for the integration of Mexican products into world markets (Echanove & Steffen 2005).

Nicaragua: After hurricane Mitch devastated northern Nicaragua in 1998, the United States Agency for International Development (USAID) funded the Cooperative League of the United States of America (CLUSA) to implement a series of economic reactivation programs. One of those focused on developing certified organic coffee production. Nine cooperatives (CECOCAFEN, PRODECOOP, PROCOSER, SOPPEXCA, La Gorrion, CORCOSAN, Solidaridad, and La Providencia) are involved in the program, with about 6,000 smallholders who developed certified organic coffee production under delivery contracts with the marketing cooperative prior to harvest time. At the same time, OXFAM started to promote alternative model of Fair Trade coffee production with about 2,000 producers under contract with CECOCAFEN (out of a total of approxinately 42,000 coffee growers). By 2005 Nicaragua's government started a new alternative way to trade coffee through Internet, with international tasters who guarantee high quality of gourmet coffee. This initiative, called "cup of coffee", brought high prices and recognition to Nicaraguan coffee and attracted important companies such as *Starbucks*, which currently not only buys coffee but also finances gourmet coffee producers. Since then, gourmet and alternative coffees represent about 20% of total exports of Nicaraguan coffee (RSI Nicaragua, p. 110-114).

Senegal: The horticultural sector plays a major role in Senegal's recent strategy of export diversification towards high-value crops. The growing demand for these products increases the need for tighter coordination and leads to important structural changes within the horticultural export chain, with major implications for farmers including: increased consolidation at the agro-exporting industry level, as well as at the primary producers' level, and increased vertical coordination with downstream buyers in the EU as well as with upstream suppliers (Maertens et al. 2006; Maertens & Swinnen 2006). The need for regular supplies in quality and quantity generates the introduction of institutional arrangements based on contracts (inputs supply), certification (EUREPGAP, HACCP norms, matching the limit of pesticide residues), and a labeling system ("Origine Sénégal"). The implementation of these contracts facilitates the development of national exports (RSI Senegal, p. 84-86); however, the number of farmers involved remains limited (around 12,000).

significant to note that some former modes of integration exist and remain, particularly when linked to agro-industries. They often rely on the existence of monopsonies (cotton in Senegal and Mali, cotton and tobacco in Madagascar) or remaining price regulations (wheat in Morocco, peanut in Senegal, sugar in Morocco and Madagascar).

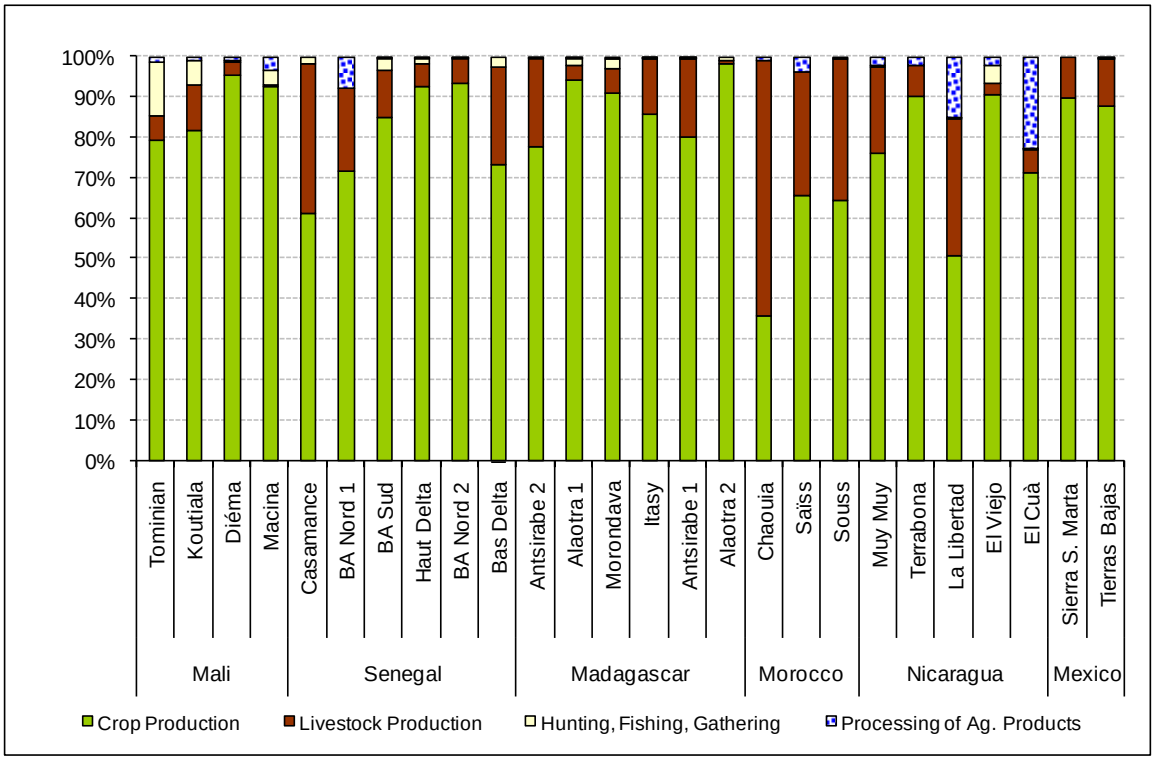
2.1.2 The Agricultural Production Pattern in the Surveyed Regions: The Weight of Staples

Even if it is only representative of the localities surveyed, the RuralStruc panel confirms the importance of the old production pattern. Though, the selected regions offer a significant range of situations in terms of connection to markets.

As previously stated (in Chapter 2), the Program distinguishes four types of on-farm productions: crops; livestock products; fishing, hunting and other gathering activities; and on-farm transformation of products. As seen in Figure 24, crop production generates the main share of the on-farm income and dominates everywhere, except in the extensive livestock regions of Muy Muy and La Libertad, in Nicaragua, and in Morocco. In Chaouia, the weight of livestock is related to important sales of cattle and small ruminants due to a very bad crop season (drought), which deeply affected the yields and obliged many farmers to sell animals. The use of natural resources is very limited in terms of income generation;[51] the main activities are: fishing in the Office du Niger zone (Macina, Mali) and El Viejo (Nicaragua), on the Pacific Coast; gathering of fruits (agroforestry) and extraction of sand in Tominian, the poorest region surveyed in Mali. Processing of on-farm products is restricted and mainly concerns livestock products (mostly cheese production) and first processing of coffee in Nicaragua, cheese and olive oil in Morocco (Saïss) and groundnut paste in Senegal.

[51] The estimation of incomes generated by gathering activities is often difficult because they relate to small amounts of products that are gathered throughout the year, and are often self-consumed. However, wild fruits, animals and fish often play a core role in the food security of the rural households.

Figure 24: Overall Structure of the On-Farm Income (in % per surveyed region)



Source: RuralStruc Surveys.

In order to analyze agricultural production further, five main categories of products were designed by summarizing more than 30 products identified during the field surveys. These five categories are presented in Table 25. This type of grouping exercise is always complicated, particularly when it includes different regions and their different consumption patterns, particularly because the utilization of products varies[52].

Table 25: Categories of Products Used for Data Analysis

Staples	Rice, maize, wheat and durum, other cereals (millet, sorghum, fonio, barley), cassava, potato, other staples (peas and beans - niebe, voandzou, chick peas, lentils, etc.), soy
Traditional Exports	Cotton, groundnut, sesame, coffee, sugar cane
Fruits and Vegetables	Olive, citrus, other fruits, green beans, tomato, onion, other vegetables
Livestock Products	Milk, other livestock products (butter, meat, etc.), live animals
Others	Forage, others (coconut, herbs and spices, etc.), other sub-products (sweet potatoe, cassava, groundnut leaves, etc.)

Source: RuralStruc Surveys.

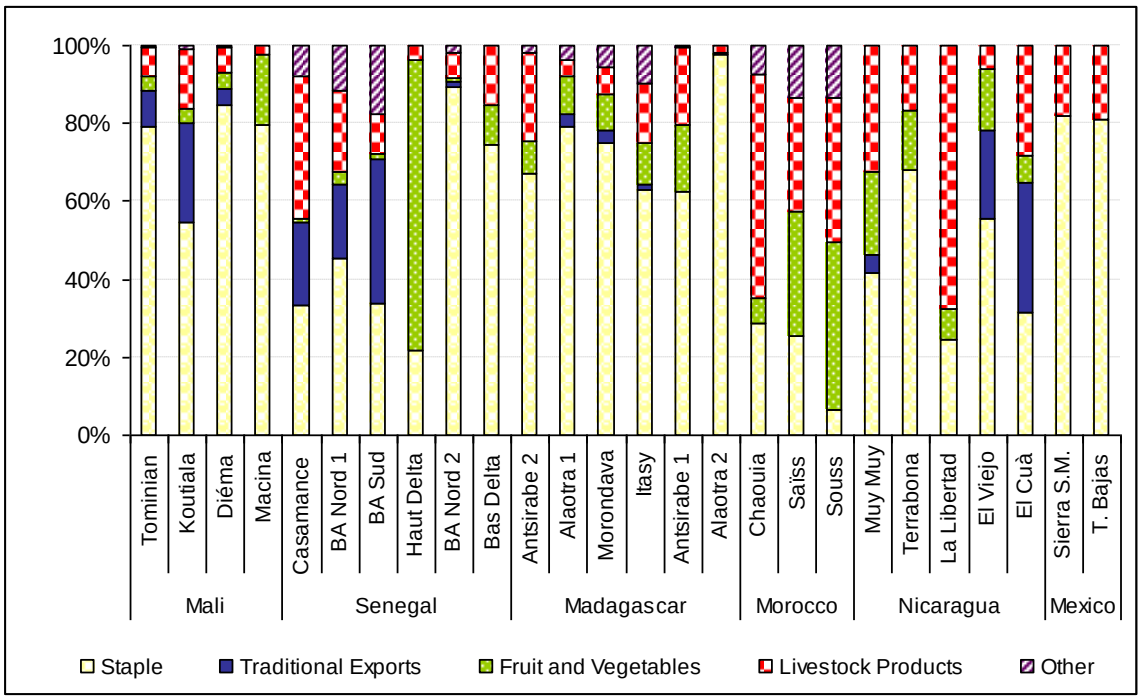
[52] This is the case of potato, a horticultural product that is also self-consumed and can be considered as a staple in Madagascar. This is also the case of groundnuts, the traditional export of Senegal, which was considered as such even if they are increasingly consumed locally, as a consequence of the adverse evolution of the value chain.

Figure 25 displays the overall structure of the households' gross farm product across the regions[53]. The striking result is obviously the large share of staple food crops. In all zones but the Moroccan and four Senegalese regions (Casamance, BA Nord 1, BA Sud, Haut Delta), staple production varies between 60 and 80% of the gross farm product. Generally, staple production concerns one main type of products, usually cereals: rice throughout Madagascar, Macina in Mali, and in Senegal's Bas Delta; millet and sorghum in the three other regions of Mali; wheat in Morocco; maize in Mexico and Nicaragua[54]. In Antsirabe (Madagascar), potato accounts for an important share of the food staple production. Although, the potato value chain originally developed in response to urban demand, the product progressively transformed the local consumption pattern and is now widely self-consumed or sold to supply cities in place of rice during the lean period.

[53] In this chapter, dedicated to on-farm production and commercialization, the survey results are displayed in absolute and relative gross farm product per household (total of sales and self-consumption of crops and livestock productions) instead of income. Self-consumption includes gifts to family, social and religious networks (see methodology). The choice of selecting the gross farm product for the analysis aims at focusing on the general pattern of production and commercialization, without the interference of adverse economic results related to specific regional conditions. It is coherent with the estimation of the global farm income, for which the aggregated farm costs were deducted from the sum of the gross products per crop (the tabulation of the costs at the crop level being impossible with this type of survey). It also minimizes the consequences of the methodological choices for the estimation of livestock results, which mainly rely on flows.

[54] Rice and sorghum are also produced in El Viejo (Nicaragua). In this very specific case, they are considered as commercial commodities and not staple food for the households, especially sorghum which is totally sold for animal food processing.

Figure 25: Main Farm Productions (in % of Gross Farm Product per surveyed region)



Source: RuralStruc Surveys.

Horticulture is important in many surveyed regions. This is particularly the case in Morocco, where exports of fruits and vegetables (mainly citrus, tomato and olive) has become a major industry over the last two decades in Saïss and Souss, although their share of farm output remains limited in our sample. This situation is the result of the selection of localities, as well as the concentration of the industry, which has a small number of big processing and / or exporting companies. Vegetable production is also developed in Terrabona (Nicaragua), where some households engage in irrigated productions that mainly supply domestic markets through traditional spot markets but also more integrated value chains (procurement systems of supermarkets, see Box 15). In Mali, a significant onion production exists in Macina that mainly targets domestic but also regional markets: it contributes to 20% of the gross farm product. Tomato production is also developed in the Senegal River valley (Haut Delta) because of a processing firm that provides the local market with tomato paste. Aside from the previously described case of potato, horticulture is also developed in Madagascar, particularly in Antsirabe and Itasy. In Antsirabe, it is related to the presence of temperate fruits and vegetables (peaches, apples, carrots, etc.), which are produced thanks to the specific agro-ecological conditions of the region, mainly to supply urban demand (cities of Antsirabe and Antananarivo). A small – and now famous (because of frequent citation in literature, see Box 17 and Box 18) – green bean production for export markets is also developed in Itasy, which is closely linked to the presence of an export-oriented processing firm.

Traditional export commodities are limited in the surveyed regions and are very region-specific. Their development is mainly related to the regional history and results from both

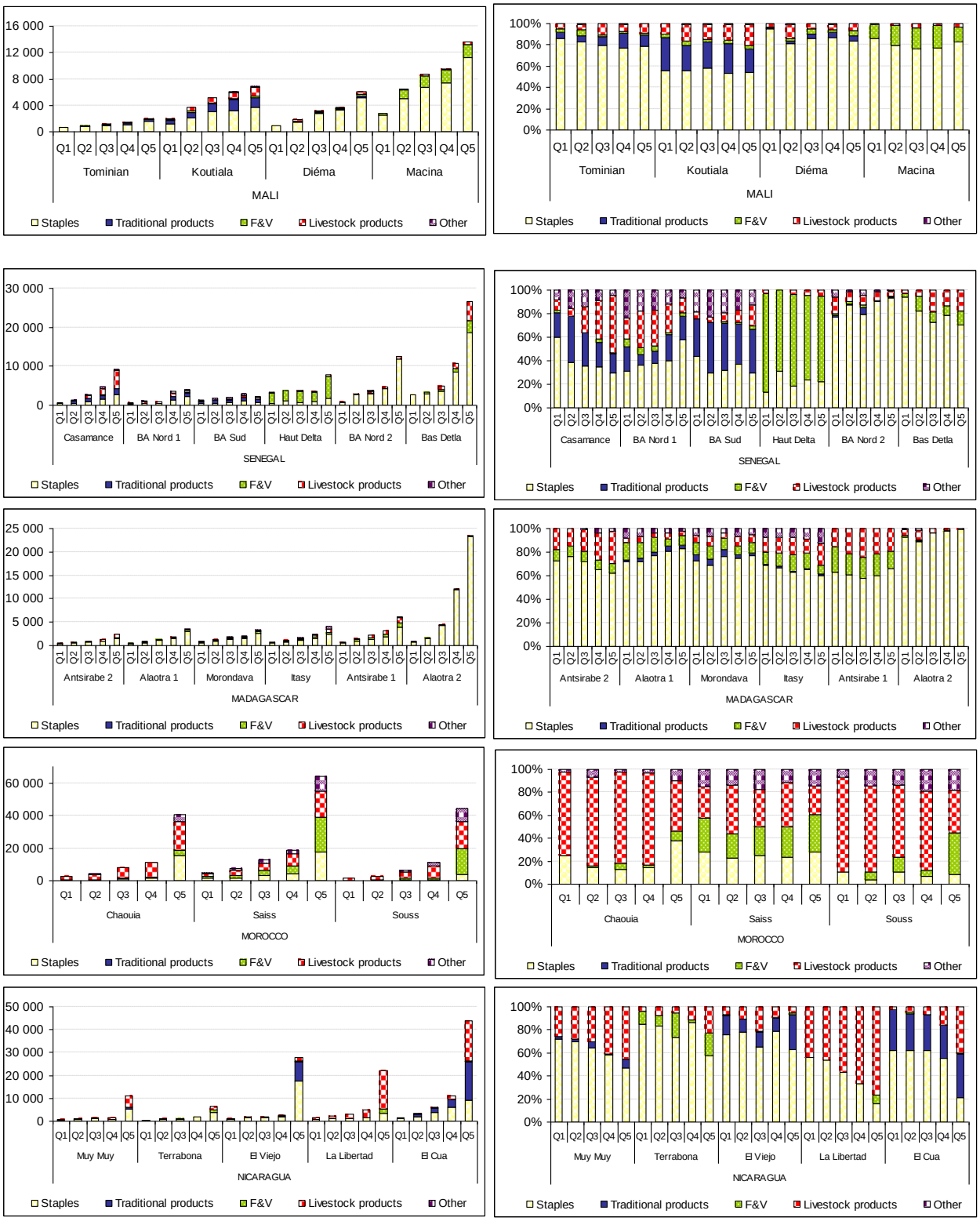
natural advantages and specific state interventions or private initiatives in relation to the conditions of regional or national insertion in the world economy, most often during colonization. Where they exist, traditional exports shape the regional output structure: cotton in Koutiala, Mali, and in Casamance, Senegal; coffee in El Cuá or sesame in El Viejo, Nicaragua; and sugar cane in Morondava. In spite of the difficulties of the groundnut sector, this product still plays a significant role in the gross farm product of the *Bassin Arachidier* and in Casamance in Senegal.

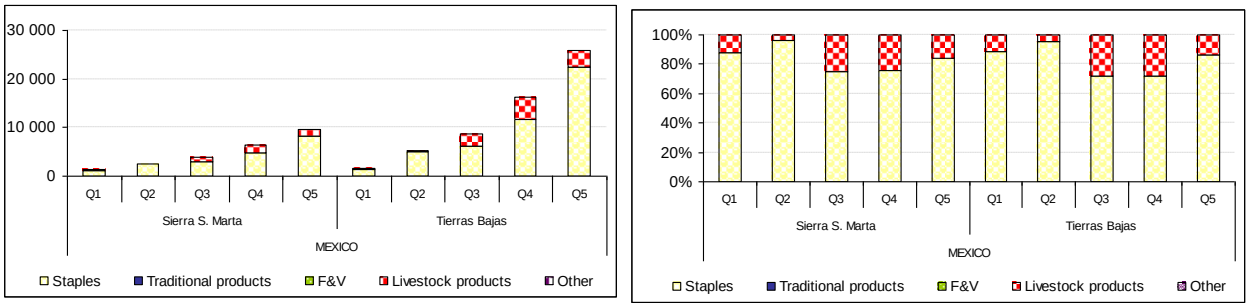
Livestock is present in all the surveyed regions. However, some regional specialization can also be noted in Nicaragua and Madagascar. Commercialization of live animals is the rule; however, dairy products can be significant, as is milk in Antsirabe, Muy Muy, and Casamance, and traditional on-farm processed cheese in La Libertad. The type of commercialized product can be explained by the quality of infrastructure, which characterizes the connection to markets. For example, because La Libertad is secluded, farmers are constrained to process their milk on-farm; conversely, Antsirabe or Muy Muy are located in collection areas of the milk industry,[55] which gives them better market access. The significance of livestock in the cotton zone of Mali (Koutiala) is more specific. In Mali, livestock is often a patrimonial asset, which provides draft force, embodies financial savings and also supplies manure for crop productions. Due to the low price of cotton that affected the growers in 2007, many of the farmers decapitalized and sold their livestock to maintain their purchasing power. On the contrary, the good crop season in Macina led to the opposite effect, with low sales of, and increased investment in, livestock. As mentioned above, the same type of situation occurred in Morocco with significant sales of livestock especially small ruminants.

Figure 26 provides a more detailed picture of the surveyed regions with a breakdown of the gross farm product per household quintiles. The resilience of the regional pattern through the stability of the gross product structure in all quintile levels is quite exceptional. The regional pattern strongly dominates in Mali, Morocco, Senegal, and Madagascar. The exception is Nicaragua where the quintile effect is clear: in every region, the share of the livestock product grows with the gross farm product, including in El Cuà, the coffee region. In Terrabona, horticulture is also quintile-related with the development of a small-scale irrigated production (using wells).

[55] Tiko, the major milk processor in Madagascar has a dairy plant in Antsirabe with collection networks. Supermarkets, procurement centers and processing plants are well developed in the so-named "milky way" of Nicaragua (Muy Muy).

Figure 26: Value and Share of Staples in Gross Farm Product (in $ PPP per HH and in %)





Source: RuralStruc Surveys.

2.2 *Market Access: A Puzzling Picture*

2.2.1 Market Insertion: Self-consumption Retains a Large Share of Agricultural Production

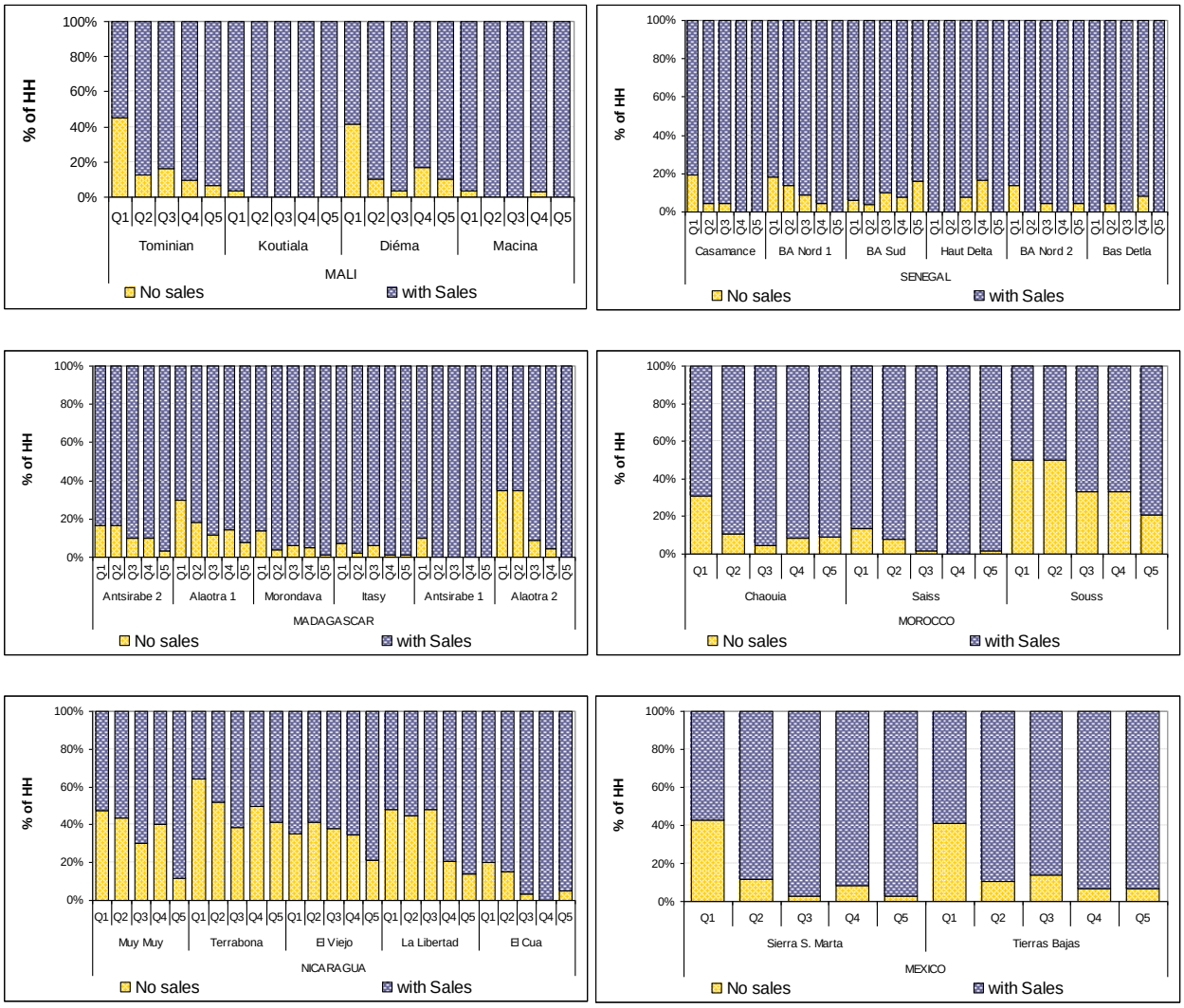
The conditions and degree of market insertion result from a combination of factors related to farm assets and income level (which shape the producer's room for maneuver), regional characteristics (densities, nearness to cities and local demand, main infrastructures, provision of public goods, etc.) and the type of product, its attributes and requirements (a major issue being the need for local transformation prior to commercialization). All of these factors interact to impact prices and determine different levels of uncertainties and risks and their perception.

a) Regional Pattern

In spite of very different regional contexts in terms of agro-ecological, agrarian, historical and institutional conditions, the main characteristic of the farm households sample is the importance of self-consumption, which accounts for a large share of the gross farm product and, consequently, reflects an unequal, and sometimes low, connection to markets. As seen previously, the vast majority of rural households are involved in farming activities, except in Mexico, Nicaragua, Morocco, and some regions of Senegal, where the share of farm households is lower. However, one of the first results in terms of market access is the surprising prevalence of farm households not selling any type of product to agricultural markets, thereby remaining fully disconnected from them (Figure 27). This is obviously the case of the most remote regions of Mali and Madagascar and of their lowest quintiles (with 20 to 40% of households having no sales), and it expresses a clear survival and "risk-management" strategy wherein all resources are dedicated to self-consumption. In the two zones of Sotavento (Mexico), the poorest households from the first quintiles are also strongly disconnected from markets. They are mainly very small-scale producers, with very low asset endowments, who generally make their living from off-farm incomes, notably agricultural wages, but who maintain the traditional maize plot (*la milpa*), where local varieties of maize and beans are grown for the family consumption. Nevertheless, for some of the poorest farmers, this complete disconnection

is sometimes impossible when the need for cash to cover unavoidable costs requires commercialization during the crop period, often under the worse price conditions, and even if the same food staple has to be bought shortly after at higher price[56].

Figure 27: Share of Farm Households Without Connection to Markets (in % of total households)



Source: RuralStruc Surveys.

The case of Nicaragua is more surprising because it shows that a very significant portion of farm households disconnected from agricultural markets (20-40% from Q1 to Q4) with the exception of the coffee zone (El Cuá). With only one region characterized by seclusion (La Libertad), the main explanation relies on the development of "risk-

[56] This is notably the case in Madagascar, where the size of the household and the size of the farm are clear constraints, and limit the storage possibilities.

management" strategies, especially during the surveyed period when food prices were very high (early 2008), and, in some cases, on the importance of alternative off-farm options, notably off-farm wage-labor, both in agriculture and in the *maquila* industry (Terrabona). In this second case, households prefer to maintain food crop productions for family consumption and search for off-farm activities to get cash revenues. These opportunities allow a dual strategy, mixing self-consumption of the farm products on one side, and insertion into labor markets (in order to meet specific monetary needs: schooling, health, and consumption goods) on the other[57]. This pattern is also exacerbated by agro-climatic conditions[58] and by the increasing food prices in 2007-08, which reinforced the dual strategies.

Though disconnection from markets only concerns certain groups of households in specific regions, self-consumption is spread across all the surveyed regions, with Mexico as the major exception. It obviously characterizes the poorest quintiles with shares of self-consumption above of 50%, sometimes up to 80% (in the remote regions of Mali) and most often around 60% (Figure 28). Self-consumption follows two main patterns: the first is region-related and differentiates distance to markets and / or integration through specific value chains (e.g. cotton in Koutiala, tomato or cassava in Haut Delta and BA Nord 2); the second is quintile-related and shows a clear decrease in self-consumption from Q1 to Q5, the richest quintile being below 40% (Madagascar) and even below 20% (Nicaragua).

The Sotavento region of Mexico provides a very interesting situation, which illustrates how, in the birthplace of maize and where maize is the long-standing pillar of rural life, food security and agricultural policy, new techniques and new commercialization networks can radically change the production-consumption pattern over approximately ten years.[59] Indeed, the development of a new technical package (a selected maize variety, inputs and technical assistance), promoted by private firms under contracts that have the support of public credit and possible price subsidies,[60] has fully reshaped the local practice. Four major features explain this rapid evolution: first, to access to the technical package and credit, producers must sell all their production to the private firms;

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[57] When compared with SSA, the accessibility to markets for goods and services is notably higher in the Nicaraguan countryside.

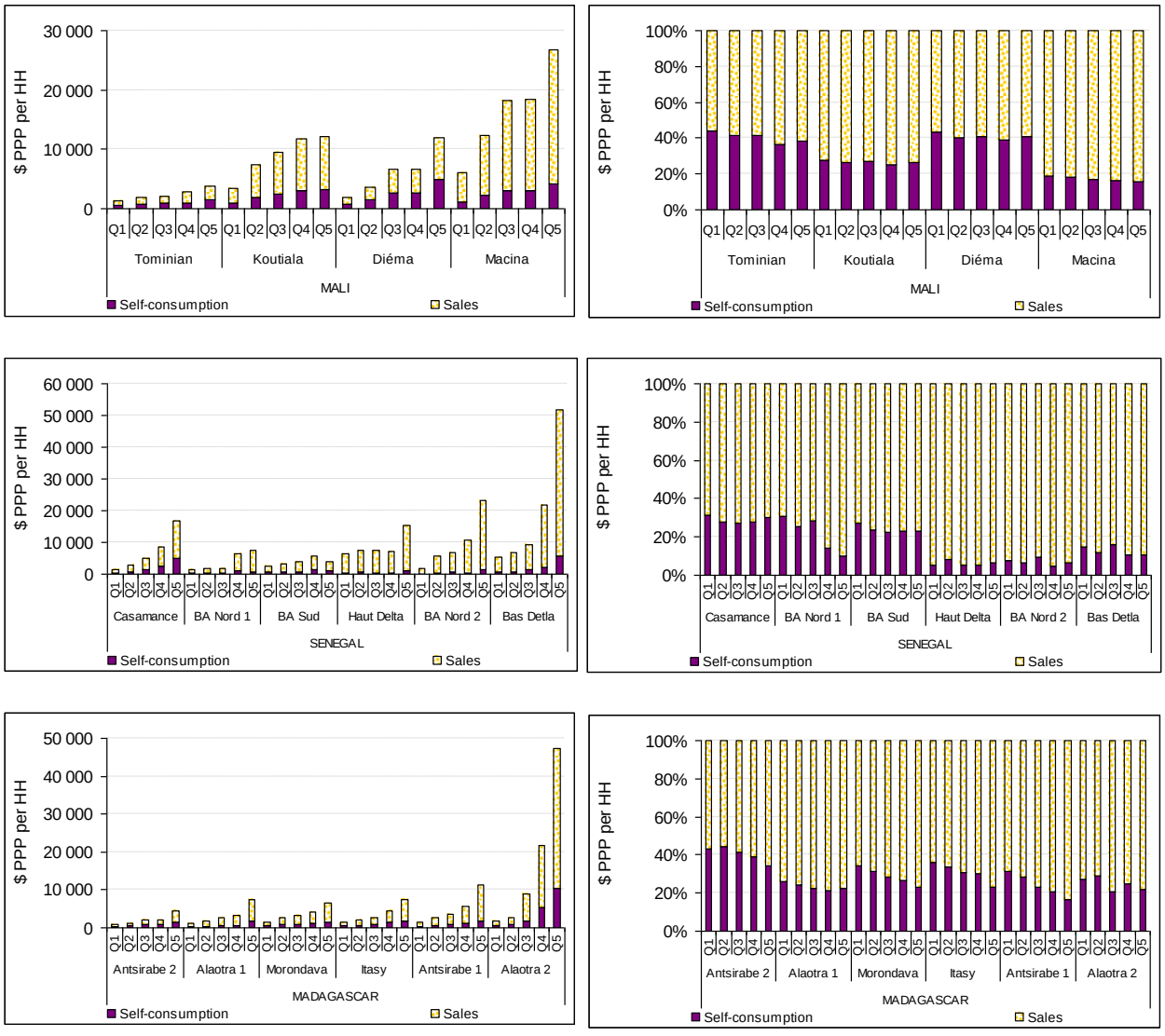
[58] Only one crop season in the dry region of Terrabona, when in the more humid regions such as El Cuà or La Libertad, two to three crop seasons are possible.

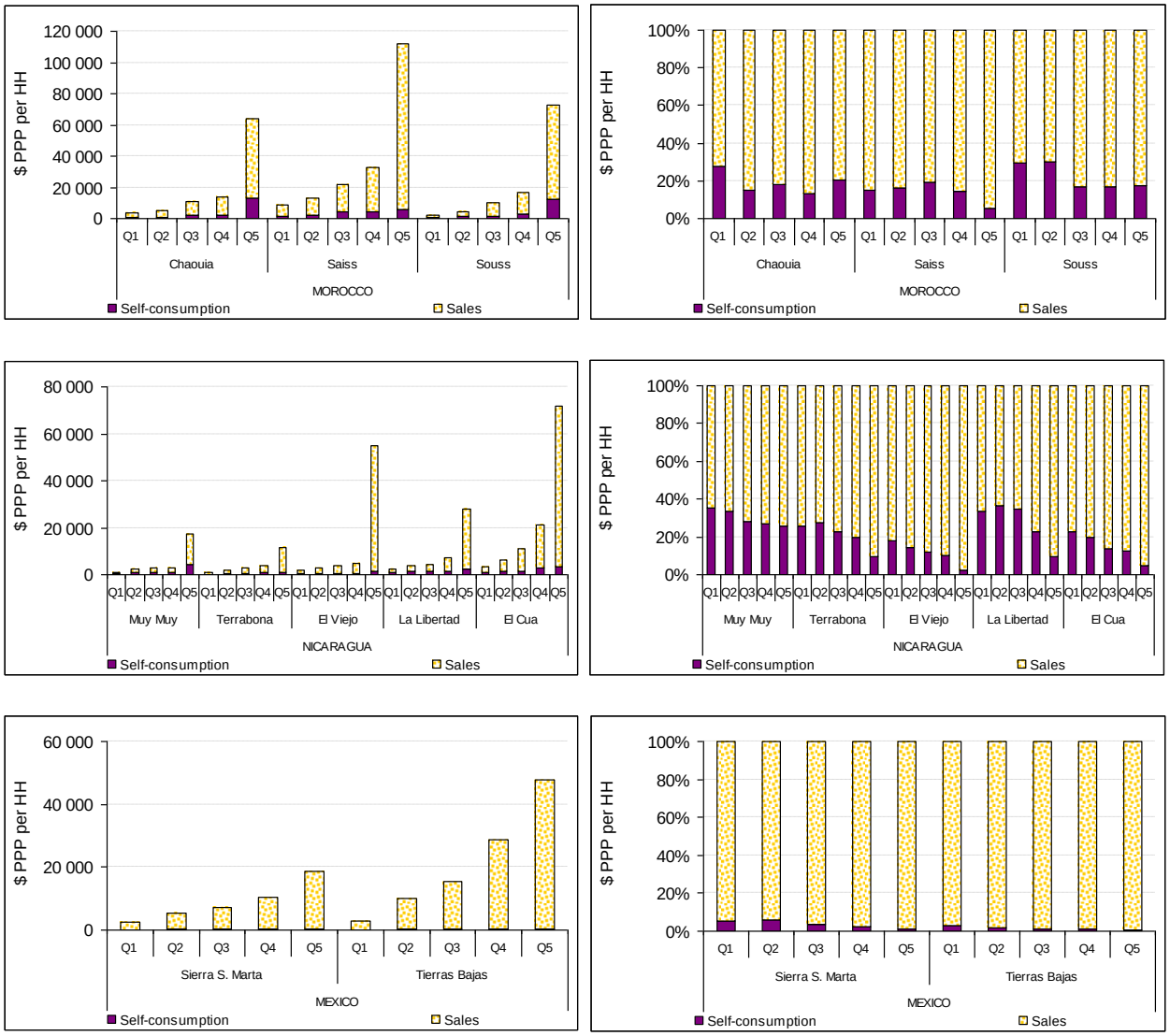
[59] The very poor households of the first quintiles who do not sell disappear when displaying the results in value.

[60] For instance, through the Ministry of Agriculture "Target Price Program" (*Subprograma de Apoyos Directos al Ingreso Objectivo*), a price support mechanism has been provided since 2003 when prices fall below a target price. The program has not operated over the last two years due to the market price increase.

second, producers are keen to do so because the new maize hybrid variety is highly vulnerable to rodents, which precludes farm conservation; third, maize harvest is completely mechanized through services provided by the firms; and fourth, women are increasingly engaged in off-farm activities and are no longer able to dedicate time to the preparation of *tortillas* from the farm-grown maize. Consequently, farmers sell their hybrid corn and buy maize flour or prepared *tortillas* at the local markets. This Sotavento exception among the surveyed regions is significant, as it shows the potentially strong impact of new marketing channels when supported by a combination of drivers of change.

Figure 28: Value and Share of Self-consumption in Gross Farm Product (in $ PPP per HH per quintile and in %)





Source: RuralStruc Surveys.

In order to stress the importance of both staple production and self-consumption, Figure 29 displays the regional structure of the gross farm product per quintile, showing the specific share of the main staple (self-consumption and sales), the share of the other staples and then all the other products. A striking result emerges, demonstrating how farming systems remain stuck in the staple economy:

- Millet and sorghum dominate in Mali (between 60 and 80%, and 40% in the cotton zone), with the exception of Office du Niger (Macina), where rice dominates with a clear orientation towards commercialization.

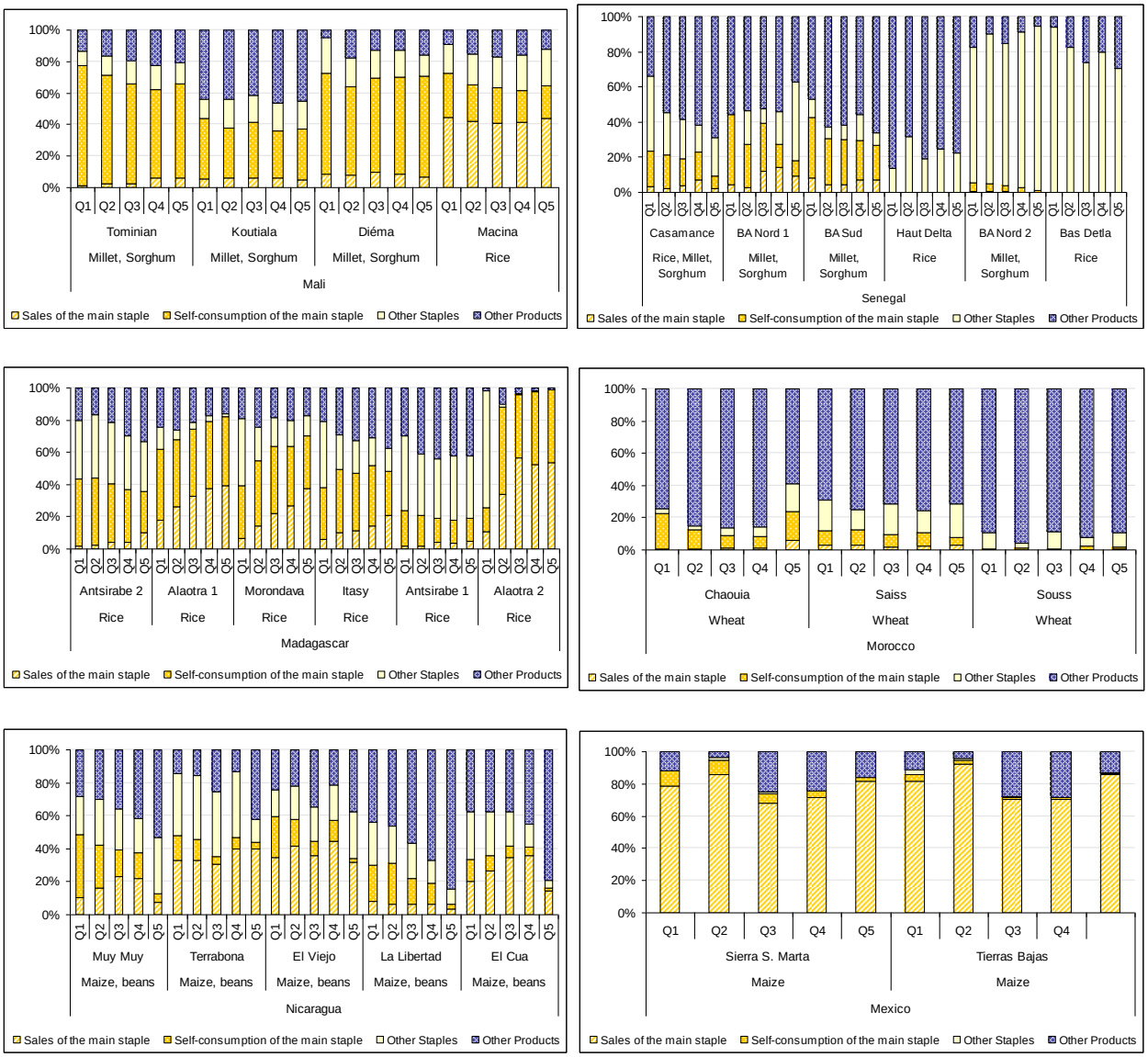
- Rice accounts for between 60 and 80% of production in Lac Alaotra (Madagascar), one of the "rice baskets" of the country, but only 50% in Itasy and Morondava, where production systems are more diversified (including cassava and maize in Morondava).

- Staples are more diversified in Senegal, but they show a high level of commercialization in BA Nord 2 (cassava zone) and Bas Delta (rice).

- Maize and beans are the undisputed food crops in Nicaragua; and maize logically dominates in Sotavento, in the context of the very specific specialization of the region.

As previously stated, in Morocco, the results are not significant because of the specific crop season (drought), leading many producers to sell livestock (cattle and small ruminants); and to an exceptional importance of the livestock production (here "other products").

Figure 29: Share of the Main Staple in Gross Farm Product (per quintile and in %)

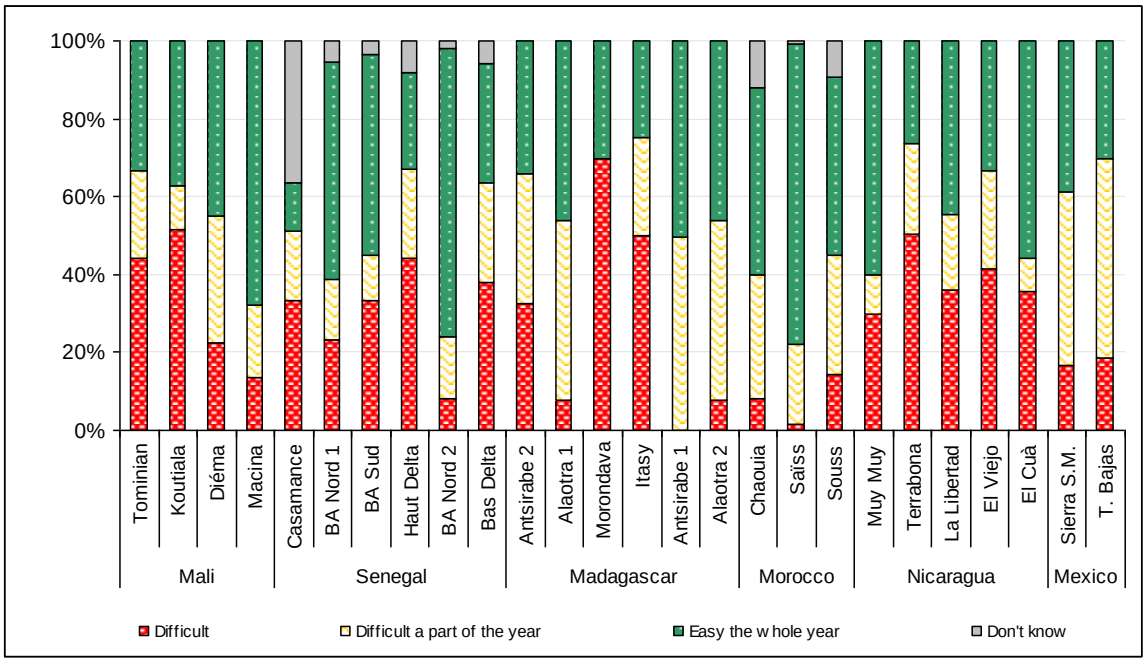


Source: RuralStruc Surveys.

While these figures show the importance of staple food crops in the farm production, they can also be used to identify, on the contrary, in which regions instances of agricultural production diversification have occurred. The main finding is that diversification of agricultural production is limited to specific cases, which all refer to the development of specific productions in specific regions, generally due to old historical of institutional patterns: cotton in the CMDT's collecting area in Mali; horticulture in the collecting areas of agro-industries or export companies (Haut Delta in Senegal, Souss in Morocco); coffee in El Cuà, Nicaragua; old *Bassin Arachidier* in Senegal.

The reasons for such resilience of staple food production and the importance of self-consumption cannot only rely on a unique explanation. Physical access to markets can be an issue, with regards to the quality of infrastructure. Figure 30 provides the perception of the access to transportation declared by the surveyed heads of household. It logically displays an uneven and mixed picture directly related to the regional conditions. However, the access is considered difficult throughout the year or only for a part of the year by 50 to 70% of the households, the most difficult cases being Casamance, Morondava and the Delta or the highlands of Madagascar. The better access, easy during the whole year, is found in Morocco and the North of *Bassin Arachidier*, which are also regions where self-consumption is lower.

Figure 30: Access to Transportation



Source: RuralStruc Surveys.

However, physical access to transportation is not enough to understand the importance of self-consumption in the surveyed regions. Among the explanatory factors, one of the most critical is the very low level of average income and the overwhelming poverty of most of the households, which is displayed by the level of quintiles. As clearly presented

in Chapter 1, for households of the lowest quintiles, food security is a main issue. In these difficult and highly risky situations, self-consumption and development of staple crops are a clear answer.

b) Fine-Tuning the Types of Connection to Markets

As previously mentioned in Chapter 2, the WDR08 identifies two types of livelihood strategies for the farm-oriented households[61] which depend on their level of connection to markets: *farm market-oriented* households sell more than 50% of their agricultural production on market; *farm subsistence-oriented* households sell less than or equal to 50% on market.

Again, the Program chose to display its surveys' results according to these two groups of farm households' strategies. Although there is an important threshold effect (50%), Table 26 presents a more contrasted picture than the previous approach based on the share of the sold gross farm product. Subsistence-oriented households remain important in the poorest and most remote zones of the sample, in Mali, Madagascar, but also in Nicaragua (Muy Muy and Terrabona). In Senegal, Casamance surveyed households only are subsistence-oriented, while the *Bassin Arachidier* and the Delta display a clear market orientation. This representation is not surprising and is consistent with the share of self-subsistence presented before.

[61] Reminder: farm-oriented households earn more than 75% of their total income from agriculture

Table 26: Livelihood Strategies of Farm-oriented Households (WDR08's Typology)

			Farm-oriented HH		
			Subsistence-oriented	Market-oriented	Total (**)
		N	% of of rural HH in each group		
Mali	Tominian	155	51.6	3.9	55.5
	Koutiala	153	45.1	40.5	85.6
	Diéma	148	41.9	2.7	44.6
	Macina	154	18.2	62.3	81.2
Senegal	Casamance	239	30.1	21.3	51.5
	BA Nord 1	111	4.5	10.8	15.3
	BA Sud	252	9.1	11.9	21.0
	Haut Delta	61	0.0	41.0	41.0
	BA Nord 2	113	0.9	16.8	17.7
	Bas Delta	121	5.0	16.5	21.5
Madagascar	Antsirabe 2	303	23.1	6.6	29.7
	Alaotra 1	385	14.3	27.5	41.8
	Morondava	506	38.7	24.5	63.2
	Itasy	503	22.3	17.9	40.2
	Antsirabe 1	206	15.5	49.5	65.0
	Alaotra 2	115	24.3	36.5	60.9
Morocco	Chaouia	228	7.5	36.8	44.3
	Saiss	261	18.0	62.5	80.5
	Souss	240	16.7	27.1	44.6
Nicaragua	Muy Muy	299	27.4	22.1	51.2
	Terrabona	281	24.2	18.1	57.3
	El Viejo	288	12.2	26.0	43.1
	La Libertad	290	25.9	30.3	57.2
	El Cuá	300	24.7	60.7	85.3
Mexico	Sierra S.M.	175	0.0	8.0	8.0
	Tierras Bajas	145	0.0	20.0	20.0
		6032			
Madagascar	*1993 (*)*	*2653*	*22.7*	*36.7*	*59.4*
Nicaragua	*2001 (*)*	*1839*	*3.9*	*15.0*	*18.9*

Sources: RS surveys, adapted from WDR08, p.76; (*) RIGA results in Davis et al. 2007, p. 162
(**) Total of the farm-oriented households in % of the total sample at regional level

In order to "fine-tune" the WDR08's livelihood strategies for the farm-oriented households, the Program chose to dispatch the subsistence-oriented farms in two groups, keeping the threshold of 50% for market-orientation. Indeed, the 50% threshold is probably too large for the remaining subsistence group and hides the progressive market insertion dynamics. Consequently, the households that do not sell any products at all or that sell only a tiny part of their farm production were separated from the households more directly engaged in markets and selling a more significant part. Two sub-groups were defined: a new *core subsistence* group, selling from 0 to 10% of its farm production; and a new *market user* group, defined as selling from 10 to 50% of its farm output, this group being more oriented towards markets, whatever its motivations are: opportunistic or more strategic.

With this new definition, only one surveyed region remains in the core-subsistence group: Terrabona, the dry and poor region of Nicaragua. Although self-consumption accounts for a large share of the gross product, the subsistence strategies are a minority and are only found in the marginalized areas.

Table 27: "Fine-tuned" Livelihood Strategies for Farm-oriented Households

			Farm-oriented HH			
			Core Subsistence	Market user	Market-oriented	TOTAL (*)
		N	% of rural HH in each group			
Mali	Tominian	155	16.1	35.5	3.9	55.5
	Koutiala	153	2.0	43.1	40.5	85.6
	Diéma	148	17.6	24.3	2.7	44.6
	Macina	154	0.6	18.2	62.3	81.2
Senegal	Casamance	239	3.8	26.4	21.3	51.5
	BA Nord 1	111	0.0	4.5	10.8	15.3
	BA Sud	252	0.8	8.3	11.9	21.0
	Haut Delta	61	0.0	0.0	41.0	41.0
	BA Nord 2	113	0.0	0.9	16.8	17.7
	Bas Delta	121	0.0	5.0	16.5	21.5
Madagascar	Antsirabe 2	303	1.3	21.8	6.6	29.7
	Alaotra 1	385	0.5	13.8	27.5	41.8
	Morondava	506	2.0	36.8	24.5	63.2
	Itasy	503	1.4	20.9	17.9	40.2
	Antsirabe 1	206	1.0	14.6	49.5	65.0
	Alaotra 2	115	0.0	24.3	36.5	60.9
Morocco	Chaouia	228	3.1	4.4	36.8	44.3
	Saiss	261	5.7	12.3	62.5	80.5
	Souss	240	10.8	6.7	27.1	44.6
Nicaragua	Muy Muy	299	11.4	17.7	22.1	51.2
	Terrabona	281	21.7	17.4	18.1	57.3
	El Viejo	288	8.3	8.7	26.0	43.1
	La Libertad	290	11.7	15.2	30.3	57.2
	El Cuá	300	7.7	17.0	60.7	85.3
Mexico	Sierra S.M.	175	0.0	0.0	8.0	8.0
	Tierras Bajas	145	0.0	0.0	20.0	20.0

Source: RuralStruc Surveys.
(*) Total of the farm-oriented households in % of the total sample at regional level

2.2.2 Market Integration: Seeking New Commercial Arrangements

a) Traditional Marketing Prevails

In the study regions, household surveys confirm the main findings of the value chains analyses developed during the Second Phase of the Program: traditional marketing channels prevail in all the surveyed regions. 'Traditional marketing' refers to the range of middlemen and rural intermediaries who connect the countryside with national and international markets: wholesalers and their agents, or brokers[62] working for them.

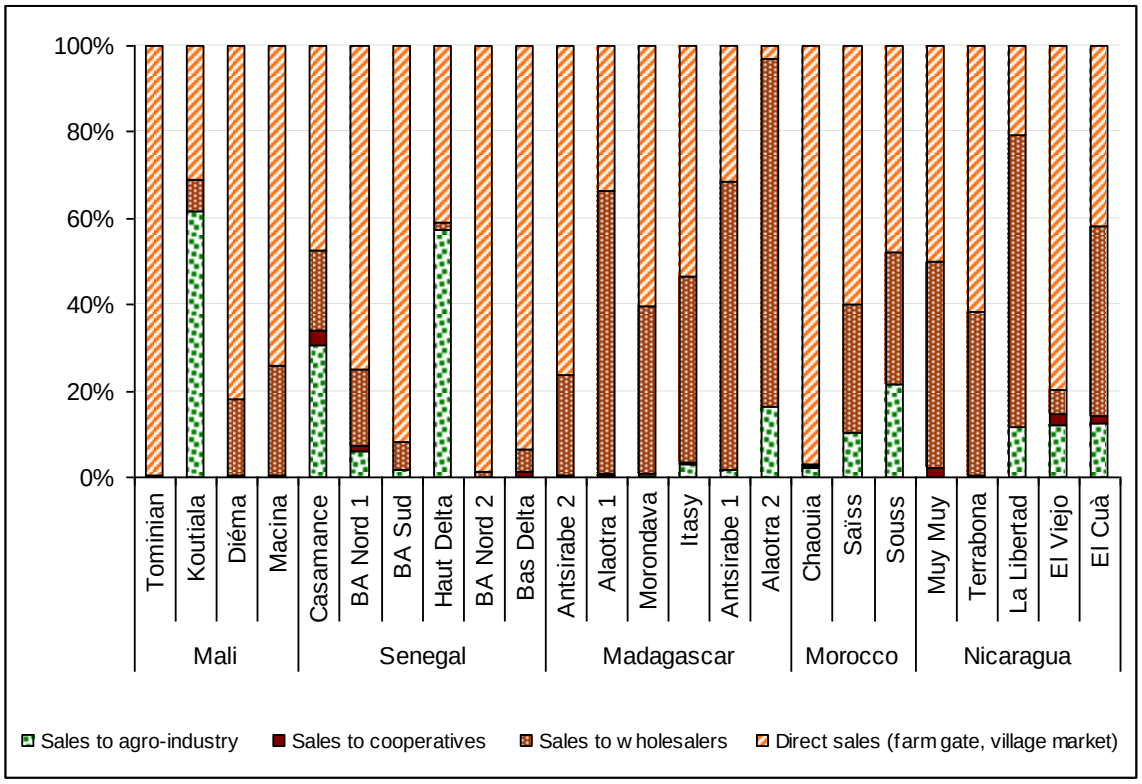
This traditional marketing means two options for farmers, the limits of which are often imprecise: sell "spot" directly at the farm gate to a broker or in the village market to a broker or a wholesaler agent; or sell on a routine basis to a wholesaler, knowing that this second option does not necessarily mean any formal arrangement, or purchase surety, or a better price than the spot price. This situation corresponds however to a type of formalization of the commercial transaction over time.

In the surveyed regions, this traditional marketing is dominant. Figure 31 shows that it counts for 80 to 100% of the total value of sales, with very few exceptions. Direct sales at the farm gate or at the village market account for the majority of sales, or are almost exclusive in Tominian in Mali, in the *Bassin Arachidier* (BA Nord 2 and BA Sud) and in the Bas Delta in Senegal, or in Chaouia (Morocco). However, commercialization with wholesalers is also significant, particularly in Madagascar for both rice (Alaotra, where wholesalers are settled) and horticulture products (Antsirabe 1, in the vicinity of the city), and also in Nicaragua.

The other channels are sales to cooperatives, agro-industry or agribusiness. Surprisingly, the share sold to cooperatives is very low, non-existent in the large majority of the surveyed localities and anecdotal in the others. On the contrary, direct sales to agro-industry are significant, although they vary strongly from one region to another. Logically, this variability is related to the presence or absence of a processor. Thus, the highest shares of sales to agro-industries are found in Koutiala, Mali, and Casamance, Senegal, where all the cotton is sold to the processing firm (CMDT and SODEFITEX), as well as in the Haut Delta, Senegal, where industrial tomatoes are sold to the SOCAS (*Société de conserves alimentaires du Sénégal*). In other regions, the importance of commercialization with agri-business is lower than 20%: rice to mills in Alaotra 2 (Madagascar), tomatoes, citrus and olives to export or processors in Saïss and Souss (Morocco), livestock products, maize and beans to processors for domestic markets in La Libertad, coffee, sorghum, groundnut and sesame to processors for export in El Cuà and El Viejo (Nicaragua), groundnut to the oil industry in BA Nord 1 (Senegal), and green beans for export in Itasy (Madagascar).

[62] A wholesaler takes possession of the product; a broker does not.

Figure 31: Modes of Commercialization in the Surveyed Zones (% of the value of the Sales of crops and livestock products)



Source: RuralStruc Surveys

b) Underdeveloped Contractualization

Even when taking into consideration the diversity of the regional situations, one of the main results of the Second Phase of the Program is the very low level of contractualization, as shown in Table 28. This result reflects the low intensity of the integration processes in the surveyed regions and is somewhat surprising because several 'winning regions' had been selected for the presence of specific market dynamics related to products and / or agro-industries.

However, some caveats are necessary here (see methodology). Firstly, because the selection of regions and localities included the objective of displaying situations illustrative of these integration processes, no conclusions can be drawn from the variation of the number of contracts between regions and sub-regions.

Secondly, the analysis of contractualization cannot afford imprecision. The definition of types of contracts is a core issue and if formal contracts refer most of the time to written contracts, informal contracts correspond to a wide range of situations where trust between buyer and seller is the main component. In the specific case of monopsonies, one can assume that tacit contracts exist, the only marketing option for the producer being the local agro-industry. Thirdly, the low level of contracts must be analyzed with regard to the organization of the whole value chain, which was not provided for in the methodology of the present fieldwork. Yet it has been noticed that, in many cases, the chain segment where contractualization occurs is not at the producer level: it is often downstream, between the wholesaler, or the cooperative, and the processing firm or the procurement service.

In fact, in some regions that were selected for their connection to markets and the development of integrated value chains, contracts with agribusinesses is almost non-existent. This is particularly true in two regions of Nicaragua (Terrabona and Muy Muy), where connection to fruit and vegetable integrated value chains (domestic supermarkets such as Wal-Mart or La Colonia) and to high value dairy chains (supermarkets and processors such as Parmalat or Eskimo) exist. However, in these cases, integration of producers is limited at national level and contract farming is not practiced, rather integration occurs mainly at collection center stage or with wholesalers.

Table 28: Importance of Formal and Informal Contractual Agreements per Surveyed Region

		# HH	with contract #	with contract %	type	Contracting agents
Mali	Tominian	155	1	0.6		
	Koutiala	153	116	75.8	T	Cotton company (CMDT)
	Diéma	148	0	0.0		
	Macina	154	16	10.4		
Senegal	Casamance	239	11	4.6		
	BA Nord 1	111	26	23.4		
	BA Sud	252	1	0.4		
	Haut Delta	61	54	88.5	F	Tomato Processor (SOCAS)
	BA Nord 2	113	33	29.2	I	Cassava wholesalers
	Bas Detla	121	12	9.9		Rice Industry
Madagascar	Antsirabe 2	303	16	5.3		
	Alaotra 1	385	2	0.5		
	Morondava	506	15	3.0		
	Itasy	503	50	9.9	F	Green beans Processor (Lecofruit) and tobacco
	Antsirabe 1	206	46	22.3	F/I	Milk Industry (Tiko)
	Alaotra 2	115	8	7.0		Rice industry
Morocco	Chaouia	228	1	0.4		
	Saiss	261	20	7.7	I	Milk Industry
	Souss	240	1	0.4		
Nicaragua	Muy Muy	299	9	3.0		"Milky way" (collection area for Parmalat and Eskimo)
	Terrabona	281	4	1.4		
	El Viejo	288	13	4.5		Sorghum Industry
	La Libertad	290	20	6.9		Milk collection
	El Cua	300	47	15.7		Coffee Industry
Mexico	Sierra S. M.	175	16	9.1	F	Maize Industry
	Tierras Bajas	145	29	20.0	F	Maize Industry

Source: RuralStruc Surveys.
Note: Proxies were used to identify contracts in two regions: cotton producers can only sell to the Malian Cotton Company (CMDT); in the Sotavento region of Mexico, all members of producers' organizations are selling maize with contracts intermediated by the organization.
T = tacit; F = formal; I = informal

Among the surveyed regions, three main types of contractual agreements configurations can be identified, whatever the type of contract is: contracts with agro-industries, contracts with wholesalers and contracts related to high value exports. Based on qualitative results of the Second Phase, it is evident that some farmers are often reluctant to engage in formal contracts because they fear consequences if they fail to deliver for any reason. It reinforces the persistence of more informal ways of commercialization and weaker types of arrangements.

Contracts with agro-industries:

This is most often the old version of contract farming, which developed long ago to meet the demand of a single national agro-industry leading to a *de facto* monopsonist logic. The results of such integration, in terms of inclusion of producers, are balanced, depending on the specific situation of the industry and the type of contract: formal, informal or tacit. Thus, several examples of traditional export value chains and important chains for domestic markets are found in the regions surveyed by the Program.

In Mali, the family farms of the Koutiala region producing cotton have a *de facto* contract (even if nothing is actually written) with the Malian cotton company (CMDT), which operates as a monospony in spite of its on-going privatization. The sector is vertically integrated, having been so for years, with the provision of inputs through producers' organizations; a system of credit secured by cotton production; extension services and technical support; and fixed prices, which are negotiated to a certain extent.

In Itasy (Madagascar), the Office of Malagasy Tobaccos (OFTAMA), a parastatal in a situation of monopsony, is supplied by individual tobacco producers under formal contracts in the area of its collection. Because the industrial component of the crop requires significant land resources, households with the largest areas of land carry out integration, whereas less-endowed households indirectly benefit from the tobacco sector through agricultural labor.

These kinds of contractual agreements also concern strategic value chains for domestic markets, as in the case of the dairy industry in Madagascar. Privatization of the former parastatal monopoly did not significantly change the configuration of the value chain, which is largely controlled by Tiko, a private firm that plays a central role in the Malagasy dairy industry. Tiko collects more than 90% of the milk sold in the main production region (Antsirabe) and processes most of the dairy products in Madagascar. Producers under contract deliver milk responding to quality criteria stipulated in a formal contract to collection centers. In return, the agro-industry provides inputs and sometimes cash advances. In this case, producers with larger herds are found to be more involved in these integration strategies.

In the Delta region (Senegal), SOCAS buys more than 50,000 tons of industrial tomatoes per year from producers under formal contract to process tomato paste (double concentrate). This company, founded in 1969, provides purchase security and also includes technical assistance and credit to farmers. The Senegalese industrial tomato sector is a short and integrated value chain. The monopsonist situation of the processor at

the regional level facilitates contractualization, which offers advantages on both sides: security of supply for the processing firm and of outlets for the producers, fixed price at the beginning of the season, dates and quality required for industrial standards, credit facilitation, etc. As tomato is a perishable product, the company depends on producers and, likewise, producers need the industry. Consultations, negotiations, compromises and agreements are binding on both parties involved.

Contracts with wholesalers

The growing urban demand for fresh products has led to the development of value chains that are structured by wholesalers and are supplied by producers with informal agreements. This is particularly common when the competition between middlemen is high and when the product is perishable.

This is the case of the fruit and vegetable sectors in Androkavato (Antsirabe), which are integrated on the basis of informal agreements between individual producers or farmers' organizations and brokers who supply urban wholesalers. The producers who benefit from these agreements are generally the biggest producers with the best factor endowments (correlations are statistically significant) that allow them to reach surplus. In the same way, in the *Bassin Arachidier* (BA Nord 2, Senegal), cassava producers have also developed informal contractual agreements with middlemen based on transaction routine and reputation. These contracts guarantee the flow of supply to urban areas, whereas production is dispersed throughout the region.

On the other hand, in Nicaragua, in response to growing urban demand and to the development of supermarkets, agribusinesses have recently expanded their collection area. Thus, La Libertad is one of the regions where verbal agreements have emerged to satisfy this demand. These agreements provide many advantages for farmers who partially integrate into dynamic markets as they obtain better prices for their production; they incur lower costs, as they do not need to process milk on farm; and they enjoy the insurance of selling milk daily, instead of selling artisanal cheese once a week. Usually, the households that access these informal agreements are also the ones with more available land and bigger herds: they own 2.3 times more land and three times more cattle on average (correlations are statistically significant).

Contracts related to high value exports

These are the typical contract cases cited in the literature. They were found in only two situations in the surveyed localities. The first case is the famous *Lecofruit* case in Ifanja, Itasy (Madagascar), where farmers grow green beans for export (see **Box 18**). The other case is in the coffee region of El Cuá, Nicaragua. In this region, organic coffee is mainly promoted by COMANUR-RL (*Cooperativa Multisectorial Alfonso Núñez Rodríguez*), which sells conventional and organic coffees. The cooperative, in addition to buying organic production at a determined price, provides technical assistance to its members involving access to coffee management, and access to plant material (new varieties of coffee), agricultural inputs (fertilizers and other agrochemicals), and to expensive equipment or infrastructure, all of which is highly valued by the partners.

Box 18: Lecofruit: Malagasy Smallholders selling on European Markets

The company " *Légumes Condiments et Fruits de Madagascar SA*" - also known as Lecofruit - was installed in Madagascar in 1989 when free zones were implemented and promoted by the Malagasy State (with tax exemptions and other fiscal advantages). Initially, Lecofruit processed pickles in small amounts in partnership with approximately 100 farmers. To develop its export markets, the firm associated with the French company *Segma Maille*, which guaranteed regular outlets for its products in Europe. Accordingly, Lecofruit began to diversify its production with green beans and snow peas, cucumbers, asparagus and baby vegetables for export to the European market. Currently, Lecofruit focuses on extra fine green beans production: the company exported 3,000 tons of products during the 2004/05 season, among which 70% were green beans. Approximately 90% of this tonnage were processed and canned in the company factory in Antananarivo and sent to Europe by sea. The remaining 10% were fresh green beans and snow peas shipped by air.

In 2007/08, the company branched out to involve 10,000 farmers under contract in the production of green beans. Producers are located in the highlands of Madagascar where a long tradition of fruits and vegetable production exists. The company now also targets the growing areas connected to major roads in order to optimize the costs of transporting products to the processing plant in Antananarivo.

Farmers cultivate their own land which helps to overcome the problems of land availability in the highlands. Production contracts are standardized and individual, though producers are obliged to belong to a producers' organization. A contract is limited to an area of approximately 1 are (1000m²) to ensure that producers will be able to comply with all stages of the production until harvest, the production being labor-intensive. Other commitments relate to specific technical recommendations (preparation of compost, plowing, seeding, etc.) and the need for daily harvest in order to meet the extra-fine size requirement of the product.

Cash advances are provided to producers under contract by the company; seeds are given for free and mineral fertilizer and pesticide costs are deducted from the final payment of the producer once green beans have been delivered. Lecofruit provides a "package" of seeds, mineral fertilizers and pesticides to ensure compliance with standards on maximum residue limits faced by agricultural products exported to the European Union. Some sanitary conditions that producers must meet are also stipulated in the contracts, such as washing of hands with non-perfumed soap before harvesting the beans, etc. Finally, producers are required to only deliver the production to Lecofruit. The payment is periodic. The price paid to farmers is set in advance by the company and remains unchanged during the season: 630 Ariary / kg for green beans in 2007/08.

Despite the balance of power that favors the processing firm in terms of prices, the number of farmers involved in contract farming with Lecofruit has never fallen, which means that farmers find the agreement as an interesting way to generate income and, above all, to provide cash to finance their other agricultural activities or to meet their needs.

Sources: RS II Madagascar, p. 84-85.

Due to the very limited information and the few cases gathered by the surveys, it is difficult to draw conclusions about the consequences of contractualization on households' income. In general, their low level of production is one of the biggest barriers to producers' participation in contractual agreements, and it was previously reminded that procurement systems or agro-industries prefer to work with large suppliers in order to lower their transaction costs. Thus, in the sample, the majority of smallholders engaged in contract agreements to produce small volumes, mainly because they have limited factor endowment (land or herd).

As previously mentioned, with the exception of the green bean producers who are restricted in area by the contracting company, the households who engage in contracts tend to be those with the best factor endowments[63]. They also earn significantly more in average than the other farms: from 1.5 to 2 times the farm income in the surveyed regions of Madagascar, Nicaragua and Mexico[64].

However these results are obviously rough estimates, knowing that the fieldwork did not specifically target the measurement of the impacts of contractual arrangements. Many other mechanisms interfere, and a precise analysis of the farm income / contract linkages would imply specific research investments based on multiple years of observation. Nevertheless, based on the RuralStruc case studies, one can assume that the implications of contractualization on incomes remain limited, with a few exceptions, and that the differences between households with or without contracts are often minimal. It is worth notice that the maximum average gross product earned from green beans production under contract in Itasy, Madagascar, is $PPP 43 per household per year. The main advantages of contractualization are certainly more related to access to technical packages, credit, and a secured marketing, as shown in the Sotavento region of Mexico.

[63] It seems to be the case especially for land. However, the small number of households with formal contracts does not allow any conclusion. In Antsirabe 1, where the number of contracts in the sample is sufficient, the T Test is significant.

[64] The result is statistically significant. However the standard deviations show a large variability.

Part 3. Lessons Learned and Policy Implications

1 Down to "Sobering" Rural Realities

1.1 *Back to the Initial Questions*

When the RuralStruc Program was launched at the end of 2005, its founding hypotheses expressed the vision of a quikly evolving context in which the global restructuring of agrifood markets – a major change linked to liberalization and, more broadly, globalization – would progressively, but surely, affect developing countries' agriculture. What was questionned was the depth and the nature of these on-going changes, as well as their consequences on the reshaping of rural economies. Would rural households' adaptation strategies have led and lead to a more diversified pattern of activities, changing sources of income, and a better interconnection with the "outside" through increased short-term and long-term migrations? How would these processes inform the on-going economic transition, its alternatives and its risks?

The collaborative work engaged over the last three years with local teams in the seven countries involved in the Program, and notably the implementation of an extensive fieldwork in 26 regions selected to illustrate the diversity of local situations in terms of wealth and market integration processes, lead to strongly temper the vision of an upheaval. Rural economies are changing, and rural households are struggling to adapt to an evolving and challenging context; however, though new modes of market integration do exist, they have not yet led to a general change in the surveyed regions.

With reference to Christiaensen and Demery's book (2007), there is a need to get "down to earth" and, more precisely, to get down to "sobering" rural realities[65] of many developing countries, especially the poorest ones. For researchers and developers, this is perhaps less exciting and stimulating than their expectations of a "new rural economy" that was supposed to emerge – at least in "well-connected-to-the-world" regions. The Program's fieldwork has, of course, revealed exceptions, but sober certainly seems to reflect and capture the current situation of most of the studied regions.

[65] The term makes reference to discussions engaged with the Program's Advisory Committee, particularly during its 3rd meeting in May 2009, where the coordination team presented the early fieldwork results. The chair of the Advisory Committee refers to "sobering results" in his memo to the Steering Committee of the donors.

1.2 *What is Old, What is New, What is Changing*

Poverty is widespread, whatever the regional characteristics

If one was needed, the Program provides a poignant reminder that rural poverty is widespread in the selected regions. By picking regions a priori classified as "winning" regions, with a supposedly better connexion to agricultural and labor markets, and a more favorable economic environment, one could have expected the results to reveal a vastly differentiated picture, with high poverty gaps between regions at the national level and between countries, and very contrasted household characteristics and incomes. Yet the fieldwork results revealed that this is not the case. It also showed that though average regional income is generally higher in "winning" regions, this is not a rule. The SSA countries show the most difficult situation with, on average, half of the surveyed households below the absolute poverty line ($1 a day). This reality is a dramatic challenge for development, and should strongly shape the way of thinking about policy interventions. The difference with the non-SSA countries, where average household income is higher, is striking; however, non-SSA countries also face high poverty levels, and the situation of their poorest households is also particularly worrisome.

When converted into kilocalories per adult equivalent in order to assess the sustainability of households' basic energetic needs, the overall situation improves in every country, but the results of the fieldwork also reveal very critical circumstances of food insecurity: most of the poorest households barely satisfy or do not reach the minimum requirement of 2,450 Kcal per adult equivalent per day. Several regions of the three SSA countries under review, but also and more surprisingly in Nicaragua, show highly vulnerable poor households with respect to their food security.

Even in the poorest regions of the sample, the income level gap between the richest 20% of households and the others is always important, notably in Nicaragua or Morocco where Gini indexes are the highest. This income gap of the richest is mostly explained by a handful of better-off households, often benefiting from better assets' endowment.

Diversification of income sources remains limited at the household level and on-farm incomes keep the larger share

A common issue in the previously noted literature is the increasing role of rural non-farm activities and a trend towards diversification out of agriculture. Indeed, diversification is widespread all over the surveyed regions: wage labor (both agricultural and non agricultural), migrations and, above all, self-employment are significantly developed, and 20 to 80% of the households in each region engaged at least in one of these activities. However, this apparent widespread diversification of activities among regions is misleading.

Firstly, although all rural households tend to engage in different income-generating activities, this diversification does not translate into an income diversification: off-farm incomes account in average for around 25% of global income at regional level, which means that the diversification process is mostly limited and uneven. Secondly, though a large share of households is involved in off-farm activities in all the surveyed regions, the situation is different and clearly more restricted when the household level is considered. Thirdly, there is a strong heterogeneity among households in terms of income structure, which can be explained by the high variability of the local context and its role in determining the range of opportunities, and also by the differences in terms of assets' endowment among households.

Because of this high variability among households within regions, no clear diversification pattern can be identified at the regional level. Depending on the region, between 60-90% of global income is concentrated in the first income source (C1), which is mostly comprised of agriculture. The two first income sources (C2) capture 95% of the global income in all regions confirming the weakness of household income diversification. Consequently, the average diversification index by region is weak in all the SSA surveyed countries, but also surprisingly in Nicaragua and Morocco.

Generally, the poorest 20% of surveyed households tend to be less diversified in all countries because of their lack of assets to engage in diversification processes, leaving them stuck in poverty traps. Madagascar, where very poor households must generate incomes out of their small farms offers an exception to this result: in order to sustain their livelihoods, producers engage in agricultural wage employment, even to the detriment of their food self-sufficiency.

Specialization in agriculture is the rule, but not in the anticipated way

Because income diversification is weak, and because farming provide the core livelihood of the majority of the surveyed population, most of the households can de facto be considered as being specialized in agriculture. However, this pattern is far from what is commonly expected of "specialization": this agricultural specialization is not a trend toward one or a few on-farm activities that would be accompanied by increased investments and productivity, as well as some assets specialization. On the contrary, this situation expresses the supremacy of risk-management farming, predominantly developed by poor producers, especially when no other income opportunities exist.

In all of the surveyed regions, in both SSA and non-SSA countries, farming is overwhelmingly oriented toward staples production, with a significant presence of livestock activities. In all countries except Morocco[66] and Senegal, staple food production varies between 60 and 80% of the farm production. Self-consumption remains high (between 20 and 40% of the farm production), especially for the poorest households,

[66] Morocco's year of bad weather conditions sharply influenced yields, and consequently farm income.

confirming the role of risk-management strategies. The only exception is the surveyed region in Mexico, where farmers are mostly fully inserted into markets as a consequence of a new consumption and production patterns for maize. Yet, this prominent self-consumption does not preclude a strong market connection. Most of the households sell the majority of their production and are "market-oriented" (more than 50% of farm production sold); while households based on "subsistence strategies", i.e. with less than 10% of commercialized outputs, are an exception.

While staples dominate in the farm output, crop diversification – where it exists – reveals strong regional patterns linked to the development of traditional exports (groundnut, cotton, coffee, etc.) or fruits and vegetables. Agro-ecological conditions, as well as specific historical situations, play a major role in the development of these other productions, but market access is the major issue. It often relies on the presence of specific economic agents, notably agribusinesses, which facilitate market insertion.

High-value chains and "modern" forms of integration are marginal

Contrary to expectations about the development of "new" agriculture and markets, the Program did not identify important changes in farm productions and marketing methods. This is the consequence of the selection of the surveyed regions, although "winning" regions with new markets dynamics were specifically included. But the finding of limited presence of high-value chains and "modern" marketing methods based on formal contractual arrangements can also be considered a Program result: these processes of integration are limited, especially in SSA countries, and are localized. They mainly rely on private initiatives and their development is linked to activities initiated by agribusinesses: contract farming and out-grower schemes articulated with first processing and packaging for export or for domestic procurement systems.

In the surveyed regions, including in the "winning" ones, staples hold the large share of farm production. When they exist, productions for export are mainly "traditional", i.e. supplying bulk markets without sophisticated specifications. Consequently, most of the products are commercialized through "traditional" marketing channels: direct sales to brokers or wholesaler agents at farm gate or in the local market, routine informal arrangements with middlemen, or buying agents of the monopsony-type local agro-industry. Products directly delivered by the farmers to the factory or to the collecting center generally follow the same pattern. This is explained by the fact that integration processes within value chains mainly occur in the downstream segment (after the first collection or process) and not at producer level. Surprisingly, the role of cooperatives in marketing is very limited. The most frequent cases are producers' organizations, which act like brokers for sales and take in charge input supply.

As a result, when looking at the national level, high value production and integration into new market segments concern an order of magnitude of tens of thousands of producers when hundreds of thousands or millions continue to rely on "old" production and marketing systems.

Though differences exist, similarities between SSA and non-SSA countries are more important than expected

Although the survey does not allow any measurement of the rate of exit from the rural areas, the main difference between the SSA and the non-SSA surveyed regions is the importance of non-farm households in the sample. There is significant variability among the non-SSA regions, but several of them count between 10 and 20% of non-farm households. This is, of course, a main issue. It illustrates the different stages in the development process, which is also logically translated in the average regional household income. Another difference is the global income distribution, which is more unequal in the non-SSA regions, as illustrated by higher Gini indexes, which translate into more pronounced dual agrarian structures, particularly in Morocco and Nicaragua.

However, and amazingly, the structural differences between the SSA and the non-SSA regions, which were an expected outcome of the fieldwork, are not so radical. Rural poverty is a sharp reality everywhere. Even if clearly less acute than in the SSA regions, the proportion of poor households below the $2 a day poverty line remains high in Morocco and Nicaragua (respectively 35% and 45%), and many of them barely meet their basic needs requirements, notably in terms of food. On-farm incomes weigh in similarly and hold the larger share of the global household income, the surprising exception being some regions of Senegal and not non-SSA regions. The structure of off-farm incomes is not radically different and the variations between all regions are more important than between SSA and non-SSA regions. The relatively higher importance of agricultural wage employment in the non-SSA regions is probably the main exception.

The pattern of on-farm production differentiation equally relies on very local factors such as agro-ecological conditions, historical situations and market access. But these are likely similarities in terms of market restructuring and development of highly integrated value-chains, which are the most unexpected. In Morocco and Nicaragua, where dairy and horticulture industries, as well as modern retail systems, are more developed, the market access pattern also remains very "traditional".

2 Back to the Transition(s) Challenges

2.1 *Exit Options and Economic Transition*

What do these sobering rural realities mean for the more global processes of structural change which are so crucial for development? And what do they mean particularly for the SSA countries that are still at the early stages of their economic transition?

One of the main results of the WDR08 is to demonstrate that, even if three "worlds of agriculture" can be identified with reference to the specific role of agriculture at the various stages of the development process, three main pathways out of rural poverty exist. These three pathways – namely agricultural entrepreneurship; rural labor markets; rural non-farm economy and migrations – are, of course, non-exclusive: they can emerge and combine in very different ways and at very different times, yet they can all contribute

to the process of change at both levels of households and the rural economy. However, in the long run, they represent two major options: on one side, specialization in agriculture, consistent with the need to increase productivity and profitability; on the other side, exit from agriculture and redeployment of the labor force in other activities. These options have deeply shaped the processes of change over the last centuries; they are embedded in the more global and progressive reshaping of the overall economy.

As summarized previously, a main lesson of the Program's sample, which reflects a wide range of regional situations in terms of levels of development and connection to markets, is the recurring importance of poverty. Poverty is most severe in the SSA surveyed regions but remains a real concern in the non-SSA regions; the case of the Mexican region under review is too specific to draw conclusions even if the general level of development of the overall country makes a difference.

The analysis of the livelihood strategies reveals the importance of the farm-oriented category (see Figure 13 and Figure 14). It largely prevails, with the exception of several surveyed regions of Senegal, knowing that the characteristics of the on-farm activity show the predominance of market orientation and, simultaneously, the role of self-consumption and the importance of staple production. The other significant category is the diversified one; apparently a "catch-all" group, the diversification group is highly sensitive to the selected threshold for qualifying the other groups (75% of the global income). Of the total households interviewed, 35% is off-farm oriented, i.e. deriving three-quarters of their income from waged labor, self-employment or transfers. The fine-tuning of the labor-oriented category reveals the importance of self-employment, notably in Senegal, which mainly relies on informal activities, petty trade and occasional "small jobs". Thus, in the surveyed regions, the only structural exit options out of agriculture concern agricultural wages in three regions of Nicaragua (15 to 20% of the households) and two regions of Morocco (5 to 10%). Other options are more marginal: 5% of non-agricultural wage orientation, again in Morocco and Nicaragua; 5 to 10% of migration orientation in two regions of these two countries and one region of Mali.

This overall picture, confirmed by the specific analysis of the diversification pattern at the household level (see the discussion on the diversification indexes), shows a recurring farming economy where opportunities outside of agriculture are scarce. The phenomenon is massive in the surveyed SSA regions, while the non-SSA regions show a slight differentiation.

The crucial question here is the effectiveness of pathways out of rural poverty using the exit of agriculture options and their perspectives. This questioning goes back to the core issue of the absorption capacity of the economy discussed in the first part of this document. It relates directly to the existing processes of growth of the national economies and their drivers.

If Mexico has been long-engaged in its structural transformation and offers a diversified economy where agriculture no longer has a significant role – which does not remove the difficulties of adjustment of its rural economy – the cases of Morocco and Nicaragua are more sensitive: agriculture still counts in the global aggregates and the perspective of

deepening their economic transition will clearly rely on the capacity to skillfully manage their regional integration. Agricultural policies could play a significant role in limiting the exclusion processes.

The situation of Sub-Saharan Africa is of course the most critical. The sub-continent is characterized by its long-lasting structural inertia: while urbanization has increased tenfold since the time of independence, the overall economy remains clearly outside of the industrialization process; growth is very volatile; agriculture still counts for 60 to 80% of the EAP; and the absorption capacity of the economy relies on the informal sector, both rural (agriculture) and urban, leading to a very low productivity.

This difficult picture takes a dramatic focus when the demographic perspective is taken into account. As seen previously in Part I, SSA is the last region in the world engaged in its demographic transition. The population prospects targets an increase of 1 billion people between 2010 and 2050, which means a doubling in forty years. Table 5 shows the sharp difference between the RuralStruc SSA and non-SSA countries.

Table 29: Evolution of the RS Countries' Population, 1950-2050 (in millions)

	1960	1990	2010	2050	Variation 2010-2050	Variation 2010-2050
Kenya	8.1	23.4	40.6	84.8	44.1	109%
Madagascar	5.4	12.0	21.3	44.5	23.2	109%
Mali	4.0	7.7	13.5	34.2	20.7	153%
Mexico	37.9	84.0	110.3	132.3	22.0	20%
Morocco	11.6	24.8	32.4	42.6	10.2	32%
Nicaragua	1.8	4.2	5.9	7.0	1.1	18%
Senegal	3.3	7.9	13.3	25.3	11.9	90%

Sources: World Population Prospects, 2006 revision.

In terms of employment, the annual additional labor supply to be absorbed by the economy is presently 10 million people in SSA and will be near 20 million in the 2030s. Table 30 shows what this trend means for the RS SSA countries and when the peak-time for labor supply is forecasted.

Table 30: Maximum Annual Labor Supply in the RS Countries

Country	Additional labor supply in 2005	Peak of annual additional labor supply	Peak time
Kenya	558,8	930,6	2030
Madagascar	286,2	473,4	2035
Mali	171,8	447,8	2045
Mexico	922,6	1,368,600	2000
Morocco	377,8	413,6	2000
Nicaragua	69	81	2010
Senegal	179,8	268,2	2025

Source: World Population Prospects, 2006 revision.

In order to illustrate the extraordinary stress of this surge of the labor supply on the labor market when compared to the average formal job creation, Table 31 provides a theoretical estimate of the range of formal employment deficit, over a five-year period. The only objective of this estimate is of course to feed the discussion on this critical absorption issue.

Table 31: Projection of Formal Job Creation and Employment Gaps over a 5-year Period in the RS Countries

	Date or Time period	Formal job creation (annual average)	Additional labor supply (annual average)	Formal job creation / additional labor demand (%)	Projected formal job deficit after 5 years (stock in Thds)
Kenya	2004	36,4	558,8	7%	2,612
Madagascar	2007	42	251,6	17%	1,048
Mali	1999	39,5	201,6	20%	810,5
Morocco	1994-2003	217	377,8	57%	804
Nicaragua	2000-2005	32	74,4	43%	212
Senegal	2000-2006	20	179,8	11%	799

Source: RS Country Reports, World Population Prospects, 2006 revision, and authors' calculations.

These figures serve as a reminder of the exceptional situation faced by SSA countries. Sub-Saharan Africa is currently confronted to the unique challenge of dealing simultaneously with the early phases of its economic transition and an unachieved demographic transition, under the very specific conditions of the period: a global open economy, which offers huge opportunities and some additional challenges in terms of productivity and competitiveness, under the growing constraints related to climate change which will particularly affect the continent. [67]

2.2 *The Role of Agriculture in SSA's Economic Transition*

The objective of this brief section is to feed the debate on agriculture's role in the process of economic transition in Africa today. Although agriculture's core roles as a means of both food production in a context of rising demand – internationally and for the African continent –, and of poverty alleviation are fully recognized and indisputable, many views contest the ability of agriculture to be a real booster for African development and consequently for its structural transformation: the productivity is too low; the handicaps are too many; and, consequently, it would be more realistic to come up with other options.

[67] These very specific African challenges have been presented and discussed in a parallel session of the last ABCDE Conference in Seoul, Korea, June 2009. The title of this parallel session, co-organized by the Program's team, was: "The Growth-Employment Challenge: A Comparative Approach between Asian Economic Transitions and Africa Today". The contribution in the panel was: Arbache J., Giordano T., and Losch B., "Africa's Traps and Challenges: What can we Learn from East Asia?"

One can easily recognize that there is no single answer to the very unique challenges faced by SSA. To deal with the surge in the active population and the weakness of the overall productivity of the economy, industrialization cannot definitely be ignored, nor can the development of more formal activities in the service sector be overlooked. However, one must recognize that industrialization did not happen over the last four decades, in spite of a huge process of urbanization which offered and offers all the economic advantages of density (cf. WDR09). Many reasons, related to both the history of the international insertion of the continent in the world economy and inappropriate economic choices and public policies, can be raised for the limited progresses in terms of industrialization. However, even with massive investments in infrastructure, capacity building and in the improvement of the business climate, such an evolution will take time and there is no silver bullet to hasten the process.

Meanwhile, the on-going demographic transition of the continent will translate into huge pressure in terms of the activities needed to sustain the livelihoods of a growing population. The figures presented in the previous section cannot be ignored, and agriculture must be part of the solution: with the existing share of the active population engaged in farming activities, its growth and development will be central in the on-going economic transition and the sector will at least continue to play its strategic buffer role in the coming years.

The lessons learnt from the last economic transitions that occurred in the emerging economies of East and South-East Asia, remind us that agriculture has been a strategic component of the development process. Governments dealt very seriously with the issue, and agriculture was not only considered as a sector for growth, but also as the core driver of the structural transformation. Profitability of the farming activities is a central issue here: the increase of farm incomes is a necessary element to engage in the poverty alleviation process, but also in rural diversification. Increasing farm income means increasing rural demand, which is the driver for development of new activities and economic change. These are lessons clearly substantiated in the literature that should not be ignored.

Now, what are the prospects for the absorption capacity of agriculture in SSA today? This question is of course notably sensitive and contains several traps because in many developing countries, and particularly in Africa, information on endowment and availability of production factors is often scarce, partial, and based on estimation at the national level. Also the possible answers to this sensitive question are clearly context-related and cannot be generalized. Indeed, global figures do not inform about the accessibility, the quality and/or the possible combination of each factor, which depend on their intrinsic local characteristics and also of the global economic and institutional environment. Global figures also mask the distribution effects among stakeholders and regions and their evolution.

The case of land is particularly illustrative of these difficulties for the analysis. The evolution of the quantity of agricultural land and its size by AgEAP is insufficient to understand the existing challenges. Further information is needed on: the soil's quality

and fertility; land access and concentration of land, which refer to property rights, structure of ownership, all of these elements being part of the characterization of the agrarian system. Each situation has its own constraints and opportunities, which directly affects the options for development. Similarly, if there is an absolute stock of agricultural land – defined by national borders or landscape – the available land is relative to the level of technology, the existing infrastructure, and the provision of public goods (water access and irrigation, roads, eradication of endemic diseases, etc.).

It is clear that the increases in the demographic in rural areas and in the number of families relying on agriculture for their livelihood have directly impacted on the size of farms and the farm structure. Impacts of these trends include the simultaneous processes of segmentation due to the integration of the new generations and, sometimes, concentration when heads of household decide to exit agriculture (if opportunities exist). The question of viability is consequently an issue; the surge of the labor supply will not be absorbed by the agriculture only; but its capacity of absorption will rely on locally-based solutions where increases in productivity and profitability and land management will be part of the answer.

3 Policy-making Guidelines

There is no easy way to deal with the huge challenges of poverty alleviation and economic transition. The most significant risk is to consider that recipes exist, which is, of course, not the case. What does exist is a well-known "shopping list" of policy measures that everyone can find in every good publication related to economic development in general, and rural development in particular. The main ingredients in the recipe for success are: public goods provision (infrastructure, research, information, and capacity building), improvement of imperfect markets (typically inputs and sometimes marketing), incentives for the development of missing markets (credit, technical support, assurance), and risk mitigation mechanisms. What is more difficult is to mix these ingredients in the policy bowl, to devise tailor-made policies (because good recipes are home-made), to define their adequate sequencing, so as to take heed of the more global development challenges.

3.1 *Reengaging in Strategy Design*

The Program's results cannot suggest a recipe. They provide information and a global perspective, which highlight the need to re-engage in development strategies in order to deal with the critical challenges faced by many developing countries, particularly in Sub-Saharan Africa. The Program's results can also contribute directly to the policy debate through a dissemination process, which will have to be defined collaboratively by the contributing donors and the participating countries.

In many countries, there has been a long-term neglect of global strategy design over the last two decades as a consequence of the development community practices. The existing consensus on global challenges invites the re-articulation of sector policies within the global framework of development strategies.

Due to the role of agriculture in growth, poverty alleviation and economic transition, agricultural policies must be carefully articulated with the other sectors, using a territorial approach, and must deal with different scales. Such a perspective implies a clear re-engagement in the policy- making process, the prerequisite for which is a diagnosis shared by stakeholders on their challenges, opportunities, and constraints.

This stage is more complex than it appears, because it implies accurate information, capacity building and consultation. The diagnosis helps to build scenarios, which must be carefully discussed in order to make choices and then identify priorities. Here again, consultation is the key word because it is the core of a development strategy: as reminded by Stiglitz (1998), a development strategy is a public good, like the rule of law, because it expresses an agreement between the different stakeholders in the processes of economic and social development. Such an approach takes time, must be cautiously planned and can be costly, but ownership is the determining factor of commitment.

3.2 *Prioritization and Sequencing*

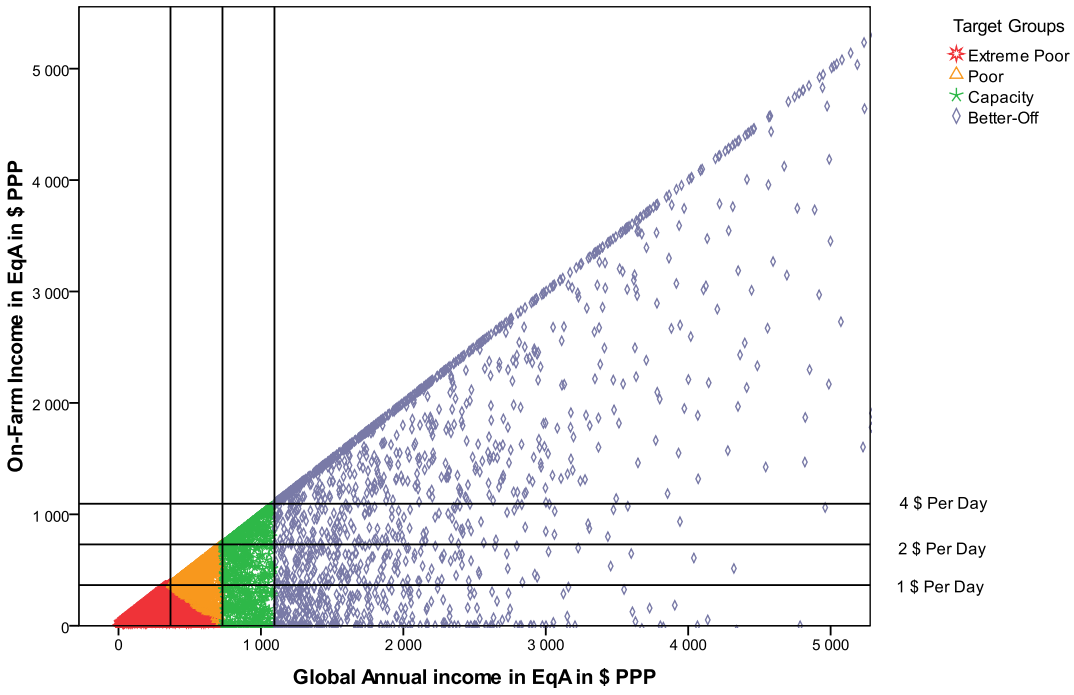
A critical issue for policy makers is, most often, the need to do everything at the same time. Of course, this is not possible due to limited financial and human resources. Choices need to be made, and making them is even more difficult under the specific conditions of developing countries.

In this perspective, prioritization and sequencing are required. Due to the variability and the high heterogeneity of the regional situations, which are clearly indicated by the Program's results, regional diagnoses must be developed. A useful approach is to identify the binding constraints in order to prioritize the needs for action.[68] Priorities can be discussed in terms of targets, which can be identified for groups of economic agents, types of productions, regions.

As an illustration, an approach for identifying target groups based on household incomes was tested using the survey results. Four groups were identified with reference to levels of global income and on-farm income in order to assess their capacity of investment: better-off (>$4 per day), capacity (>$2 per day) and poor and extreme poor (<$2 per day). The "poor" group was selected considering that it aggregates households that could exit poverty if they duplicated their on-farm income. However, this approach, which is very basic and static and does not include any reference to assets, allows consideration of the overall situation in the surveyed regions. In terms of policy design, it shows the challenge represented by the two "poor" groups – by far the most important in SSA.

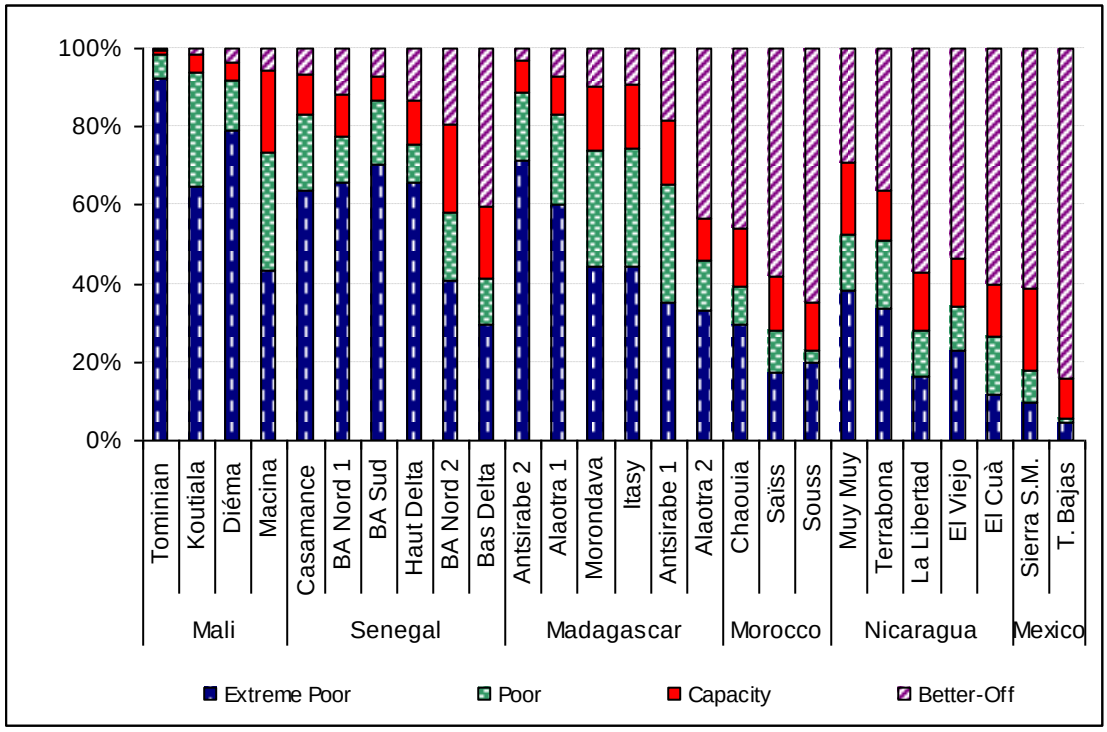
[68] A clear reference here is the Growth Diagnostics method developed by Hausmann, Rodrik and Velasco (2005) which could be usefully adapted to a regional approach.

Figure 32: Method of Targeting Households' Groups



Sources: RuralStruc Surveys

Figure 33: Distribution of Households per Target Group in the RuralStruc's Sample



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List of Acronyms

AFD: Agence Française de Développement

AgEAP: Agricultural EAP

AGOA: African Growth and Opportunity Act

CAADP: Comprehensive Africa Agriculture Development Program

CAFTA: Central American Free Trade Agreement

CIRAD: Centre de Coopération Internationale en Recherche Agronomique pour le Développement

DCs: Developing countries

DDA: Doha Development Agenda

DDC: Direction du Développement et de la Coopération (Swiss Development Agency)

EAP: Economically active population

ECA: Economic Commission for Africa

EPAs: Economic Partnership Agreements

FAO: Food and Agriculture Organization

FDI: Foreign direct investment

FTA: Free Trade Agreement

GATT: General Agreement on Tariffs and Trade

GDP: Gross domestic product

IFAD: International Fund for Agricultural Development

ILO: International Labor Organization

IPCC: Intergovernmental Panel on Climate Change

LDCs: Least Developed Countries

LSMS: Living Standards Measurement Study

MDGs: Millennium Development Goals

NAFTA: North American Free Trade Agreement

NEPAD: New Partnership for Africa's Development

OECD: Organization of Economic Co-operation and Development

RIGA: Rural Income Generating Activities

RS: RuralStruc Program

SPS: Sanitary and Phytosanitary Measures

SSA: Sub-Saharan Africa

WDI: World Development Indicators

WDR08: World Development Report 2008 "Agriculture for Development"

WDR09: World Development Report 2009 "Reshaping Geography"

WTO: World Trade Organization

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Annex 1
Structural change in historical perspective: A statistical comparative approach 1960-2005

A statistical overview of the structural characteristics of the RS countries can only be fully executed if placed in context by other country cases. In this annex, four countries are chosen for comparative purposes: Brazil, Chile, Indonesia and Thailand.

This selection is by no means random. These comparative countries are emerging economies, all within the middle-income category, that have made significant achievements on their path to structural change and economic development through growth strategies that are generally liberalized and export-oriented. In Latin America, Brazil recently achieved the ninth rank in world GDP, as measured by PPP (Purchasing Power Parity) (2006), whilst Chile has also been successful at maintaining the fastest growing economy in the region over the past 15 years. In Asia, Indonesia and Thailand have both recovered from the 1997 financial crisis with projections of economic growth rate pegged at 6% in 2007 for Indonesia and an average growth rate of 5.6 % for the 2002 – 2006 period for Thailand.

As a side-note, India and China are often chosen as comparative cases in current discussions on economic development processes but they are not presented here because their macro figures, particularly their large demographic sizes, make them both unique cases.

Data and methodology

The RS first phase national reports have served as a qualitative knowledge base for this statistical annex. Qualitative information on the four comparative countries was sourced from country briefs produced by the World Bank[69]. Data was extracted from the World Bank databases (GDF & WDI Central) for use in every section of this statistical annex and was accompanied by data provided by FAO (FAOSTAT) in the assessments of population variables such as economically active population (EAP) and rural population. The following notes are an outline of the compilation of the figures presented in this statistical annex.

Trends of GDP per capita

The data tables – annual data from 1960 until mid-2000s - will not be presented in the annex because they are extensive. There was enough data to assess trends for the "GDP per capita (constant 2000 US$)" indicator for the entire 40-year period but data records only start from 1980-onwards for the "GDP per capita, PPP (constant international $)" indicator.

[69] Country Briefs for Indonesia (August 2007), Brazil and Chile (October 2007), and Thailand (February 2008).

Trade Composition

Under this section, the aim was to assess the trends in trade composition for the sample of countries from 1960 until mid-2000s. The indicator illustrating the share of total exports held by agriculture was calculated as the sum of the indicators "Agricultural raw materials exports (% of merchandise exports)" and "Food exports (% of merchandise exports)" in the World Bank databases (originating from COMTRADE). The components of each of these indicators can be found below in section Table 20).

The shares of total exports accounted for by agriculture was used to construct averages of 5-year periods for the time period and was also used to construct the corresponding non-agricultural exports for each country. Both results were tabulated before being presented in graphical form. This data is identical to that used in the structural transformation exercises.

Primary, Secondary and Tertiary Sectors

The indicator *"Agriculture, value added (% of GDP)"* was chosen as a proxy for the primary sector, *"Industry, value added (% of GDP)"* as a proxy for the secondary sector and *"Services, etc., value added (% of GDP)"* for the tertiary sector. Averages of 5-year periods were created and tabulated before being presented in graphical form.

All RS countries had sufficient data for these particular series except for Morocco and Nicaragua. For the case of Morocco, actual shares of GDP were calculated using value added series, delineated in current US$m, for agriculture, industry and services and GDP in current US$m. For the case of Nicaragua, data was sourced from Banco Central de Nicaragua for the available years of 1960-1999 and the remainder of the series (2000-2004) was sourced from the World Bank databases. The specific data that was sourced from the Central Bank was in total values, in current prices, from the country's *"Actividad Primaria"* (Primary activity), *"Actividad Secundaria"* (Secondary activity) and its *"Actividad Terciaria"* (Tertiary activity). It must be noted that although the data components of the production sectors from the two data sources are broadly similar, they are not strictly comparable. For instance, the relatively small component of electricity, water and gas is included in the *"Industry, value added (% of GDP)"* World Bank indicator, but is excluded from the *"Actividad Secundaria"*, Banco Central indicator and included in the *"Actividad Terciara"*. The exact components of each of the variables are outlined below Table 21;

Agricultural Indicators

Structural transformation was assessed with the use of four indicators which were aggregated in diamond charts: Rural population (% of total population), Agricultural GDP (% of GDP), Agricultural exports (% of exports) and Agricultural EAP (% of EAP). For the RS countries, there was an incomplete set of data for the share (%) held of GDP by agriculture in Madagascar, Mali and Nicaragua (in the 1960s for the three countries and only for Nicaragua in the 1980s). The comparative countries – Brazil, Chile, Indonesia and Thailand – all have complete sets of data points for the required variables.

The "GAP" indicator (the difference between the share of GDP held by agriculture and that of EAP held by Agriculture) was also created from the available data. This was tabulated and used with the share indicators to create a graph that incorporates the three time-periods of 1961-1965, 1981-1985 and 2001-2005.

Data Analysis

Trends of GDP per capita

GDP per capita is an indicator that is used universally as a comparative measure of national wealth and the following graphs (Figure 34 and Figure 11) illustrate the historical trends of the RS countries and the comparative countries.

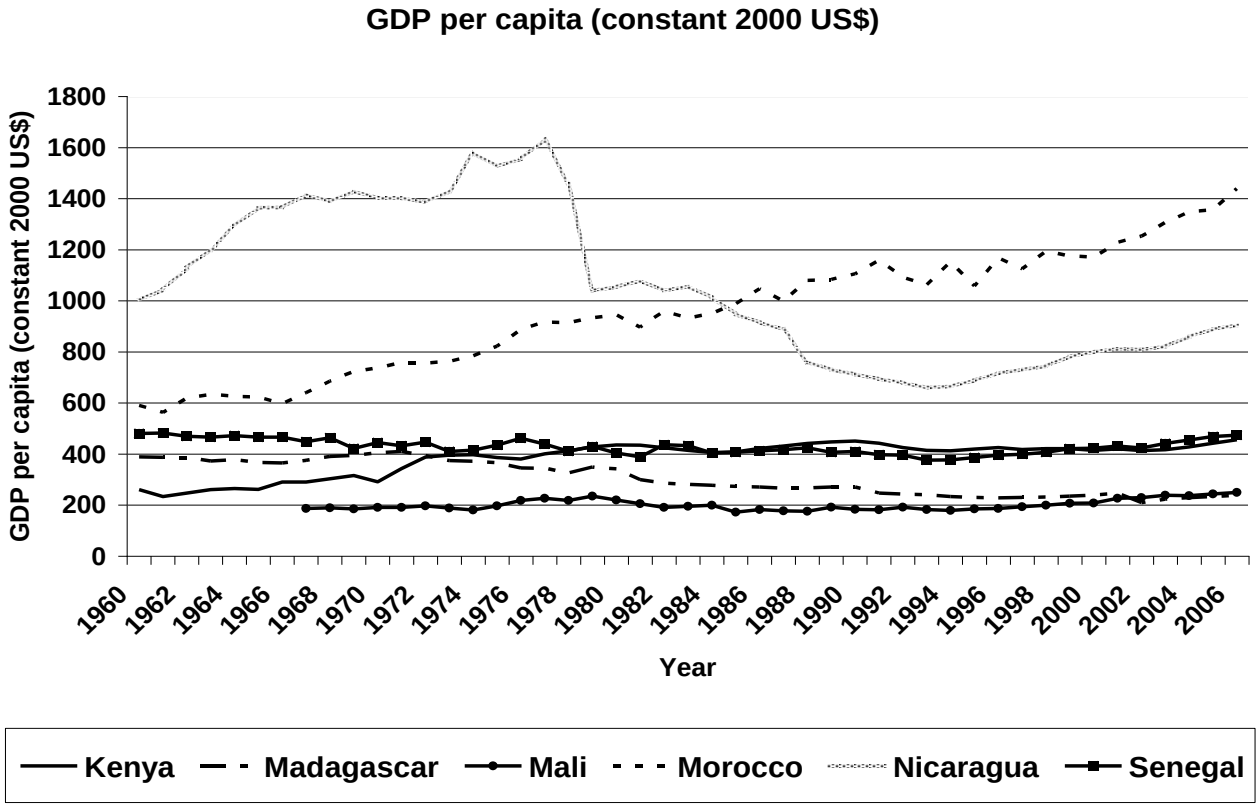
Mexico, which was chosen as a benchmark in the RS study, is an upper-middle-income country and OECD member, and is placed with the four comparative countries because its GDP per capita trajectory follows a similar trend to those of this group of countries. The six other RS countries are low-income or lower-middle-income countries and have trajectories that are comparable with each other and are thus grouped together. This is illustrated in Table 1 below with the chosen year of 2006 for GDP per capita (constant US$).

Table 32: RS and comparative countries: GDP per capita and income classification

	Population (MM)[1]	**GDP per capita (constant 2000 US$) (2006)[2]**	**Income Classification[3]**
Madagascar	18.6	238	Low-income ($905 or less)
Mali	11.6	250	
Kenya	35.6	456	
Senegal	11.8	473	
Nicaragua	5.5	904	Lower-middle-income ($906 - $3,595)
Indonesia	226.1	983	
Morocco	30.5	1439	
Thailand	63.0	2549	
Brazil	186.8	4055	Upper-middle-income ($3,596 - $11,115)
Chile	16.3	5846	
Mexico	104.3	6387	

Note: High income bracket: $11,116 or more[3]
Sources: [1] United Nations Development Program (UNDP) 2005 figures, [2] World Bank (2007), [3] Income categories based on World Bank Atlas method: 2006 GNI per capita statistics

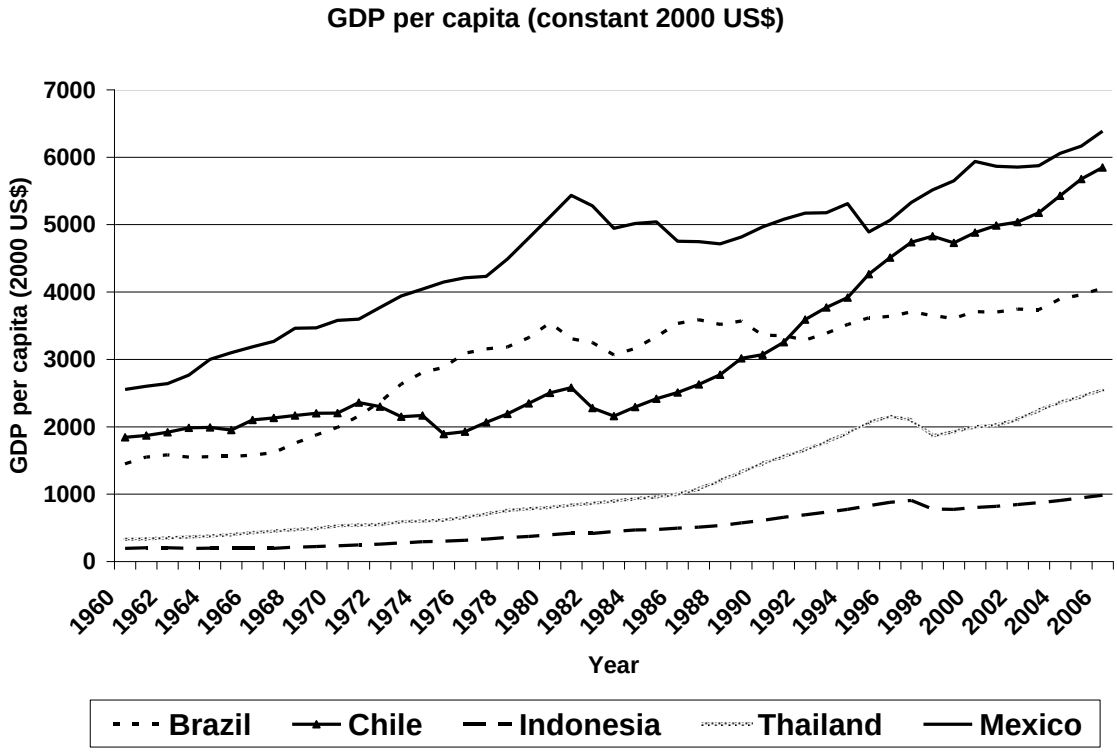
Figure 34:



In Figure 34, the RS countries are seen to have GDP per capita trends that are in accordance with their country classifications; the lower-middle-income countries of Nicaragua and Morocco are logically at a higher level than the four other RS countries. However, the progress made by Morocco over the four decades must be noted and assessed relative to the higher platform reached by Thailand and Indonesia, countries that started at the same level (see below). In the case of Nicaragua, the trend clearly shows the impact of the civil war. All the other low income countries from the RS group share a common characteristic of stagnation.

As for the comparative countries of Brazil, Chile, Indonesia and Thailand, along with Mexico, they are all on rising trajectories, in line with their respective country classifications as seen in Figure 11.

Figure 35



The assessment of the GDP per capita indicator can be enhanced by using the GDP per capita (PPP) which takes into account the differences in the cost of living across different countries. As seen in a comparison of Figures 1 and 2 with Figures 3 and 4, the trends (and subsequent country rankings) in the series remain largely unaltered although the levels logically change, when GDP per capita (PPP) is used.

Assessing the trend of the GDP per capita indicator as GDP per capita (PPP) provides no spectacular differences in marked trends as seen in the Figures 3 and 4 below even though the shortage of data for the period 1960 – 1980 renders an assessment of this earlier period impossible using this data alone. However, Brazil and particularly Mexico show a certain stagnation over the last two decades, and Thailand and Indonesia appear closer to the other RS countries group in the early 1980s.

Figure 36:

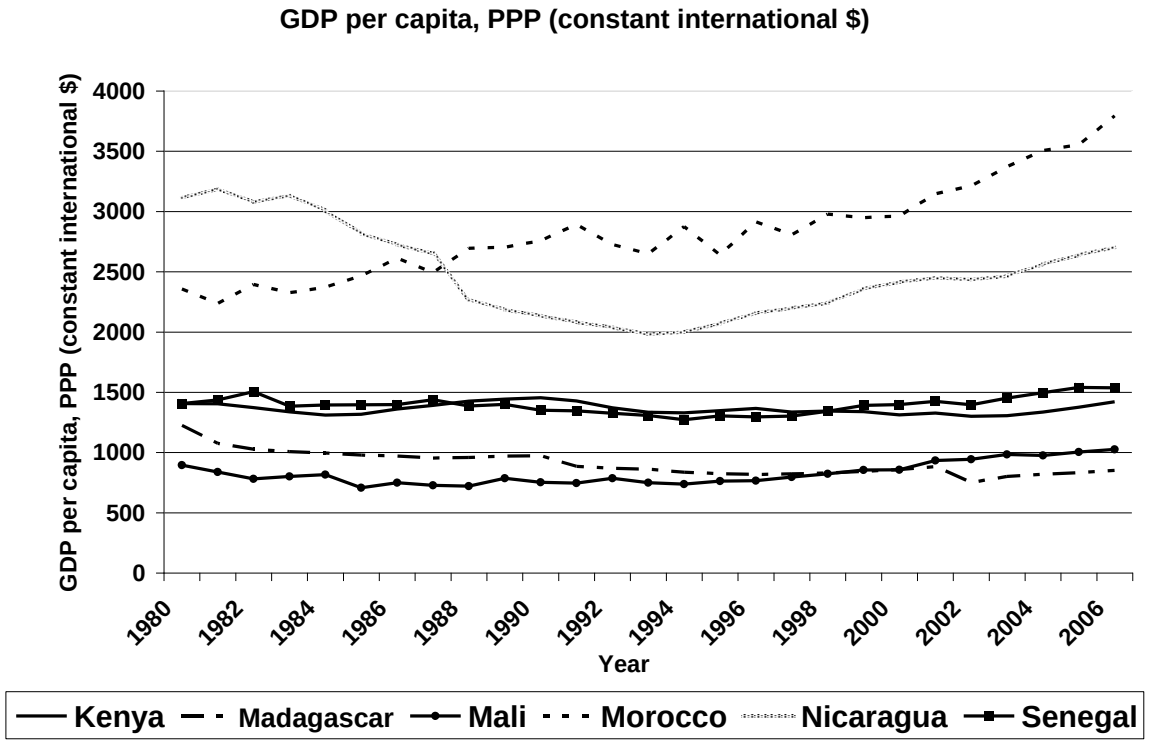
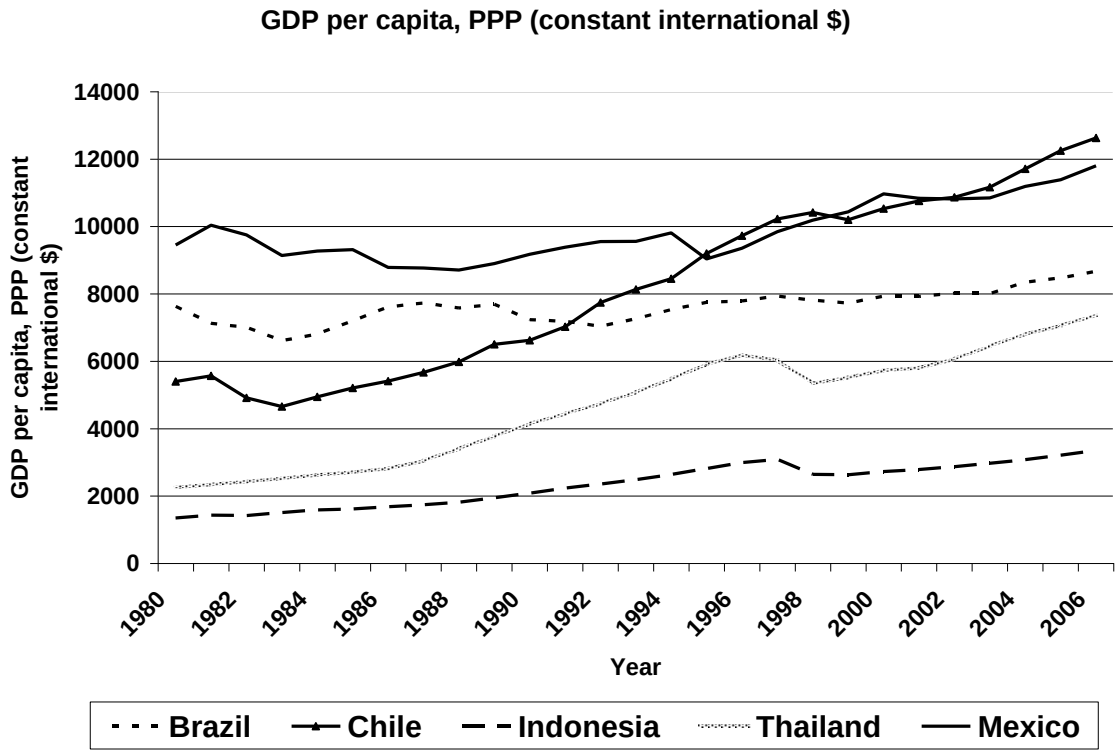


Figure 37:



Trade Composition: Agricultural and Non-Agricultural Shares of Exports

Economic change can be assessed through an evaluation of the composition of exports in trade. This is because as a country develops from being agriculturally-based to industrially-based, the development is expected to be directly reflected in the evolution of the composition of its exports. This process is broadly evident in the sample of countries – there is a general trend of a transformation in the composition of exports from agriculturally-based to industrially-based over time. Chile (Figure 10) appears to be a very specific case over the designated time-period: the share of exports held by agricultural products *rises* whilst non-agricultural exports *decline* over time and clearly illustrates the success of an agricultural exports-led growth strategy.

Figure 38:

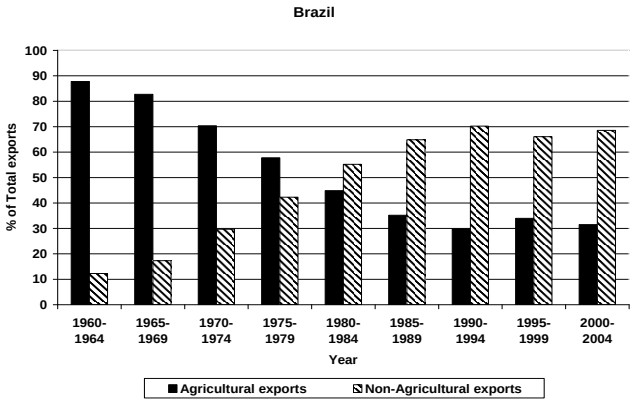
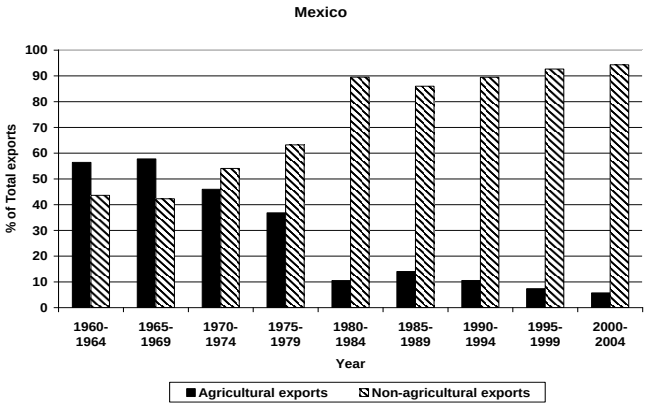


Figure 39:

Figure 40:

Figure 41:



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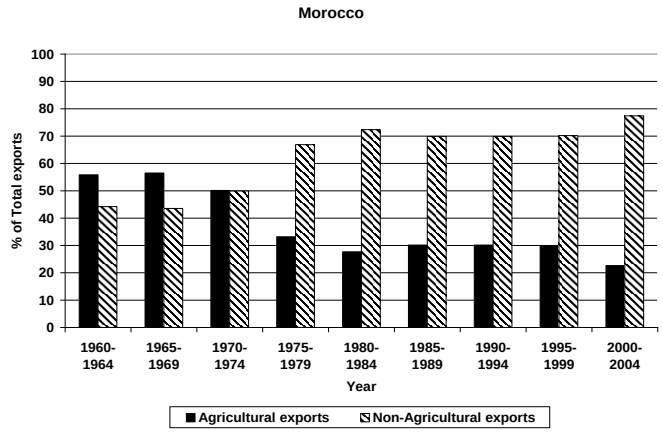

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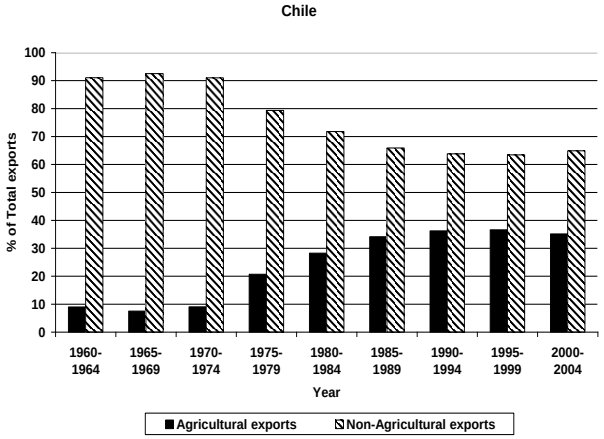

In the RS group of countries, Madagascar, Nicaragua and Mali each have persistently high agricultural export shares over time, whereas countries like Senegal and Kenya do not exhibit this trait because they are engaged in export diversification, particularly in the case of Senegal. However, it must be noted that in the case of Madagascar and Mali, there is a clear decline in the agricultural export shares accompanied by growing shares of non-agricultural exports, since the mid-1990s, reflecting the development of apparel exports in the case of Madagascar, and the development of gold exports in the case of Mali.

Figure 44:

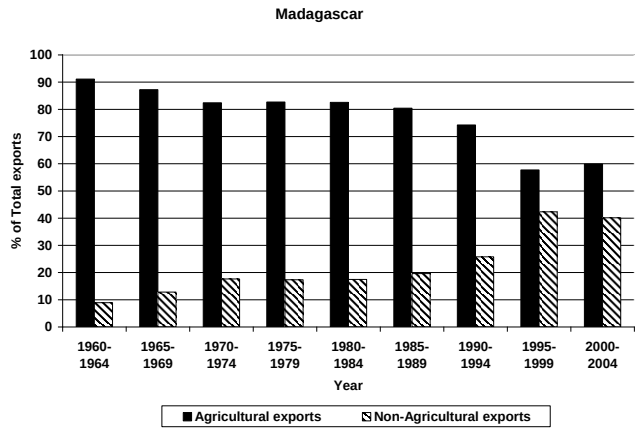

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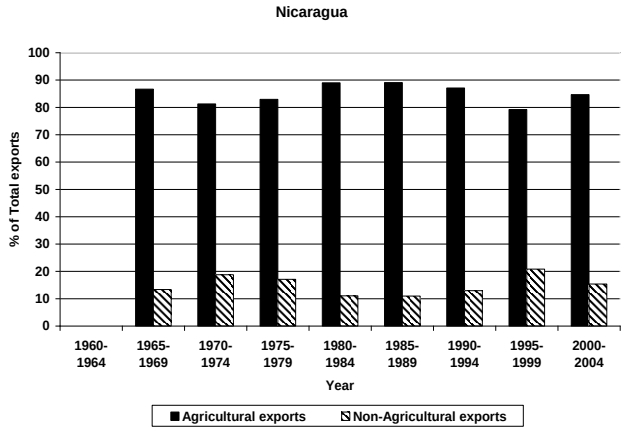
Figure 46



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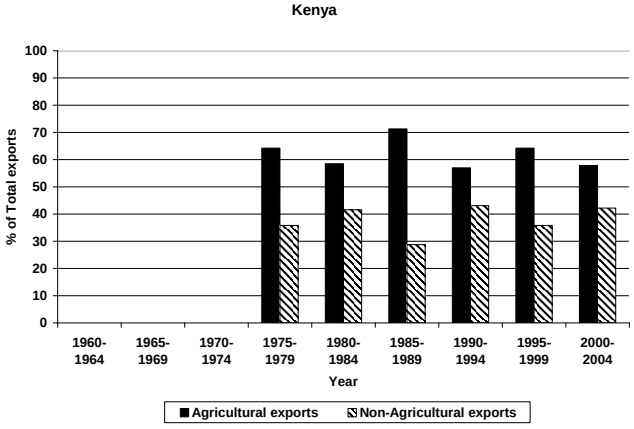

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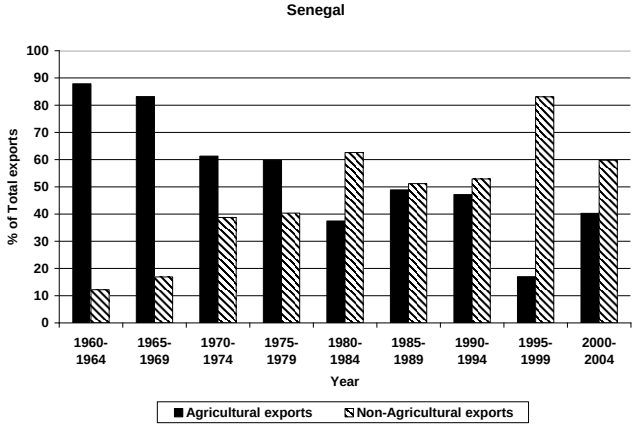


Structural Transformation:

- Changes in Economic Structure

Trends in structural transformation are a means by which the economic development of countries can be gauged. Structural transformation is a process which is characterized by a decline in the relative importance of agriculture to industry and services and has been witnessed in the historical paths of modern-day's industrializing and post-industrialized nations as they have developed. The decline in relative importance of agriculture is due to the net transfer of production factors from agriculture into industry and services as agriculture experiences its own transformation which is triggered by the rising productivity within that sector.

From the group of comparative countries, Thailand and Indonesia are both cases where structural transformation is clearly underway with the visible decline in agriculture, as a share of GDP, over time, alongside the increase in the share of GDP held by industry. The only marked difference between these two cases is the generally higher share of GDP accounted for by services for the case of Thailand.

Figure 49

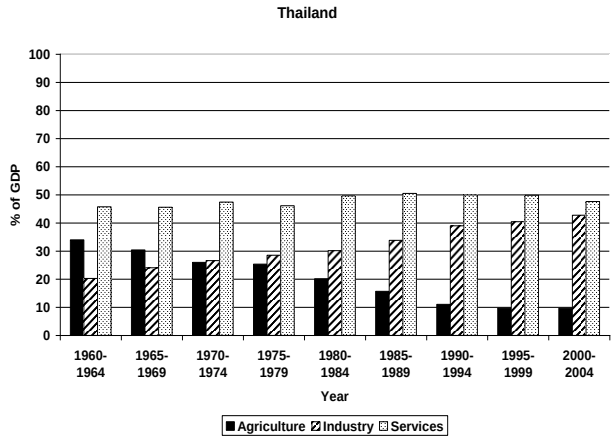
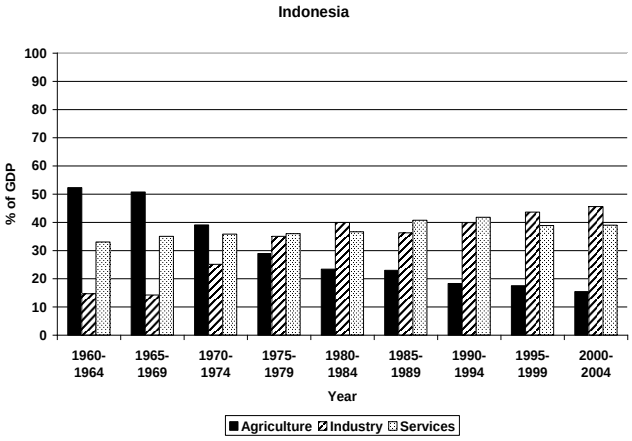


Figure 50



The other cases of Brazil and Chile produce results that are less striking because structural transformation had already occurred in both countries before the time-period under analysis – in the 1940s and 1950s. In both Brazil and Chile, there is the key feature of declining shares of agriculture, albeit subtle declines, alongside rising shares held by services in Brazil. Brazil is seen to have declining shares held by industry, though, whilst that in Chile remains virtually unchanged. Mexico exhibits a picture of declining agricultural shares of GDP with rising shares accounted for by services but a slight decline in the shares held by industry.

Figure 51

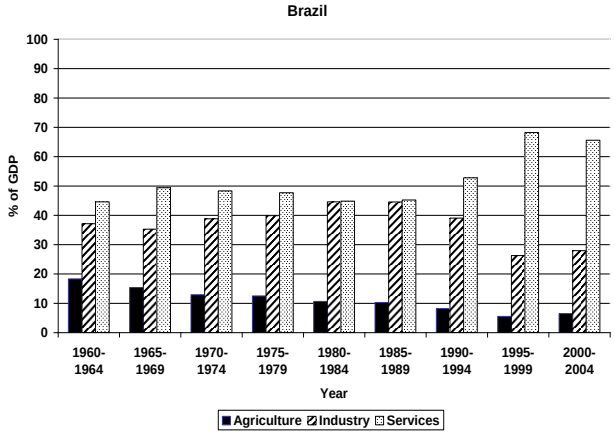


Figure 52

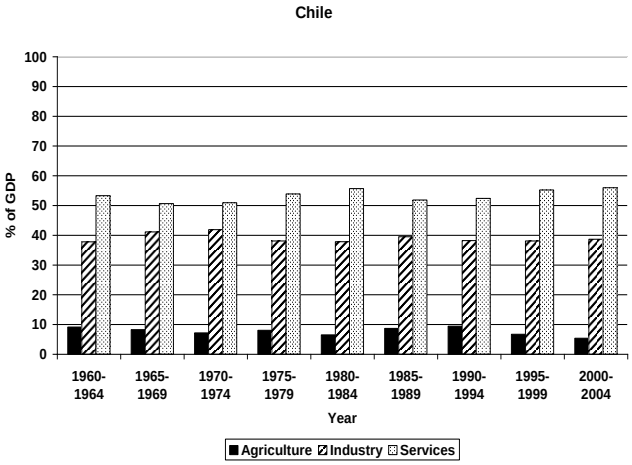
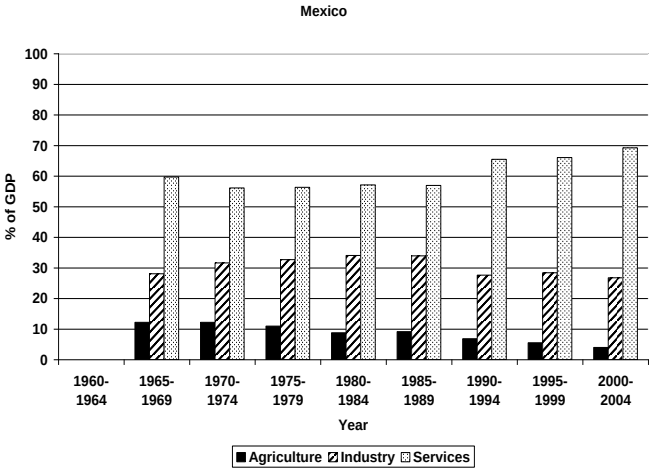
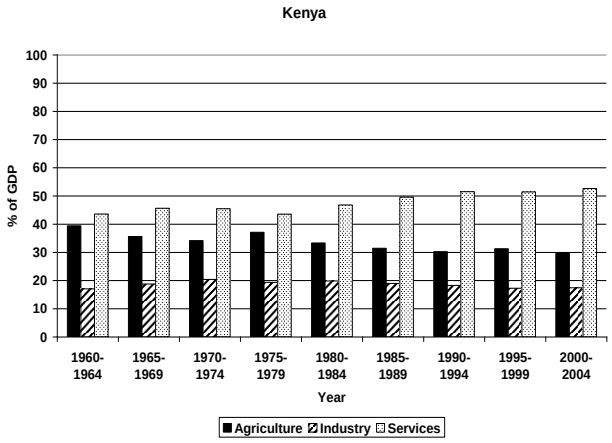


Figure 53



In view of the evidence from Thailand and Indonesia, it cannot be stated that the process of structural transformation is 'clearly underway' in the rest of the RS countries. For the cases of Kenya and Morocco, although there is a decline in the share held by agriculture, there is virtually no change in the share held by industry over the 40-year period from the 1960s to mid-2000s whilst the share held by services has slightly risen throughout the entire period, notably in Kenya. Does it mean that this country has been experiencing a specific transformation with a more direct path from agriculture to services?

Figure 54



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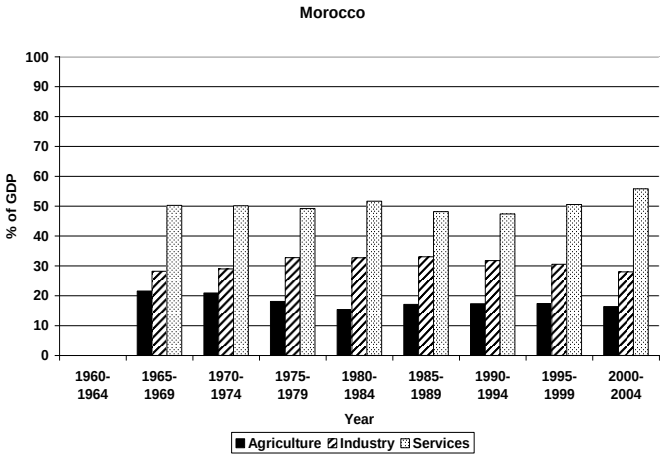
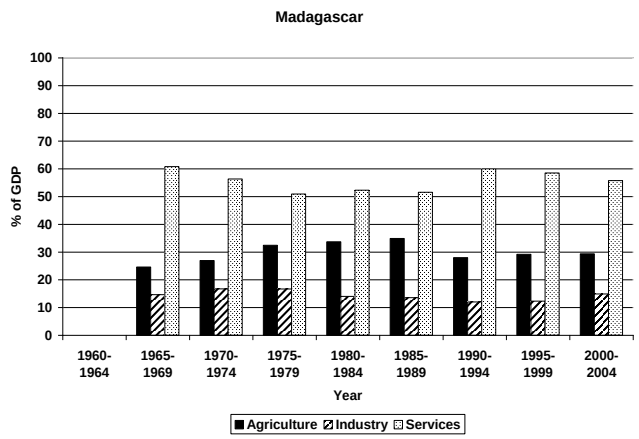


In Madagascar, the situation is broadly static – the share of agriculture has actually *risen* whilst the share of industry has risen modestly and the share held by services has decreased. For the case of Senegal, although a decline in the share held by agriculture is accompanied by a slight rise in the share held by industry, the share held by services has virtually remained unchanged from the 1960s to the mid-2000s.

Figure 56:



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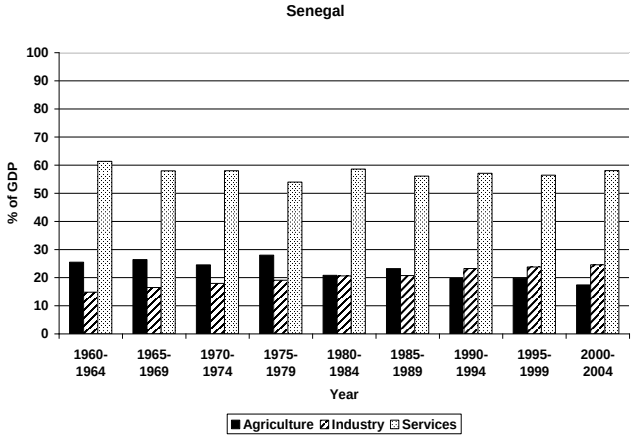


Nicaragua exhibits a slight decline in the GDP share held by agriculture in the last period which is accompanied by a rise in the share held by industry. Out of all the RS countries, Mali could be seen to exhibit the largest decline in the agricultural share of GDP, from over 65 % in 1965-1969 to just over 35 % in 2000-2004. This trend is accompanied by dual trends of rising shares held by both industry and services. However, this change is brought about only because of the recent developments in the country's gold industry. Despite these changes, agriculture still holds a significant share of the country's GDP of approximately 45 % of GDP, the highest of all the RS countries.

Figure 58

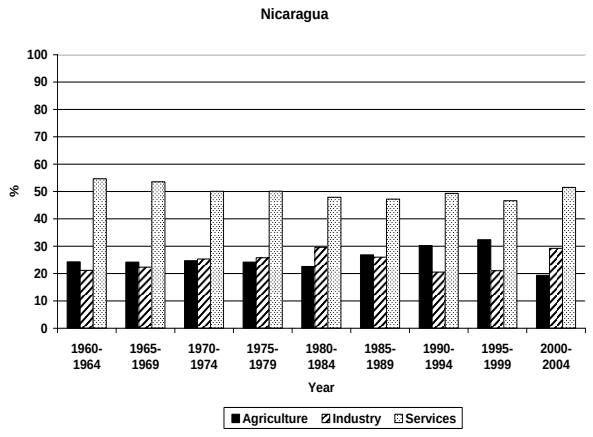
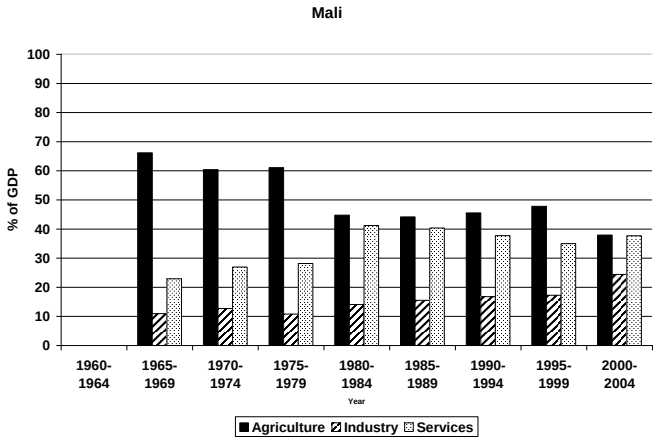


Figure 59



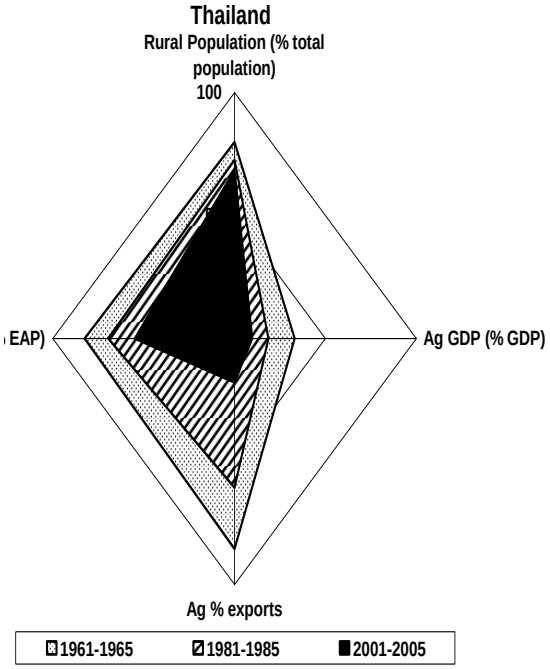
- Changes in Rural and Agricultural Indicators

To add to this analysis, it is useful to illustrate the trends regarding the general weight of agriculture within the economy as well as the rural/urban divide in the demographic structure, agriculture being the main activity in rural areas. The combination of the share of agriculture in EAP, GDP and trade over 40 years illustrate the economic transformation within the selected countries.

From the group of comparative countries, Thailand (Figure 27) and Indonesia (Figure 28) follow similar transitions with their respective shares of AgEAP and of rural/total population decreasing less than the agriculture share in exports and GDP over the 40-year period. This is in line with a common observation stating that with rapid developers, shares of GDP held by agriculture fall faster than their shares of the labor force. Brazil (Figure 29) and Chile (Figure 30) show a clear convergence over the period and they are structurally similar by the 2000s.

From the group of RS countries, Mexico (Figure 31) is most like the Latin American countries in the comparative cases, with all its agricultural/rural shares falling below 50% of the respective total indicators and a GDP share under 5%, the exception being the small share of agriculture in exports. Morocco also presents a process of change contrary to the other RS countries with marked reductions in its shares. Madagascar (Figure 33) and Kenya (Figure 34) reflect little change. The trends seen in the case of Mali (Figure 37) reflect the developments which have been noted to have been in occurrence in the country since the mid-1990s, notably the decline in the share of exports held by agriculture in recent years because of the developments in the country's gold industry. Nicaragua (where there is an issue of missing data) is characterized by the strong resilience of its export structure. It must also be noted that the rapid decrease of the EAP reported by the FAO is contradicted by national sources which report higher levels for this indicator.

Figure 60:



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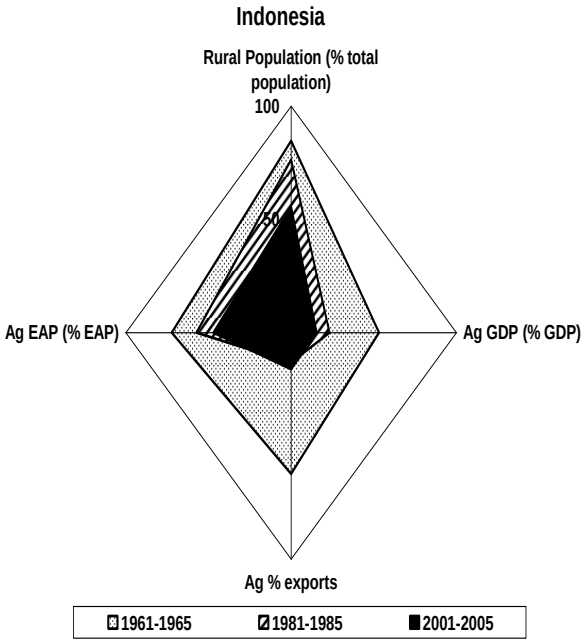

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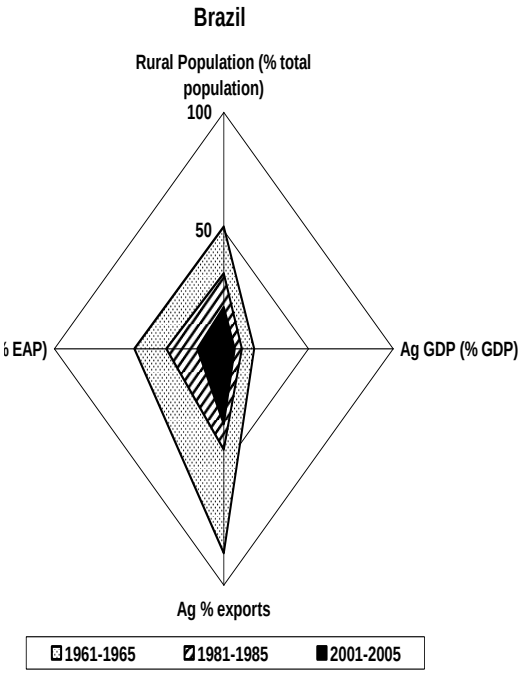

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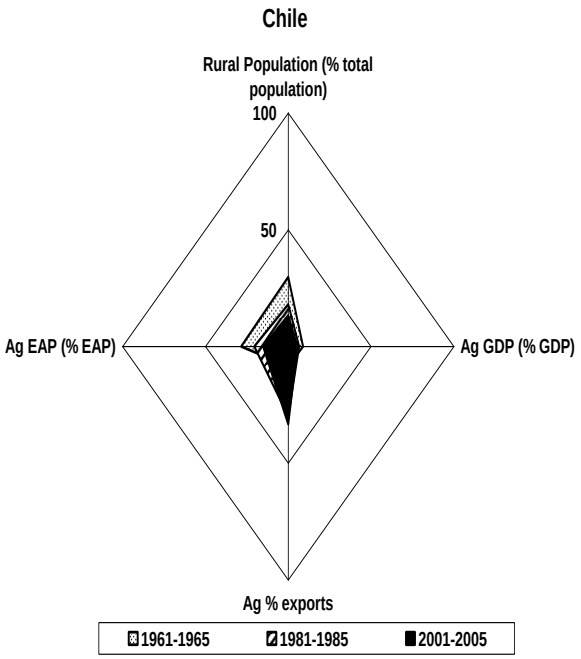


Figure 64

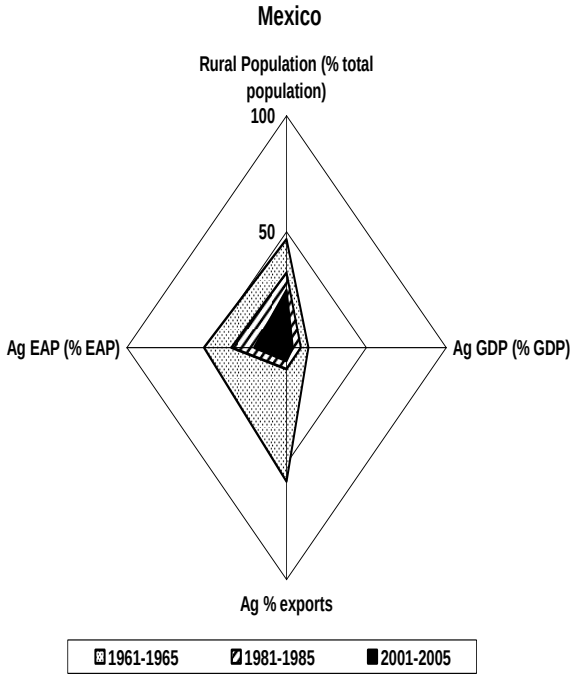
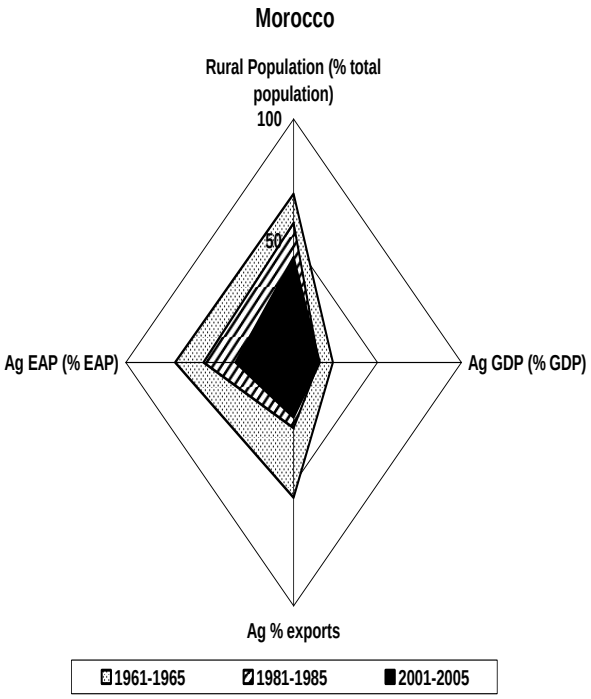


Figure 65



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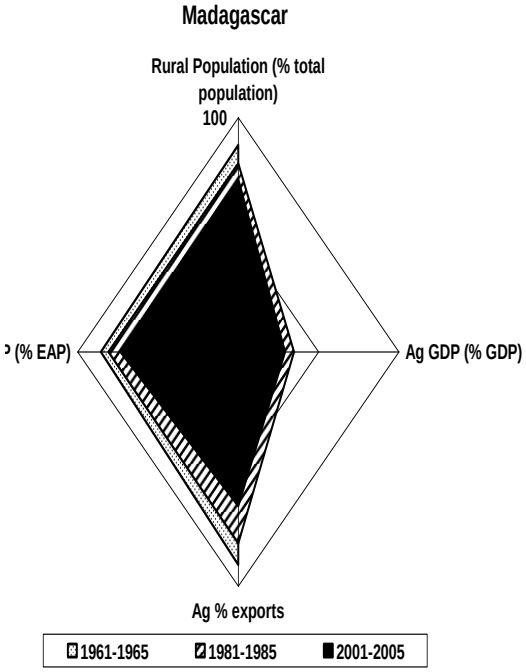

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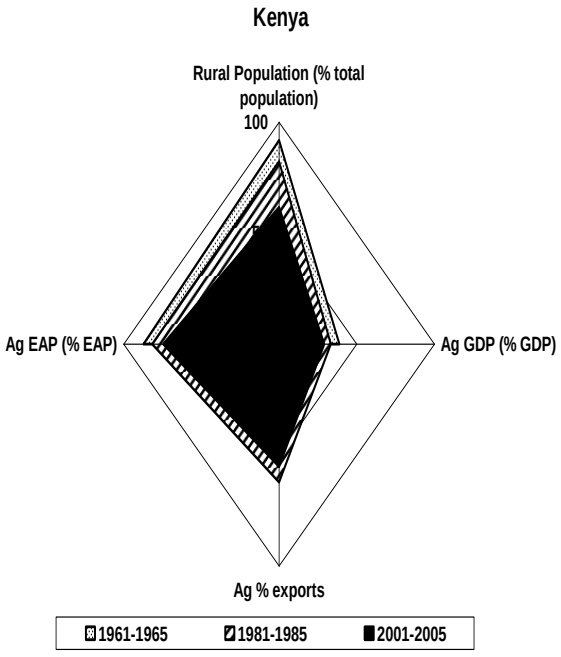

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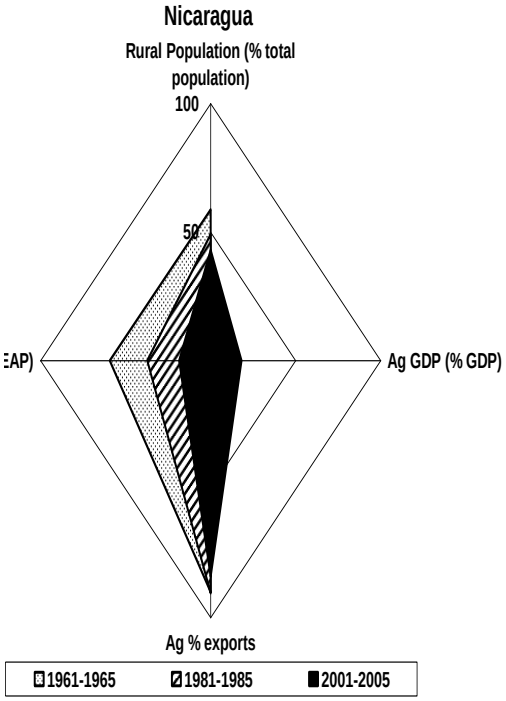


Figure 69:

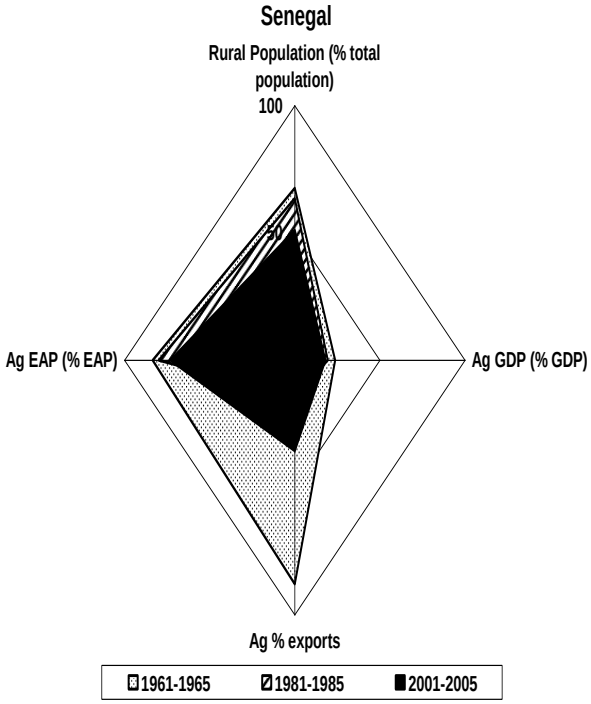
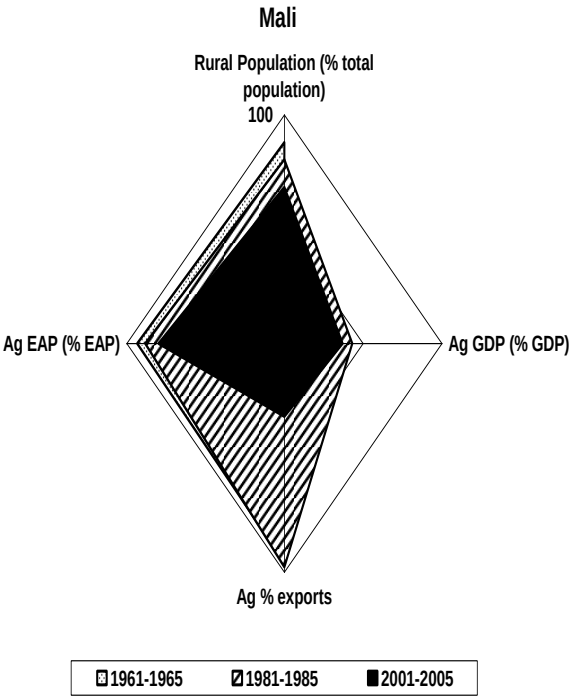


Figure 70

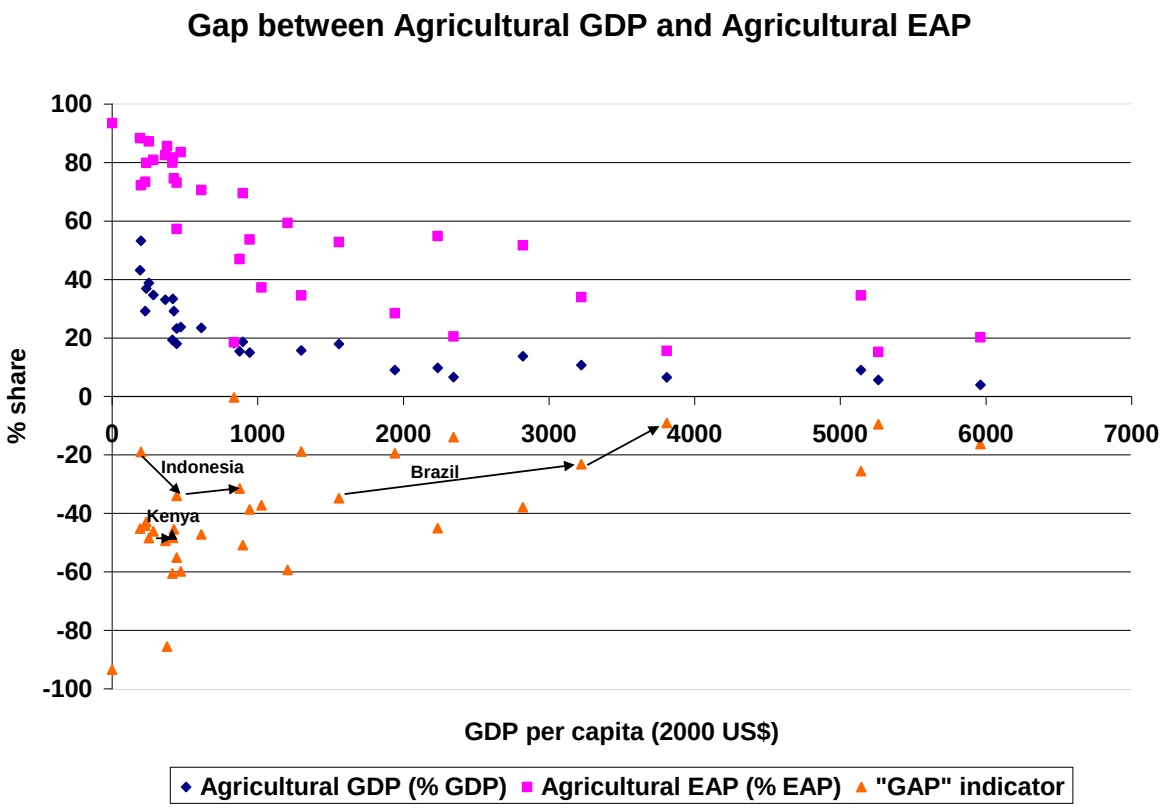


Timmer and Akkus (2008) remind us that analyses of structural transformation tend to focus on the share of GDP and the share of EAP held by agriculture, when it is also important to assess the gap between these two indicators. They address the argument for the use of the

"GAP" indicator by showing that one of its advantages is to exhibit the inequality of incomes between agriculture and the other sectors of the economy.

Figure 38 incorporates the three time-periods for the sample of countries in showing the evolution of the Agricultural GDP, Agricultural EAP and the GAP indicator with reference to the evolution of the GDP per capita. In the graph, one can view clear differences in the evolution of the "GAP" indicator with the cases of Brazil, Kenya, and Indonesia.

Figure 71:



Timmer and Akkus stress that the rural-urban income gap widens during the early stages of economic development. This characteristic is very evident in assessing the "gap" for Indonesia where the difference in the shares has widened during the 1980s from the figure of the 1960s (Table 2). Countries like Brazil and Chile which had already experienced their own economic transitions, prior to the time-period under analysis, in the 1940s and 1950s, exhibit a declining difference from the 1960s until the 2000s; this characteristic is also true of Mexico, even if the last period clearly shows a lag. In the RS countries, the change is very slow – the exception being Mexico and Morocco – confirming the global stagnation of their trajectories of structural change.

Table 33: "GAP" indicator

	1961-1965	1981-1985	2001-2005
Brazil	-34.84	-23.18	-9.06
Chile	-19.47	-13.90	-9.53
Indonesia	-19.02	-34.04	-31.55
Kenya	-48.41	-48.36	-45.42
Madagascar		-46.14	-44.20
Mali		-45.19	-42.91
Mexico	-37.92	-25.53	-16.28
Morocco	-47.16	-38.68	-18.87
Nicaragua[1]			-0.31
Senegal	-59.81	-60.60	-55.11
Thailand	-49.41	-50.84	-45.09

Source: World Bank, 2007; FAO, 2007
1Nicaragua: Missing data: Agricultural GDP (% GDP) for 1960s and 1980s

Table 34: Composition of Total Exports: Agricultural and Non-Agricultural Shares

Brazil	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	87.75	82.70	70.35	57.73	44.84	35.18	29.80	33.95	31.48
Non-ag. exports(%of Total exports)	12.25	17.30	29.65	42.27	55.16	64.82	70.20	66.05	68.52
Chile	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	8.99	7.49	9.00	20.70	28.25	34.12	36.23	36.58	35.12
Non-ag. exports(%of Total exports)	91.01	92.51	91.00	79.30	71.75	65.88	63.77	63.42	64.88
Indonesia	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	62.40	49.63	43.48	25.20	14.43	20.89	16.03	16.53	15.29
Non-ag. exports(%of Total exports)	37.60	50.37	56.52	74.80	85.57	79.11	83.97	83.47	84.71
Thailand	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	86.19	79.28	71.42	68.81	61.12	48.23	29.43	22.80	18.20
Non-ag. exports(%of Total exports)	13.81	20.72	28.58	31.19	38.88	51.77	70.57	77.20	81.80
Kenya	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)				64.21	58.47	71.25	56.96	64.22	57.82
Non-ag. exports(%of Total exports)				35.79	41.53	28.75	43.04	35.78	42.18
Madagascar	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	91.08	87.19	82.39	82.66	82.54	80.40	74.24	57.72	59.90
Non-ag. exports(%of Total exports)	8.92	12.81	17.61	17.34	17.46	19.60	25.76	42.28	40.10
Mali	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	95.96	97.00	88.93	91.59	98.20	99.24	98.34	89.37	58.57
Non-ag. exports(%of Total	4.04	3.00	28.86	8.41	1.81	0.76	1.66	10.64	41.44

exports)									
Mexico	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	56.39	57.76	45.94	36.80	10.48	14.01	10.53	7.35	5.70
Non-ag. exports(%of Total exports)	43.61	42.24	54.06	63.20	89.52	85.99	89.47	92.65	94.30
Morocco	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	55.83	56.47	50.10	33.14	27.65	30.12	30.13	29.83	22.61
Non-ag. exports(%of Total exports)	44.17	43.53	49.90	66.86	72.35	69.88	69.87	70.17	77.39
Nicaragua	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)		86.66	81.23	82.91	88.95	89.04	87.08	79.17	84.64
Non-ag. exports(%of Total exports)		13.34	18.77	17.09	11.05	10.96	12.92	20.83	15.36
Senegal	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Ag.exports(%of Total exports)	87.85	83.12	61.28	59.68	37.45	48.83	47.14	16.97	40.25
Non-ag. exports(%of Total exports)	12.15	16.88	38.72	40.32	62.55	51.17	52.86	83.04	59.75

Source: World Bank, 2007

Notes:

Definition of "Agricultural raw materials exports (% of merchandise exports)", World Bank: "Components may not sum to 100 % because of unclassified trade. Agricultural raw materials comprise SITC section 2 (crude materials except fuels) excluding divisions 22, 27 (crude fertilizers and minerals excluding coal, petroleum, and precious stones), and 28 (metalliferous ores and scrap). World Bank staff estimates from the COMTRADE database maintained by the United Nations Statistics Division."

Definition of "Food exports (% of merchandise exports)", World Bank: "Components may not sum to 100 % because of unclassified trade. Food comprises the commodities in SITC sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) and SITC division 22 (oil seeds, oil nuts, and oil kernels). World Bank staff estimates from the COMTRADE database maintained by the United Nations Statistics Division."

Table 35: Agriculture, Industry, Services

Brazil	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	18.30	15.36	12.90	12.48	10.62	10.27	8.20	5.53	6.50
Industry (%)	37.14	35.27	38.80	39.86	44.56	44.53	39.03	26.25	27.93
Services (%)	44.56	49.37	48.30	47.66	44.81	45.20	52.76	68.21	65.57
Chile	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	9.12	8.26	7.18	8.07	6.49	8.68	9.44	6.71	5.36
Industry (%)	37.80	41.10	41.88	38.06	37.81	39.48	38.18	38.06	38.66
Services (%)	53.29	50.64	50.93	53.87	55.69	51.84	52.37	55.22	55.97
Indonesia	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	52.29	50.76	39.08	28.96	23.38	22.98	18.30	17.52	15.44
Industry (%)	14.70	14.22	25.09	35.04	39.96	36.29	39.90	43.64	45.57
Services (%)	33.02	35.02	35.83	36.00	36.67	40.73	41.80	38.85	38.99
Kenya	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	39.39	35.61	34.14	37.10	33.33	31.45	30.25	31.28	29.92
Industry (%)	17.05	18.77	20.41	19.35	19.87	18.96	18.25	17.28	17.44
Services (%)	43.56	45.62	45.45	43.54	46.80	49.59	51.50	51.44	52.64
Madagascar	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)		24.60	26.95	32.43	33.69	34.91	27.98	29.21	29.35
Industry (%)		14.63	16.71	16.66	14.02	13.57	12.01	12.28	14.90
Services (%)		60.78	56.34	50.91	52.30	51.53	60.02	58.51	55.75
Mali	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)		66.16	60.38	61.08	44.74	44.14	45.54	47.77	37.91
Industry (%)		10.96	12.70	10.77	14.07	15.49	16.75	17.23	24.39
Services (%)		22.88	26.92	28.16	41.19	40.37	37.71	34.99	37.69
Mexico	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)		12.21	12.21	10.99	8.79	9.14	6.86	5.53	4.01
Industry (%)		28.07	31.65	32.70	34.08	33.93	27.63	28.41	26.76
Services (%)		59.73	56.14	56.31	57.13	56.93	65.50	66.06	69.22
Morocco[1]	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)		21.59	20.91	18.07	15.36	17.09	17.28	17.37	16.36
Industry (%)		28.18	28.96	32.75	32.68	33.04	31.74	30.53	27.96
Services (%)		50.24	50.14	49.17	51.63	48.16	47.38	50.53	55.81
Nicaragua[2]	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	24.23	24.15	24.68	24.16	22.58	26.82	30.19	32.36	19.33
Industry (%)	21.14	22.33	25.27	25.77	29.55	25.98	20.52	21.03	29.18
Services (%)	54.63	53.51	50.05	50.07	47.86	47.20	49.29	46.61	51.49
Senegal	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	25.48	26.41	24.51	27.99	20.81	23.20	19.68	19.81	17.38
Industry (%)	14.80	16.49	17.92	19.07	20.59	20.74	23.22	23.75	24.58

Services (%)	61.32	57.96	58.01	53.98	58.61	56.07	57.10	56.44	58.05
Thailand	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
Agriculture(%)	34.00	30.38	25.98	25.37	20.16	15.69	11.04	9.73	9.66
Industry (%)	20.27	24.04	26.62	28.53	30.17	33.82	39.00	40.46	42.73
Services (%)	45.73	45.57	47.41	46.10	49.67	50.49	49.96	49.82	47.61

Source: World Bank, 2008

[1]For the case of Morocco: series calculated using value added series for agriculture, industry and services delineated in current US$m and current US$m GDP

[2] For the case of Nicaragua: Years 1960-1999 calculated using data from Banco Central de Nicaragua, May 2008, http://www.bcn.gob.ni; years 2000-2004 calculated using data from World Bank, 2008

Notes: Definitions of production indicators, World Bank

"Agriculture, value added (% of GDP)": "Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production."

"Industry, value added (% of GDP)": "Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas."

"Services, etc., value added (% of GDP): "Services correspond to ISIC divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling."

For each of the World Bank definitions, the following note is attached: "Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The industrial origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator. World Bank national accounts data, and OECD National Accounts data files."

Components of production indicators, Banco Central de Nicaragua:

- *"Actividad Primaria" (Primary Activity)*: agriculture, livestock, fishing, forestry.
- "*Actividad Secundaria" (Secondary Activity):* industrial manufacturing, construction, mining.
- *"Actividad Terciaria" (Tertiary Activity):* commerce, general government, transport and communication, banks and securities, energy, electricity and potable water, housing property and other services.

Table 36: Radar Chart Data

	1961-1965	1981-1985	2001-2005
Brazil			
Rural Population (% total population)	51.66	31.92	17.61
Ag GDP (% GDP)	17.93	10.73	6.51
Ag % exports	86.45	42.67	31.91
Ag EAP (% EAP)	52.77	33.91	15.57
Chile			
Rural Population (% total population)	29.73	18.09	13.34
Ag GDP (% GDP)	8.98	6.57	5.66
Ag % exports	8.50	29.80	33.32
Ag EAP (% EAP)	28.45	20.47	15.19
Indonesia			
Rural Population (% total population)	84.68	76.34	55.50
Ag GDP (% GDP)	53.19	23.22	15.43
Ag % exports	62.40	13.26	16.12
Ag EAP (% EAP)	72.22	57.26	46.98
Kenya			
Rural Population (% total population)	91.89	82.31	61.69
Ag GDP (% GDP)	38.81	33.33	29.13
Ag % exports		62.26	55.29
Ag EAP (% EAP)	87.22	81.69	74.55
Madagascar			
Rural Population (% total population)	88.28	80.44	73.68
Ag GDP (% GDP)		34.70	29.14
Ag % exports	90.93	81.79	65.82
Ag EAP (% EAP)	85.57	80.84	73.34
Mali			
Rural Population (% total population)	88.02	80.52	68.39
Ag GDP (% GDP)		43.14	36.91
Ag % exports	96.00	97.74	31.93
Ag EAP (% EAP)	93.43	88.33	79.82
Mexico			
Rural Population (% total population)	46.71	32.33	24.81
Ag GDP (% GDP)	13.74	9.00	3.94
Ag % exports	57.75	9.31	5.78
Ag EAP (% EAP)	51.66	34.53	20.22
Morocco			
Rural Population (% total population)	69.23	57.28	43.22
Ag GDP (% GDP)	23.45	15.00	15.68
Ag % exports	55.55	27.02	22.58

Ag EAP (% EAP)	70.61	53.67	34.54
Nicaragua			
Rural Population (% total population)	58.78	49.15	43.01
Ag GDP (% GDP)			18.20
Ag % exports	90.02	90.48	84.03
Ag EAP (% EAP)	59.33	37.28	18.51
Senegal			
Rural Population (% total population)	67.61	63.59	51.08
Ag GDP (% GDP)	23.70	19.34	17.97
Ag % exports	87.90	14.40	35.59
Ag EAP (% EAP)	83.50	79.94	73.08
Thailand			
Rural Population (% total population)	79.82	72.61	68.40
Ag GDP (% GDP)	33.09	18.67	9.78
Ag % exports	85.61	60.69	17.88
Ag EAP (% EAP)	82.50	69.51	54.86

Source: World Bank, 2007; FAO, 2007

Annex 2
What is a household in the RS countries?

Annex 3
the Modules of the Questionnaire

The general frame of the questionnaire was made of 5 modules.

Module 1 aimed to characterize the rural household (Composition of household, Accommodation characteristics and quality of living; Description of economic activities of all the members of the household, including non-farm activities and related income sources; Identification and characterization of household members who migrated (long and short terms migrations) and of related remittances to the remaining members of the household; Identification of public transfers received by the household; Characterization of the human and social capital of the head of household and his spouse).

The objective of Module 2 was to characterize household's capital in terms of assets and factors endowment and identification of its development trend (Land (owned or rented); Material and equipment (owned or rented); Rentals (accommodation being reviewed in module 1); Other properties dedicated to economical activities: estimates of activities income (to be cross-checked with module 1 data) and rental costs). At the end of those two first modules, the collected data allowed the estimate of the level of diversification of economic activities, household earnings, assets evolution, and economic, human and social capital. The collected data also gave information about some of the indicators of economic and social vulnerability.

Module 3 aimed to describe in detail on-farm activities (crops, livestock, fishing, hunting and gathering activities, processing on-farm of vegetal and animal products). A specific module (Module 3bis) was designed to take into account market integration and contractualization issues. Since those issues applied neither to all crops and livestock productions nor to all households, Module 3bis was used as an "if needed annex". The collected data of Module 3 allowed the estimate of total on-farm income (in its broad sense). Of course, this estimate was only based on farmer's declarations on general productions and farming systems. Because of inter-annual variability of production, estimation of production costs (which are not exclusively monetary) is a big issue. More detailed information would have required more time than a one-shot survey. However, it was critical to estimate farm income to identify and describe the share of agriculture in the global range of rural households' activities and income.

In order to make sure that collected information on the outputs and costs were coherent and consistent, it was useful to collect for each region basic data on: yields and market prices (by crop / livestock), levels of intensification and unit costs of inputs. Those basic references were collected when carrying out the regional characterization work prior to or during the survey itself.

Module 4 "Food and household expenditures" included questions related to costs of food, origin (farm production, purchases, gifts, etc.). It also included questions related to food shortage management strategies and household perception of the evolution of their food security. Regarding expenditures, questions deal with current and occasional expenditures, investments in durable goods, credit, savings, as well as transfers that rural households might send to others.

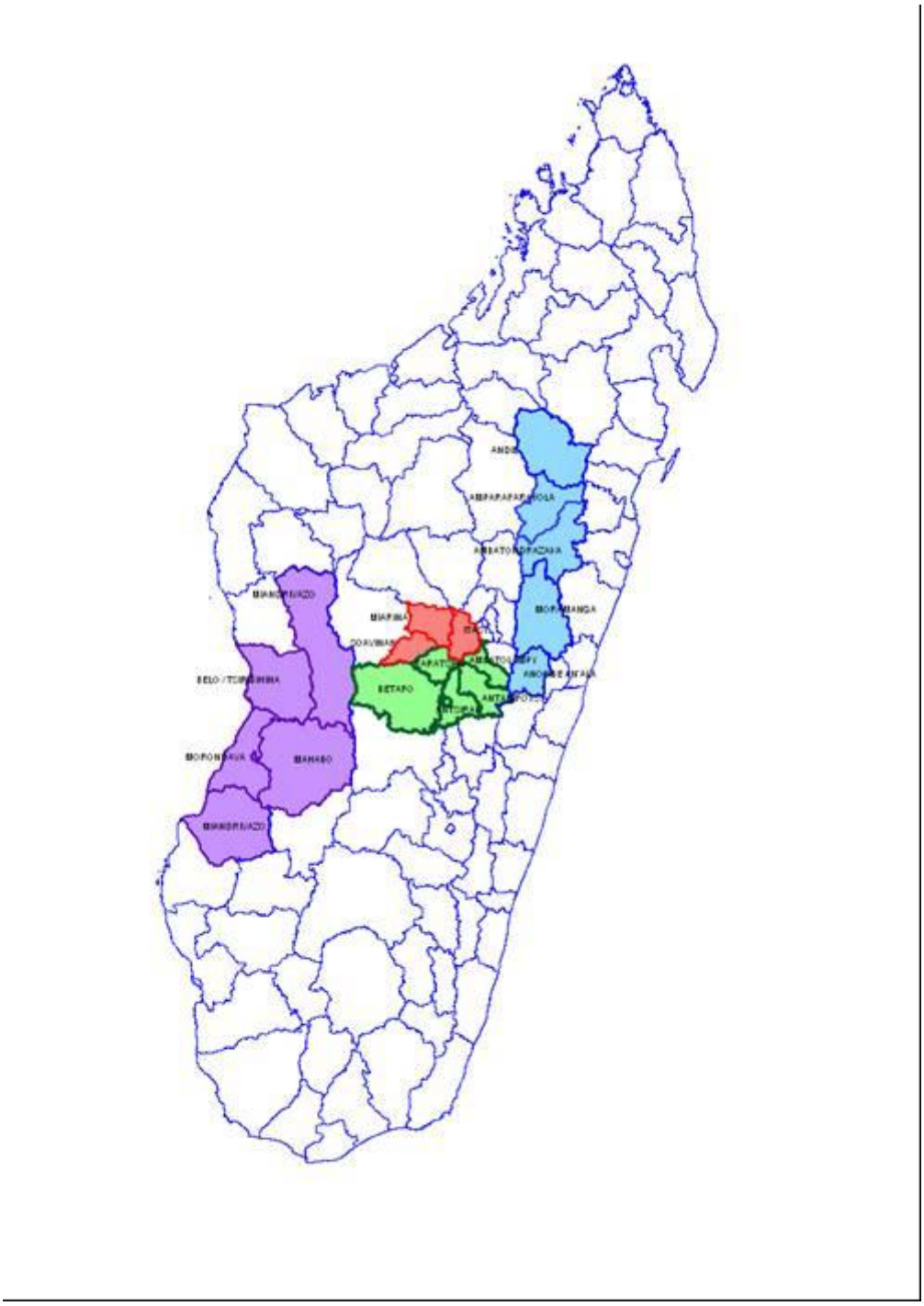
That module allowed to approach the use of rural household income, the breakdown of expenditures into different categories, access to services (health, transports, etc.), and to supplement information on indicators of vulnerability and sustainability.

Finally, Module 5 related to trajectories issues and rural households prospects. It included open and qualitative questions which explored issues related to parents' activities, development of non-farm activities, prospects for children in terms of activities and farm transferability, and perception of the evolution of their livelihood.

Annex 4
Main Characteristics of the Surveyed Regions

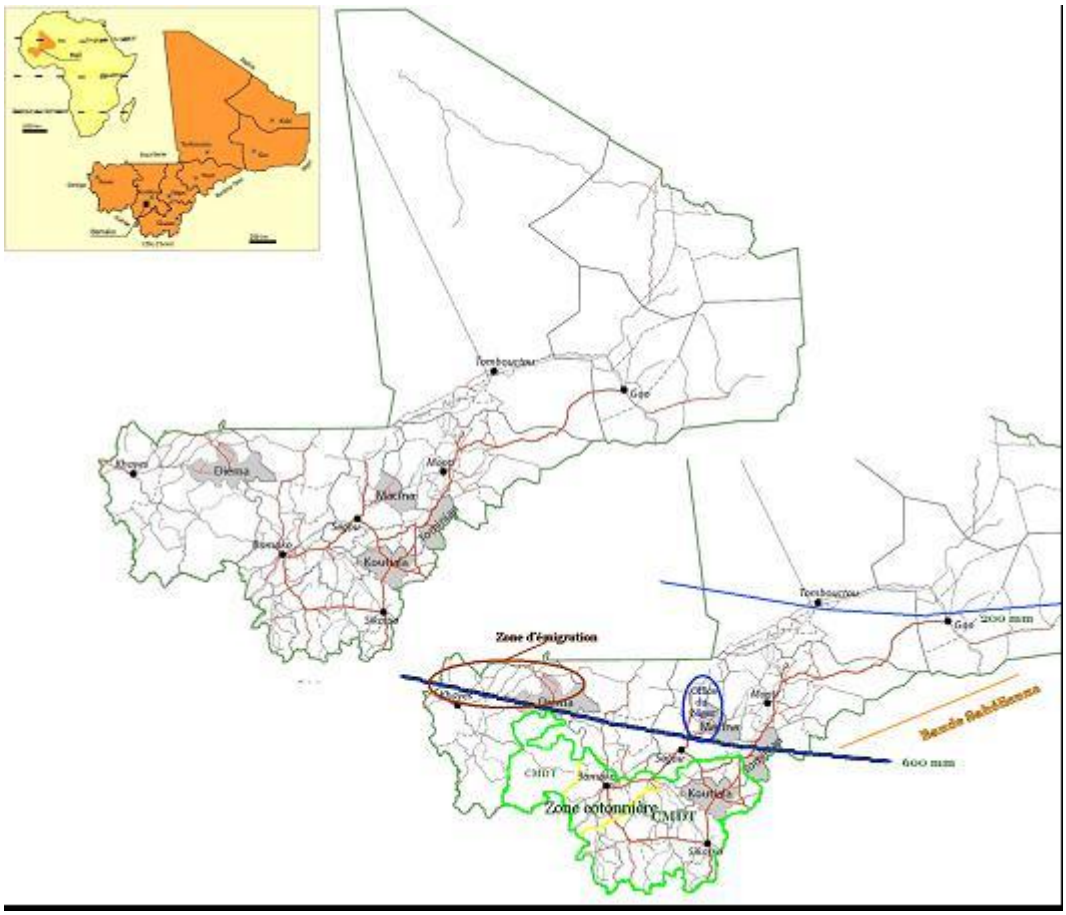
	MADAGASCAR			
Region	**ANTSIRABE**	**ITASY**	**ALAOTRA**	**MORONDAVA**
A priori Classification	Winning	Intermediary	Intermediary	Losing
Population characteristics	90-125 inhabitants/km^2 - emigration out of the region because of lack of agricultural lands	105 inhabitants/km^2. Immigration from the Highlands: people searching for available agricultural lands	55 inhabitants/km^2. Seasonal immigration (for harvesting and agricultural works in general, but also for trade of paddy rice)	12 inhabitants/km^2. Immigration from the Highlands.
Accessibility and proximity to major cities and markets	2 sub-regions. One is served by a dirt road (medium accessibility), which can be used by collective transport, while the other is more difficult to access (stony dirt road). Near the third major city of the country: Antsirabe (pop. 183,000)	Region served by the national road (RN43) or a dirt road, but the accessibility of some localities can be very difficult. The region is known to offer many opportunities because of the nearness of the amjor town Antananarivo (pop. 1.7 million) and the network of roads serving the region	Dirt road or tarmac road (RN44) => good accessibility, but difficulties are possible during the rainy season	Dirt roads or path without bridges, which imply difficulties during the rainy season. Near the city of Morondava (pop. 40,000)
Agro-ecological characteristics	Located in the Central Highlands (altitude 1,500-1,900 m) characterized by red lateritic soils and tropical highland to temperate climate (mean of 13 to 18°C with morning frost in winter, 1,300 to 1,950 mm of rain)	Located between the Highlands and the Lowlands of the Middle-West of the country (1050-1450 m), characterized by volcanic formations (Lake Itasy itself is found in a volcanic crater) tropical highland climate (mean of 20°C, 1,350 to 1,700 mm of rain)	Located along the eastern escarpment (altitude 700 m) characterized by the presence of the Lac Alaotra, the largest body of water on the island which is in a large fault-controlled basin and is known for the islands most fertile and productive rice fields. The climate is semi-wet tropical (1,091 mm of rain, 17 to 24°C)	Located on the west coast (altitude 50-75 m) composed of sedimentary formations that allow broad alluvial plains, which are believed to have great agricultural potential. The climate is tropical to wet-dry tropical (25 to 27 °C, 750 to 1,250 mm of rain)
Main agricultural productions	Rice and other temperate cereals (wheat, barley), fruit and vegetables (potatoes, tomatoes, carrots, onions, temperate fruits such as apples, pears, peaches, etc.), cattle (dairy products and draft oxen), pork and poultry	Rice, fruit (tropical fruits such as papaya, avocados etc.) and vegetables, tobacco, roots, cattle (draft oxen), pork and poultry, fishery (Lake Itasy)	Rice, roots (cassava) cattle (draft oxen), pork and poultry, fishery (Lake Alatotra)	Rice, beans (*Phaseolus lunatus*), maize, cattle (draft oxen)
Existing agribusiness or integration processes	KOBAMA (wheat), MALTO (barley for brewery industry), TIKO and SOCOLAIT (dairy), FIFAMANOR and private actors (potatoes)	LECOFRUIT (green beans), OFMATA (tobacco)	Private rice buyers (ROGER, SILAC, FANAMBY, etc.)	Private actors (maize, beans)
Existing job opportunities	Trade and handicraft (embroidery)	Trade and handicrafts (embroidery, basketry)	Mostly, opportunities as an agricultural laborer in the rice industry	Charcoal production, trade

Map 1: study regions in Madagascar



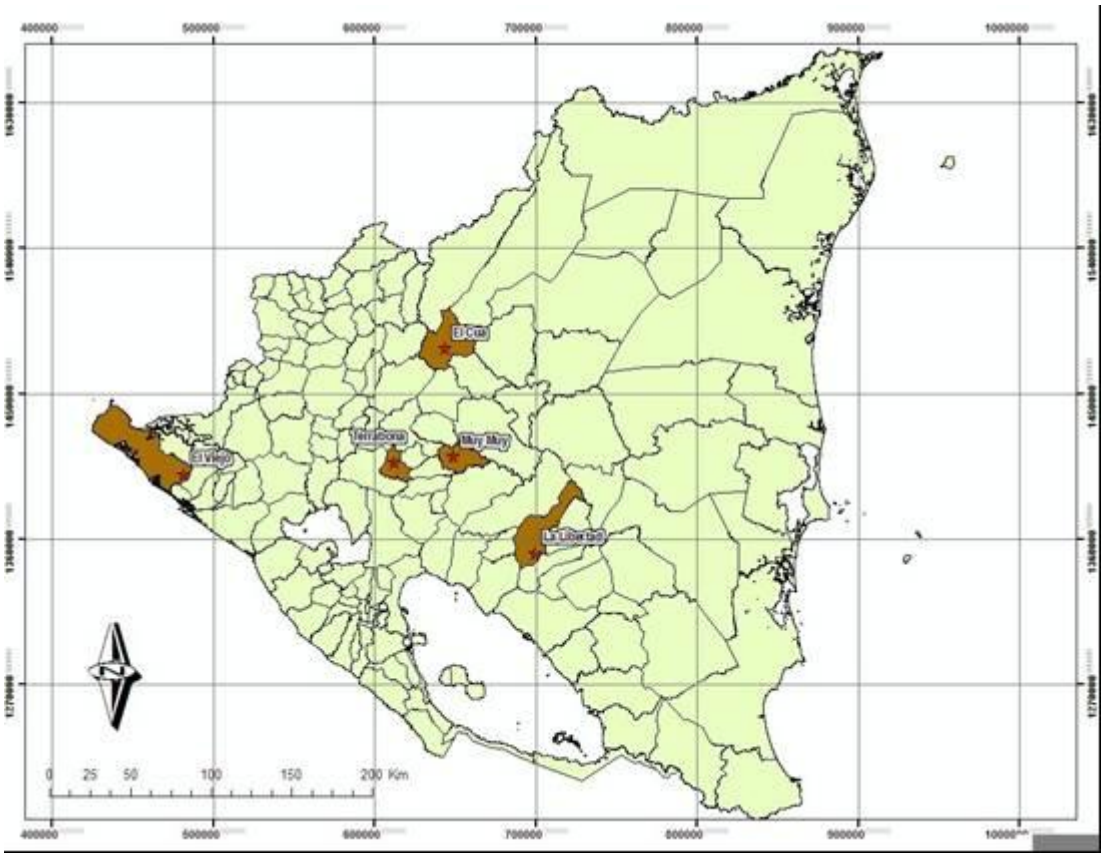
	MALI			
Region	**TOMINIAN**	**KOUTIALA**	**DIEMA**	**MACINA**
A priori Classification	Losing	Winning	Intermediary	Winning
Population characteristics	32 inhabitants/km². High dependency ratio (1.1). Seasonal emigrations to main cities of the country (Bamako, Ségou et Sikasso)	41 inhabitants/km^2. Few migrations. High pressure on land due to the growing population	12 inhabitants/km². Emigration to foreign countries (African countries, Europe, USA) is a common and established path	High density of population around the irrigation scheme (Office du Niger), but average of 18 inhabitants/km^2 at region level. Old immigration region (agrarian colonization due to irrigation infrastructure) from the rest of the country and from other African countries. High land pressure in the irrigation scheme area
Accessibility and proximity to of major cities and markets	A tarmac road serves the town of Tominian and dirt roads serve the other localities with very difficult accessibility during the rainy season. Mainly rural area (no city exceeding 5,000 inhabitants. in 1998)	Good accessibility with 4 national tarmac roads (in particular the main road Bamako-Burkina-Faso-Ivory Coast). Important network of dirt roads that allow good accessibility, except for a few localities during the rainy season. Nearness of Koutiala, one of the major cities of the country which offer industrial and trading activities	Main crossroads of the roads Bamako-Kayes-Dakar and Bamako-Nioro-Mauritania. Near to only one city whose pop. exceeds 5,000.	Good accessibility in the irrigation scheme with a tarmac road (Macina-Ségou). Difficult accessibility with dirt roads for the rest of the area, in particular during the rainy season. Only one town bigger than 5, 000 inhabitants.
Agro-ecological characteristics	Intermediary region between a South-Sahelian and a North Sudano-Guinean climate (600-900 mm of rain concentrated in 4 months: June to September). Mainly tropical ferruginous soils, which are fragile and easily erodible	Sudanese climate (750-1,000 mm of rain). Soils highly fragile and easily erodible with possibility of acidification and pollution, particularly in the cotton area	Sahelian climate (400-800 mm of rain concentrated from July to October). No permanent river but presence of ponds during the rainy season. Sandy soils in the north and between clay and silty soils in the south	Sahelian climate (450-650 mm of rain, concentrated from July to October). Fertile alluvial plains located in the Delta of the Niger River
Main agricultural productions	Staple (millet, maize, sorghum, *niébé, fonio*, etc.), groundnut, sesame	Cotton, dry cereals (millet, sorghum, maize), cattle (mainly for draft force and manure production)	Staples (millet, maize, sorghum, *niébé, fonio*, groundnut, roots such as potatoes and cassava, rice), horticulture (onion for instance), cattle	Irrigated rice, horticulture, dry cereals, cattle, fisheries along the river
Existing agribusiness or integration processes	No agribusiness or integration process. Low level of commercialization of agricultural products	Vertical integration within the cotton industry (CMDT)	No agribusiness or integration process. Low level of commercialization	No agribusiness or integration process. Rice and onion are well commercialized in traditional value-chains
Existing job opportunities	Few opportunities out of the agricultural sector, but possibility of use of natural resources (gathering, wood, etc.)	Opportunities for seasonal or permanent employment in the main regional town (Koutiala), especially when cotton production is favorable	Few opportunities: agricultural seasonal workforce, trade and services activities are based in towns (Kayes or Bamako)	Opportunities for seasonal or permanent employment as agricultural laborer, and existing of some opportunities in the agricultural value chains (downstream and upstream segments) and in services

Map 2: study regions in Mali



	NICARAGUA				
Region	**EL VIEJO**	**EL CUA**	**MUY MUY**	**TERRABONA**	**LA LIBERTAD**
A priori Classification	Winning	Winning	Intermediary	Losing	Losing
Population characteristics	30-6 inhabitants/km^2. Relative proximity of the Salvadoran border	15-20 inhabitants/km^2	35-40 inhabitants/km^2.	20-30 inhabitants/km^2. High level of emigration	4-9 inhabitants/km^2 Relatively recent colonization area (1970s)
Accessibility and proximity to major cities and markets	Good accessibility for most of the localities with tarmac roads or dirt roads. Nearness of towns such as Chinandega (pop. 134,000) and El Viejo (pop. 70,000)	Medium accessibility with tarmac and dirt roads. Near the city of Matagalpa (pop. 100,000.), which is important in terms of service provision and agribusiness related to coffee production	Region located at the junction between the municipalities of Boaco, Matiguas and Matagalpa with relatively good network of connections between the Pacific and central area. However, medium accessibility of the localities with mainly dirt roads (very unequal quality of dirt roads in this area). Near medium towns such as Matagalpa (pop. 100,000)	Medium-to-poor accessibility with dirt roads, but relative proximity to a major tarmac road (Pan-American road)	Dirt road with very difficult accessibility. Secluded region
Agro-ecological characteristics	Located in the Pacific plains. Mainly volcanic soils with good level of fertility and good potential for agriculture. Topical climate (1,100-1,650 mm of rain during 7 months in winter)	Located in the highlands (altitude 600-1000 m) with a semi-humid climate (1,500-2,500 mm of rain)	Located in the lower highlands (altitude 400-600 m). Tropical climate (1,100 to 1,500 mm of rain, 24-26°Callowing for 2 cropping seasons for maize and 3 for beans. Fertile (*rendzine*) to acid soils	Semi-arid to dry climate (800 to 1,000 mm of rain, but badly dispersed during the winter with possibility of drought) and poor, erodible soils	Tropical climate (1,200-1,400 mm of rain) which allows 2 to 3 cropping seasons for maize and beans, and fragile, easily erodible soils (low mineral fertility)
Main agricultural productions	Sesame, sugar cane, maize, beans, industrial sorghum, cattle	Coffee, maize, beans, cattle (meat)	Maize, beans, cattle (dairy and meat)	Maize, beans, vegetables, cattle (meat)	Maize, beans, roots, fruits, cattle (dairy and meat). This area is progressively used by huge cattle producers of the dry areas who can use the pastures the whole year
Existing agribusiness or integration processes	Main industries and agribusinesses are located in the Pacific Plains (cotton, sugar cane, sorghum, sesame, etc.)	Agribusiness related to coffee processing and export. Also irrigation related to basic grain commercialization	Integration processes in the dairy value chain: for the collection of fresh milk processed in pasteurized cheese for export to El Salvador and USA (Calbri y Anael.SA) and for the procurement of agribusiness (Parmalat, Eskimo and Prolacsa)	Integration processes for horticulture (with supermarkets such as HortiFruiti, WalMart, etc.) for domestic market	Low level of integration processes, but progressive penetration of collectors for agribusiness (dairy) when accessibility allows for collection
Existing job opportunities	Agricultural labor (e.g. in the sugar cane industry for harvests) or in service and trade activities (oil, flour, groundnut and shrimp industry, sugar cane and liquor factories) in El Viejo and Chinandega	Agricultural labor (particularly for coffee harvesting) but also activities in the production of flour and the textile factory in Matagalpa	Mostly, agricultural labor (coffee, cattle) and processing of agricultural products	*Maquila* industry, services and trade activities	Mainly agricultural labor

Map 3: Study regions in Nicaragua

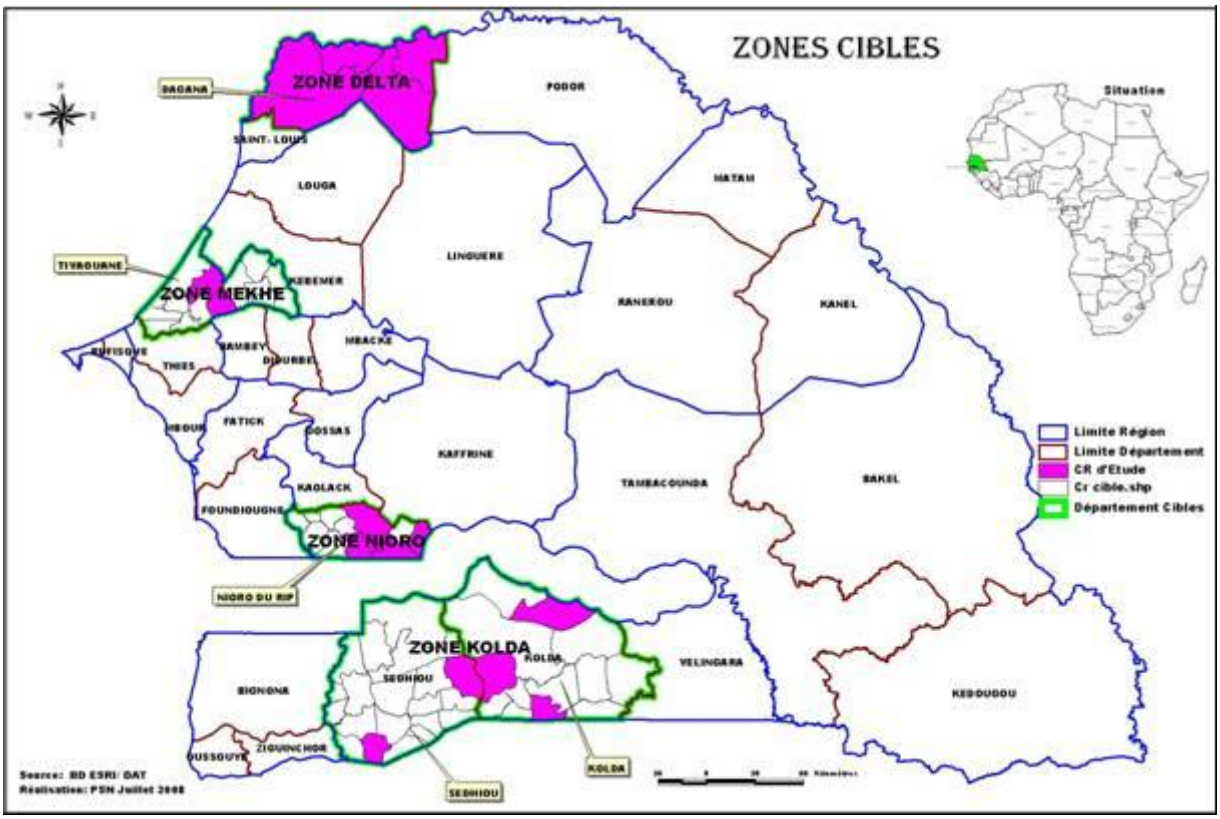


	MOROCCO		
Region	**CHAOUIA**	**SOUSS**	**SAISS**
A priori Classification	Losing	Winning	Intermediary
Population characteristics	236 inhabitants/km^2. Immigration of people coming to work in the engineering and carpentry workshops of Berrechid. Old emigration to Casablanca and to Europe (from the 1960s)	40-50 inhabitants/km^2(but very large region with people concentrated in urban localities). High level of emigration to Europe	197 inhabitants/km^{2}in plains, 40 inhabitants/km^{2}in mountains, regional average 25 inhabitants/km^2
Accessibility and nearness of major cities and markets	Important network of tarmac roads that link the region to the major towns. However, the dirt roads serving the localities can be in bad condition during the rainy season. Nearness of Casablanca (pop. 3-4.5 million.) for one of the surveyed localities - Jaqma (30 Km)	Medium accessibility depending on the localities (unequal distribution of tarmac and dirt roads, especially in mountain areas). Near Agadir (pop. 68, 000.)	Medium accessibility depending on the localities (unequal distribution of tarmac and dirt roads, especially in mountain areas). Near to Fes (pop. 98,000) and Meknes (pop. 950,000)
Agro-ecological characteristics	Semi arid climate (280-380 mm of very irregular rain, average temperature of 24°C - from 2 to 45°C) with high possibility of drought. Fertile clay soils in plains (*Tirs*), rocky and sandy poor soils in mountains (*Hrach*, *Rmel*)	Arid climate (120-250 mm of rain) with the possibility of severe droughts	Continental climate (255-625 mm of rain)
Main agricultural productions	Cereals (wheat,), cattle, small ruminants	Horticulture (early vegetables, such as tomatoes), fruit trees (citrus, banana, almond, olive trees), cereals, legume crops, forage, saffron	Cattle (dairy), tobacco, cereals, legume crops, horticulture, orchards (such as apple, pear and olive trees)
Existing agribusiness or integration processes	Few agribusinesses (flour, oil, etc.)	Irrigation schemes. Integration processes for early vegetables and fruit trees (especially citrus)	Integration processes in the milk industry
Existing job opportunities	Many opportunities in urban areas due to the proximity to Casablanca		Many agricultural labor opportunities (for industrial crops, horticulture and fruit trees)

Map 4: Study regions in Morocco

	SENEGAL			
Region	**DELTA**	***Bassin Arachidier SUD***	***Bassin Arachidier NORD***	**CASAMANCE**
A priori Classification	Winning	Intermediary	Intermediary	Losing
Population characteristics	11-40 inhabitants/km^2. 37% of the population at regional level is urban	88 to 229 inhabitants/km^2(144 inhabitants/km^2 on average). Importance of emigration and seasonal emigration to Kaolack, Dakar, Ziguinchor and to foreign countries (Gambia mostly, but also Europe), but also immigration from other regions	200 inhabitants/km^2 (Tivaouane). 56% of the population at regional level is urban (20% in Tivaouane). Emigration processes (to Dakar, Thiès, Touba, coastal regions for fisheries such as Kayar, Thiaroye, Mbour, and to foreign countries)	60 inhabitants/km^2. Importance of immigration from *Bassin Arachidier* and Gambia in particular
Accessibility and proximity to major cities and markets	Good accessibility. One major road linking Saint Louis to the other towns located along the Senegal River and to Mauritania. A network of dirt roads serves the irrigation scheme. Near the city of Saint Louis (pop. 700,000) and 2 medium towns (Dagana and Richard Toll)	Good to medium accessibility. Near Gambia and of the city of Kaoloak (pop. 1 million).	Relatively good accessibility (tarmac and dirt roads). Near the city of Thiès (pop. 1 million).	Medium to difficult accessibility. Near the city of Kolda (pop. 800,000).
Agro-ecological Characteristics	Semi arid climate (200 to 400 mm of rain, but irregularly dispersed). Alluvial humid and clay soils in depressions (*walo*), which are favorable to irrigated rice production, sandy soils (*diéri*) in rain fed areas. Possible presence of salty soils	North Sudanian climate (600-900 mm of rain, mostly concentrated from June to September and with high inter-annual variability) and poor and often degraded tropical ferruginous soils to clay soils	Semi-arid climate (300-500 mm of rain, concentrated from June to September). Poor and degraded *dior* soils (= tropical ferruginous soils)	Sudano-Guinean climate (1000 mm of rain) and clay to sandy or silty tropical soils, combined to high hydrographic net offer high potential for agriculture
Main agricultural productions	Rice, horticulture (mainly industrial tomato, onion, etc.) in the irrigation scheme of the SAED, sugar cane (CSS), cattle (meat and draft force) and small ruminants, fisheries	Staples (millet, sorghum, maize), groundnut, cattle and small ruminant (but also donkey and horse for draft force)	Staples (millet, *niébé*, cassava), groundnut, cattle and small ruminants	Staples (maize, sorghum, millet, rice, *fonio*), cotton, groundnut, cattle (mainly meat, but also dairy), fisheries
Existing agribusiness or integration processes	Agribusiness (tomato processor = SOCAS, sugar cane industry = CSS) and integration processes in the rice industry	Integration processes through groundnut industry	Integration processes through groundnut industry and with informal actors with cassava	Integration processes through groundnut industry
Existing job opportunities	Many job opportunities in trade and services due to the proximity to the city of Saint Louis, but also jobs in the value chains, particularly in the sugar industry	Due to the proximity to Gambia, existing trade activities and opportunities in the informal sector	Basketry, leather handicrafts	

Map 5: Study regions in Senegal



Annex 5
Statistical Breackdown of Livelihood Strategies

		Farm-oriented HH				Labor-oriented HH				Transfer-oriented HH				Diversified HH			
		n	Mean	Perc 05	Perc 95	n	Mean	Perc 05	Perc 95	n	Mean	Perc 05	Perc 95	n	Mean	Perc 05	Perc 95
Mali	Tominian	86	169	48	346	1	149	.	.	2	144	91	198	66	234	57	449
	Koutiala	131	297	90	585	0	.	.	.	1	13	.	.	21	344	115	681
	Diéma	66	193	54	401	2	370	118	622	12	1 140	129	5 568	68	261	62	666
	Macina	125	424	77	942	3	358	31	679	1	193	193	193	25	430	58	890
Senegal	Casamance	123	381	11	1 011	22	369	76	1 104	0	.	.	.	94	332	45	978
	BA Nord 1	17	321	23	990	39	480	73	1 293	0	.	.	.	55	440	69	1 190
	BA Sud	53	245	37	440	57	556	94	1 403	5	300	42	749	137	355	97	881
	Haut Delta	25	334	51	1 089	11	544	81	2 238	1	435	.	.	24	510	92	1 106
	BA Nord 2	20	868	91	2 628	19	560	107	1 578	2	262	237	287	72	610	152	1 273
	Bas Delta	26	979	84	2 801	24	836	234	1 545	1	270	.	.	70	1 099	271	3 166
Madagascar	Antsirabe 2	90	396	115	836	10	799	117	2 640	1	353	353	353	202	292	100	649
	Alaotra 1	161	496	147	1 344	75	340	123	931	2	200	147	252	147	405	130	964
	Morondava	320	488	128	1 238	16	587	230	1 211	3	383	266	491	167	494	133	1 611
	Itasy	202	607	210	1 312	25	497	126	1 249	2	614	571	657	274	457	157	1 109
	Antsirabe 1	134	711	224	1 691	6	1 047	158	5 138	0	.	.	.	66	416	119	1 035
	Alaotra 2	70	1 535	210	4 337	13	454	129	1 454	0	.	.	.	32	701	128	2 021
Morocco	Chaouia	101	2 378	52	11 394	47	954	77	3 239	16	2 795	32	23 322	64	1 831	387	5 406
	Saïss	210	3 142	78	10 540	7	1 287	265	3 158	10	1 827	61	9 781	34	2 366	346	14 153
	Souss	107	5 078	92	29 976	59	1 631	200	4 229	21	2 301	26	11 710	53	3 243	375	10 819
Nicaragua	Muy Muy	153	1 350	52	4 000	68	683	248	1 168	21	773	58	2 246	57	1 257	99	5 471
	Terrabona	161	978	37	2 785	47	1 131	299	2 685	19	1 052	62	3 663	54	1 641	244	5 271
	La Libertad	166	2 366	64	9 334	54	1 021	448	2 158	1	1 316	.	.	69	1 509	425	4 042
	El Viejo	124	3 149	37	8 493	92	1 133	352	2 507	14	1 209	233	2 397	58	1 295	316	2 668
	El Cuà	256	3 081	157	13 451	8	790	100	1 235	0	.	.	.	36	1 539	461	4 501
Mexico	Sierra S. M.	14	2 354	445	8 032	22	920	344	2 188	2	1 332	611	2 053	137	1 595	431	3 953
	Tierras Bajas	29	4 559	1 085	8 759	24	1 464	329	2 544	4	2 665	645	5 242	88	2 455	750	5 258

Annex 6
Results of Regression Analysis

Madagascar

Variables	Dependant variable = Global income per household											
	Antsirabe 2		Alaotra 1		Morondave		Itasy		Antsirabe 1		Alaotra 2	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Nb_PersonPres_hh	34,53	40,07	79,07 **	83,63 **	50,13 **	48,87 **	68,03 **	55,50 **	55,64	-7,72	246,38 **	252,04 **
	(0.969)	(1.065)	(2.599)	(2.716)	(2.487)	(2.394)	(2.585)	(2.097)	(0.777)	(-0.108)	(2.073)	(2.093)
c_Educ_Head_hh	143,48	140,49	219,98 **	213,87 **	243,07 **	223,19 **	270,66 **	224,91 **	119,43	185,98	111,36	98,71
	(1.434)	(1.398)	(3.528)	(3.420)	(4.991)	(4.672)	(4.028)	(3.416)	(0.745)	(1.173)	(0.432)	(0.368)
Nb_CattleTot_hh	-20,09	-14,83	-13,26	-8,40	17,08 **	14,61 **	56,06 **	31,62	196,46 **	182,05 **	-130,33 **	-131,28 **
	(-0.460)	(-0.333)	(-0.751)	(-0.473)	(3.655)	(3.181)	(2.016)	(1.154)	(3.130)	(2.979)	(-2.543)	(-2.519)
Index_Eqh_hh	176,67	208,31	846,20 **	888,91 **	355,67	323,60	144,19	114,90	-15,67	-32,48	-	-
	(1.147)	(1.320)	(2.845)	(2.979)	(1.520)	(1.415)	(1.290)	(1.056)	(-0.054)	(-0.116)		
Ha_CultivatedLand_hh	2949,60 **	2860,34 **	1208,02 **	1225,85 **	823,07 **	901,66 **	2162,00 **	2401,98 **	3096,10 **	3277,39 **	-	-
	(8.943)	(8.422)	(7.246)	(7.301)	(12.448)	(13.570)	(13.815)	(15.166)	(13.043)	(13.322)		
Ha_LandIrrig_hh	-1216,62 **	-1269,55 **	-438,09 **	-434,27 **	-504,08 **	-580,87 **	486,17 **	598,96 **	641,48	696,14	1635,89 **	1623,73 **
	(-2.627)	(-2.71)	(-2.494)	(-2.467)	(-3.914)	(-4.575)	(1.974)	(2.489)	(1.038)	(1.163)	(19.865)	(18.574)
1-IHH		-811,59		632,62 *		1453,02 **		1985,98 **		2010,98 **		-485,42
		(-1.137)		(1.906)		(5.185)		(5.558)		(2.187)		(-0.324)
Nb_MigrLT_hh		127,91		-140,32		44,21		-129,72		776,59 **		1097,29
		(0.888)		(-0.912)		(0.463)		(-1.170)		(3.453)		(0.835)
NB_MigrST_hh		84,10		46,00		7,92		-31,89		570,00		1097,29
		(0.602)		(0.257)		(0.146)		(-0.193)		(0.580)		(0.448)
Constant	93,6858	424,81	370,154 **	155,49	348,13 **	-125,66	207,757	-570,62 **	-143,743	-1042,40 *	413,72	0,48
	(0.367)	(1.075)	(2.080)	(0.733)	(2.727)	(-0.801)	(1.011)	(-2.339)	(-0.299)	(-1.773)	(0.471)	(0.500)
N	303	303	385	385	505	505	503	503	206	206	115	115
Adj. R2	0,373	0,372	0,581	0,583	0,611	0,629	0,630	0,650	0,632	0,656	0,862	0,859
F-Stat	30,98	20,86	89,74	60,67	133,36	96,25	143,20	104,61	59,79	44,48	178,96	100,54

A strong multicolinearity between irrigated areas and cultivated areas and the equipment index led to the exclusion of the former ones in Alaotra 2.

* Significant at the 0.10 level

** Significant at the 0.05 level

t-values shown in parentheses.

Mali

Variables	Dependant variable = Global income per household							
	Tominian		Koutiala		Diéma		Macina	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Nb_PersonPres_hh	30,50 *	34,25 **	83,52 **	94,94 **	19,53	-4,70	65,61	51,56
	(2.306)	(2.420)	(2.847)	(3.216)	(0.457)	(-0.107)	(1.441)	(1.176)
c_Educ_Head_hh	206,37 *	173,60 *	-124,97	-166,31	-524,33	-325,43	-384,68	-404,75
	(2.017)	(1.787)	(-0.497)	(-0.682)	(-0.654)	(-0.422)	(-1.303)	(-1.434)
Nb_CattleTot_hh	12,77	1,62	13,23	2,51	36,16 *	38,74 **	52,43 **	37,01
	(0.699)	(0.091)	(0.994)	(0.190)	(1.963)	(2.179)	(1.993)	(1.461)
Index_Eqh_hh	265,39	225,56	233,83	195,19	1944,82 *	1538,29 *	1549,93 **	1510,04 **
	(1.437)	(1.282)	(0.942)	(0.799)	(2.396)	(1.927)	(2.567)	(2.650)
Ha_CultivatedLand_hh	207,29 **	211,19 **	271,57 **	302,25 **	305,12 **	266,81 **	240,37 **	316,82 **
	(8.437)	(9.017)	(0.942)	(7.412)	(5.759)	(5.074)	(2.743)	(3.586)
Ha_LandIrrig_hh	-256,55	-126,56	-	-	-	-	704,44 **	733,98 **
	(-0.791)	(-0.410)					(5.639)	(6.233)
1-IHH		1911,51 **		2865,60 **		-2910,60		7156,20 **
		(4.366)		(2.887)		(-1.162)		(4.574)
Nb_MigrLT_hh		97,51		-428,62 *		926,07 **		-240,22
		(1.518)		(-1.744)		(3.831)		(-0.807)
NB_MigrST_hh		-105,48		-258,41 *		-341,56		133,58
		(-1.187)		(-1.996)		(-0.466)		(0.259)
Constant	89,5016	-635,69 **	-322,24	-1196,09 **	-778,87	-168,28	-575,33	-1953,54 **
	(0.492)	(-2.724)	(-0.810)	(-2.414)	(-0.834)	(-0.153)	(-1.066)	(-3.341)
N	155	155	153	153	148	148	154	154
Adj. R2	0,519	0,571	0,575	0,604	0,481	0,524	0,619	0,664
F-Stat	28,70	23,80	42,15	29,95	28,28	21,19	42,48	34,66

The variable "Irrigated areas" is not included for Koutiala and Diéma where no irrigated land is recorded.

* Significant at the 0.10 level

** Significant at the 0.05 level

t-values shown in parentheses.

Morocco

Variables	Dependant variable = Global income per household					
	Chaouia		Saiss		Souss	
	(1)	(2)	(1)	(2)	(1)	(2)
Nb_PersonPres_hh	280,73	243,31	-318,54	-330,61	-303,55	-320,84
	(0.758)	(0.639)	(-0.721)	(-0.740)	(-0.399)	(-0.424)
c_Educ_Head_hh	5361,82 **	5377,52 **	1501,85	1409,18	541,43	-201,60
	(4.209)	(4.195)	(1.632)	(1.515)	(0.322)	(-0.119)
Nb_CattleTot_hh	-344,67	-353,58	272,56	337,43	2222,26 **	2403,76 **
	(-1.280)	(-1.304)	(0.710)	(0.862)	(2.357)	(2.515)
Index_Eqh_hh	-	-	-	-	-	-
Ha_CultivatedLand_hh	829,42 **	831,38 **	2277,44 **	1409,18 **	2506,29 **	3148,51 **
	(7.459)	(7.381)	(7.618)	(7.683)	(3.011)	(3.659)
Ha_LandIrrig_hh	737,95 **	729,15 **	1997,31 **	1962,24 **	2714,71 **	2424,38 **
	(4.228)	(4.138)	(9.738)	(9.491)	(4.223)	(3.754)
1-IHH		2429,96		-7796,24		-11761,30
		(0.409)		(-1.232)		(-1.277)
Nb_MigrLT_hh		-404,69		-528,31		-4370,51 **
		(-0.384)		(-0.634)		(-2.173)
NB_MigrST_hh	-	-	-	-	-	-
Constant	1749,06	1466,31	-48,7204	2841,75	9065,94	14507,53 **
	(0.613)	(0.461)	(-0.014)	(0.713)	(1.612)	(2.445)
N	228	228	261	261	237	237
Adj. R2	0,429	0,425	0,636	0,636	0,202	0,219
F-Stat	35,16	24,95	91,73	65,82	12,92	10,46

The equipement index and the number of short term migrants are not available.
Three households were removed from the Souss region because of missing data.
* Significant at the 0.10 level
** Significant at the 0.05 level
t-values shown in parentheses.

Nicaragua

Variables	Dependant variable = Global income per household									
	Muy Muy		Terrabona		El Viejo		La Libertad		El Cua	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Nb_PersonPres_hh	956,77 **	886,23 *	296,23	-74,26	1809,65	2100,56	34,48	36,74	390,42	153,03
	(2.008)	(1.749)	(1.138)	(-0.259)	(1.243)	(1.732)	(0.047)	(0.049)	(0.808)	(0.315)
c_Educ_Head_hh	1636,63	1591,40	873,98	778,60	1675,88	-152,59	48,86	164,86	-2922,51 **	-3109,17 **
	(1.501)	(1.453)	(1.540)	(1.398)	(0.525)	(-0.057)	(0.029)	(0.099)	(-2.512)	(-2.690)
Nb_CattleTot_hh	130,72 **	136,91 **	468,78 **	420,39 **	-49,43	117,65	350,45 **	354,94 **	950,41 **	842,55 **
	(2.963)	(3.087)	(4.496)	(3.806)	(-0.151)	(0.429)	(9.056)	(9.112)	(10.083)	(7.857)
Index_Eqh_hh	193,66	281,98	1688,66 **	1578,56 **	-405,97	-269,78	-6676,22 **	-5880,53 *	2718,80 **	2957,14 **
	(0.209)	(0.301)	(2.609)	(2.462)	(-0.534)	(-0.425)	(-1.981)	(-1.717)	(3.649)	(4.002)
Ha_CultivatedLand_hh	490,03	398,62	221,41	273,21	1658,11 **	1452,10 **	-107,86	-145,30	426,31 **	435,24 **
	(1.017)	(0.817)	(0.769)	(0.964)	(9.757)	(9.945)	(-0.185)	(-0.249)	(4.375)	(4.531)
Ha_LandIrrig_hh	-74,24	121,48	-185,20	-175,34	-361,87	-215,96	-	-	182,29	152,16
	-0.095)	(0.154)	(-0.883)	(-0.850)	(-0.394)	(-0.282)			(0.286)	(0.228)
1-IHH		-8520,75		3830,93		-44499,04 **		-11211,58		12590,63 **
		(-1.527)		(1.005)		(-3.337)		(-1.466)		(1.996)
Nb_MigrLT_hh		1961,42		4516,12 **		64787,32 **		3976,44		29814,58 **
		(0.583)		(2.546)		(5.767)		(0.369)		(2.657)
NB_MigrST_hh		579,10		1627,87		37708,63 **		-1627,17		603,54
		(0.459)		(1.334)		(6.746)		(-0.192)		(0.148)
Constant	-3770,25	-1398,13	426,2663	1112,49	-9133,17	-8854,88	5068,04	8701,77	3982,97	3130,72
	(-1.046)	(-0.356)	(0.226)	(0.586)	(-0.885)	(-1.001)	(1.038)	(1.595)	(1.096)	(0.867)
N	273	273	247	247	204	204	264	264	295	295
Adj. R2	0,064	0,062	0,136	0,171	0,458	0,629	0,261	0,259	0,395	0,413
F-Stat	4,09	3,00	7,43	6,64	29,62	39,32	19,54	12,50	33,01	23,99

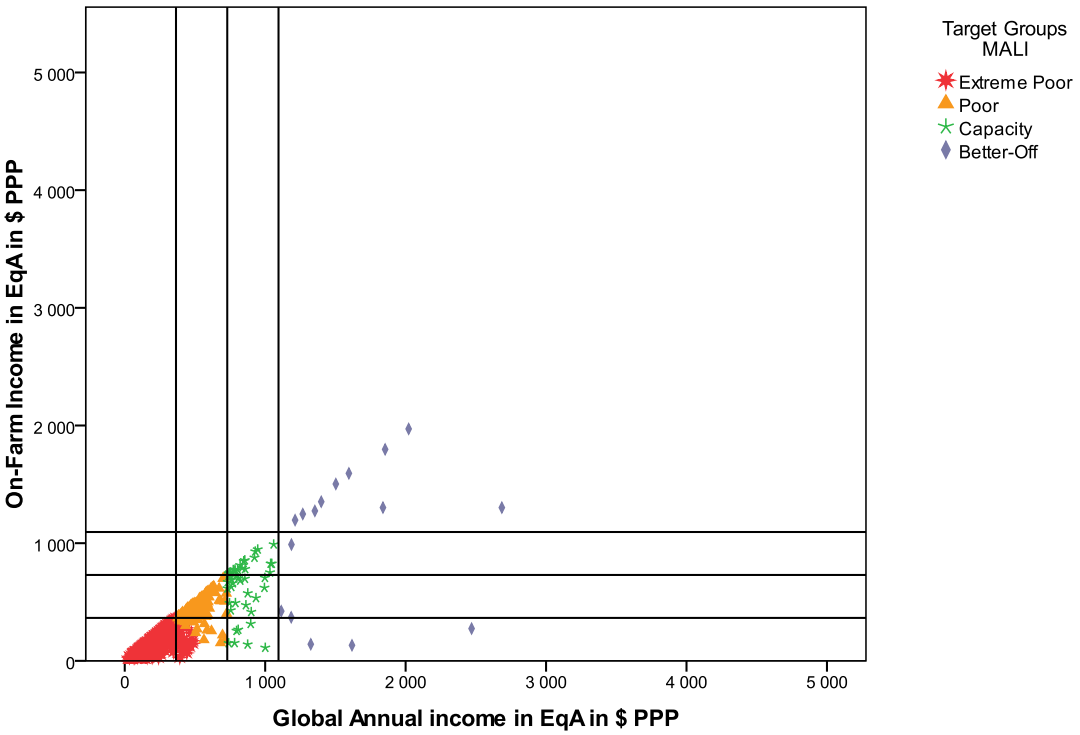
Due to missing data, the following number of households was removed: Muy Muy: 26; Terrabona: 34; El Viejo: 84; La libertad: 26; El Cua: 5.
The variable "Irrigated areas" is not included for La Libertad where no irrigated land is recorded.
* Significant at the 0.10 level
** Significant at the 0.05 level
t-values shown in parentheses.

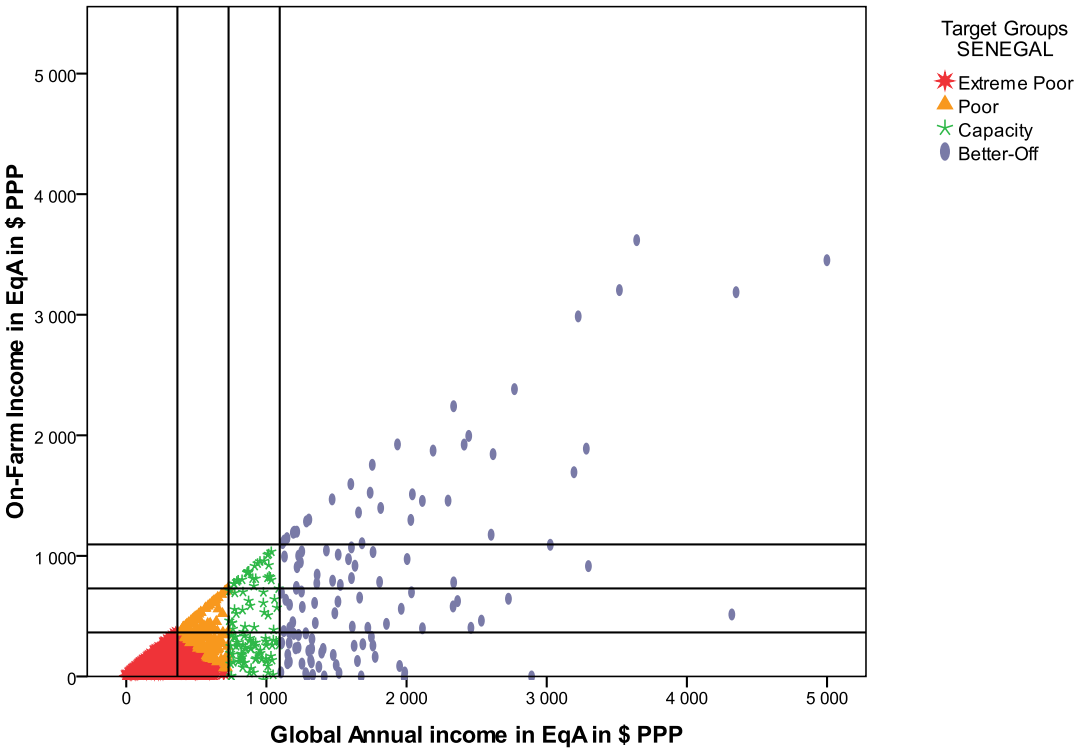
Sénégal

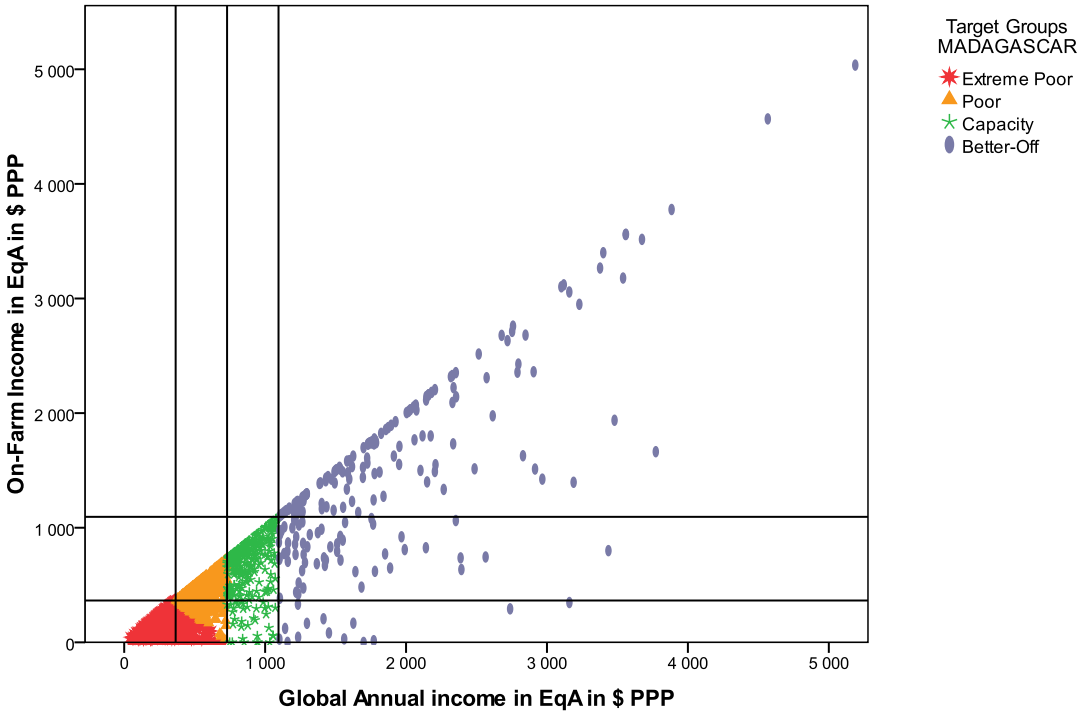
Variables	Dependant variable = Global income per household											
	Casamance		BA Nord1		BA Sud		Haut Delta		Bas Nord 2		Bas Delta	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Nb_PersonPres_hh	122,13 **	116,54 **	242,36 **	250,22 **	191,58 **	175,48 **	-76,22	-78,90	328,14 **	319,44 **	341,09 *	306,64
	(3.430)	(3.258)	(3.658)	(3.639)	(5.009)	(4.525)	(-1.235)	(-1.305)	(3.129)	(3.033)	(1.681)	(1.526)
c_Educ_Head_hh	856,13 **	824,02 **	264,01	306,62	583,01 **	664,50 **	-150,14	-3,91	1031,87	1802,63	4572,80 **	4380,57 **
	(2.290)	(2.204)	(0.261)	(0.297)	(2.213)	(2.523)	(-0.280)	(-0.007)	(0.465)	(0.805)	(4.665)	(4.468)
Nb_CattleTot_hh	63,03 **	65,80 **	431,46 **	434,09 **	37,97	29,21	395,66	409,26	35,63	63,35	208,93 **	213,93 **
	(7.275)	(7.463)	(2.988)	(2.979)	(1.370)	(1.032)	(0.829)	(0.874)	(0.195)	(0.342)	(4.886)	(5.020)
Index_Eqh_hh	779,66 **	769,26 **	754,35	568,97	-424,18	-585,43 *	556,06	878,40	2527,79 **	2041,87	4787,09 **	5043,38 **
	(2.259)	(2.131)	(0.892)	(0.629)	(-1.410)	(-1.919)	(0.936)	(1.462)	(2.039)	(1.572)	(4.645)	(4.938)
Ha_CultivatedLand_hh	392,04 **	382,71 **	231,62	199,63	52,83	55,75	248,80	370,36 *	984,57 **	1000,21 **	-111,06	-48,03
	(6.135)	(5.974)	(1.187)	(0.986)	(0.981)	(1.039)	(1.317)	(1.927)	(4.557)	(4.436)	(-0.722)	(-0.309)
Ha_LandIrrig_hh	220,76 **	227,30 **	-286,53	-203,94	14,13	27,75	566,28 **	526,94 *	63,40	228,69	357,69 **	308,88 **
	(2.032)	(2.093)	(-0.329)	(-0.230)	(0.083)	(0.164)	(2.667)	(2.482)	(0.052)	(0.186)	(2.705)	(2.330)
1-IHH		103,07		1923,60		2130,00 **		4385,20 *		-5401,76		6534,21
		(0.072)		(0.665)		(1.988)		(1.998)		(-1.386)		(1.481)
Nb_MigrLT_hh		354,53 *		199,66		182,11		403,70		1267,38 *		1877,72 *
		(1.785)		(0.431)		(1.021)		(0.749)		(1.802)		(1.789)
NB_MigrST_hh		-721,68		-793,77		303,81		381,68		-667,41		-2699,07
		(-0.634)		(-0.700)		(1.173)		(0.618)		(-0.481)		(-1.406)
Constant	-1337,52 **	-1542,93 **	-443,012	-961,72	1626,85 **	998,97	2095,26	-187,52	-4562,95 **	-2529,21	-4939,41 **	-7845,19 **
	(-2.107)	(-2.108)	(-0.280)	(-0.540)	(2.982)	(1.631)	(1.625)	(-0.119)	(-2.175)	(-1.004)	(-2.111)	(-2.811)
N	239	239	111	111	252	252	61	61	113	113	121	121
Adj. R2	0,487	0,488	0,236	0,222	0,159	0,172	0,098	0,148	0,376	0,387	0,543	0,557
F-Stat	38,63	26,19	6,67	4,50	8,88	6,78	2,09	2,16	12,24	8,86	24,73	17,78

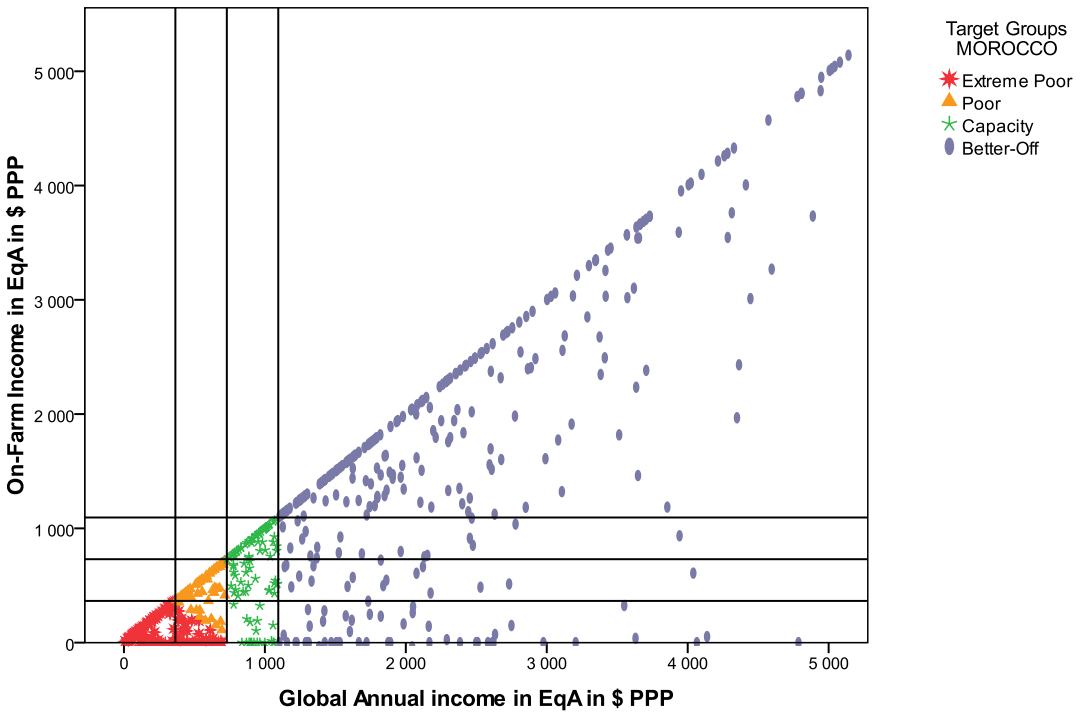
* Significant at the 0.10 level
** Significant at the 0.05 level
t-values shown in parentheses.

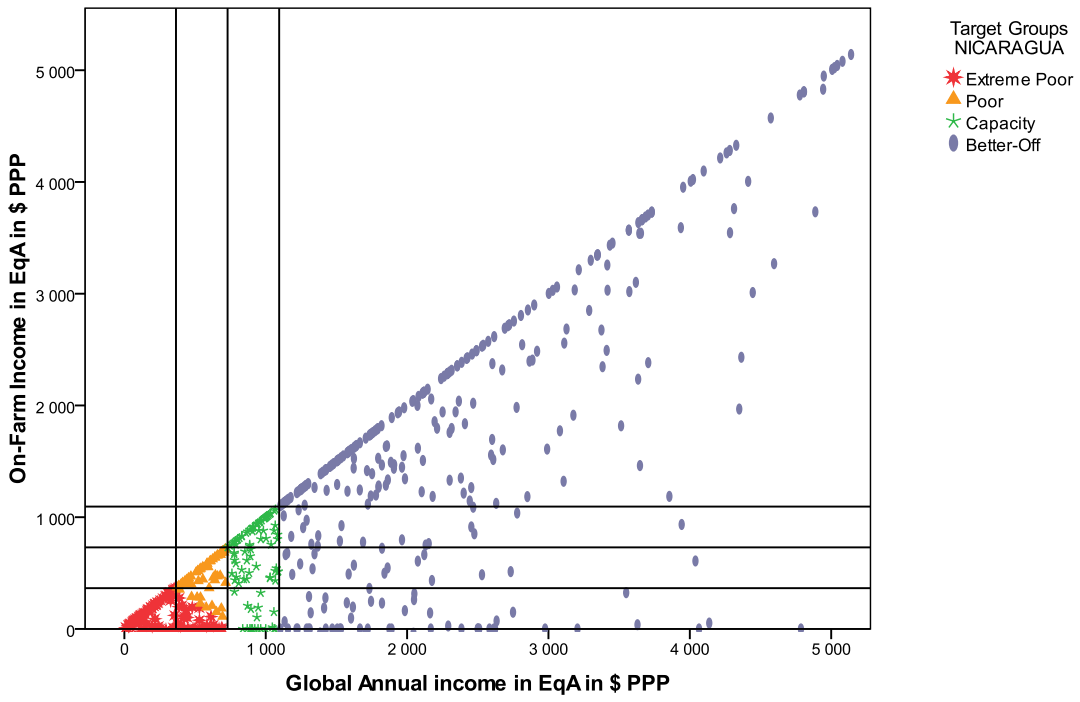
Annex 7
Distribution of Surveyed Households per Target groups in the Study Countries

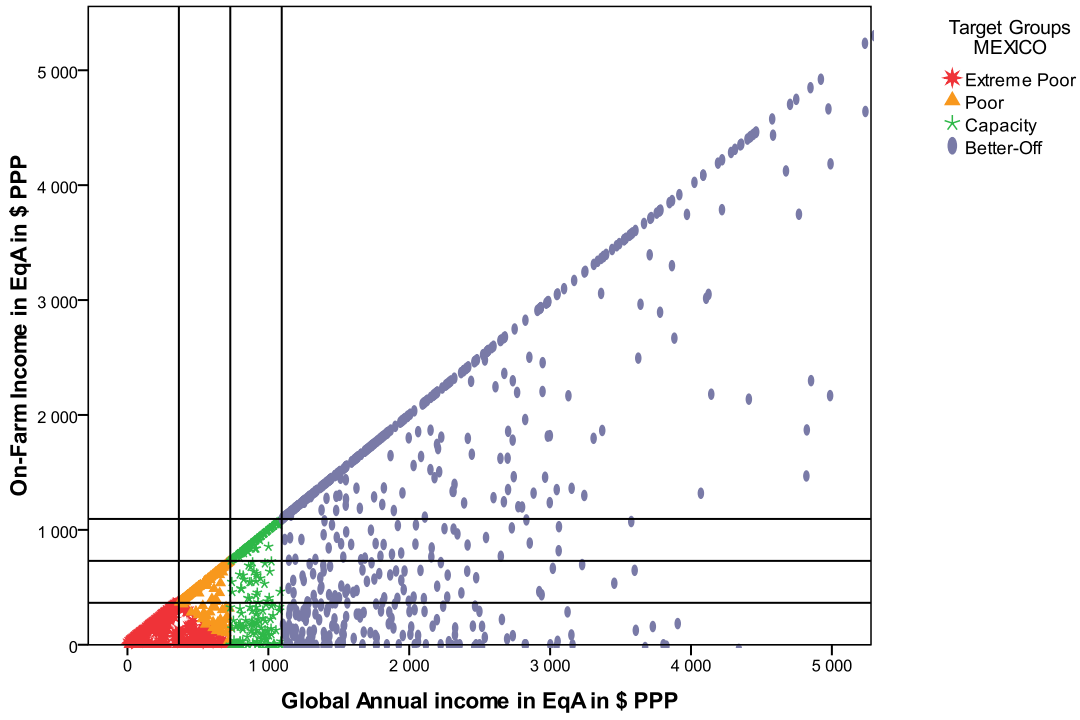

Target Groups
MALI
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
5 000
4 000
3 000
2 000
1 000
0
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP


Target Groups
SENEGAL
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
5 000
4 000
3 000
2 000
1 000
0
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP


Target Groups
MADAGASCAR
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
5 000
4 000
3 000
2 000
1 000
0
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP


Target Groups
MOROCCO
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
5 000
4 000
3 000
2 000
1 000
0
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP


Target Groups
NICARAGUA
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP


Target Groups
MEXICO
Extreme Poor
Poor
Capacity
Better-Off
On-Farm Income in EqA in $ PPP
0
1 000
2 000
3 000
4 000
5 000
Global Annual income in EqA in $ PPP

Annex 7
Households' Quintiles

Table 37: Number of Households in each Quintile per Zone

		Households Quintiles based on Global Income per Adult equivalent				
		Q1	Q2	Q3	Q4	Q5
Mali	Tominian	31	31	31	31	31
	Koutiala	30	31	31	31	30
	Diéma	29	30	30	30	29
	Macina	31	31	30	31	31
Senegal	Casamance	47	48	48	48	48
	BA Nord 1	22	22	23	22	22
	BA Sud	50	51	50	51	50
	Haut Delta	12	12	13	12	12
	BA Nord 2	22	23	23	23	22
	Bas Delta	24	24	25	24	24
Madagascar	Antsirabe 2	61	61	61	61	59
	Alaotra 1	78	77	78	77	75
	Morondava	102	101	101	101	101
	Itasy	101	101	100	101	100
	Antsirabe 1	42	41	41	41	41
	Alaotra 2	24	23	24	22	22
Morocco	Chaouia	40	47	47	47	47
	Saïss	49	53	53	53	53
	Souss	47	48	49	48	48
Nicaragua	Muy Muy	59	60	60	60	60
	Terrabona	55	57	56	57	56
	La Libertad	57	58	59	58	58
	El Viejo	55	58	59	58	58
	El Cuà	60	60	60	60	60
Mexico	Sierra S. Marta	35	35	35	35	35
	Tierras Bajas	29	29	29	29	29

Sources: RuralStruc Surveys

Table 38: Minimum and Maximum of Global Income per Adult Equivalent in Each Quintile

		Q1		Q2		Q3		Q4		Q5	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Mali	Tominian	32	111	113	159	161	217	220	292	298	2 685
	Koutiala	15	212	213	284	284	360	368	532	545	1 268
	Diéma	34	141	146	213	215	278	286	442	442	6 518
	Macina	39	226	229	350	353	475	499	770	773	2 022
Senegal	Casamance	1	124	124	250	252	405	405	669	674	3 642
	BA Nord 1	27	164	172	338	341	491	492	758	821	3 282
	BA Sud	21	183	188	298	299	438	438	609	620	8 483
	Haut Delta	31	173	178	240	265	431	497	785	802	2 459
	BA Nord 2	44	312	333	511	526	751	756	1 091	1 115	3 225
	Bas Delta	76	382	405	706	722	1 162	1 192	1 808	1 857	7 786
Madagascar	Antsirabe 2	64	186	187	257	257	344	346	517	520	3 159
	Alaotra 1	50	243	244	333	333	450	451	673	674	3 189
	Morondava	45	267	267	394	395	541	542	807	807	3 230
	Itasy	110	306	308	420	421	574	575	808	813	3 772
	Antsirabe 1	71	297	305	448	451	635	650	1 048	1 051	6 518
	Alaotra 2	158	345	363	583	610	1 273	1 386	2 150	2 159	8 265
Morocco	Chaouia	12	353	355	695	705	1 280	1 285	2 609	2 691	31 249
	Saïss	11	442	456	1 021	1 029	1 798	1 822	3 630	3 643	90 798
	Souss	22	630	640	1 244	1 275	2 343	2 380	4 445	4 699	62 854
Nicaragua	Muy Muy	29	252	252	552	553	879	882	1 504	1 512	46 909
	Terrabona	5	262	268	534	541	984	1 005	1 796	1 810	26 949
	La Libertad	8	543	567	977	992	1 505	1 528	2 555	2 556	55 589
	El Viejo	18	423	430	914	924	1 416	1 422	2 305	2 315	127 585
	El Cuà	34	555	556	1 104	1 105	1 919	1 950	4 144	4 285	42 062
Mexico	Sierra S. Marta	307	755	736	1 118	659	1 752	1 129	2 803	1 481	18 955
	Tierras Bajas	257	1 275	909	1 927	1 894	3 177	1 925	5 072	2 940	19 774

Sources: RuralStruc Surveys

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