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The role of agriculture in economic development

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Gerdien Meijerink & Pim Roza

1. Introduction

Those of us who preach the gospel of agriculture with evangelical zeal find the text compelling and convincing. We are regularly possessed by the spirit only to look around and see out colleagues, in other sectors, in country management, or even our senior management doubting, yawning or subtly edging towards the door. We face the implicit query, "If agriculture can do such great things, why have they not yet happened?"[1]

The past decade has been one of agro-pessimism. The promises that agricultural development seem to hold did not materialise. This pessimism seemed to coincide with pessimism about Sub-Saharan Africa. Especially for Sub-Saharan Africa the hope was that economic development would be brought about by agricultural development. After the success of the green revolution in Asia, the hope was that a similar agricultural miracle would transform African economies. But this hope never materialised, agricultural productivity did not increase much in SSA (figure 1), and worse, the negative effects of the green revolution in Asia became more apparent, such as pesticide overuse and subsequent pollution. Also in Asia the yield increases tapered off.

The sceptics put forward several arguments why agriculture is no longer an engine of growth[2]. For instance, the liberalisation of the 1990s and greater openness to trade has lead to a reduction in the economic potential of the rural sector: cheap imported Chinese plastic buckets out compete the locally produced pottery. On the other hand, it does mean cheaper (imported) supplies. With rapid global technical change and increasingly integrated markets, prices fall faster than yields rise. So, rural incomes fall despite increased productivity if they are net producers[3]. The integration of rural with urban areas means that healthy young people move out of agriculture, head to town, leaving behind the old, the sick and the dependent. It is often also the men who move to urban areas, leaving women in charge of the farm. This has resulted in the increased sophistication of agricultural markets (and value chains) which excludes traditional smallholders, who are poorly equipped to meet the demanding product specifications and timeliness of delivery required by expanding supermarkets. The natural resource base on which agriculture depends is poor and deteriorating. Productivity growth is therefore increasingly more difficult to achieve. Finally, multiplier effects occur when a change in spending causes a disproportionate change in aggregate demand. Thus an increase in spending produces an increase in national income and consumption greater than the initial amount spent. But as GDP rises and the share of agriculture typically decreases, the question is how important these multiplier effects are, especially when significant levels of poverty remain in rural areas, which is the case in middle-income countries[4].

The disappointment with agriculture led many donor organisations to turn away from agriculture, looking instead to areas that would increase the well-being of poor people, such as health and education. Those organisations that still focused on agriculture, such as the CGIAR, were put under pressure to focus more on reducing poverty, besides increasing agricultural productivity. However, since the beginning of the new century, there seems to be a renewed interest in agriculture. A review of major policy documents[5], including the well-publicised Sachs report and the Kofi Annan report, show that agriculture is back on the agenda again. The most influential report, however, has been the World Development Report 2008 of the World Bank[6]. This report argues that growth in the agricultural sector

contributes proportionally more to poverty reduction than growth in any other economic sector and that therefore alone, the focus should be on the agricultural sector when achieving to reach MDG 1.

A reassessment of the role of agriculture in development seems to be required. This policy paper addresses several timely though complex questions:

- First, how can or does agriculture contribute to economic development, and in particular how does it relate to poverty?
- Second, the agricultural sector has changed considerably in the past decades: what are the main drivers of this change?
- Third, what is the relationship between economic or agricultural growth and pro-poor development?
- Fourth, how does agriculture relate to other sectors in the economy?
- Fifth, who is included and who is excluded in agricultural development, specifically focusing on small farms?
- And finally, if agricultural development is indeed important to economic development, then why, despite all the efforts and investments, has this not led to more successes?

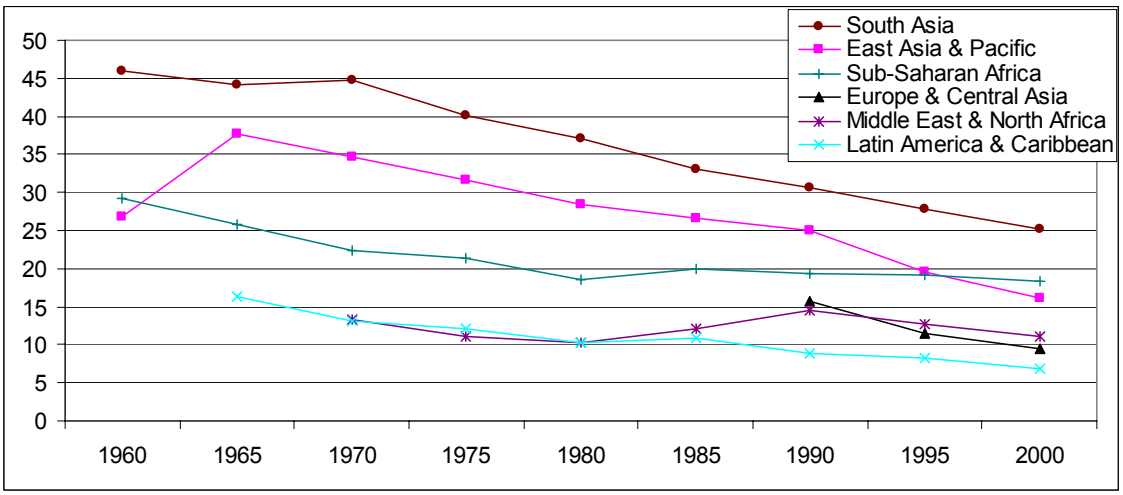
2. Agriculture and economic growth

This section presents a number of factual observations describing how the agricultural sector changed in terms of productivity, contribution to economic growth, and indicating the relevance of the agricultural sector for poverty alleviation in different regions.

Background: some facts

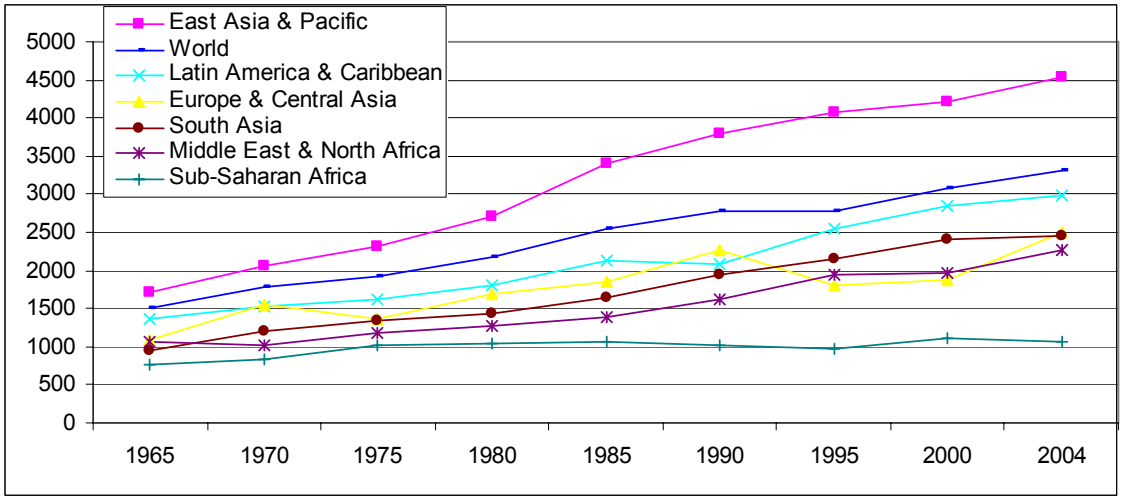
In the discussion of the role of agriculture in economic development, a leading question is how agriculture contributes to economic growth, and especially to pro-poor growth. There seems to be a paradox in the role of agriculture in economic development. The share of agriculture contributing to GDP is declining over the years (see figure 1). At the same time, the productivity of for instance cereal yields has been increasing (see figure 2). It seems that as agriculture becomes more successful, its importance declines in the overall economy. Of course, other sectors in the economy can be even more successful, such as the Asian Tigers.

Figure 1: Share of agriculture (value added) in GDP[7]



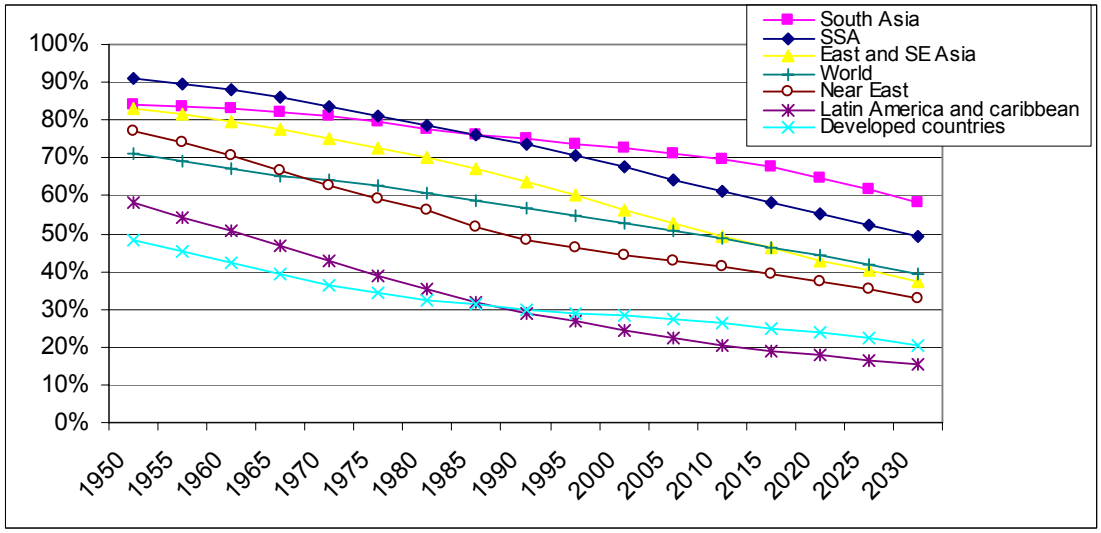
A quick reading of figure 1 might suggest that focusing on other sectors of the economy at the expense of agriculture is a recipe for economic growth. Of course, with the benefit of hindsight, most observers today now agree that the agricultural sector contributes to economic growth, but that economic growth reduces the role of agriculture in terms of GDP[8].

Figure 2: Average yield of cereals (kg per ha)[9]



The share of the population living in rural areas is also declining (see figure 3), with increasing urbanisation areas becoming more populated, sometimes very rapidly. In South Asia and Sub-Saharan Africa, the share of rural population is still well above 50%. In the other regions of the world there are now more people living in urban areas than in rural ones.

Figure 3: Share of population in rural areas from 1950-2003 (projected)[10]



The number of poor people living in cities has grown parallel to increasing urbanisation. Despite this, the share of poor in rural areas remains higher; i.e. there are relatively more poor people in rural areas than in urban areas with estimates varying from 60%[11] to 75%[12]. The shares differ substantially per country (see table 1), but the main message here is that for poverty reduction, it is important to focus on rural areas where still the majority of the poor live in terms of share and number of poor.

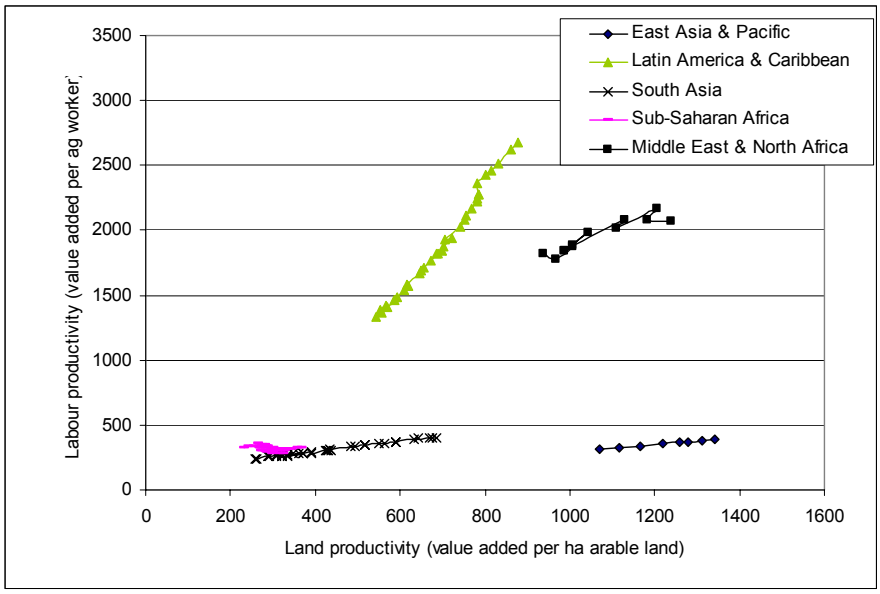
Country	Rural	Urban	National	Survey year
Brazil	51	15	22	1998
Colombia	79	55	64	1999
Ghana	50	19	40	1999
Kenya	53	49	52	1997
India	30	25	29	2000
Vietnam	36	7	29	2002

Table 1: rural and urban poverty in a few selected countries (in % of population below the poverty line)[13]

Agriculture constitutes the main source of employment of the majority of the world's poor. In total, the share of agriculture in total employment in developing countries constitutes 53% of the total workforce in 2004. In Sub-Saharan Africa 60% of the economically active population works in the agricultural sector[14].

Much effort has been put into trying to raise productivity in agriculture, and calls have been made for more investment in agricultural science and technology, especially for Africa[15]. The reasons for this seem evident when one considers the productivity growth in developing countries (see figure 4). In many regions (much) progress has been made in raising land and/or labour productivity measured in output quantity units[16] (see also figure 2 for cereal productivity). When productivity is measured as *value added* per hectare arable land or labour, Sub-Saharan Africa has not made much progress. East Asia and the Pacific, as well as South Asia experienced productivity growth in terms of value added per unit of land, but not much in terms of value added per unit of labour. Thus although progress has been made in some regions in raising productivity, many other regions have lagged behind.

Figure 4: Labour and land productivity in agriculture 1961-2003[17]

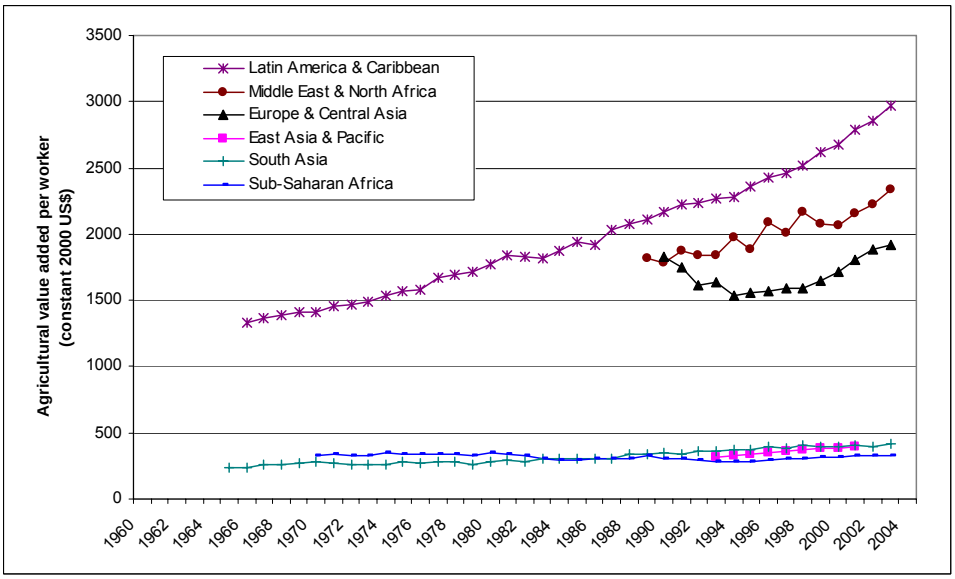


When we measure agricultural growth, in terms of value added annual % growth, Sub-Saharan Africa has performed better than East-Asia and the Pacific in the past 10 years (see figure 5). It seems that the agricultural sector Sub-Saharan Africa has made some progress towards closing the gap with East Asia & the Pacific.

Figure 5: Annual agricultural growth (value added, in %) in Sub-Saharan Africa and East Asia & Pacific[18]

Figure 6 shows big differences in agricultural value added (per worker) of the different regions in the world. Asia and Africa both have very low levels of value added, compared to Latin America, Europe or the Middle East. This illustrates the importance of low value, subsistence agriculture in Asia and Africa.

Figure 6: Value added per agricultural worker, in constant 2000 US$[19]



In conclusion, we can say that in most developing regions, agricultural productivity has increased considerably, except in Sub-Saharan Africa and South Asia, where labour productivity gains have hardly materialized, and land productivity only somewhat in South Asia. The Green Revolution and other technology changes that increase productivity seem to have bypassed these regions and the gains of the Green Revolution are diminishing. Annual agricultural growth decelerated in East Asia, but has been quite constant level in Sub-Saharan Africa. These figures do not say much about underlying trends and driving forces, which are the subject of the next section.

3. Drivers of change

The above section highlighted with facts and figures how the agricultural sector has changed over the past decades. Some general underlying causes of change of these facts and figures will be addressed in this section, although a full discussion on the differences between regions is not given here.

Globalisation and liberalisation

Globalisation refers to the increasing integration of economies around the world, particularly through trade and financial flows. The term sometimes also refers to the movement of people (labour) and knowledge (technology) across international borders. Liberalisation in this context refers to the policy reforms accompanied by privatization and domestic price reforms that specific countries have implemented[20]. When a country liberalises its economy and trade policies, it can participate more easily in the international economy. Thus, globalisation and liberalisation go hand in hand, and we will discuss the implications of both.

In the past, the state played an important role in shaping agricultural production and marketing in most developing countries. Governments were often heavily involved in agricultural marketing and food processing through the creation of parastatals (marketing boards, government-controlled cooperatives and parastatal processing units). These parastatals constituted often monopolies, sole buyers of agricultural products, including basic food crops as well as important export crops (such as cotton, coffee and cocoa). Important objectives of the parastatals were to obtain tax incomes for the government and in some cases also to gain political control. In the 1980s and the 1990s most of these systems of state intervention and control came under pressure to liberalize, often under guidance of the World Bank. In many countries, the process of liberalisation and privatisation was by no means smooth. The withdrawal of the state often led to a vacuum – the private sector that was expected to fill up that vacuum and improve service delivery (inputs, output marketing, credit, etc.), did not arise, or only slowly. As production, processing, marketing, the provision of inputs and credit, and retailing were all directed and controlled by the government, vertical coordination (VC) in agro chains already existed in many developing countries. The dominant form of state-controlled VC was that of seasonal input and credit provisions to small farmers in return for supplies of primary produce. Often they were the only source of input and credit provision for small-scale farmers[21]. The dismantling of state-controlled VCs led to the decline of input and credit supply to farms.

The liberalization of the investment regimes did induce foreign investments in agribusiness, food industry, and further down the chain, with major implications for farmers[22]. Yet, the overall picture is quite patchy – some countries do well with FDI, others suffer from FDI (i.e. mining sector), others are not able to attract FDI at all. A well-known example of these investments is the rapid growth of modern retail chains (supermarkets) in some developing countries and which was triggered by the reform process in former state-controlled economies[23]. We will discuss these implications in the paragraphs on "increased vertical coordination" below. Trade liberalisation also led to an increasing share of developing countries in world agricultural trade.

In addition to an increasing volume of global agricultural trade, also the structure of this trade changed considerably during the past decades. There has been an increase in the share of high-value products – mainly fish and fishery products, and fruits and vegetables in world agricultural trade. Especially developing countries experienced a sharp increase in such high-value exports while the importance of their traditional tropical export commodities – such as coffee, cocoa, and tea – has decreased. Analysis of agricultural trade for developing countries now needs to focus on the new commodities, such as seafood, fruits, vegetables, cut flowers and on other processed products, which together constitute almost 50 percent of the exports of developing countries[24]. However, it is important to keep in mind that the traditional crops still play a role of importance for many countries.

Associated with increasing international trade is the spread of (private and public) food standards. Consumers in the North are increasingly demanding specific quality attributes of processed and fresh

food products and are increasingly aware of food safety issues. Food-standards are increasingly stringent, especially for fresh food products such as fruits, vegetables, meat, dairy products, fish and seafood products, which are prone to food safety risks. These food quality and safety demands are most pronounced in western markets (and increasingly in urban markets of low-income countries[25]) and affect traders and producers in developing countries through international trade.

Vertical coordination in international value chains

Recently, new forms of vertical coordination[26] (VC) have emerged, through private vertical coordination systems. These are growing rapidly as a response to consumer demand for food quality and safety on the one hand and the problems that (small) farms face to supply such products reliably, consistently and timely on the other hand. Reasons for these problems of small farmers include financial constraints, as well as difficulties in input markets. Specifically for high-standard products, farmers might lack the expertise and have no access to crucial inputs such as improved seeds (see also chapter 4). Major *institutional* constraints occur: the importance of VC in developing countries is further explained by the lack of efficient institutions and infrastructure to assure consistent, reliable, quality and timely supply through spot market arrangements[27]. VC can therefore be seen as a private institutional response to the above described market constraints.

These new forms of vertical coordination are also an effect of the globalisation and liberalisation trends. They are made possible by the liberalisation of the economy, in which governmental vertical coordination is replaced by private efforts, the integration of the economy in the global market, which enables the production of high value export crops and increased foreign investment – the private vertical coordination system is owned by international companies. Despite their increasing importance, these international value chains still cover a small share of total agricultural sectors in the world.

Urbanisation

The share of population living in urban areas has been increasing steadily over the past decades (see section 2.1). For the agricultural sector, there are various positive effects of urbanisation. Urbanisation increases the scope for economies of scale in food marketing and distribution, while reductions in transaction costs increase the size of the market for distributors and retailers. The result has been a remarkable increase in the volume of food marketing handled by supermarkets, but also substantial organisational and institutional changes throughout the food-marketing chain[28]. The effects are not only in agricultural processing and marketing but in production as well. The types of crops demanded by urban population differ, increasing the market for vegetables and horticultural crops.

Hazell[29] underlines that "while much of the attention today is on high value market chains and the challenges of linking farmers to those chains, we should not overlook the importance of food staples markets and their own particular support needs. Given the global glut of food staples and historically low prices, it is tempting to conclude that developing countries can neglect their food staples sector and rely more on food imports while focusing their efforts on producing higher value products. This would also be consistent with the notion that few small farmers are going to get rich growing food staples at current prices. In reality, market opportunities are more nuanced than this, and food staples (cereals, roots and tubers and traditional livestock products) actually offer more important growth opportunities for small farmers in many low-income countries."

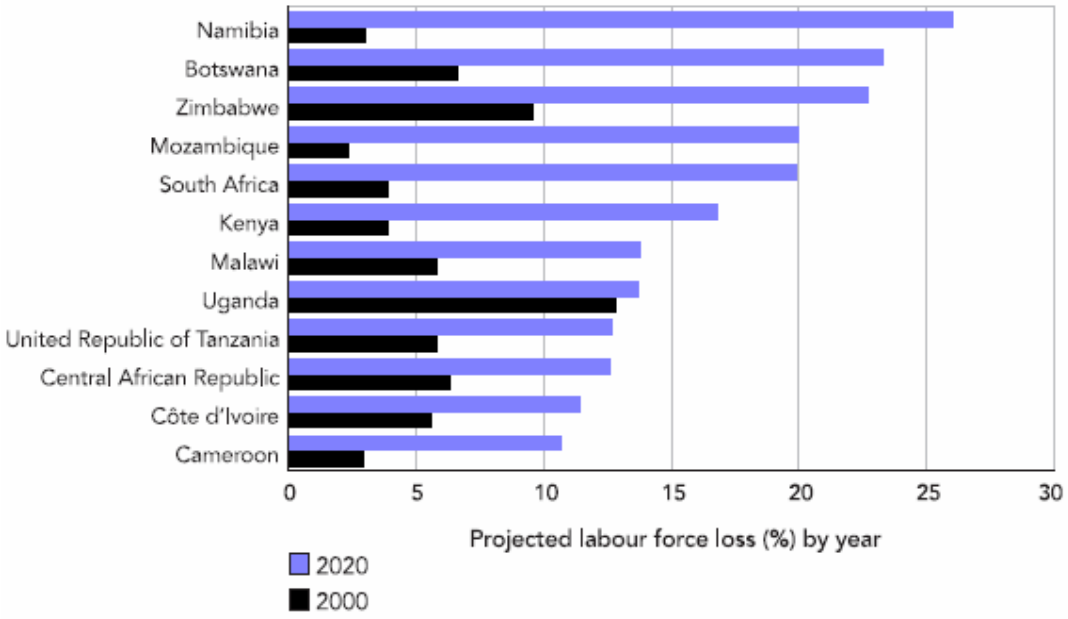
Urbanisation means not only an increased market for agricultural (food) products, but also for labour. Off-farm labour activities have increased considerably over the past decades in all developing countries, even in remote areas.[30] Not all off-farm employment can be found in urban areas, in rural areas they also play an important role, but in urban areas the wages are often higher. In general the boundaries between rural and urban areas are disappearing in many areas, as rural and urban areas are becoming increasingly integrated, not only geographically (with urban sprawl into rural areas) but also economically.

HIV/AIDS

The impact of HIV/AIDS has an increasing impact on many rural areas in developing countries and affecting agricultural production in these areas. AIDS used to be more prevalent in urban areas but AIDS is increasingly becoming a rural issue in many developing countries. For instance, more than two-thirds of the population in the 25 most-affected African countries live in rural areas.[31] But the problem is not only in Africa. For instance in India where 73% of the population is rural, the spread of HIV is nowadays faster than in urban areas[32].

The impact of AIDS on communities is deep and tragic. It is often the young men and women who die, leaving grandparents and their grandchildren or orphans left to fend for themselves. AIDS is diminishing the agricultural labour force. AIDS has killed around 7 million agricultural workers since 1985 in the 25 most-affected countries in Africa[33]. Figure 8 gives an overview of the projected reduction in African agricultural labour force due to AIDS by 2020.

Figure 7: projected reduction in African Agricultural labour force due to HIV/AIDS in 2020[34]



AIDS reduces peoples' productivity as people become ill and die, with others spending time and resources on caring for the sick, mourning and attending funerals. But more importantly, AIDS affects the social fabric of communities. AIDS has a greater chance affecting areas that are poor because the people living in these areas often do not have the resources or the knowledge to cope with AIDS. They may not know how it is transmitted, do not have the resources to go to hospitals; the medical infrastructure in those areas is usually inadequate as well. But AIDS also worsens the situation of the poor, killing the most productive members of the society and diverting scarce resources to medical care.

Increasing limits to natural resource use

In many countries, the combination of population growth, a lack of technical development and ineffective allocation mechanisms have led to a rapidly decreasing availability of natural resources for many poor farmers. Soil fertility is still declining in many areas, due to a lack of nutrients (mineral or organic) of which the availability is impeded by imperfect markets or lack of purchasing power. Water is becoming increasingly scarce around the world, as water resources such as rivers are being increasingly used for different purposes, such as agriculture, hydro-power, or drinking water.

According to the Millennium Ecosystem Assessment[35], the degradation of ecosystem services poses a significant barrier to the achievement of the Millennium Development Goals and to the MDG targets for 2015. Many of the regions facing the greatest challenges in achieving the MDGs overlap with the regions facing the greatest problems related to the sustainable supply of ecosystem services. Among other regions, this includes sub-Saharan Africa, Central Asia, and parts of South and Southeast Asia as well as some regions in Latin America.

The Millennium Ecosystem Assessment reports the following main fields of concern:

- **Biodiversity:** Changes in biodiversity due to human activities were more rapid in the past 50 years than at any time in human history, and the drivers of change that cause biodiversity loss and lead to changes in ecosystem services are either steady, show no evidence of declining over time, or are increasing in intensity. Under the four plausible future scenarios developed by the Millennium Assessment, these rates of change in biodiversity are projected to continue, or to accelerate. Some 10–20% of drylands are already degraded (medium certainty).
- **Land degradation:** Based on these rough estimates, about 1–6% of the dryland people live in desertified areas, while a much larger number is under threat from further desertification. Scenarios of future development show that, if unchecked, desertification and degradation of ecosystem services in drylands will threaten future improvements in human well-being and possibly reverse gains in some regions. Therefore, desertification ranks among the greatest environmental challenges today and is a major impediment to meeting basic human needs in drylands.
- **Water:** The amount of water impounded behind dams quadrupled since 1960 and three to six times as much water is held in reservoirs as in natural rivers. Water withdrawals from rivers and lakes doubled since 1960; most water use (70% worldwide) is for agriculture.

It is especially the people who live in ecologically and economically marginal and poor areas who suffer most by a decreasing availability of natural resources, as their livelihoods directly depend on them. Climate change, characterised by more extreme and unpredictable weather, such as prolonged droughts affects these people disproportional.

Climate change

Most studies of climate change impacts have focused on changes in mean climate conditions although global climate change is likely to bring changes in climate variability and extreme events as well. The IPCC[36] has outlined the various climate changes and effects for the various continents. For Africa, being a vast continent, and experiencing a wide variety of climate regimes it depends on the location, what the effect will be. Farmers have adapted to patterns of climate variability through land-use systems that minimize risk, with agricultural calendars that are closely tuned to typical conditions and choices of crops and animal husbandry that best reflect prevailing conditions. Rapid changes in this variability may severely disrupt production systems and livelihoods. Besides an increased variability, the IPCC detects a pattern of increased aridity throughout most of the continent. Mean rainfall decreased by 20-49% in the Sahel in most of the years between 1930 and 1997 and generally 5-10% across the rest of the continent

Asia is another huge continent with very different climates – from the permafrost in the North to tropical climate in the south. Tropical Asia has a unique climatological distinction because of the pervasive influence of the monsoon. In tropical Asia, in spite of some differences, the climates of countries have one factor in common: The Asian monsoon modulates them all to a large extent. There is some evidence of increases in the intensity or frequency of some of extreme weather events, such as extra-tropical and tropical cyclones, prolonged dry spells, or intense rainfall, on regional scales throughout the 20th century, although data analyses are relatively poor and not comprehensive. As mountain glaciers in Asia continue to disappear, the volume of summer runoff eventually will be reduced as a result of loss of ice resources. Consequences for downstream agriculture, which relies on this water for irrigation, will be unfavourable in some places. For example, low- and mid-lying parts of central Asia are likely to change gradually into more arid, interior deserts.

In Latin America, glaciers have receded dramatically in the past decades, and many of them have disappeared completely, which have had negative impacts on stream flows of rivers in those regions[37]. Large variations in temperature and rainfall are detected in different parts of Latin America, but the IPCC is not able to relate these to climate change due to CO_2 increases. But modelling studies predict a general increase in temperature which will affect the large forest ecosystem that is typical to Latin America.

According to (Mendelsohn and Dinar, 1999)[38] climate change is not likely to dramatically reduce aggregate productivity in developing countries due to various mitigating factors and adaptations implemented by farmers. In addition, global warming is likely to increase productivity in industrial countries in the temperate and polar regions. Therefore, on a global scale, food production is not at risk. But as these cooler regions become more productive, the increased supply is likely to depress world prices, making farmers in developing countries even worse off. Although these price effects are estimated to be small, the situation of developing countries will deteriorate as their production potential is decreasing and trade balance will shift towards more food import. Furthermore, in developing countries the agricultural labour force is huge. Besides this projected price effect, it must be taken into account that the adaptation costs for groups of farmers can be very high, especially resource poor farmers, who do not have the means to adapt.

4. Economic development and pro-poor growth

"What makes some countries rich and other poor? Economists have asked this question since the days of Adam Smith. Yet after more than two hundred years, the mystery of economic growth has not been solved"[39].

What is economic growth

In this section we will briefly consider what determines economic development, how agriculture features in this and whether economic growth (i.e. through agricultural development) contributes to poverty reduction. What determines economic growth, or more broadly economic development, is a topic of much research. There are several factors that should be taken into consideration, and we will briefly scan these here[40].

First, the accumulation of physical (machines, equipment, and structures) and human capital (education and training embodied in the labour force) are important explanatory factors for economic growth, but only explain part of the variations across countries. Technological and institutional factors influence the rate of accumulation of capital and therefore they are more fundamental explanations for growth.

Second, besides accumulation of capital, total factor productivity (TFP)[41] is an important element in explaining economic growth. Improving the quality of inputs (e.g. labour through education, physical inputs through technological innovation) as well as improving the organisation of production and distribution increases productivity to a large extent and thus are an important determinant of growth (see section 2.3.1). There have been several studies that explored the (positive) relationship between investments in agricultural research and development and explored increases in TFP[42].

Third, capital, knowledge and innovation flows between countries are important. Foreign trade and investments affect the incentives to innovate, imitate and use new technologies and thus countries' income levels are interdependent. Free trade is a politically sensitive issue, as is illustrated by the suspension of the WTO Doha trade rounds in 2006. On the one hand, trade enables a country to make use of innovations abroad, import products and to export its produce, on the other hand, it faces competition of other countries. Thus, (Helpman, 2004)concludes that international trade does not necessarily lead to the convergence of growth rates between countries. Second, even when it does, it does not necessarily lead to faster growth for all countries. Whether trade can encourage growth of income per capita depends on several factors. Lower trade barriers promote growth when it is

effected in combination with a stable and non-discriminatory exchange-rate system, prudent monetary and fiscal policies and corruption-free administration of economic policies[43]. It is not evident that these conditions always prevail in developing countries. We will discuss the effect of trade on poverty in section 2.2.2.

Finally, a (recent) surge of research has focused on the effects of economic and political institutions on economic growth and has shown the importance of these for economic growth. North[44] especially, has been instrumental in showing how institutional innovation have contributed to economic development, as well as how institutional failures have contributed to economic deterioration of societies. Technological know-how is necessary for success, but not sufficient. Chapter 4 deals with this issue more in-depth. Briefly we will discuss the "geography versus institutions" debate. Some authors, notably Jeffrey Sachs[45], have argued that geography plays a major role in attaining economic growth, including factors such as climate or access to seaports (vs. being landlocked). However, Helpman[46] cites various authors[47] who show that although geographical traits of a country play a role, they have no direct impact on its income per capita once the effects of institutions are accounted for. Institutions therefore play a prime role[48].

Does economic growth lead to poverty reduction?
Much has been written about the relationships between economic growth and poverty reduction. The much-cited study by(Dollar and Kraay, 2002)instigated a lively debate. They found that there is a clear link between national income and poverty incidence, which is not really surprising. More surprising however, is that they argued that policies usually considered as important in reducing poverty such as public spending on health and education, and improvements in labour productivity in agriculture had little marginal effect on the average income of the poorest[49]. This understandably led to much controversy. Other findings qualify these results by noting that although economic growth raises the income of the poor on average, there are variations across countries[50]. In some cases growth might even contribute to more inequality. In general, one can state that growth alone is a rather blunt instrument for poverty reduction, since the consensus of empirical work suggests that it is distribution-neutral. A more important finding is that the growth-poverty relationship works the other way too: in a situation where there is less inequality, there is more potential for growth – i.e. poverty constrains growth[51]. Thus reducing poverty by enhancing asset ownership for the poor (e.g. through investment in infrastructure, credit targeted to the poor, land redistribution, and education) has emerged as important mechanisms to make growth 'pro-poor'.

If economic growth is relevant but a rather blunt instrument for reducing poverty, what about agricultural growth? Does agricultural growth contribute to reducing the poverty of small-holder farmers? It seems that agricultural growth does contribute to poverty reduction, in several ways. (Irz *et al.*, 2001)[52] identify effects of agricultural growth on farm economy, rural economy and national economy. The effect on farm economy is achieved through higher incomes for farmers, including smallholders who constitute a large share of the rural poor, especially in Sub-Saharan Africa. It is also achieved through more employment as on-farm labour demand rises per hectare because the area cultivated increases or frequency of cropping increases. Positive effects on the rural economy are achieved by creation of more jobs in agriculture and the food chain. These include production links both "upstream" from the farm in demand for inputs and services for agriculture as well as "downstream" from the farm in the demand for processing, storage, and transport of produce (see section 2.3). But there are also consumption links as farmers and farm labourers spend their increased incomes on goods and services in the local (rural) economy. Finally, on a national level, an increase in agricultural output tends to decrease food prices and benefiting consumers and net purchasers of food (which may include farmers). Since the poor, both urban and rural spend a greater proportion of their incomes on food they benefit relatively more. Therefore, low food prices are often an objective of governments. The effect depends a great deal on the degree to which farm production is tradable and the associated price elasticity of demand[53]. In many countries markets do not function well (see chapter 4) and infrastructure is inadequate. In such cases farm produce cannot be treated as a tradable and increased output leads to major decreases in output prices.

In a comprehensive study on the effect of agricultural development on the poor in Tanzania, (Minot, 2005)[54] finds that the significant reforms that had been implemented during the 1990s (e.g. market liberalisation) have led to increased growth rates and a reduction in poverty. The headcount poverty rate declined, roughly, by equal amounts in urban and rural areas. Poverty reduction was greater among male-headed households than among female-headed households. In other words, men can take more advantage of opportunities created by market liberalisation than women. Interestingly, the gains in poverty reduction were greater among less educated households than among more educated households, which may be related to the fact that less educated households live in rural households, where poverty reduction has been significant. Minot[55] also found that large gains in poverty reduction were found in the Southern Highlands, where the removal of fertiliser subsidies and maize transport subsidies were expected to have negative consequences, as they used to favour this region. This points to the importance of growth in offsetting the negative effects of reforms such as removing subsidies.

The role of agricultural trade[56]

The engine of economic growth in low-income countries consists of tradables that can be sold, usually into deep markets[57] abroad[58]. These tradables consist of agriculture, tradable services (such as tourism or IT), manufacturing and overseas migration (in the form of remittances). Agricultural trade and trade reforms to facilitate trade influence economic growth substantially. Important to know is how much multilateral agricultural reforms affect the economy of a developing country and especially what the impacts are on poor rural households. This seems to be self-evident, but not all agricultural production can be seen as tradables. Many (staple) crops are produced not for the market but for home consumption, some may be sold only in local markets that are quickly saturated. Stimulating agricultural production of crops in these areas will therefore not lead to economic growth.

During recent years, trade and investment regimes in many developing countries have been liberalized. This has been accompanied by a global process of increased international trade and investment and structural changes in the global food markets[59]. According to McCulloch, Winters and Irera[60] trade liberalization affects the (rural) poor through three pathways: price transmission (distribution); profits of enterprises, and thus employment and wages; and through its impact on the government's fiscal position (taxes and spending). They see agriculture as 'the key sector for nearly all poverty analysis', since the majority of the poor live in rural areas. Furthermore food makes up an important share of all poor people's expenditure. At the same time agriculture is often the major source of income for the poor and farm incomes and has a large spill over to others in the rural economy.

The debate about the effects of trade on poverty is often dominated by the question whether opening up to trade leads to higher economic growth. According to (Dollar and Kraay, 2004)[61] there is a certain consensus about the belief that openness to international trade accelerates development. The World Bank[62] further argues that 'openness to trade has been a central element of successful growth strategies'. Other economists are more sceptical about the trade-growth relationship. From their review of empirical literature on the trade-poverty relationship (Rodríguez and Rodrik, 2000)conclude that there is 'little evidence that open trade policies […] are significantly associated with economic growth'. Recognizing the lack of consensus in the debate, the World Bank has drawn two careful conclusions in an attempt to summarize the current stance of the debate: 1. trade *protection* is not good for economic growth; 2. trade openness by itself is not sufficient for growth[63].

Multilateral agricultural trade liberalization particularly affects two groups of developing countries. Major exporters with a comparative advantage in agriculture will profit from increased access to markets in developed countries, where they will receive relatively higher prices. Major importers often profit from cheap subsidized food imports from developed countries. Multilateral trade liberalization (in this case removal of export subsidies) will probably increase the world prices of these imports and thereby the terms of trade. Consumers in developing countries will have to pay higher prices for their

products, while at the same time domestic agricultural producers are better able to compete with the imported products.

The above mentioned impact of trade liberalization on major importers points towards the importance of the net supply position of the poor household. Most rural households in developing countries are both consumer as well as producer. They produce food for their own consumption as well as for the market. At the same time they buy other food products which they do not produce themselves. In case of trade liberalization the effect on the poor household depends on the net position the household has with regard to consumption of the affected good(s). When the liberalization of good X will lead to a price increase, the poor household will lose if it is a net consumer of good X, and it will gain if it is a net producer of the same good. These direct price effects are called 'first-round effects', since they have an immediate impact on the household. When a household both produces and consumes different goods that are liberalized at the same time, the first round effects can be quite complex, since the poverty impact on the household will be the sum of different positive and negative price shocks. Furthermore the first-round effects cannot always be measured since the consumption and production decisions of poor rural households often cannot be separated.

The size of the effects of trade reforms depends also on the ability of the household to respond and adapt to the changes. This ability is determined by the access to assets, the nature of institutions and the extent of involvement of the poor in policy-shaping institutions and processes[64]. In the agricultural sector, the access of the poor to land is particularly important in determining their ability to benefit from agricultural trade liberalization. Secondly, the question here again is to which degree farm production can be perceived as tradable, which partly depends on the functioning of markets in rural areas. Winters *et al.*[65] find that there is a good amount of evidence that poorer households face more difficulties protecting themselves against adverse effects or taking advantage of positive effects from trade reform. This is inherent to the vulnerable position of most poor households, which often survive on a narrow margin[66]. When this is the case, Winters *et al.*[67] see a role for the government to provide effective pro-poor policies that help the poor reacting on trade liberalization. These could take the form of safety net measures.

Trade liberalization will not only cause direct price effects, but will also change the long-term variance of prices and incomes. This is the case when a rural economy is shifted from local price-determination to an economy following fluctuating world prices. As stated above, especially the vulnerable poor rural households will have difficulties in coping with this variability of prices. A case study from Madagascar shows that small rice farmers reacted to the rice reforms of 1980 (the mean price rose by 42% and price variance by 53%) by increasing their output in order to compensate for the higher variability. The result of this reaction to the growing variability of prices was that average real incomes increased but overall welfare decreased, due to the same variability[68].

Although the first-round effects have the largest impact on poor rural households, the poverty situation may be adjusted by more indirect, second-round effects, caused by the reaction of the poor household on the direct price effects. The household's ability to adjust to direct price effects will in the end determine the overall welfare effect of the price shock. For example, when a poor household succeeds in switching consumption away from and production towards goods whose price has risen, the household can influence the impact of trade liberalization on its own welfare position. The production and consumption substitutions will transmit the initial price shock to other markets.

The source of income (and the availability of alternative income sources) is an important variable in determining the impact of external shocks on households[69]. The degree to which assets are distributed equally within a country strongly impacts the way in which trade liberalization shocks are transmitted to poor households. For example in a land-abundant country with a skewed distribution of land, the majority of the poor will probably earn their income from working in employment, rather than from production on their own plot of land. Thus, since in general poor households do not have much

influence on the asset distribution, they should take more advantage of their most valuable asset: their own labour[70].

Although trade liberalization is not always among the most important determinants of poverty reduction, it is at the same time one of the most cost effective anti-poverty policies available to governments. Specific pro-poor policies might be more targeted to the poor than trade liberalization, but they are often administratively complex and expensive. If trade liberalization is implemented with special focus on the poor, it can be a good means to tackle poverty[71]. The governments of developing countries thereby need to ensure that increased agricultural incomes filter through the poor. This can be done by policies such as extension services, land redistribution and improved access to inputs and credit.

5. Linkages between agricultural and non-agricultural sector

"The rural non-farm sector is a poorly understood component of the rural economy of developing countries and we know relatively little about its role in the broader development process"[72].

The policy implications of linkages between the agricultural and non-agricultural sector are particularly important. Rural development programmes have traditionally tended to increase agricultural production but have often neglected (rural) non-farm activities such as the processing of raw agricultural materials and the manufacturing of agricultural equipment, tools and inputs, and this has resulted in the marginalization of some groups in rural areas. Moving away from the traditional paradigm that rural and agriculture are the same has proven difficult, both conceptually and operationally. Many rural development policies often continue to ignore or fail to put sufficient emphasis on the role of the rural non-farm sector, and its synergies with agriculture. Even in Poverty Reduction Strategy Papers (PRSPs), policy makers have frequently paid little attention to the rural non-farm sector[73]. Winters et al.[74] identify several factors for this apparent neglect. First, empirical evidence on the processes and distributional implications of participation in certain types of non-farm activities remain ambiguous. Secondly, it is unclear where rural non-farm activities are located – whether they tend to cluster in certain areas or whether specific *types* of activities tend to cluster thereby creating agglomeration economies. The spatial relationship between rural non-farm activities and different types of agricultural activities are not well understood and are potentially important. Third, with respect to development policy, the separated focus of agriculture (under the Ministry of Agriculture) and rural non-farm activities (under the Ministry of Commerce, Industry and Tourism) has not lead to an integration of the two in development policies and programmes.

Ashley and Maxwell[75] observe a crisis in rural development, reflecting a loss of confidence in the rural development 'project', which has for long been central to the development effort. In policy terms, rural development has lacked a convincing narrative, offering manageable and internationally agreed solutions to clear and well-understood problems. On similar lines, there is a growing realisation that the traditional role of agriculture is too narrow[76]. If we want to know what the role of agriculture is in economic development, we need to take a broader view of agriculture and recognize the numerous ways in which agriculture links up and plays an important role in other sectors of the economy.

Backward and forward linkages

Rural income growth from increased crop production can have multiplicative effects on a region when that income is re-spent on local goods and services that would not otherwise have had a market outlet. These spin-off effects on local activities from the spending of increased farm incomes are called "agricultural growth linkages," and they were shown to be an important element in the creation of rural industry in Asia following the Green Revolution in cereals production. Yet it has been more difficult to demonstrate the existence of such spin-offs from crop growth in Africa, since additions to farm income have typically been spent on goods that are considered to be either imports to rural localities or displacements of potential exports from these[77]. Recent studies have found positive linkages also in

Africa. The DFID policy paper "Growth and poverty reduction: the role of agriculture"[78] sees a major role for agriculture in development through the linkages of the agricultural with the non-agricultural sector. Agricultural growth can lead to strong multiplier effects in the non-farm economy[79], see table 2. We will examine these linkages more closely in this section.

Study location and time	Multiplier estimated	Source*
Malaysia, 1972	1.83	Haggblade et al., 1989
Tamil Nadu, India, 1982-3	1.87	Hazell & Ramasamy 1991
Sierra Leone, 1974-5	1.35	Haggblade et al, 1991
Burkina Faso, 1984-85	Ranging from 1.31 – 4.62	Delgado et al,. 1994a Delgado et al., 1994b
Niger, 1989-90		
Senegal, 1989-90		
Zambia, 1985-86		

Table 2 Multipliers from increases in farm output to other sectors [80]

Traditionally, the importance of agriculture in economic development is often reflected by its share in total GDP. The early development literature of the 1950's was rather pessimistic about the possibilities of spurring agricultural growth[81]. After the groundbreaking work of Schultz[82] and his "efficient farmer" hypothesis, a host of literature showed that not only was agriculture capable of productivity growth and responsive to technological change (on which the "green revolution" was based), but also that the agricultural sector can have significant multiplier effects and therefore growth in the agricultural sector could be spread to other sectors in the economy.

Three different views have been posited to explain linkages between agriculture and the rest of the economy.[83] The Lewis linkages focus on factor markets, especially labour and capital, and reveal the ways in which higher productivity in agriculture is reflected in the rest of the economy. These will be explored in section 2.3.2. Johnston-Mellor linkages look at product markets and the productive interactions by which industry and agriculture, by supplying one another with products, both grow more quickly. Non-market linkages are based on relationships among different sectors. For example, growth in agriculture improves the general food supply and nutritional levels, which in turn improves the overall economy. In another example, food security has a direct impact on social stability. Likewise, countries that have eased the profound urban bias in economic policy experience faster growth both in agriculture and in other sectors because resources are allocated more efficiently.

The debate on the role of agriculture in economic growth is centuries old; yet, the realization that agriculture is central to the growth process in *poor* countries is relatively recent[84]. The discussion in recent decades has been shaped by Johnston and Mellor's classic article[85], in which they identify five types of inter-sectoral linkages that highlight agriculture's role in economic growth. These forward and backward linkages[86], operating through both production and consumption, include:

1. Providing food for domestic consumption,
2. Releasing labour for industrial employment,
3. Enlarging the market for domestic industrial output,
4. Increasing the supply of domestic savings,
5. Earning foreign exchange.

Recent empirical work on the regional level has specifically measured the Johnston-Mellor linkages, finding substantial growth multipliers from exogenous increases in agricultural income[87]. In general, these studies have found the growth multipliers from agriculture to exceed those from non-agriculture. Indeed, the most recent additions to this literature have found agricultural growth multipliers in Sub-Saharan Africa to be substantially larger than previously thought (Delgado *et al.*, 1998)[88]. For instance, (Block and Timmer, 1994)[89] calculated the economic growth multiplier associated with additional agricultural income in Kenya and found it to be nearly three times the magnitude of the growth multiplier for non-agriculture. A dollar of agricultural income generates an additional $0.63 of income outside the agricultural sector, while a dollar of non-agricultural income generates only $0.23 of

income in the wider economy. This and related simulations suggest that economic growth strategies for countries like Kenya should give high priority to supporting the agricultural sector.

The non-agricultural sector can be present in rural areas as well as urban areas. In rural areas, the non-agricultural sector consists mostly of micro-enterprises (employing 9 or fewer workers) and small enterprises (10-49 workers). These enterprises are becoming increasingly important and contribute significantly to employment in rural areas (non-farm employment)[90].

Access to urban markets is key to increasing incomes for rural and peri-urban farmers[91]. Three aspects determine the success of rural-urban linkages: physical infrastructure, including road networks, reliable and affordable transport, post-harvest storage facilities; relations between producers, traders and consumers; and information on how markets operate, including price fluctuations and consumer preferences (see also chapter 4). Poor physical infrastructure can have far-reaching consequences on producers' prices, as inadequate roads usually entail very high transport costs. Traders and middlemen are often perceived as inherently exploitative but can in fact play an important role in providing credit and information to producers[92]. In areas where production volumes are small and scattered between several small farms, local traders operating on a small scale are often the only link with markets. Lack of storage and processing facilities and high transport costs increase the vulnerability of these trade networks[93].

Spatial proximity to markets does not necessarily improve farmers' access to the inputs and services required to increase agricultural productivity. In studies of the factors influencing individuals participation in non-farm employment, household endowments (land, labour and capital) and individual characteristics, particularly education and gender, play an important role[94]. Finally, investments in non-farm opportunities are often related to ethnic or kinship ties, limiting access to non-farm opportunities to subsets of a rural population. The development of rural non-farm employment opportunities for households or individuals is thus highly temporally, spatially and socially specific[95].

Studies show that West African cities are consuming over 80% of farm produce and thus have a significant economic impact on the rural economy[96]. The influence of cities on agriculture is not evenly spread across rural areas and has been recorded as favouring those areas near to urban markets[97]. Urban cities influence rural economic growth especially in crop and livestock production. The ability of farmers to respond to demand depends on marketing conditions, transport and communication networks, transaction costs and internal and external competition.

Farm product may also be processed or distributed by (rural) enterprises. The type of local agriculture will play an important role in determining the type of agro-processing or distribution services taken up by the rural enterprises. Agricultural growth plays an important role in stimulating local economies[98]. The rising incomes of small farmers and agro-processors are typically spent on locally provided goods and services, many of which are supplied by – or employ – poor people (for example local traders, brick-makers, carpenters etc) in villages and small towns. Estimates of the multiplier effects of increased farm output on other sectors range from 1.3 to 1.9[99]. This in turn boosts the demand for agricultural produce and hence increases rural incomes – the so-called virtuous circle of rural-urban development[100].

Factor markets: land, labour and capital

Agriculture is a source of both labour and capital for non-agricultural production. These "Lewis"-type linkages through factor markets are complemented by the Johnston-Mellor linkages, which operate primarily through input and output markets[101]. Factor markets are the markets where factors of production (labour, land or capital) are traded and the equilibrium price of the factor is determined. Factor markets are often missing or incomplete in rural areas. A land market may not be functioning because farmers do not have the right to sell their land, or incomplete because selling and buying of land is hardly taking place. Factor markets for labour are also often incomplete, for instance in peak

periods (such as during weeding or harvesting), labour is scarce and cannot be hired in or out (as all family labour is tied up).

Land

Land use is often influenced by the proximity of (urban) markets, which can be enhanced by good infrastructure (such as roads). Von Thunen was the first to model this, and his basic insights are still relevant. Basically he outlined that proximity to urban centres will determine cropping patterns. Perishable crops (such as vegetables) will be grown near the centre, while non-perishable crops (such as cereals) will be grown further away. In very remote areas, agriculture is no longer profitable and here land is left in its natural state (e.g. nature reserves). Once differences in land productivity, prices, transport costs and multiple markets are introduced, the analysis becomes more complex but the basic insights of the importance of location and transport cost in determining land use remain[102].

Land often becomes a scarce and valuable resource in peri-urban areas, with competing claims from the non-agricultural sector (e.g. construction of housing or industry), and the agricultural sector[103]. On the one hand, peri-urban agriculture can benefit by being close to urban centres, especially when they have a comparative advantage over more remote regions in having access to a large consumer market, saving on transport costs and the ability to provide perishable products quickly to markets. But when land prices increase significantly, the value of their production may be too low to justify continuation of agriculture in that region, and the farmers may be pressured to sell their land, or even be evicted.

The location of agro-industrial systems in rural areas may also increase the value of land as well as cropping patterns, as it has, for example in horticultural areas of Chile, Peru and Bolivia[104].

Areas that are remote usually focus for a large part on subsistence crops and livestock, with some products being traded in the local markets. When infrastructure from these remote areas to urban areas exists, and other advantages are present (such as available cheap land or water resources) it might be worthwhile to grow high value crops in relatively remote areas (such as roses in Kenya or Vietnam).

Economics has ignored geographical features and spatial dimensions for a long time (amongst others, due to modelling difficulties), but recently the topic has received renewed interest[105].

Labour: Non-farm employment

For a long time it was assumed that opportunities outside the agricultural sector were limited and therefore the labour market was incomplete. But increasing evidence is being brought forward that farmers do not live by farming alone. It is estimated that rural non-farm income presents on average 42% of rural income in Africa, 32% in Asia and 40% in Latin America[106]. Even in areas with predominantly subsistence agriculture, such as many regions in Africa, off-farm employment can constitute as high as 40% of rural household income[107].

In the literature different terms (off-farm, non-farm, non-agricultural, non-traditional) are used interchangeably. We will use the three-way classification proposed by (Barrett *et al.*, 2001)[108], which is based on (i) sectors as defined in national accounts; (ii) location distinguishing at-home, local away-from-home and distant away from-home (domestic of foreign migration); (iii) self-employment or wage labour. Using such a three-way classification allows a study of the dependence of rural households on the local or more distant economies, (local) intersectoral linkages, rural-urban linkages, or the importance of foreign sources of income. We will use the second and third categories to denote non-farm activities.

Non-farm employment reduces the amount of 'surplus labour' in rural areas and allows rural households to earn other sources of income. Non-farm income is increasingly an important source of

revenue in rural areas, even in traditional subsistence areas such as many regions in Sub-Sahara Africa.

When opting for non-farm labour, farm households can be motivated by "pull" or "push" factors[109]. Pull factors include better returns in the non-farm sector relative to the farm sector. Pull factors include an inadequate farm output (either because of short term reasons, e.g. drought, or long term reasons, e.g. land constraints), an absence of or incomplete crop insurance and consumption credit market, risks of farming, inducing households to diversify, an absence or failure of farm input markets or input credit markets which means households need to pay for inputs with their own cash resources.

The fact that farm households engage in non-farm employment therefore can be a positive sign when pull factors are involved, which means possibilities exist for economic development outside the farm sector. When push factors are involved, it is more a sign of the poor condition the rural sector is in, rather than offering a real possibility of improving the economic situation of the farm household. But even when push factors are involved, (Reardon *et al.*, 1998)[110] argue that it will be the non-poor households rather than the poor ones who will diversify their income sources more, because they are in a better position to self-finance this diversification.

When labour markets are increasingly linked, induced by better infrastructure and commuting, subcontracting, and location of agro-industrial enterprises in rural or peri-urban regions, forces outside the rural economy will influence the labour use and overall sectoral composition of the rural non-farm economy. When there is an increase in labour demand due to a boom in a certain industry (e.g. the oil industry in Nigeria in 1980s, or the textile and construction industry in China), local wages can be raised in rural economies. This can induce investments in labour-saving technologies[111] or labour extensive activities. China is a case in point. Its rapidly developing industrial sector has attracted large numbers of cheap labour, mainly from the rural countryside. Here labour is often a constraint, and farmers switch to crops that are less labour intensive, such as rice[112]. Households whose members have migrated (temporarily) to cities often shift to one-season rice, which induces a stronger shift to two-season rice by households lacking access to this type of off-farm employment. An increasing flow of migrants to the city will thus magnify the shift away from rice and towards capital intensive but labour extensive livestock production.

Capital

In rural areas, capital markets are often incomplete, with virtually no possibilities to save money with interest and borrowing money usually comes at a high cost, this limiting the opportunity of rural households to borrow money for investments. Non-farm cash income can bridge this gap. In times of crop failure, non-farm income can fill the food deficit. Other mechanisms are contract farming whereby the buyer of produce will pre-finance inputs such as fertiliser.

The recent years have seen a surge of interest in "micro-finance". The Nobel Prize for peace in 2006 was awarded to Mohammed Yunus who founded the Grameen Bank in Bangladesh, which focused on providing small loans to mainly poor women. These small loans made a huge difference in their lives. Such initiatives bridge the gap between the need of poor people who do not have access to the formal banks as the amounts they want to borrow are too small or they cannot provide any collateral. Although such small scale micro-credit schemes can function quite well, it does not completely make up for the failing of capital markets. Transaction costs are high and interest rates (therefore) as well.

6. Inclusion and exclusion: the role of small farms

"…the only part of agriculture in developing countries that will continue to grow significantly faster then population in the next twenty years is the high value sector. The implications for the vast mass of smallholder farmers (…) are sobering: to significantly improve their incomes per capita over the next twenty years, they must either be part of the shift to high-value agricultural production or increase the share of income they get from non-agricultural sources. Furthermore, the analysis in the preceding section suggests that unless smallholders become vertically integrated with processors and retailers, they will increasingly have difficulties in participating in increasingly more demanding high-value markets."[113]

One of the main concerns in the discussion of agriculture as a driver of change is how this change will affect rural households, and especially poor rural households. Can these households benefit from economic development or are they left behind, widening the gap between rich and poor? We will discuss the role of small farms, which often constitute the poorest households in rural areas, but will touch upon landless as well. Small farms can be drivers of change and play an important role in the rural economy, but at the same time may be left behind in the current rapid economic developments characterised by globalisation, vertical change integration etc.

The position of poor rural households is also influenced by the fact that agricultural markets are characterized by large distortions, both domestically and internationally. According to Dorward and Kydd[114] the "new economy" (characterized by globalization of trade, financial flows and institutions) can both provide opportunities and threats to poor farmers in developing countries. One of the threats is that poor smallholder households get locked out of markets due to slow progress in participation of their country in the global economy. Another reason is the physical and institutional isolation of poor households in rural areas. Furthermore, the fact that poor households have access to local, national and international markets does not always mean that they can benefit from this access, since a number of institutional deficiencies limit smallholder areas from taking advantage of market opportunities: inadequate access to information, contractual enforcement and finance. Often transaction costs are in excess of the potential benefits of the transaction, which leads to market failure. It is argued that "policy trends (liberalization) and autonomous developments in technology and supply chains (globalization) may have made the achievement of broad-based smallholder development more difficult"[115].

Output prices for many crops (e.g. cereals) are generally declining, while many input prices are declining but less fast, thus worsening the terms of trade. There has been a paradigm of agricultural growth based on small-farm efficiency[116]. With the assumption that the rural poor are also small farmers the emphasis has been on supporting small scale-farming. Ellis and Biggs[117] point out that this view has been criticised because it is the rural landless that often constitute the poor and these derive their income from the non-agricultural sector.

Many small-scale farmers are diversifying their revenues by engaging in non-farm activities, and at the same time not investing in agriculture at a time when the demands on agricultural production in terms of technology and product quality are increasing. Because agriculture is no longer their main focus, farmers may not see the need to maximise the returns from farming. (Kuiper *et al.*, Forthcoming)[118] have found preliminary evidence that this also means they do not invest non-farm income into agriculture (e.g. by buying fertiliser) Another implication is that they are more likely to invest in food crops (for their own consumption) and not in high value cash crops. (Kydd and Dorward, 2001)suggest that the case for the efficiency of smallholder farming may be "breaking down, where globalisation intrudes, non-traditional crops are promoted, and agricultural modernisation involved increasing use of capital".

There is also evidence that the current challenges in agriculture cannot be met by these small farms. New technology is often capital-based and requires certain skills that are beyond the scope of many small farmers. In general small farmers pay more for inputs and receive less for outputs than large farms, thus decreasing their rates of return. The high value chains impose quality and timeliness requirements that are difficult to comply with for small farmers[119]. Vertical coordination has been identified as an important development for agricultural development (see section 2.1). Evidence suggests that private vertical coordination efforts can yield important positive effects[120]. Farmers that are involved in such VC schemes have experienced beneficial effects on output, productivity and product quality, and ultimately also on incomes through improved access to inputs, timely payments, and investments. But not all farmers can participate in these schemes. There are two potential equity issues with VC schemes[121]. The first concerns the inclusion or exclusion of small farms in contract-farming. The second concerns the distribution of rents within vertically coordinated food supply chains. VC can bring several benefits to farm households, including higher welfare, more stable incomes and shorter lean periods. But there are several reasons why contracting firms might prefer to contract wealthier farmers, thus leaving out small farms. Contracting larger farms in supply chains reduces transaction costs (firms have to deal with a few large forms instead of many small ones). When some amount of investment is needed in order to be able to supply the firm, small farms may not be able to do so, being more constrained in their financial means. These reasons would work against small farms. In some cases firms do contract small farms. Sometimes, these firms have no choice – small farmers represent the vast majority of the potential supply base. Some firms may choose to prefer a mix of suppliers in order not to become too dependent on a few large suppliers. Even when firms contract small farms, these will still constitute a minority in the total population of small farms. Many others are still excluded.

A second development in VC is the shift from contract farming (of large or small farms) to fully integrating production and agro-industrial holdings. This shift is often in response to increasingly stringent food standards. Small farms lose out in this shift, but employment opportunities are increased, which may benefit poor households or the landless. Thus (Swinnen and Maertens, 2006)[122] conclude that in combination, contract-farming and agro-industrial employment are significantly positive, reaching different groups of poor.

The options for small farms to participate in profitable markets but do not participate in beneficial VC schemes are limited. In the section on non-farm income, we have seen that this constitutes an important livelihood strategy of small and poor farms. The rural as well as urban non-farm employment often does not represent substantially more profitable income opportunities, although they can help diversify incomes. In many cases, *push* factors drive farmers to seek alternative income generating activities. A move out of agriculture is therefore not an option for many of these small-scale farmers. In the mid 20th century in Europe, many farmers left the agricultural sector to work in upcoming industries (e.g. textile). The land they left was taken up by farmers who could increase their farm and become more competitive. In many developing countries however, this movement cannot be perceived. Because the non-farm employment sector is either not sufficiently profitable or uncertain, rural households maintain their plots of land as a security, often extensively managed[123].

There seem to be important gender deviations in the general trend of labour moving out of agriculture. A slightly increasing feminization of the agricultural labour force in most developing countries may reflect the fact that women are lagging behind men and abandoning agriculture at a slower rate[124]. Thus female farmers are usually those who attend to the management of the farm while their husbands and sons find (part-time) employment outside agriculture. This does not automatically mean that the women have taken over de management of the farm completely, often the decision-making over e.g. investments often still lie (partly) in the hands of the men.

Remittances sent back to the farm household by its members who have migrated can be an important source of household income. Wouterse[125] found for Burkina Faso that households with members who migrated to other African destinations were indeed better off, but that this was due to the fact that

there are fewer members to feed than due to the remittances. Households whose members migrated to Europe were better off due to increased remittances. The beneficial effect of a move out of agriculture thus depends on several factors, including the economic potential of job opportunities outside the farm, as well as the productivity of labour in the agricultural sector (do households members represent additional production or merely extra mouths to feed?).

Vertical coordinated supply chains offer a profitable marketing opportunity to (a relatively small group of) small-scale farmers. The share of production in developing countries marketed through these supply chains is still small[126]. Especially small farmers who have limited resources (e.g. technology) and limited access to markets (because of their location or because they lack information or networks) may face restrictions in participating in these supply chains. Furthermore, supplied produce are usually small and heterogeneous in quality, supply can be irregular and combining produce into a steady stream of product of constant quality difficult to realize. A study by (Reardon and Berdegué, 2002)[127] shows that the rapid growth of supermarkets in Latin America have had drastic impacts for and exclusion of small farmers from supermarket supply chains.

On the other hand, small-scale farmers also have an advantage which comes up frequently in literature[128], and that is that their production cost in labour-intensive products is often 20-40% lower than that of large-scale commercial farms. The latter have high overhead and supervision costs and paid labour is generally less motivated than self-employed farmers. In some cases, where lack of access to land forms an obstacle to the emergence of commercial farms, access to land is a competitive strength of small-scale farmers.

Thus, vertical coordination can offer good opportunities for small-scale farmers, but at the moment, only for a small proportion of these. For the majority of small-scale farmers, especially those in remote areas, participation in these coordinated supply chains is not yet an option. This leads us to the point that (de Janvry and Sadoulet, 2006)[129] have made, which is that although much progress has been made in specific areas and countries, there have been uneven outcomes[130] and high and rising *local* inequalities. Poverty is caused by a lack of assets and access to risk-coping instruments (health, education), but these factors also contribute to the fact that these poor households cannot seize the opportunities that rural development presents, inequalities are therefore produced and reproduced by these factors. They also point out that capital and insurance market failures are increasing sources of social segmentation with the emergence of the "new agriculture", which consists of the production of high value crops and new marketing channels (e.g. supermarkets, vertical coordinated supply chains). This is due to the rising capital intensity of agriculture, and wealth constrained credit markets, in spite of the "microfinance revolution" that hardly reaches agriculture.

7. Discussion and conclusion

We have covered a very broad topic in relatively few pages. What comes out of our analysis is that recent years have seen tremendous changes, in economic development in developing countries in general, but for the agricultural sector in particular. This coincides with a renewed debate on the role of agriculture, whereby the realization of the important role of agriculture is not only reaffirmed, but also the importance of the linkages between agricultural and non-agricultural sectors, farm and non-farm activities and rural and non-rural regions is emphasized.

Important questions and concerns remain and a new agenda for agriculture is slowly emerging. In this agenda, there are several key elements:

- The consequences of "new agriculture" as coined by (de Janvry and Sadoulet, 2006)[131], which includes high value crops and quality foods required by urban distribution channels and exports (health standards, organic foods), standardized delivery in contracts with supermarkets, demands of agro-industry for non-traditional exports, labelling and certification, vertical coordinated chains, etc.

- The future of small farms, poor rural households and remote (or marginal) areas who are often excluded from the "new agriculture"
- The role of local supply chains and food crops, which we can label the "local agriculture" (as opposed to the "new agriculture") in rural development and for small farms
- The role of the non-farm (rural) economy, in offering opportunities to rural (poor) households
- The establishment of safety nets, for those vulnerable poor households who have very little opportunities, little access to non-farm income and for whom agriculture is a risky and low subsistence livelihood strategy.

On the establishments of safety nets, (Valdés and Foster, 2005)[132] stress that the point is not to maintain millions of small farmers, but to eliminate poverty – safety nets where agricultural and overall growth is not enough. This can be done through programs that target poor rural households with income support that is based on the numbers of children in the household, and contingency on the impact on human capital (e.g. education and health). Several countries in Latin America (e.g. Mexico and Brazil) have achieved major success with such programs[133]. The objective of such programs is thus not to keep people on the farm, or even in rural areas, but to promote opportunities and mobility of future generations, both in economic and geographic terms.

On the other hand, as Hazell[134] writes "*but safety net programs should not be seen as a substitute for policy support for agricultural development*". The need for agricultural development is still very much acknowledged, although in a new form than a few decades ago. Hazell[135] stresses the importance of food staples for low-income countries, which might offer more important growth opportunities for many small farmers than the "new agriculture", which is available only to a relatively small group of farmers. There are no other markets that offer this kind of growth potential, and unlike many higher value products, food staples also have relatively low credence attributes making them much easier products for small farmers to sell in today's markets.

But he continues to say that "it is not only important to recognize that food staples still have a key role to play in many developing countries, but also to recognize that the markets for food staples are inherently different from markets for many high value products and need greater public attention. Many producer markets for high value products have been successfully privatized and this is in part because of their higher profit margins and greater integration into export and retail markets. However, hardly any credible evidence exists to suggest that the private sector can successfully take over the producer market chains for staple foods during the early stages of agricultural development. As farmers struggle with low productivity and high subsistence needs, low input use, low incomes, poor infrastructure, high risks, and the like, the amount of profit to be made in market chains for food staples remains low and unattractive for much private investment. There is also a growing body of studies showing that important institutional and market failures are to be expected at that level of development"[136].

Finally, policy attention has long focused on agriculture's traditional role to provide food, create jobs, earn export income, generate savings and funds for investment, and produce primary commodities for expanding industries. But the role of agriculture often goes beyond these direct, market-mediated contributions. Agriculture plays also an important role in providing indirect non-commodity contributions that are public goods, social service benefits and environmental services not captured by markets. Agriculture thus contributes to (i) environmental services such as soil conservation, watershed services, biodiversity, and carbon sequestration; (ii) poverty reduction; (iii) food security; (iv) agriculture as a social safety net or buffer in times of crisis, and (v) social viability[137]. A review of 11 case-studies by FAO revealed that these indirect contributions are not well understood, seldom analyzed in the context of development, and rarely reflected in national and rural development policy formulation. This may be due to the fact that the market signals are missing and policy signals are wrong and the lack of information concerning the sector's evolving market and non-market roles. The study underlines the strong interdependence between agriculture and other sectors, as well as the

many cross-sector linkages through which agricultural growth supports overall economic growth and the many benefits to society that are not measured by economic growth indicators alone.

6. Notes

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[4] Valdés, A. and W. Foster. 2005. *Reflections on the Role of Agriculture in Pro-Poor Growth*. Research Workshop: The Future of Small Farms: Wye, Kent.
[5] (Löffler *et al.*, 2007) Löffler, H., J. Jiggins, J. Woodlhill, K. Giller, P. Oosterveer, and W. Andriesse. 2007. "The Role of Agriculture in Achieving Mdg1: An Expert Survey. " Wageningen. 56 pages.
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[17] Note: Measured in constant 2000 US$. Based on World Development Indicators (WDI), 2006. http://devdata.worldbank.org/wdi2006/contents/index2.htm
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[26] (Swinnen and Maertens, 2006) explain that vertical coordination can take various forms, which can be thought of as institutional arrangements varying between the two extremes of spot markets exchanges (no coordination) to full

ownership integration (full coordination). Within these extremes, there is a large variety of different forms of coordination and an equally vast literature trying to classify these various forms. A useful distinction, however, is between marketing contracts and production contracts. Marketing contracts are agreements between a contractor and a grower that specifies some form of a price (system) and outlet. Production contracts are more extensive forms of coordination and include detailed production practices, extension services, inputs, quality and quantity of a commodity and a price.
Swinnen, J. and M. Maertens. 2006. "Globalization, Privatization, and Vertical Coordination in Food Value Chains in Developing and Transition Countries", *Plenary Session on "Trade and Marketing of Agricultural Commodities in a Globalizing World" at the 26th Conference of the International Association of Agricultural Economists*: Queensland, Australia.

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Schultz, T. 1964. *Transforming Traditional Agriculture*: New Haven and London: Yale University press.
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