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# **Fundamentals of African Agriculture**

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## **Abstract**

During the past decades farmers in Sub-Saharan Africa had been prevented from making more intensive use of their mostly under-utilised production potentials by unattractive prices and market conditions, which in many countries were reinforced by a less than conducive policy environment. At the same time, there were no sufficient opportunities outside agriculture to allow rural families to give up their subsistence production. Now, as agricultural prices tend to rise with a long-term perspective, while natural conditions tend to deteriorate, African farmers (and policies) are facing both incentives and a pressure for intensification of their production systems. However, most small-scale farmers, having been forced to get involved in diversified, multi-locational rural-urban livelihood systems, are not well-prepared to respond flexibly to the new conditions. Based on this assessment, this article concludes by emphasising the necessity to support a new, albeit alternative (i.e. context-specific), ‘Green Revolution’ for Sub-Saharan Africa.

**Keywords:** agricultural policy, agricultural development, rural development, Africa

**JEL:** Q 18, O 13, N 57

## **1 Introduction:**

### **Are African Farmers Unable to Feed the People of Africa?**

Most authors tend to agree that the performance of African agriculture in terms of per capita growth in agricultural output in the past fifty years has been disappointing (e.g. DORWARD et al., 2009). Hunger and malnutrition are still predominant in most countries of Sub-Saharan Africa. Food crop production per capita has declined to approximately 85% of the level of 1960 (FAO, 2008). The majority of African countries has become dependent on food imports, while Africa’s share in agricultural exports has also decreased.

**Table 1. Selected macro-level indicators on trends in African agriculture**

	1960	2010
Proportion of rural population (%)	90	70
Rural population (mill.)	220	600
Total cultivated area (mill. ha)	60	115
Staple food production (mill. tons)	50	150
Staple food production per capita (tons)	0.20	0.17
Staple food production per capita of rural population (tons)	0.23	0.25
Yield of cereals (t/ha)	0.8	1.3
Share of agricultural output in GDP (%)	43	28
Share of Sub-Saharan Africa in global agricultural exports (%)	8	2

Sources: tentative approximations based on FAO-STAT ONLINE (2009) and WORLD BANK (2007)

Acknowledging that the figures in table 1 are merely rough approximations, they still indicate some significant facts and trends:

- Despite urbanisation, the rural population, and thus rural population density, has nearly tripled. Rural areas continue to be the foundation for the livelihoods of the vast majority of Africans.
- Production has increased at a higher rate than rural population, but slower than total population, indicating that production per agricultural labour force has increased, but not enough to feed the total population.
- Most of the added production results from expansion of cultivated land (by more than 90%), while only a smaller part is a result of intensification (yields per acreage increased by 60%).
- Export figures indicate that the disappointing performance in food crop production is not a result of a shift towards export crops. Africa's share in agricultural exports has dropped dramatically, indicating reduced competitiveness.

A more differentiated country by country analysis could offer a slightly modified picture. A disaggregated analysis shows that a majority (70%) of Sub-Saharan countries was on average (i.e. in the absence of serious droughts) self-sufficient in their supply of staple foods at the end of the 1990s, while most of the countries with a food deficit were affected by civil wars, armed conflicts or a massive influx of refugees (RAUCH, 1999; FAO/GIEWS, 2003). This would indicate that under normal

conditions, food crop production in Africa has increased more or less in line with the rise in population. Not very much more than that, but also not less.

Though there are no good aggregated data on farm sizes and subsistence production, based on the evidence from many countries, it is safe to assume that – with the exception of South Africa – the greater share of staple food production comes from small-scale peasant farmers, partly for subsistence and partly for the market. Many among them are both sellers and buyers, selling part of their production after harvest out of an urgent need to generate cash, while buying food - often the same produce - before harvest. In that sense, African farmers have become increasingly dependent on agricultural and food markets, although per capita production did not decline.

Even such a differentiated picture cannot deny that Sub-Saharan Africa is characterised by a situation where the majority of the population is involved in farming, while simultaneously neither being self-reliant in food supply, nor playing a strong role in trade in agricultural products. In contrast to other developing regions, a significant and wide-spread intensification of agricultural production has not happened in the past five decades. This article tries to identify the factors which have influenced that comparatively poor performance. Is it due to natural and locational disadvantages? Is it caused by the adverse effects of the global agricultural markets, by trade policies of industrialised countries, or by food aid? Is it a result of socio-cultural factors related to deep-rooted norms in subsistence economies? Or is it the agricultural policies and the weak formal institutions that are to blame for providing disincentives to farmers rather than incentives? Agricultural development depends on all these factors: nature (chapter 2), markets (chapter 3), culture/society (chapter 4) and policy/institutions (chapter 5). Only a multi-dimensional analysis can help to find answers to the interrelation of these factors and their relative importance to African farmers in the time since independence (chapter 6). While all these factors have continuously shifted over time, partly related to trends such as climate change, deregulation policies, or urbanisation, there has been a marked change in the dynamics of the global agricultural market from a low-price and surplus situation to a high-price and deficit situation during the last few years. The implications of this change for African agriculture are analysed in chapter 7. The article concludes with some considerations on policy implications in chapter 8.

## **2 Held back by Nature and Location?**

It is a wide-spread popular belief that Africa is disadvantaged by nature and there is some degree of scientific evidence for this claim. The geographer W. WEISCHET (1977) diagnosed an “Ecological Disadvantage of the Tropics”, referring to the low nutrient content of soils in tropical rainforests on the one hand, and to the water stress situation

in semi-arid areas on the other hand. Low population density would be a result of low ecological carrying capacity. BROMLEY (2009: 6) goes one step further by interrelating the hypothesis of limited agro-ecological potential with the observation of wide-spread negligence of African governments in rural areas: "... the effective reach of the African state is rationally attenuated by both historic and contemporary considerations of the benefits and the costs of extending coherent governance across vast landscapes of dubious economic value." Following von Thünen's logic, BROMLEY holds that the distances are just too great and soil fertility is too low to make investment in controlling and developing rural regions in Africa worthwhile.

While this assessment of limited agro-ecological potential is correct for tropical rainforest and for semi-arid regions, it is not only too generalising, but a grossly misleading diagnosis for Sub-Saharan Africa as a whole. Only 10% of the population lives in rainforest areas and some 15% in the drought affected areas of the Sahel and parts of Southern Africa. 75% of Africans and even 86% of the rural population in Southern and Eastern Africa have settled in agro-ecological zones with good or at least medium potential for crop cultivation (IFAD, 2002). The share of suitable land for rainfed agriculture is estimated to be in the range of 13 to 16%. This equals 0.25 hectare of agricultural land per capita, which compares favourably to a world-wide average of only 0.12 hectare. Meanwhile most of that (approximately 12% of the total area) is under cultivation (BRANDT, 2004). On the one hand, this indicates that possibilities for the extension of the cultivated land have largely been exhausted (compare FAO, 2003). Only 20 to 25% of the rural population is located where there are opportunities for the sustainable extension of cultivated land. On the other hand, there still is a large unutilised potential for intensification in most places – even by means of local land use practices, i.e. without commercial inputs (BRANDT, 2004). With the exception of a few densely populated areas (e.g. in Rwanda, Burundi, parts of Kenya), the agro-ecological potential in Sub-Saharan Africa is far from exhausted. This holds true despite the facts that many locations are affected by degradation of natural resources due to inappropriate cultivation practices, and that climate change has increased farmers' risks. There is ample room for intensification in order to better cope with such challenges. Thus, it is not nature that holds back Africa's agricultural development.

If geographical location is taken into consideration, the overall picture becomes less encouraging. There are considerable locational disadvantages, such as low population densities, great distances and poor transport infrastructure, which have a negative impact on the competitiveness of farm products in many places (ZELLER and JOHANNSEN, 2005). More than half of the farmers in Sub-Saharan Africa live in areas with poor market access. Thus, "almost two-thirds of the Sub-Saharan rural population are in less-favoured areas with either or both low agricultural potential or poor market

access, compared with only 25 percent for South Asia.” (WORLD BANK, 2007: 56). For many farmers, it is poor market accessibility that prevents them from making greater use of their potentials for intensification and surplus production.

### **3 Held back by Markets?**

Markets for agricultural products were characterised by declining real prices for many decades until 2005 (IMF, 2006). While a general declining trend on agricultural goods could be explained by the industrialisation strategies many African countries pursued in the first decades after independence (compare Heidhues in this volume), global markets were, at least since the 1970s, also flooded by subsidised products from industrialised countries, resulting in extremely low world market prices, and subsequently in low producer prices for farmers in developing countries. In the case of traditional tropical products from developing countries (such as coffee, cacao, bananas) an increasing supply resulting from successful promotion efforts met an inelastic demand on the side of consumers in rich countries. The only exception were “non-traditional export crops” (horticulture, flowers, nuts, seafood) which offered new market niches for farmers at favourable locations. There was no fast growth in mass purchasing power within African countries and correspondingly no fast growing domestic demand for agricultural commodities (HERMANN, 2005). Trade in agricultural products has increased by an annual rate of only 4% between 1980 and 2005, compared to a 9% increase for total trade (UNCTAD, 2007). Again, the familiar effect was a decline of real farm-gate prices.

Under such market conditions, market-oriented agriculture was only attractive in case of significant increases in productivity which could compensate for declining prices. This happened in some Asian countries at locations close to huge domestic markets, in addition to other favourable locational factors such as access to irrigation (“Green Revolution”). They did not happen in most African countries with their limited domestic markets and other less favourable locational factors. Consequently, for the vast majority of African farmers there was no sufficient incentive to increase surplus production and to invest in the intensification of land use. There were just not enough people prepared to buy these surplus products at a reasonable price.

The hypothesis of a lack of demand for African farm products is supported by the experience that many rural and agricultural development programmes in African countries were successful in assisting to increase productivity, as long as they were involved with some hundreds or a few thousand farmers only. Their successes, however did not result in broad dissemination, because as soon as the improved practices were adopted more widely, markets were just not able to absorb the surplus

production and prices dropped. Thus, it was rational – to a certain degree – for farmers, governments and aid agencies to withdraw from the agricultural sector. It was just not worthwhile investing in something nobody was willing to pay a reasonable price for.

Certainly, it is difficult to make generalising statements about limiting factors for agricultural production in Africa. Such factors differ by location, product and farm category. Nevertheless, it is safe to assume that African farmers have generally been negatively affected by low producer prices and demand-side constraints. Prices have been depressed by high transport costs on domestic roads compared to the costs of shipments of agricultural goods from overseas. In addition, the imported commodities were artificially low priced due to overproduction and dumping policies in industrialised countries. Moreover, domestic markets did not develop as vigorously as in other world regions. In summary, in many African locations these demand-side constraints have been a major limiting factor for an expansion of production.

#### **4 Held back by Tradition?**

The majority of agricultural producers in Sub-Saharan Africa are peasant farmers with farms of less than two hectares in size, who are still involved in subsistence farming to some degree. At the same time, most farming households are engaged in a range of income-generating activities such as the production of cash crops (or selling the surplus from food production), seasonal or occasional employment, non-agricultural business activities such as trading or producing handicrafts, or labour migration. Thus, they are mostly not merely small-scale farm enterprises, but form diversified, multiple-activity and often multi-locational rural-urban livelihood systems (CHAMBERS and CONWAY, 1992), in which agricultural production plays a varying role. In other words: peasant households form part of a system in which subsistence economy and market economy are closely interlinked “modes of production” (ELWERT, 1985). Subsistence production is no longer sufficient to satisfy basic needs. People have become used to market commodities since colonial times. On the other hand, income from market-oriented production and from employment is also often not sufficient to be able to afford needed food and non-food items. Above all, it is not stable enough to rely on it exclusively for food security. In consequence, rural (and many urban) people in Africa are forced to combine both types of income sources to minimise their vulnerability.

Development programmes have always tried to enable peasant farmers to cope with the requirements of the market economy. As far back as the 1960s, rural and agricultural development projects were oriented towards the goal of supporting small-scale farmers in their transition from subsistence to the market economy. As recently as

2008, the World Bank in its World Development Report on Agriculture was still concerned about “bringing agriculture to the market” (WORLD BANK, 2007: 118). Transition from subsistence to market economy has not made much progress in Sub-Saharan Africa, as the opportunities which the market economy had to offer were too limited and too insecure for a growing population. As global economic growth was associated with world-wide competition for higher productivity and rationalisation, it did not result in a global rise in employment. Most African countries experienced “job-less growth” (ILO, 2007), if there was growth at all. There was not enough safety in the market economy to give peasant families the confidence to give up subsistence production.

The necessity to maintain subsistence farming implies the necessity to also hang on to some elements of the value system which is connected to the subsistence economy. People tend to go for risk-avoiding strategies by diversifying their economic activities, rather than going for productivity-increasing specialisation options. People have to maintain social networks, as there is no alternative system of social security. Thus, they have to invest surplus and time into the stabilisation of family ties, rather than being free to invest them into the expansion of their business. They feel the need to have many children in order to have a higher probability that somebody will take care of them when they are old and ill. They tend to maintain clientelistic dependency relationships to qualify for patronage in case of an emergency. All those strategies are effective in reducing vulnerabilities in a subsistence-based livelihood system. However, they are less appropriate for increasing productivity and to become competitive in a market economy. But there are also trade-offs the other way around: the more people follow the rationale of market economies, the more they tend to neglect their social obligations, so that the traditional social security networks are at risk.

Most rural (and many urban) people are thus caught in a dilemma between the requirements of an economy based on subsistence against those of a market economy, rather than moving on a transition path from the one to the other. As both types of economy are based on contradicting value systems, people face a lasting situation within a pluralistic value system or, in less optimistic terms, a moral vacuum related to a high degree of insecurity and conflict. It is not African traditions *per se* that hinder people from making better use of limited opportunities, it is the crisis resulting from being caught between systems with contradicting requirements. African people are held down by being stuck in an arrested transformation process that offers neither an option for moving forward nor one for going back.



## 5 Held back by Policies?

Agricultural development depends to a higher degree on governance than the performance of other economic sectors. This is particularly true in rural areas with an underdeveloped infrastructure, where markets do not function well. Accordingly, governance problems are considered a key factor for the comparatively poor performance of the agricultural sector in Sub-Saharan Africa (WORLD BANK, 2007: 245). It would be misleading, however, to assume that since independence, there has been one uniform type of agricultural policy and governance throughout Africa. There have been significant differences from country to country, reaching from mere neglect of agriculture to exploitation and to partial subsidisation. More important was the difference between two distinct phases of agricultural policy: A phase of state-run agriculture – mostly from the 1960s to the late 1980s – followed by a phase of market-led agriculture after 1990 (compare KIRSTEN et al., 2009; and Heidhues as well as Hoeffler in this volume for other aspects of these two policy phases).

### *The Phase of State-Run Agriculture (1960-1990)*

There were massive government interventions in African agriculture in the decades after independence. These were partly guided by the necessity to promote agricultural development and partly by the interest to control this sector. Most markets – for food crops as well as for export crops – were controlled by the governments through state-owned marketing boards or cooperatives. All agricultural services, such as agricultural research, extension services, input supply and credit were provided by the state. It was the era of the big donor-supported Integrated Rural Development Programmes (IRDPs). While most of those inputs and services were subsidised, producer prices in most countries were fixed at low levels, either to keep food prices for urban consumers at an affordable level, or to skim off the difference between farm-gate and world-market prices as government revenue. Even in cases, where agriculture was subsidised, “economy-wide policies, notably the exchange rate overvaluation, led to an overall bias against agriculture” (KIRSTEN et al., 2009: 14). It became difficult for African farmers to compete on export markets as well as on domestic markets under the prevailing price and exchange rate regimes. These policies were labelled as “urban biased”. The disincentives on the marketing side for the farming community as a whole were too strong, compared to the isolated incentives provided temporarily to a section of that farming community by rural development programmes. As a result, these programmes were rarely ever successful in achieving a broad and sustainable impact (compare Heidhues as well as Hoeffler in this volume). There were differences from country to country, however. In economies based on agriculture such as Malawi or Tanzania, where governments depended on agricultural surplus, the state actively promoted agriculture, while simultaneously using it as a revenue base. Countries

endowed with rich mineral resources such as Nigeria tended to neglect the farming sector (RAUCH, 1996).

Farmers tended to respond flexibly with a high price-elasticity to the support and marketing conditions set by governments. They took advantage of opportunities without taking them for granted. Generally, they expanded production in line with demand, unless they were prevented from doing so by armed conflicts and droughts. At the same time, they were marginalised by not being able to reliably sell their surplus at reasonable price-levels due to the above-mentioned policy bias, high transport costs, or unfavourable international prices. In any case, the peasantry was considered as “uncaptured” (HYDEN, 1980) for being able to withdraw from the market if conditions were too unfavourable. While it was not attractive to produce agricultural surplus in most places during that period, neither were there many possible alternatives to agriculture in Sub-Saharan African countries. Thus, the proportion of those seeking their fortune outside rural areas increased, while farming had to be maintained as a matter of survival.

It is fair to conclude that African governments, though making efforts to promote agriculture with the assistance of donors, did not use their powers for market intervention to rectify adverse world market conditions, but added more disincentives. Consequently it is appropriate to characterise that period as an era of policy failure.

#### *The Phase of Market-Led Agriculture (1990-2005)*

Global efforts towards market deregulation, in combination with Structural Adjustment Programmes (SAPs) aimed at deregulating domestic markets, were a response to the problems resulting from state failure (see also Heidhues as well as Hoeffler in this volume). The market mechanism was expected to provide the solution to all problems related to failed policies, including the depressed state of African agriculture. Foreign exchange rates were adjusted, price control and restrictions on private trade were abolished, subsidies were reduced and agricultural service systems were privatised.

The results of the new policy environment were ambiguous: On the one hand, new market opportunities emerged, in export as well as in domestic and local markets. On the other hand, competition for agricultural products on domestic and international markets had hardened, resulting in a continuation of a low-price regime. Liberalised markets resulted in heavily fluctuating exchange and interest rates, creating a highly instable market environment and increasing vulnerability for rural producers and consumers. Moreover, deregulated prices for staple food crops resulted in strong seasonal price fluctuations and regional price differentiation. The expected prospering market dynamics in the field of agricultural commodities and services only

materialised in a few central locations and for some high-value crops. However, in many of the vast rural areas of Africa the withdrawal of state services left a vacuum, or a dependence on few monopolistic providers and traders.

As a result of the new market dynamics introduced by SAPs, accompanied by new opportunities on the one hand and new threats on the other, a part of the farming population managed to emerge as winners, while others, presumably the majority, came out as losers. Winners were those who had the capacities to respond flexibly, those who had access to markets and additional resources. The losers, farmers with limited resources and in remote places, found it difficult to cope with the new challenges. For lack of access to credit, guaranteed purchases and controlled food prices, they had to sell at the lowest prices right after harvesting and were forced to pay higher prices when they themselves had to buy food later on. As a consequence, they became more vulnerable. Migration to urban areas and to booming locations became an even more widespread strategy than before. In circumstances of continued mass-unemployment, migrants did not find secure opportunities on arrival, and remained in a precarious situation. Consequently, families would not give up their subsistence holdings. The trend towards multi-local livelihood systems with a diversified set of insecure income opportunities became even stronger. While farming was maintained, it often lost its central role within the livelihood system. It received less attention, less investment, and some local knowledge was lost.

One can conclude that deregulated markets resulted in selected islands of re-established international competitiveness, without offering sufficient and reliable opportunities for the majority of the rural population. Thus, the period of state failure was followed by a period of market failure.

None of the policy frameworks dominating during the past fifty years proved to be appropriate. Neither state-domination nor state-withdrawal has provided the majority of African farmers with the opportunities and incentives necessary to encourage them to make better use of their under-utilised potential for producing higher quantities of marketable surplus. Whether there are other policy frameworks that would have done better (compare KIRSTEN et al., 2009) under conditions of over-supplied world markets and comparatively unfavourable local factors, remains to be answered.

## **6 A Multi-Dimensional Comparative Perspective**

The previous chapters have analysed several common hypotheses why African agriculture did not perform well:

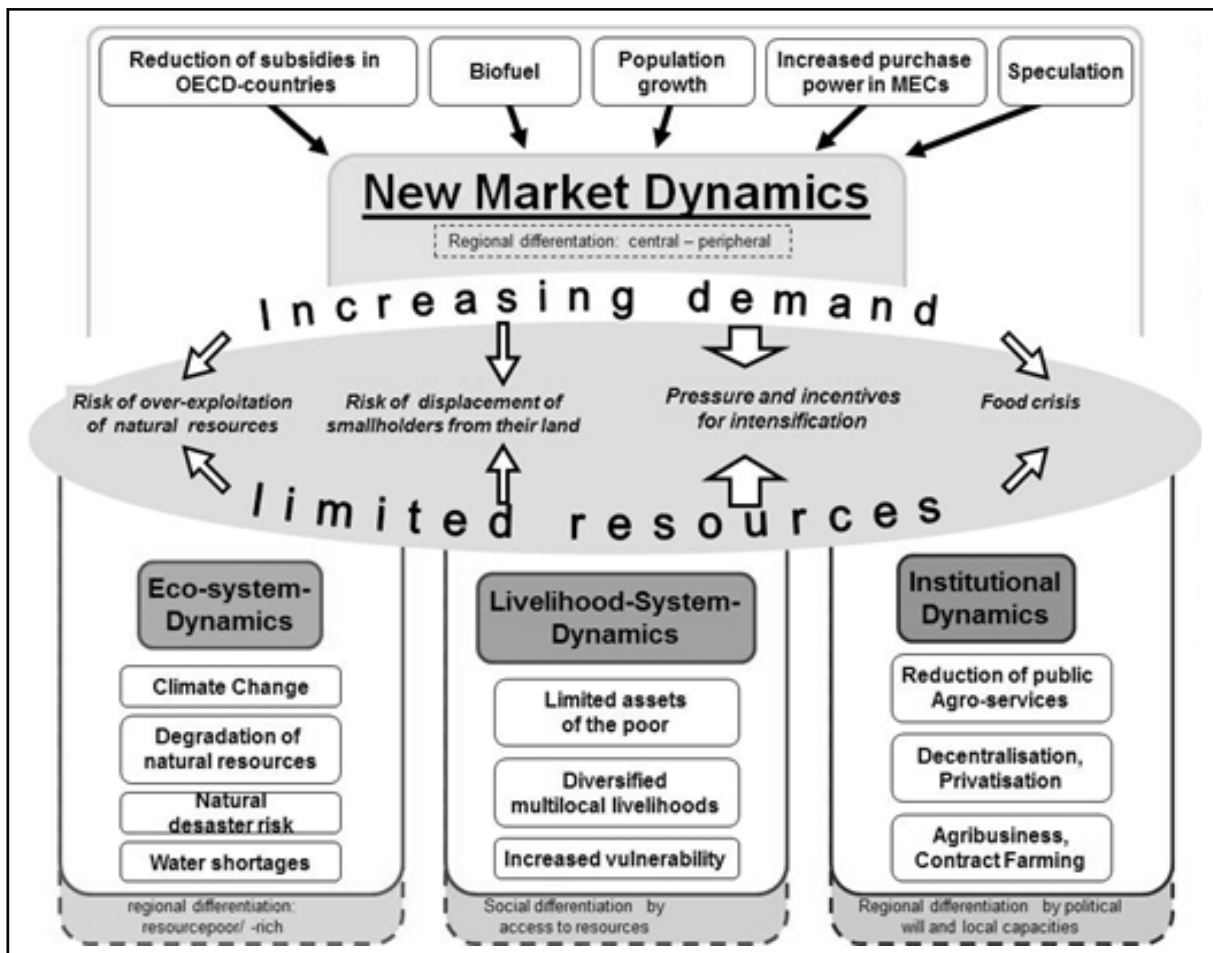
1. There is under-utilised potential for intensification to feed African people, but – considering distances and infrastructure – many of the locations are not competitive within a global market environment.
2. There were demand-side constraints going along with unfavourable producer prices caused by over-supply of world markets with – partly subsidised – agricultural products, which made it rather unattractive for African farmers to invest in an intensification of agricultural production.
3. The policy and institutional environment has not been conducive to help overcome locational disadvantages and demand-side constraints. During the period of state control – despite extensive support programmes with subsidised services – governments added more disincentives through their policies on pricing and exchange rates, which favoured international competitors rather than local farmers. During the period of deregulation, farmers were left without the services necessary for overcoming infrastructural and demand-side constraints.
4. As a consequence of incomplete market integration and continuing dependence on the subsistence economy and related value systems (such as diversification or investing in social networks), African farmers have not been in a position to effectively use the limited opportunities that markets and institutions were providing them.
5. Taking all these constraints and challenges into account, it is not surprising, that the majority of peasant farmers decided not to rely on cash crop farming, but to go for a diversification of their livelihood activities by continuing subsistence farming, while at the same time looking for rural or urban non-farming activities, in addition to making use of any opportunity to produce agricultural surplus. As a consequence, possibly available human resource potential for agricultural intensification was lost.

Looking at these factors in context, one might find it easy to conclude that it is a combination of adverse conditions which held African farmers back. At a second glance, it is plausible to conclude that demand-side constraints have played the role of a key factor during the period between independence and 2005. Only in a situation characterised by global over-supply and declining real world market prices, locational disadvantages gained so much weight to prevent urban consumers from buying from local farmers. And even a much better policy and institutional environment (except perhaps better protection of farmers against cheap imports) would not have been able to provide enough incentives to compensate farmers for unattractive prices. Finally, it was the unfavourable market conditions, rather than the socio-cultural background, that prevented peasants from making better use of their farming knowledge. Unless there are customers paying a good price, it is not worth the effort – neither for governments nor for farmers.

## 7 New Dynamics, New Opportunities, New Challenges

From 2005 onwards, the situation on the global agricultural markets has changed fundamentally (compare figure 1). Demand is going up and for the first time in five decades, world market prices for agricultural products are rising. The situation culminated in a dramatic boom in 2007/2008, with price increases of more than 100% within a year for some food crops (VON BRAUN, 2008; BRÜNTRUP, 2008), resulting in a hunger crisis in many developing countries. While the acute shortages have been overcome and prices have gone back to normal levels in 2009 (HEADEY, 2010), experts agree that the period of agricultural surplus supply and low agricultural prices is likely to be replaced by one of surplus demand, accompanied by a trend towards increasing world market prices (OECD and FAO, 2010). Can African farmers now benefit from new market opportunities?

**Figure 1. New dynamics affecting agricultural production in Sub-Saharan Africa**



Source: own design

New market dynamics tend to find African peasant farmers in a situation of mounting scarcity of natural resources, aggravated by climate change, which mostly affects agricultural production by increasing weather variability. As indicated above, the scope for an expansion of cultivated land has been largely exhausted in most places. Where rising demand meets limited natural resources, intensification is called for (RAUCH, 2008). Together with the new dynamics related to the natural environment, these new market dynamics not only establish a need for intensification, they also create an incentive for it. As there is still room for intensification, the time seems to have come for a broad development of the agricultural sector in many rural regions of Sub-Saharan Africa.

However, the new market opportunities and the intensification challenges related to them, find African farmers, African governments and donor agencies a bit unprepared. Many farmers, having been frustrated for too long by low producer prices and poor market access, have left their farmsteads in search of better opportunities. In that process they have lost their identity as farmers, their “ties to the soil” and some of the local agricultural knowledge passed from generation to generation. Though most of them have not yet given up their farmland, the new opportunities catch them unprepared. In other words: their supply elasticity, their flexibility to respond to market opportunities and to intensification pressures are reduced. In such a situation, strong agricultural institutions and support organisations would be required to assist farmers to overcome their present constraints. Well-functioning services are needed to provide them with the appropriate technologies, knowledge and credits. Better rural infrastructure and functioning markets are required to improve market access and to make sure that farmers also get the benefit of higher world market prices (and not just the monopolistic traders) (HOEFFLER and OWUOR, 2009).

But the capacities of African governments to provide agricultural services were dismantled in the course of SAPs (see contribution of Heidhues in this volume), as they did not render the expected results in a low-price scenario. Now, as the higher prices render investments worthwhile, these capacities are missing. The same applies for the supporting capacity of development cooperation. Private service providers were only prepared to fill the gap in attractive, easily accessible locations and for selected agricultural commodities. While small farmers are only rarely capable of benefiting from the agricultural price boom without external support, agro-business is eager and well prepared to take advantage of the new opportunities. Wherever smallholder farmers are able to deliver required quantities and qualities on a reliable basis, they are welcome as contract farming partners (PELTZER, 2007). Where they fail in that role, agro-business is determined to make use of the opportunity by acquiring land for large-scale commercial farming (WORLD BANK, 2010).

This scenario entails great risks: in cases where small-scale farmers and support institutions are not ready to take advantage of new opportunities and to intensify their production system, increasing demand will either result in a depletion of natural resources or in a displacement of peasant farmers from their production and subsistence base (RAUCH, 2008). Certainly, it is necessary to differentiate this generalising scenario. Regarding market dynamics, it is appropriate to distinguish between central and peripheral locations. Considering eco-systems dynamics, it may be useful to distinguish between hot spot locations with over-utilised or marginal resources (e.g. water or land deficit areas) and those with under-utilised or abundant natural resources (e.g. water or land surplus areas). While, for example, central regions with high natural resource potential may be affected by the struggle for access to these resources, the rural population in peripheral regions with marginal resource potentials may have to face increasing vulnerability with regard to climatic risks. Looking at the institutional and policy framework, it may be appropriate to distinguish between countries with adequate and those with deficient standards of governance.

## **8 In Need for an Alternative Context-Specific “Green Revolution” for Africa**

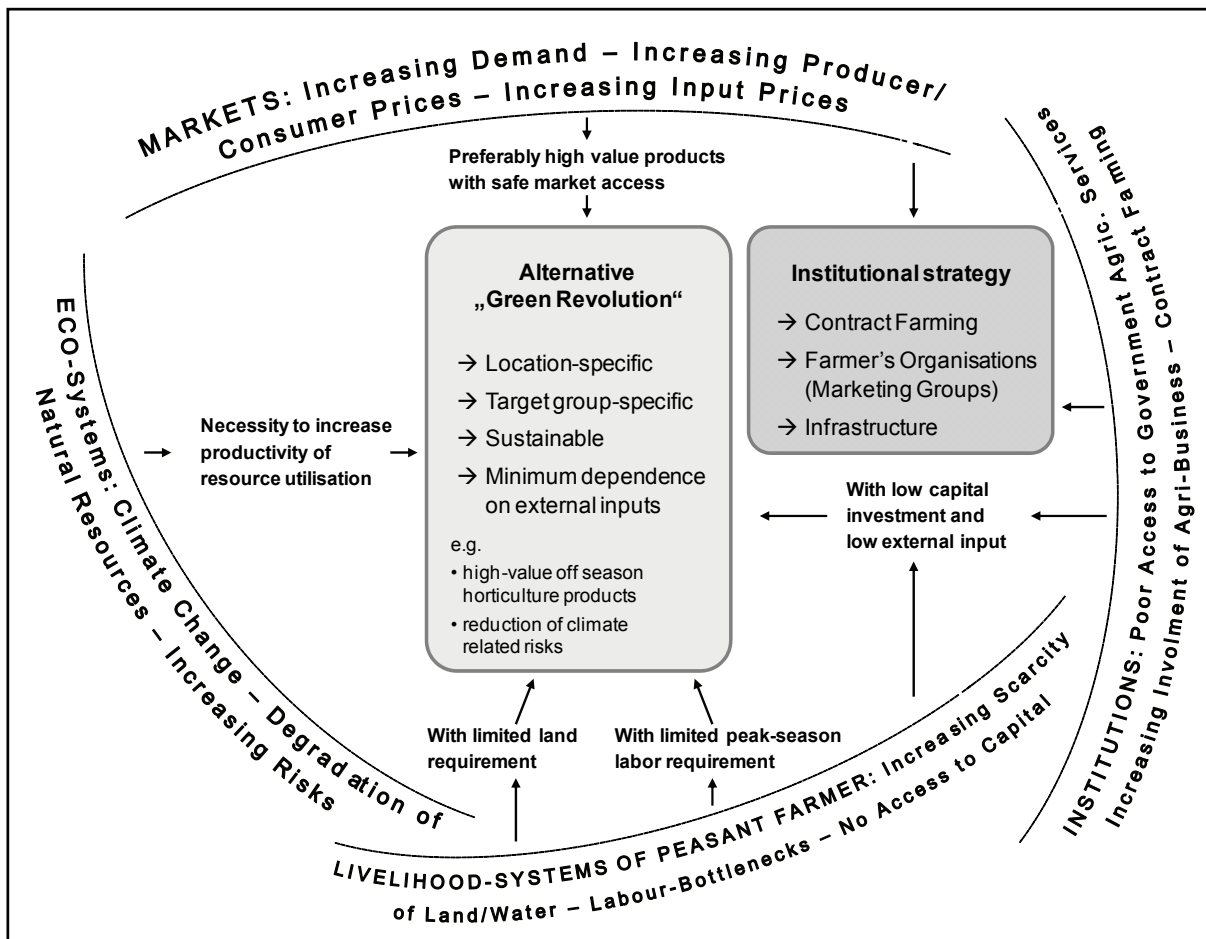
African agriculture faces the challenge of intensification. It needs a sort of “Green Revolution” in the sense of taking a great step towards intensification of agricultural production. But conditions in Sub-Saharan Africa are quite different from those in parts of Southern Asia, where the first “Green Revolution” was successfully initiated in the 1960s and 1970s. Taking into account the conditions which have been analysed in the previous chapters, a strategy for a new, alternative “Green Revolution” should be based on the following strategic guidelines (compare figure 2):

*Context-specificity:* there are no standard recipes for the intensification of African agriculture. Neither a “Green Revolution” based on bio-technological innovations and high amounts of external inputs, nor specific forms of eco-farming will be appropriate for all locations and all farming systems. Appropriate land use practices need to be identified in consideration of locational factors, market demand for the products of each ecological niche and farmers’ livelihood systems (RAUCH, 2009).

*Preference for low external input technologies:* while context-specificity calls for an undogmatic view on the choice of technologies, there are a range of conditions prevailing in rural Africa, which lead to the assumption that in most cases low external input practices are more appropriate for the majority of smallholders. Most peasant farmers are short on the financial means to afford large amounts of commercial inputs and they find it difficult to get access to seasonal credits. Moreover, they also find it

difficult to take the risk of pre-financing, considering the increasing climatic and market insecurities. External inputs only result in higher productivity if they are provided reliably and on time. This is often not the case in rural Africa, considering the deficiencies of the institutional environment. Last but not least, most external inputs come from crude oil, the price of which is expected to rise substantially. Taking these aspects into account, high external input agriculture will be the exception in some easily accessible, high potential areas and for contract-farming arrangements, while low external input agriculture is still going to be the norm as long as the institutional and infrastructural environment is not favourable to higher input use. There is considerable potential for intensification of farming based on local inputs and technologies.

**Figure 2. Strategy for a context-specific “Green Revolution” in Sub-Saharan Africa**



Source: own design



*Diversified mix of food and cash crops:* acknowledging the importance of a high degree of food sovereignty as a means of reducing food insecurity, it is important to realise that this cannot always be achieved through a simple “food first” strategy. Where land is limited, farm level food self-sufficiency can often only be achieved through mono-cropping of a staple food such as maize involving the use of large amounts of fertiliser. As a rule, this is neither environmentally sustainable nor economically feasible. On the other hand, some cash crops (in particular tree crops, legumes and vegetables) can contribute to a diversified and sustainable land-use system and provide other advantages for small farmers like requiring less land and fitting nicely into the seasonal availability of labour in a farming household. For instance, in Homa Bay (Western Kenya) food security has been increased by producing groundnuts for the market as part of a crop rotation system, rather than by raising the productivity of maize cultivation through applying mineral fertilisers (RAUCH, 2006). In other places, off-season market-oriented vegetable gardens based on rainwater harvesting have reduced farmers vulnerability by providing them with cash throughout the year and enabling them to buy staple foods when prices were lower.

*Taking advantage of the private sector’s capacities of providing services and access to markets by aiming at fair contract farming arrangements:* contract farming can combine the (crop-dependent) comparative advantages of small-scale farmers in the field of production with the comparative advantages of agro-business enterprises in managing other parts of the value chain, such as ensuring reliable access to services and markets. Therefore, farming based on contracts can be an attractive alternative for smallholders, compared to a dependence on unpredictable free market conditions, non-available access to seasonal loans, insufficient access to relevant know-how and dependence on monopolistic middlemen or ineffective, wasteful and troubled cooperatives (GLOVER, 1994).

*Getting farmers organised as reliable and powerful market partners:* only organised small-scale farmers will be attractive and powerful market partners for agro-business and for public service providers. Being organised is a requirement in order to reliably provide necessary quantities and quality on time, thereby fulfilling the qualifications of a viable market partner. And only if small-scale farmers are organised, will they be empowered to negotiate fair trading conditions. As poor farmers with diversified livelihood activities find it difficult to get organised, it is important to keep organisational requirements as low as possible. That is one reason, why informal marketing groups linked to contract farming partners may be a more attractive option for small farmers than a formal cooperative enterprise, which requires joint management and control of equipment, staff and accounts.

*Promoting public research and extension services:* the private business sector is mostly interested in profitable locations and commodities. Promoting sustainable land use practices while ensuring climate change mitigation and/or adaptation measures for the sake of increasing food security at peripheral or marginal locations is not a high priority of private service providers. In such cases, research and extension services financed through public funds have to fill that gap. Public responsibility in those cases is related to the internationally acknowledged human right to food on the one hand, and to the principle of paying for external effects (or for environmental services) resulting from sustainable land use practices on the other. Funds for the mitigation of climate change and adaptation should be used for this purpose (in low income countries), recognising the global responsibility for climate change and the globally shared benefits from any mitigation of the effects of climate change. Public funding does not necessarily mean returning to the widely ineffective means of state-run extension services. Instead, internationally co-sponsored and jointly managed special funds could provide the source of funding for any governmental or non-governmental service providing agent involved in promotion of sustainable agricultural practices.

As a result of the often discouraging experience with rural development programmes in the 1970s and 1980s, many people question whether it is possible to design effective agricultural support for African countries. That scepticism tends to overlook the fact that back then, agricultural innovations were hampered by an unfavourable market environment. Now, as the perspectives for demand are quite promising, it has become likely that under-utilised intensification potentials, together with attractive prices and the necessity to adapt to environmental changes, will provide a favourable framework for African agriculture to make good use of appropriate, context-specific support.

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