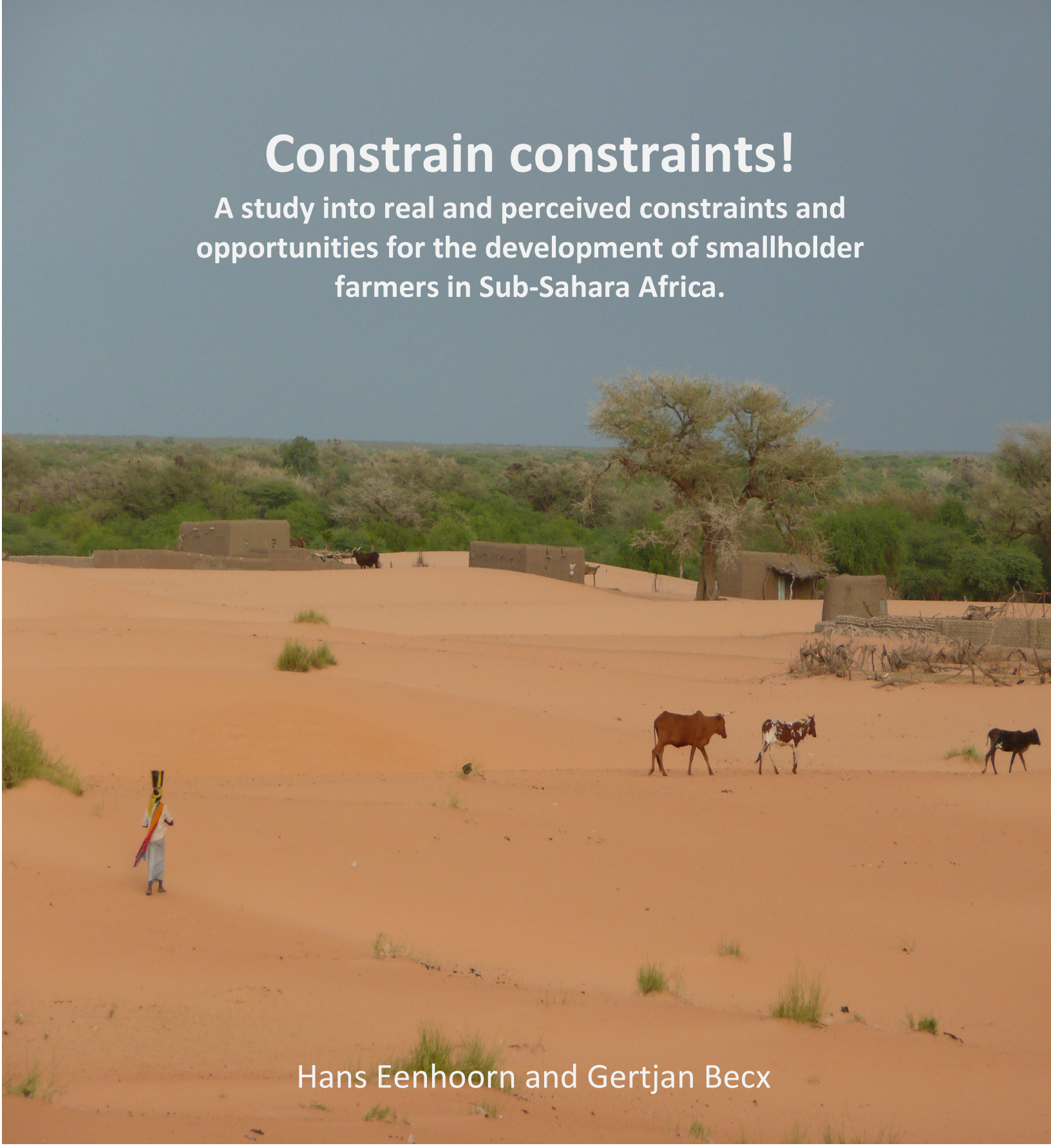
Constrain constraints!

A study into real and perceived constraints and opportunities for the development of smallholder farmers in Sub-Sahara Africa.



Hans Eenhoorn and Gertjan Becx

WAGENINGEN UR
For quality of life

Constrain Constraints !

A study into real and perceived constraints and opportunities for the development of smallholder farmers in Sub-Sahara Africa.

by Associate Professor Hans Eenhoorn and Ir. Gertjan Becx

"We must address poverty at its core. In Africa, this means enabling small-scale farmers to grow and sell Africa's food. Our goal is to dramatically increase the productivity, food security, incomes and livelihoods of small scale farmers, many of whom are women."
***Kofi Annan**, June 14th. 2007*
(on accepting the position of Chairman of the Alliance for a Green Revolution in Africa)

A public lecture, Wageningen, February 17th, 2009

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I. Executive Summary

1. Crises

A big danger in the present financial crisis is that the world will lessen its efforts in development cooperation and renege on the promises made to poor countries. A society which has no adequate answer to the enormous differences between poor and rich or to the massive prevalence of poverty and hunger (> 1,000,000,000 people) is by definition not sustainable.
Nowhere is the failure to alleviate hunger more glaring than in Sub-Saharan Africa (SSA), where the number and proportion of hungry people continues to increase in many countries, in particular those countries that are net food and energy importers.
The sheer size of the poor rural African population (200,000,000 people) coupled with the absence of sufficient jobs for unskilled labour in the urban areas make it imperative to mitigate migration from rural to urban areas. Sub-Saharan Africa industrial development is very weak and for the coming decades will be unable to offer employment for its poor and low-educated masses. Agricultural development that enables subsistence farmers to feed their families adequately and produce surpluses to feed the cities is, for the time being the only realistic alternative to fighting chronic hunger and poverty.
This publication demands attention for the multitude of constraints that poor farmers in Africa face in trying to escape their "poverty trap" of perpetual poverty and hunger. It advocates a way forward to develop and a way out of poverty, based on a holistic, market-oriented approach.
If the world is serious about the Human Right of access to sufficient food of sufficient quality, and about the Millennium Development Goal of halving hunger by 2015, it is imperative that we support smallholder development in particular in Africa.

2. Entrepreneurship

It is of great importance that we start concentrating on entrepreneurship by smallholders, as there are virtually no examples of mass poverty reduction that did not start with sharp rises in employment and self-employment due to the higher productivity in small family farms. Few countries have ever enjoyed an industrial revolution without first undergoing a revolution in agriculture. Besides, raising yields on smallholder farms would have positive distributional consequences. Food is doubly important to the poor, because growing it accounts for a big share of their employment, and buying it accounts for a big share of their expenditure.

Regarding entrepreneurial smallholder development, we simplified the definition of Entrepreneurship to: **"Planned production for a defined market with a profit objective".**
However, this simplified definition lays bare many of the problems and constraints a smallholder farmer faces in day-to-day life, or in his struggle to survive or progress to a level above subsistence farming. Planning, markets and profit are concepts a subsistence smallholder farmer is at best ill at ease with and at worst these words are meaningless to her/him.
"Planned production" assumes the availability of relevant information about market opportunities, climatic circumstances and information about the availability, quality and prices of input factors. "A defined market" assumes understanding of market demand, market forces (e.g. middlemen and market queens) and the availability of infrastructure to physically reach that market. "A profit objective" needs on the one hand the understanding of the cost of input factors like fertilizer, seeds, water, land, labour (including the opportunity cost of his/her own labour) and capital, and a reasonable expectation of revenue on the other hand.

3. Research question, method and execution

The question: “What is holding smallholders back from moving from (sub) subsistence farming as a way of life, towards a more entrepreneurial attitude?” led to the study reported in this publication. This study executed by Wageningen University and Research Centre (WUR) took place between November 2007 and November 2008. Following desk research and literature studies on rural entrepreneurship, 1200 smallholder farmers in Ghana were interviewed on their perceived and real constraints towards a brighter economic future. By understanding the constraints better, it becomes easier to propose measures to overcome them and to suggest where opportunities for the entrepreneurial development of smallholders can be enhanced.
Within the research, we focused on the livelihood of the smallholders. In addition to the livelihood analysis, three chain analyses have been conducted. Respectively the corn, cocoa and shea-nut chain have been analyzed to gain an understanding of the constraints for smallholders in the whole chain.

4. Constraints

Our study revealed 26 discrete constraints that restrict smallholders from increasing productivity and marketing their produce profitably.
With an entrepreneurial perspective in mind, we found four clusters of constraints regarding market-driven productivity increase:

- **The first cluster includes constraints related to production and processing**. These constraints are connected with the problems farmers have with land, labour and capital. Productivity increases are constrained by a lack of capital, little access to (micro) credit, poor soil quality and no possibilities to increase soil fertility, poor seed quality, lack of water, uncertainty about land entitlement, a shortage of adequate labour, lack of traction and lack of knowledge and technology. The weak physical and mental state of the undernourished rural population is an additional burden to productivity.

- **The second cluster contains the insurmountable risks and uncertainties farmers face**. These risks are related to the erratic climate, lack of information, uncontrollable market forces, corruption, crime (lack of “law and order”), and hostile institutions. Farmers feel highly vulnerable have great difficulty in organizing themselves, in order to provide for countervailing power to face the risks and uncertainties.

- **The third cluster deals with the lack of incentives to invest that poor smallholders perceive**. This lack of incentives constrains the farmers from facing the uncertainties and taking entrepreneurial risks. Current conditions (unfavourable input/output ratios) result in most rural livelihood generating activities being more or less unprofitable. Furthermore, the highly deficient infrastructure is a serious constraint. On top of that, farmers perceive that if they can make a profit, their extended family, their patrons and the government (tax) will claim most, if not all, of the fruits of their activities.

- **The fourth cluster deals with the mindset farmers have developed that limits entrepreneurial activity**. Culture and religion often restrict them from exploring new opportunities. An inclination to consume rather than to save and invest prevails for various reasons. Farmers feel also vulnerable because of a lack of knowledge and information. Most importantly, subsistence farmers deeply mistrust their local, regional and national governments.

These constraints seriously limit entrepreneurial behaviour in the sense of; “planning production for defined markets with a profit objective”.

5. Appraisal of the results and opportunities for smallholder farmers

The most striking aspect of this study is the complexity of the situation that the smallholders face in day-to-day life.
This study confirmed that most subsistence smallholders live in a "poverty-trap"[1] and are not capable of escaping that trap on their own. The number and magnitude of the constraints is overwhelming and the rhetoric question arises: "Is there any hope for the African smallholder?" Our answer to this question is a modest yes!
Despite prevailing constraints, our desk- and field research uncovered examples of successful interventions to stimulate small-scale entrepreneurship and successful smallholders that operate above the subsistence level.
These examples show that after decades of failures[2], lessons have been learned and the opportunities are there. However, in most cases, opportunities only emerge if governments provide an enabling environment for private sector (entrepreneurial) development, and if sufficient money for investing in agriculture is available.
Besides successful interventions set in motion from the outside, we see small leaps towards entrepreneurship from within. We witnessed that in every village there are farmers that are capable of "navigating through the constraints". Despite still being very poor in absolute terms, they are wealthier and smarter than their neighbours. Concentration of interventions on the "wealthier and smarter" part of the poor creates a chance of developing a virtuous cycle.
Agricultural development of the smallholders with better chances also will give rise to a local processing and "service industry", like millers, blacksmiths, store keepers, tailors, transporters etc., who can also employ cheap rural labour. These small-scale processing and service industries will be suppliers to, and customers of bigger companies in the cities, who see their business opportunities increasing, which in turn will stimulate economic growth, employment and income. In this way, markets that work for the poor will arise. The formation of such so-called agro-food chains is essential for a longer-term transition towards industrialization with sustainable solutions for hunger and poverty.

It can thus be argued that for "the less poorer of the poor", abundant opportunity to improve their unfavourable economic situation exists, once the major constraints can be overcome, for which external support is required in most cases. Most sub-Saharan countries are net importers of food and one-third of the SSA population (>200,000,000 people) has a chronic lack of food, which means, potentially, that the markets for increased productivity do exist.

However, from our study it also became clear that a considerable number of smallholder farmers cannot or will not become agricultural entrepreneurs. Many millions have to give up farming as a means to support their families, because they are too poor, their farms are too small, their formal education levels are too low, and more often than not they are physically and mentally incapacitated due to prolonged periods of chronic hunger and malnutrition. For them, productive safety nets[3] are required in a longer-term perspective of industrial employment.

6. Conclusions

The analysis in this study results in the conclusions that sustainable food security in SSA can only be achieved through **entrepreneurship of small farmers**; farmers that are capable of moving beyond subsistence farming and of planning production for defined markets with a profit objective.
It can also be concluded that productivity increases through entrepreneurship that are of sufficient scale to seriously reduce hunger and poverty can only develop if the major constraints for entrepreneurial development can be removed. However, the poor smallholder faces so many constraints to improving his/her economic situation (which also differs from individual to individual and from community to community) that resolving one or two of these constraints will not be sufficient. It is therefore concluded that a **holistic or**

integrated approach is required to identify and understand the whole set of constraints (or at least the most important ones) in a given situation and to remove the major constraints simultaneously. The holistic view has to embrace the whole agricultural system from planning to production to market. The most important constraints in a given situation have to be properly defined and tackled in a concerted action.

Arguably, it can be concluded that the most **important constraints** are:

- **Capital**: with money, soils can be improved, better seeds bought, water-harvesting projects financed, knowledge and technology provided and labour and extension services paid.
- **Countervailing power:** with strong farmer-based organizations (FBOs), negotiation power with Governments and partners in the agro-food supply chain will be enhanced, and technology transfer made easier.
- **Good Governance**: with reliable governance and law and order, risk and uncertainty will be mitigated and formation of FBOs enhanced.
- **Technology and Education**: technology development and transfer is essential for productivity increases.
- **Infrastructure**: better roads and communication will be an enormous incentive for entrepreneurship.
- **Mindset**: understanding the mindset of smallholders will be essential for enabling effective support, and a change of mindset is essential for progress.

Capital, trust and incentives can change the mindset and stimulate entrepreneurship for the majority of farmers.

It is recognised however, that in the short term we might face a Catch-22 situation, as we cannot realistically expect sufficient capital, good governance and an acceptable infrastructure to appear in SSA in the short run. However, the chronic and even acute hunger situation, in particular in SSA, is so severe that we must break through the vicious circle of hunger and poverty and the constraints that perpetuate this. The identified constraints need to be tackled now!

7. Recommendations

Following analysis and conclusions, we propose actionable recommendations. It is hoped that actions are taken based on these recommendations, so that large numbers of smallholder farmers can participate in commercial systems that are profitable for them.

1. Think entrepreneurial

The overriding recommendation following our study and its conclusions is that new initiatives to fight poverty and hunger should develop their action plans starting from an entrepreneurial point of view. This implies the understanding that entrepreneurship is more than just producing or processing. It is also about **markets, profit and fair trade**. This is very much the realm of business and interlocking agro-food chains, profitable in every link of the chain. Here the established national and multi-national agro-food industries should play a major role in providing incentives for smallholders to enter the chain. “Out grower” systems for supplying the local food-processing industry, for import substitution or export operations are opportunities that have been underdeveloped so far.

2. Be very generous with capital injections for a prolonged period

Capital injections to the tune of billions of dollars for a prolonged period are necessary[4] to provide investment for profitable development of smallholder farming. Public and private donors should live up to their promises to invest in agriculture. African Governments should live up to the UA agreement to spend at least 10% of BPP on agricultural development[5]**.**

3. Build efficient and effective farmer-based organizations

It is essential for **smallholder farmers to organize themselves** and create countervailing power on input and output markets and become respected partners in negotiations with the governments. It is recommended to dramatically increase the support for farmers to organize themselves properly. Local governments, NGOs, knowledge institutions, international donors and the private sector must give the highest priority to the facilitation of the establishment of FBOs**.**

4. Increase vigilance on Good Governance

Good Governance at national, regional and local level that facilitates an enabling environment and a **positive business climate** for smallholders is at present more of an exception than the rule. It is therefore recommended that in bilateral and multilateral discussions and negotiations, a lot of emphasis be placed on measures to provide incentives for smallholder farmers. Governments in the North, individually or through their organizations (EU, OECD) and the national and international private sector should use their influence and increase their pressure on Governments in the South to accomplish this.

5. Enable a step-change in agricultural research and knowledge transfer

Agricultural research and knowledge transfer is essential to stimulate productivity increase. It is strongly recommended that renowned knowledge institutions like WUR are enabled to make their skills and competencies available on a wide scale, for smallholder development, in close cooperation with national institutions in the South. Governments in the South, private donors, private companies and the knowledge institutions themselves should make ample funds available for agricultural research and knowledge transfer.

6. Improve rural infrastructures drastically

An adequate infrastructure is a precondition for the successful marketing of agricultural products. It is recommended to place **rural infrastructure** improvements very high on every development agenda. Rural infrastructure projects are usually sustainable investments with a long life span and which also provide economic impulses by employing surplus rural labour. Governments in the North and international institutions (World Bank, IMF) should become much more generous with low-interest loans and grants to stimulate infrastructural development in rural areas.

7. Take a holistic approach in order to tackle constraints simultaneously

The (new) action plans to stimulate agricultural development of the multitude of smallholders must take the constraints for entrepreneurial development in their holistic context into account; **an integrated approach is a must**. This is not to say that any individual support organization/donor has to solve all constraints, but that "orchestration" is required to tackle the main constraints in a cooperative way (unfortunately cooperation is not the strong point of most development-assistance actors).

8. Place women at the core of every Development Cooperation programme

In any action plan for Africa, it would be an enormous mistake to overlook the African woman, as she is the backbone of society. Fifty percent or more of Sub-Saharan smallholder farmers are women. Without **empowering** them, supporting them to organize themselves and obtain full democratic rights, which they can really exercise, very little progress will be made. Discrimination of women is one of the most important reasons for the perpetuity of hunger and poverty in Africa.

9. Realize that fair trade sometimes means protection

In order to create a dynamic farming society it is necessary to have **stable output price relations**, for which (temporary) protection from cheap imports is required and taxation on agricultural products is minimized. It is recommended that governments, in the North and in the South and their institutions (EU, AU, OECD, WTO), that want to stimulate smallholder productivity take this into account. The development of markets that also

work for the poor (smallholders) is essential for the economic development of developing nations that are dependent on agriculture to feed and employ the urban and rural poor.

In summary:
An entrepreneurial approach, addressing constraints in their holistic context and defining realistic operational action criteria is necessary to ensure that (new flows of) development money reach the bottom of society to help the real poor out of their "poverty traps". Enhancing the entrepreneurial spirit of smallholders and creating an enabling environment to help the smallholders to improve their economic situation is the key to reducing poverty and hunger in Africa.

[1] Sachs JD. 2005.The End of Poverty: Economic Possibilities for Our Time, The Penguin Press: New York
[2] Minbuza 2008. IOB report; het Nederlandse Afrika beleid 1998-2006.
[3] UN Millennium Project. 2005. Halving Hunger: It Can Be Done. Summary version of the report of the Task Force on Hunger. The Earth Institute at Columbia University, New York, USA
[4] The Bellagio Working Group for the African Green Revolution. 2008, The Bellagio Declaration. 22 February 2008. see appendix 2
[5] The Maputo Declaration; To the second summit of the heads of states and governments of the African Union, meeting in Maputo, Mozambique 4-11 July 2003

II. Prologue

This publication was written in November 2008 in the midst of the worldwide financial crisis. During that period all media devoted prime time and headlines to the financial disaster that was affecting our bank accounts and pension schemes. The news item on October 28, reporting that at least 100,000,000 people had to be added to the 850,000,000 people that are chronically hungry, passed almost unnoticed. The Millennium Development target of halving hunger by 2015 seems more distant than ever.
The financial crisis is to be regarded as the echo of other crises that manifested themselves earlier; the climate/environment crisis, the energy crisis, the food crisis and the cultural crisis.
These crises reinforce each other (e.g. think of the lunacy of burning good food in the form of bio-fuel in a vehicle) and, if these are unchecked, will lead to the destruction of the world as we know it.
In the early seventies, the Club of Rome[6] described the predicament of mankind and indicated similar trends related to shortage of food and energy and devastating environmental damage. But their so-called 'doomsday prophecy" was not taken seriously, much to our peril today. Maybe this time in the history of mankind we have a unique opportunity to change track and denounce the neo-liberalism that brought us unprecedented wealth but also an unprecedented existential crisis, and now choose for a sustainable world, both socially and materially[7].
A big danger in the present crisis is that the world will decrease its efforts in development cooperation and renege on the promises made to poor countries. A society that has no adequate answer to the enormous differences between poor and rich or to the massive prevalence of poverty and hunger (> 1,000,000,000 people) is by definition not sustainable.

This publication demands attention for the multitude of constraints poor farmers in Africa face if they are to escape their "poverty trap" of perpetual poverty and hunger, and advocates a way forward to support these people. In sub-Sahara Africa, one third of the population lives below the absolute poverty line of $1 a day and most of them live in rural areas and are destined to remain dependant on agriculture for many decades to come. If the world is serious about the Human Right of access to sufficient food of sufficient quality[8], it is imperative to support smallholder development, in particular in Africa.

III. History

The recommendations of the 'UN Taskforce on Hunger' to reduce World Hunger by half by 2015 (Millennium Development Goal I, target 2) concentrate on increasing the productivity of food-insecure farmers, making markets work for the poor, and improving nutrition for the chronically hungry and vulnerable. A so-called "quick-win" solution embracing simultaneous productivity increase, market access and nutritional improvement was developed by the Hunger Taskforce together with NEPAD (an advisory council to the African Union). This is the idea of the "Home-grown Schoolfeeding Programmes"[9]. The idea is to provide schools in poor rural regions with money (from government and/or donor funds) to buy food from local farmers to serve their pupils one nutritious meal per day. The school functions thus as a captive market for increased productivity by the local farm community in order to feed malnourished children. The expected results are then a triple-win situation: improved enrolment in primary schools, better nourished children with enhanced learning abilities, and economic stimulants for the smallholder farmers' communities. The U.N. endorsed this programme in its General Assembly of 2005. The Government of Ghana was brave enough to introduce the programme and act as a pilot for sub-Saharan countries. At the General Assembly of the U.N. in 2005, prime minister Balkenende of the Netherlands announced that the Dutch Government would support Ghana with the execution of the programme, with a grant to buy locally produced food[10]. The programme made a flying start in Ghana, reaching about 500,000 children in 1,000 schools in two years, in rural districts all over the country. However, it appeared that local farmers were barely involved in producing the food for the school meals, putting the sustainability of the programme at risk. An investigation[11] into the causes of the lack of involvement of local farmers revealed not only serious flaws in the organization of the programme by the Ghanaian authorities but also the existence of a series of constraints on smallholders to increase productivity and delivery to the schools. The question thus arose: "What is holding smallholders back in moving from subsistence farming towards a more entrepreneurial attitude?" Wageningen University decided to investigate this question more in detail. This study took place between November 2007 and November 2008 and the results of this study are described in this publication

1. Introduction: Rationale and background

Nowhere is the failure to alleviate hunger more glaring than in sub-Saharan Africa, where the number and proportion of hungry people continues to increase in many countries, in particular those countries that are net food and energy importers. According to U.N./FAO estimates, sub-Saharan Africa accounts for more than 200 million of the world's chronically hungry. The recent food price- and energy crisis hits the poor and malnourished populations of SSA extra hard[12]. Business as usual will not achieve the Millennium Development Goal (MDG) of halving hunger by 2015. A paradigm shift has to be realized, away from the conventional macroeconomic improvements and towards an approach that places more emphasis on agricultural development, entrepreneurship, application of science, capital investment, and public commitment to achieve food security for the poor and help them out of their "**poverty trap**". Economic growth alone is not sufficient to lift the poor and hungry out of their misery, because the poverty-reducing effects of economic growth largely bypass the rural poor.

More than fifty percent of the rural poor have access to farmland, but for various reasons are incapable of growing enough food to feed themselves adequately, let alone produce marketable surpluses.[13]

Given the pressing needs of sub-Saharan Africa, where more than 30% of the population is chronically hungry and an even higher percentage malnourished, and the fact that 70% of the population live in rural areas, it is essential to place smallholder development at the centre of the activities to achieve food security in Africa and realize the MDG of halving hunger by 2015.

The sheer size of the poor rural African population and the lack of sufficient jobs for unskilled labour in the urban areas make it imperative to mitigate migration from rural to urban areas. Sub-Saharan Africa industrial development is very weak and for the coming decades will be unable to offer employment for its poor and low-educated masses[14]. This situation is different from the development of agricultural societies towards industrial societies in Europe after the Industrial Revolution and more recently in China and India . The conclusion is thus justified that for SSA, agricultural development is essential for survival and for laying a foundation for a better future. Because the rural masses must be enabled to feed themselves, a focus on smallholder development is essential. This is not to say that development of larger farming systems, in particular cash crops for export, would not be extremely desirable, but these systems do not offer sufficient employment for the rural masses[15]. The World Development Report (WDR) 2008[16] confirms that the future is in commercial farming in Africa, just as it has developed in the rest of the world. This will mean higher labour productivity, higher land productivity and entrepreneurship, but also less farmers cultivating larger areas. This is necessary, since if agriculture stimulates the economy at large, the countries will need to free labour forces for other economic sectors. In this respect, small-scale agricultural entrepreneurship is a first step towards large-scale farming and large-scale entrepreneurship.

At the "High level Conference on World Food Security", in Rome in 2008, the "UN Comprehensive Framework for Action on the Global Food Security Crisis" (CFA) was established to address the food crisis and the rising numbers of people trapped in hunger. The CFA emphasizes the importance of raising smallholder food production to meet the immediate needs of vulnerable populations, and then of sustaining the growth of food production through a combination of enabling policies and public and private investments in the agriculture sector (Appendix 5). At the Hokkaido Toyako Summit in July 2008, the G8 pledged to work with the international community along the lines of the CFA and urged "the relevant stakeholders to swiftly implement plans to achieve prompt delivery for countries in need." The importance and potential of smallholder agriculture is also emphasized by FAO, most recently in *The State of Food Insecurity in the World 2008*[17], and at the *High Level meeting on Food Security for all* in Madrid in January 2009.

The scientific underpinning of agricultural productivity improvements in smallholder agriculture has been strengthened by more than three decades of research by the international research centres of the

Consultative Group on International Agricultural Research (CGIAR) and their national, sub-regional and regional partners.
The view that small-scale agricultural development has to be the base for a broader economic development in Africa is also held by the "International Assessment of Agricultural Science and Technology for Development" (IAASTD)[18].
It is a tragedy that despite all earlier pledges and promises Official Development Aid (ODA) for agriculture, diminished dramatically over the last decades. (Box 1)
However, smallholder development can only be effective and sustainable if smallholders adopt an entrepreneurial spirit in order to improve their economic situation. This requires a change of mindset as well as external support, because it is well-known that the smallholder faces many constraints in improving productivity and serving markets. Habits and attitudes, developed through experiences (both good and bad) over many generations, have resulted in "coping" strategies and risk avoidance being embedded in the culture. Therefore, more often than not, the smallholder takes the constraints as a given that cannot or must not be changed. These constraints can be climatic, financial, political, infrastructural, institutional, cultural and even religious. They can be (culturally/historically) perceived or real. A major constraint, which is the cause and effect of low productivity, is the poor physical and mental condition of chronically hungry and malnourished people. Prolonged periods of lack of adequate food renders poor smallholder families incapacitated for productive labor and induces mental apathy and lethargy.

This study of Wageningen University attempts to map the constraints that smallholder farmers in Ghana experience. By understanding the constraints better, it becomes easier to propose measures to overcome them and to suggest where opportunities for the entrepreneurial development of sub-Saharan smallholders can be enhanced.

Box 1: Strong decline in Official Development Aid (ODA) for Agriculture.

There has been a catastrophic decline of aid to agriculture since 1980, aid has declined by roughly half, from a peak of around $7 billion per year in the mid-1980s to a low of around $3 billion in the mid-2000s.
The cut in agriculture aid was heavily ideas driven, based on the notion that smallholder agriculture would be modernized through market forces and privatization. Along with the cuts in donor support, state enterprises were privatized, agricultural extension was sharply curtailed, and government subsidies were eliminated. As the World Bank has made clear in several important recent studies, including the independent review of its programs in Africa and the 2007 World Development Report, this strategy failed, since markets did not in fact replace the drop in aid. Critics of the structural adjustment approach to agriculture already in the mid-1980s emphasized that markets alone would not work, especially for smallholder farmers who lacked the creditworthiness, collateral, market access, and basic infrastructure to participate effectively in markets. They emphasized that Asia's Green Revolution was a public-private partnership, including substantial subsidies and government credit schemes to ensure access of smallholders to the critical input package.
The result since the early 1980s in Africa and other impoverished regions has been that smallholder farmers have been unable to access basic improved inputs – especially improved seed, fertilizer, small-scale water management, and extension services – resulting in a poverty trap. The trap has worsened appreciably as soil nutrient depletion, especially nitrogen, has intensified because of the lack of fertilizer use. The dramatic inability of African farmers to access fertilizer is now well appreciated. The situation is even more dramatic than as it looks at first sight, since the low fertilizer use in Africa is almost entirely directed to cash crops, so that the actual use on staple food products is even lower than shown. This lack of improved inputs is the single most important factor in the continued poor yields in smallholder farming in Africa. Put conversely, the package of improved inputs was the key to the Asian Green Revolution, and remains the core of the forthcoming African Green Revolution.

2. Vision and Objective

We believe that Sustainable Food security for poor rural populations can be enhanced by increasing productivity of (sub-)subsistence smallholders and development of fair markets for their products. This vision is shared (among others) by the FAO[19], World Bank[20] and the Alliance for a Green Revolution for Africa (AGRA). Based on an analysis of financial needs[21] to make the AGRA initiative successful and for achieving the

target of halving hunger by 2015 in Africa, U.N. Secretary-General Ban-Ki-moon called for an investment of $8-10 billion per year to realize this "African green revolution"[22].
Just pouring money into African agricultural development will not result in food security for the poor, because too many constraints exist at present for the poor smallholder farmers to benefit in a sustainable way from the interventions envisaged by AGRA, the World Bank, and at the "High Level Conference on World Food Security"[23] in Rome in 2008.
Therefore our research aimed at understanding constraints for (sub-)subsistence smallholders to achieve sustainable food security and opportunities for stimulating an entrepreneurial spirit and environment. Thus enabling smallholder farmers **to plan production for a defined market with a profit objective.**

The objective of our study is to report a validated set of constraints that restrict entrepreneurial (private sector) driven development of smallholder farmers. Understanding the constraints, in turn, provides a view of the opportunities available. This report should therefore be useful for the "international development cooperation world" and governments in developing countries that really want to improve the situation of chronic hunger. Indirectly, this report can be useful for farmer-based organizations (FBOs) in understanding the holistic nature of the constraints the farmers face. It is essential to keep in mind that interventions to overcome the constraints can only be successful when the perspective of the smallholder is always kept in mind, when the farmers and their communities are actively involved, and that reality-checks on their consent with programmes and actions are executed (bottom-up approach).

3. Entrepreneurship

Because "entrepreneurship" is key to agricultural development (in principle every farmer is an "entrepreneur"), it is important to clarify what "entrepreneurship" entails.

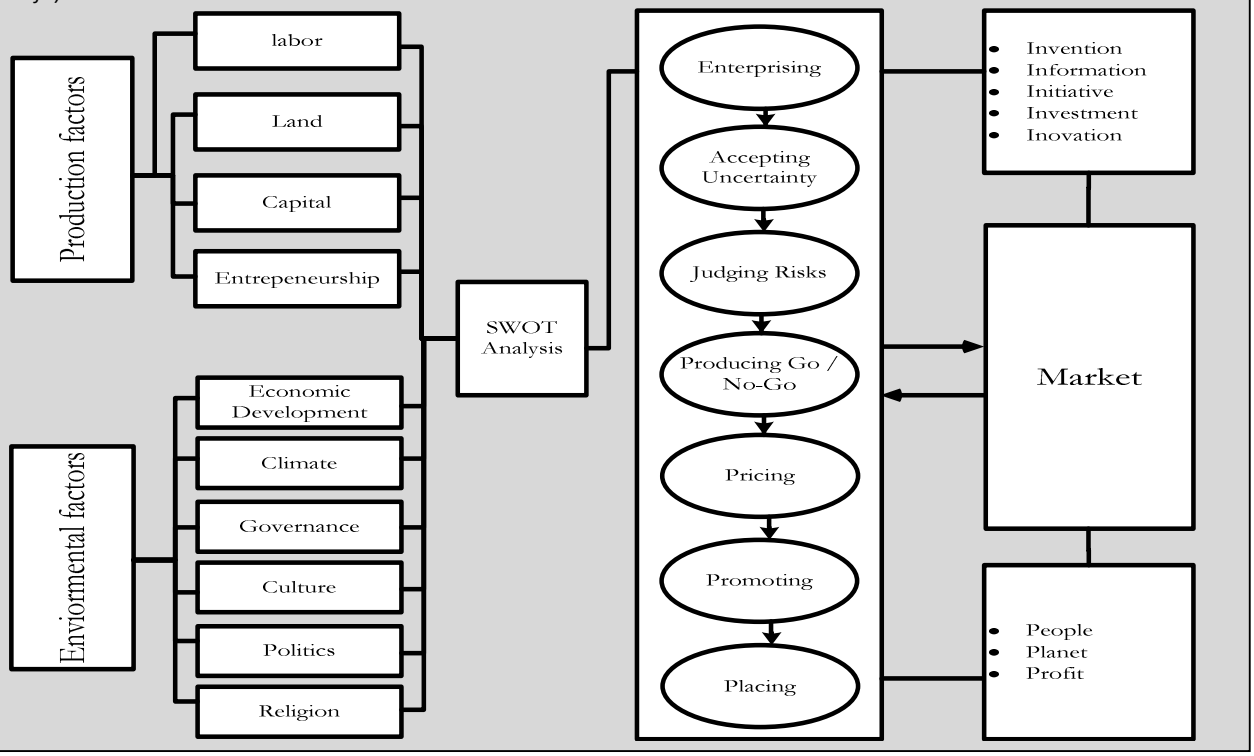
An entrepreneur is a person who is willing to task risks in the face of uncertainty with the expectation of a reward (profit), or in other words: "The entrepreneur is the person who risks losses and earns profit". The chief aim of the entrepreneur is to avoid losing money[24]".
The entrepreneur is the only factor of production whose duty it is to combine and organize the other factors of production: land, labour and capital with their respective rewards of rent, wage and interest. The entrepreneur himself provides the fourth factor of production: enterprise, with profit as its reward (in early stages of entrepreneurial activities, it is not unusual for various or even all factors of production to be embodied in one single individual).
The entrepreneur will try to make a profit but the information at his disposal will rarely be adequate to allow him to know whether he will succeed. He has to face uncertainty and take risks. He has to decide in advance what revenues and costs could be and his ideas about them are therefore subjective estimates embodying his own hunches and guesses (Box 2).
In our attempts to enhance food security, in particular for the rural poor, we have to gain insight into the "conditions of uncertainty" that the (potential) entrepreneur faces, support him in managing the uncertainty, and improve the confidence in his own judgement about the likelihood of success or failure, if he expands or contracts his output (and raises or lowers his prices). Summarizing, we could say: "Entrepreneurship is a state of mind that identifies rewarding opportunities, takes action to pursue these, is willing to take calculated risks, and is capable of managing uncertainty".
It is recognised that at the level of the smallholder farmer, entrepreneurial skills are low or even non-existent. 'The majority of smallholder producers in the developing world practise farming as a way of life and not necessarily as a business. Even where they have been given technical skills and knowledge to enhance profitable productivity, no business (or vocational) training is given for them to transform such skills into

business. There is little knowledge of matters such as production planning, marketing, contracts, financing and bookkeeping and negotiating skills[25]'.

The entrepreneur can be a man or a woman. In the sub-Saharan context at the micro level, it is the woman who displays the best entrepreneurial spirit when given a chance. In general, African women are thriftier, more responsible, more hard-working and more reliable than their male counterparts. Supporting women to become entrepreneurs is therefore highly effective.

Box 2: Entrepreneurship, Risk and Uncertainty

The schedule below shows the links between the production factors, the external environment, the market, and the various types of risk and uncertainty. The market is the place where demand (uncertainty) and supply (risk) meet and the price (risk) is established. The entrepreneur analyses the uncertainties, judges the risks and then decides whether to produce and market the goods.
The diagram is also intended to stimulate the thinking about the link between the five entrepreneurial Is (Intention, Information, Initiative, Investment, Innovation), the four marketing Ps (Product, Price, Place, Promotion) and the three business Ps (People, Planet, Profit).



Regarding smallholder development, we simplified our definition of Entrepreneurship to: **"Planned production for a defined market with a profit objective".**

However, this simplified definition lays bare many of the problems and constraints a smallholder farmer faces in day-to-day life, or in his struggle to survive or progress to a level above subsistence farming. Planning, markets and profit are concepts a subsistence smallholder farmer is at best ill at ease with, and at worst these words are meaningless to him.

"Planned production" assumes the availability of relevant information about market opportunities, climatic circumstances and information about the availability and prices for input factors. "A defined market" assumes understanding of market demand, market forces (e.g. middlemen and market queens) and the availability of infrastructure to physically reach that market. "A profit objective" needs on the one hand the understanding of the cost of input factors like fertilizer, seeds, water, land, labour (inclusive the opportunity cost of his/her own labour) and capital, and a reasonable expectation of revenue on the other hand.

Like any entrepreneurs, the smallholder farmers face many uncertainties, but if they want to improve their economic situation, entrepreneurial risks have to be taken to make progress.

Prof. David Millar of the University for Development Studies in Tamale (North Ghana) asks the rhetoric question: “Why would subsistence farmers want to be entrepreneurs, enter the market economy and take risks?”. The answer is not so obvious. On the one hand, avoidance of taking risks implies maintaining the status quo of survival strategies of the past, with the result, bluntly said, that if the rains come on time people survive, but if the rains do not come on time they will perish. On the other hand, poor people have “learned” through centuries of experience, that if they take risks and are successful, much of the fruit of their labour is taken away from them under the vigilant patron/client systems or the pressure of “the extended family”. However, if they are unsuccessful, their situation deteriorates (loss of financial and social capital). So why take risks? This last question was very important in our study on constraints and opportunities for smallholder farmers with respect to seeking entrepreneurial development and an improvement of their economic situation.

4. Research question, method and execution

The objective of this study is to report a validated set of constraints for entrepreneurial-driven development of smallholder farmers. Consequently, the research question was defined as: *"What are the constraints for entrepreneurial development of smallholder farmers in agro-food chains in West Africa?".*

Within the research, three main stages were completed:

- Firstly a desk research was conducted reviewing the literature available on small-scale entrepreneurship in agro-food chains, concentrating on the smallholder farmer. This part of the research was conducted by two interdisciplinary Msc. student groups of Wageningen University. Each group consisted of five students, supervised by a member of the science staff. After the groups had been briefed on the objectives of the research, they developed a framework and used standard literature search and review methods to collect and process as much literature as possible. This resulted in a non-validated list of constraints for entrepreneurial development of smallholder farmers in agro-food chains in West Africa.

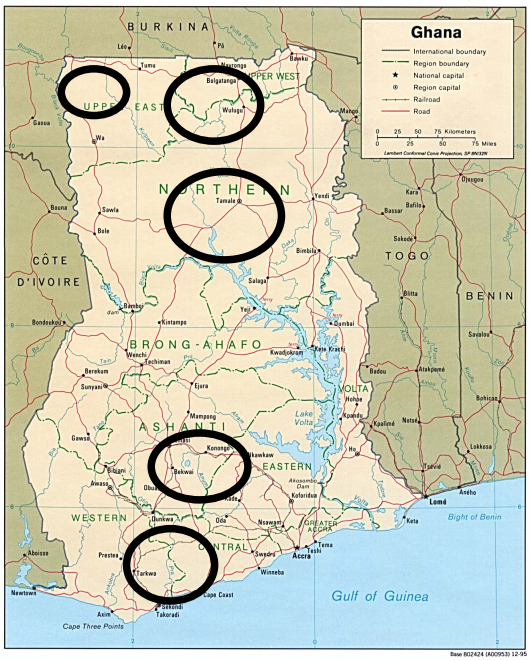
- Secondly, the list of constraints was analyzed and modified during group and individual discussions with Ghanaian students who were studying at the WUR, and with various experts in the Netherlands and in Ghana. Literature analyses by the authors included a number of recently issued International reports: IAC 2004[26], UN Hunger Taskforce 2005[27], IFPRI 2006[28], World Development Report 2007[29] and IAASTD 2008 and an extensive analysis by WUR of these reports[30]. Following analyses and discussions, a final list of constraints was agreed upon. From this list a questionnaire was derived that was used during the fieldwork in stage 3 (see Appendix 1 for the questionnaire).

- Thirdly, the data on constraints were collected in five different locations in Ghana (box 3) through individual and group interviews involving 1200 smallholder farmers. Given the fact that more than half of SSA farmers are women, it was intended to interview as many women as men. This gender balance did not materialize, partly due to the difficulties of interviewing women in Muslim territories. Twenty Dutch and Ghanaian students executed the fieldwork. The group consisted of students studying in the field of development economics, sociology, soil science, agronomy, irrigation, marketing, communication and rural development. All students used the same questionnaire developed in stage 2 to find out which constraints were restricting economic development, as perceived by the farmers in their area. After questioning farmers on the occurrence of constraints, the students continued their interview, going deeper into the background of the constraints or opportunities mentioned by the farmers. Farmers were interviewed one-on-one using a questionnaire, and in groups using participatory methods including priority games and Rural Rapid Appraisals (RRA). Besides asking direct questions the students used "Observation Techniques" to validate the answers. All interviews were conducted with the help of qualified translators.

Picture 1; conducting individual and group interviews © picture Gertjan Becx

In May 2008, halfway through the students' field period, a 3-day workshop was organized in Tamale, with the participation of all the Dutch and Ghanaian students. Prof. Millar of the University of Development Studies, IFDC representatives, and Dr. Flor from the Millennium Village Project gave lectures. This allowed a mid-research review and gave further direction for the completion of the study.
Within the research, students focused on the livelihood of the smallholders. Besides the livelihood analysis, three chain analyses were conducted. The corn, cocoa and shea-nut chains were analyzed to gain an understanding of the constraints for smallholders in the whole chain.

Although the study was restricted to Ghana, it is assumed that the results are largely valid for West Africa as a whole or even all of sub-Saharan Africa, since the five chosen locations represent the predominant climatic systems of Africa.



Box 3; Map of Ghana indicating the communities where the study was conducted

5. Concentrating on Local Development of Entrepreneurship

It is of great importance that we start concentrating on entrepreneurship in small family farms as "there are virtually no examples of mass poverty reduction that did not start with sharp rises in employment and self-employment due to the higher productivity in small family farms"[31]. Few countries have ever enjoyed an industrial revolution without first undergoing a revolution in agriculture. Besides, raising yields on smallholder farms would have positive distributional consequences. Food is doubly important to the poor, because growing it accounts for a big share of their employment, and buying it accounts for a big share of their expenditure[32].

Our choice for the (sub-)subsistence smallholder farmer is based on the fact that they form the majority of the rural poor and that their development is the fastest route to food security for the rural masses. The 2008 World Development Report[33] recognises that African smallholder development is the quickest and most efficient way out of poverty. However, this report also recommends concentrating on agricultural development for the production of high-value-added crops. For the great majority of African smallholder farmers today, this is "a bridge too far" and will not sufficiently contribute to food security for the rural poor in the short run.

Our study concentrated on perceived or real barriers that restrict the formulation of ways and means of stimulating entrepreneurial activity for (sub-)subsistence smallholders, with an immediate effect on the reduction of hunger and malnourishment.
Concentrating on the local and national levels does not mean that regional and globalizing forces can be ignored. USA/EU agricultural subsidies, trade barriers, dumping practices and, more recently, competition between "food and fuel" regarding bio-energy, can or will affect the rural poor negatively. Prof. Ken Giller from Wageningen University makes this very clear in his research program "Competing Claims on Natural Resources"[34].

Our line of thought is that millions of poverty-stricken rural families have access to a piece of land (not necessarily title to the land), suitable for agricultural production. However, for various reasons, most of these families are not capable of producing enough to feed themselves adequately and are forced to live in a situation of (sub-)subsistence farming, and consequently suffer from chronic hunger. Most of them are not net producers of food, but net consumers of food and their lack of means to buy food exacerbates their food insecurity.
Improving their productivity to subsistence level will improve their fate, but will be hardly enough to guarantee food security, and will therefore still result in a situation of malnourishment (hidden hunger). Further productivity development should lead to self-sufficiency in nutritional needs (food security) and the production of marketable surpluses, provided there is a functioning market.
Self-sufficiency also enables **differentiation** and intensification of crops, whereby productivity increases in the main crop (carbohydrate-based, e.g. corn, rice, cassava, sorghum) creates room for diversification to supplement the own nutritional needs (e.g. vegetables, fruits, poultry, cattle) and/or the marketing of surpluses.
Under favourable economic conditions, differentiation can develop into **specialisation** in crops with an added value for the open market. Further investment in specialisation should lead to the production of staple and cash crops for local, regional, national, and export markets. The availability of some form of capital (grants, micro-finance, regular loans, etc.) for investment in productivity increase is necessary in all phases of the process.
However, Prof. Paul Richards of Wageningen University warns that productivity increase might not be the right emphasis. In his opinion, the main problems are the predatory, corrupt system, and transport problems, bad roads, bad vehicles and endless obstructions along the road, like road blocks, illegal tolls and robbery.

Note that the move from (sub-)subsistence to cash crop does not necessarily have to follow the four above-mentioned phases sequentially.

Once the production phase of subsistence farming has been completed, the surpluses can either move directly to a physical market (schoolfeeding, broker, roadside sales, village market) or be processed for conservation and/or adding value.
In the early phases, processing will be rather basic and directed to adequate storage (e.g. mould- and pest-free) and requiring little capital investment (e.g. drying, cooking). In later phases, processing will move to a "cottage industry", with limited capital investment (e.g. pressing of fruits/nuts, soap making). The availability of micro-finance (micro-credit), subsidies or grants, will more often than not determine the chance of success of such operations. When markets are responsive, a "cottage industry" can develop with further capital investment and more advanced technology into small- and medium-sized businesses.

When preparing our study and in the "desk research" phase, we had expected to cover constraints and opportunities in the primary production and processing chain. We failed to do so due to the complexity of the fieldwork. Apart from a limited analysis of the shea-nut, cocoa and corn processing chains, our study is to a great extent restricted to the production constraints that smallholders face in developing themselves into small-scale agricultural entrepreneurs.

6. The nature of constraints for entrepreneurship

Our study revealed 26 discrete constraints that restrict poor smallholders in increasing productivity and marketing their produce profitably.
Overall, the approximately 1200 farmers interviewed for this study[35] gave surprisingly similar answers to our questions. If we were to take an average farmer from the collection of interviewed farmers and ask him/her about the greatest constraints in their agricultural enterprise, the answer would certainly contain the following components: I have no money, my soils are poor, I have no tractor or oxen to plough, and transport and labour is scarce, I have problems dealing with pests, weeds and diseases and I deeply mistrust the government.
This section and the next will detail the challenges so familiar to millions of smallholder farmers south of the Sahara and their constraints with regard to developing a more entrepreneurial attitude to improving their economic situation.

With an entrepreneurial perspective in mind, we clustered the constraints we found in literature and field research into 4 distinct clusters:

- The first cluster includes constraints related to **production and processing**. These constraints are connected with the problems farmers have with land, labour and capital. Productivity increases are constrained by a lack of capital, little access to (micro-)credit, poor soil quality, uncertainty about land entitlement, and a shortage of adequate labour. The weak physical and mental state of the undernourished rural population is an additional burden to productivity.

- The second cluster contains the insurmountable **risks and uncertainties** farmers face. These risks are related to the erratic climate, the highly deficient infrastructure, uncontrollable market forces, corruption, crime and hostile institutions. Farmers feel highly vulnerable and have great difficulty in organizing themselves, or are incapable of doing so, for the purpose of providing countervailing power to face the risks and uncertainties.

- The third cluster deals with the **lack of incentives** to invest as perceived by poor smallholders. This lack of incentives constrains the farmers from facing the uncertainties and taking entrepreneurial risks. Current conditions make most rural livelihood generating activities more or less unprofitable. They perceive that if they can make a profit, their extended family, their patrons and the government (tax) will claim most, if not all, of the fruits of their activities.

- The fourth cluster deals with a **mindset** farmers have developed that limits entrepreneurial activity, most probably due to the perceived and real constraints mentioned above. Culture and religion often restrict them from exploring new opportunities. An inclination to consume rather than to save and invest prevails for various reasons. A feeling of being vulnerable is generated through a lack of knowledge and information.

These constraints seriously limit entrepreneurial behaviour in the sense of: "planning production for defined markets with a profit objective". In the following section the constraints as detected in desk- and field research will be described in more detail.

7. Constraints

7.1 Constraints for production and processing

Poor access to capital/credit

By definition, poor farmers have hardly any capital of their own. They also have little access to capital for buying inputs or farm implements. Poor farmers are a big risk for every provider of capital, including micro-finance, because they have no collateral to present as mortgage. Very often they do not own their land (community-owned or leased) and their possessions are so limited that hardly anybody is willing to provide them with credit. Individuals and financial institutions that provide credit at extremely high interest rates do exist, but few farmers can afford to pay them.

In our study, farmers indeed told us that a lack of money was their main problem. Farmers state that loans are often unavailable because (1) there are no credit organizations working in their area, sometimes because the farmers have a bad repayment record, (2) loans are only available for cash crops, (3) some loans are given on conditions that prohibit intercropping ,and (4) loans are only provided to women.
If loans are available, farmers perceive them as unprofitable or consider the risk of borrowing too high, because interest rates are very high, the conditions are unclear, the repayment period is too short, and the loans are too small. Furthermore, many credit schemes only operate a few years in a certain area, leaving the farmers indebted with insufficient time to repay the loan.

Restricted access to land

For smallholders in sub-Saharan Africa, taking more land into production in order to increase productivity is often not possible. This may be due to population pressures and competing claims on the land. The most productive land is generally under cultivation. If land is still available, the remaining uncultivated land is mostly of extremely poor quality or too far away to be worked efficiently. Additionally, mechanization is so low that more land does not necessarily improve labour productivity.

Farmers in our study who live near cities indicated that their production is limited by the amount of land available to them. This is mostly due to an absolute limitation on land availability in the area, but also because of culturally embedded land allocation rules. However, farmers living in more remote areas did not find land to be a constraint. They indicated that if they had the labour, inputs or methods of mechanization they could find sufficient fallow land to produce on.

Poor soil fertility

Many soils in tropical parts of Africa have become so degraded that they have greatly reduced productivity. Soils in the Sahel are generally infertile. Small-scale farmers over decades have removed large quantities of nutrients from the soils without replacing them with manure or fertilizers in sufficient quantities. Many of the food-insecure farmers in Africa are farming on severely degraded soils, which lack nutrients and organic matter, have poor structure, and often suffer from unchecked erosion

The debate concerning whether land quality is actually declining remains ongoing, but the soils are generally infertile and an increase in fertility would help to increase crop yields. Even though soil fertility is generally considered a limiting factor for production - and consequently for entrepreneurship - as it can be changed through human intervention, it also limits the extent of the incentives that can be gained. Soil fertility can be improved but this is normally expensive. Soil fertility determines what can be produced against what input/output rate.

The farmers in our research also indicated that this was the case. Their soils where poor and would never generate very high yields. They also stated that even if they would have money to use fertilizer on plots of land with low soil fertility, they would not do so as this was not 'economical'.

Farmers in our study blame low soil fertility on: a lack of mineral and organic fertilizer, shorter or no fallow periods, less intercropping and a lack of possibilities for crop rotation. The latter can be an indicator of low soil fertility as crop rotation is less effective on degraded. Some farmers indicate however that their soils are fine or even excellent compared to areas further away.

Picture 2; landscape in northern Ghana © picture Joris van der Kamp

Limited access to fertilizer

When attempting to increase production, fertilizers are essential. The soil nutrients needed by crop plants can be provided by either organic inputs or inorganic and mineral fertilizers. High energy and commodity prices make chemical fertilizers more and more expensive. Fertilizer was already expensive in Africa because of bad infrastructure, non-functioning government schemes to supply and/or subsidize fertilizers, a failing market and deficient agro-input networks. Other ways to increase productivity is through application of organic fertilizers. However, these are always in short supply in arable production systems. To produce enough manure, there is a need for large grazing areas or imported fodder. Additionally, manure loses most of its nutrients when not managed properly. Also the making of compost for improved fertilization is an option. This is not easy however, requires a lot of labour, and quantities of good enough quality are small in relation to the land to be fertilized. The use of fertilizer trees and cover crops achieve good results in some areas, but are rainfall-dependent and thus not very applicable in arid areas.

The farmers in our research indicated that they hardly use chemical fertilizer as they cannot pay for it. They indicate that the price of fertilizer has also been rising for years, limiting the access even further. Besides access to fertilizer, farmers also indicate they lack knowledge on the application of fertilizers. Additionally, they also say that they have little knowledge of other farm practices (plant density, weeding, and pest abatement) that improve the effects of fertilizer. Therefore, knowledge of modern farming methods is conditional before chemical fertilizer can be effectively used.
Farmers in Northern Ghana claimed that they worked on soils that are generally poor and sensitive to ecological degradation, and mentioned that when chemical fertilizers are applied and fields are ploughed, there seems to be a considerable risk of acidification and soil erosion. This reduces the effectiveness of external inputs, which makes market production even less profitable and more risky. However, the technique of “precision fertilization” whereby individual plants are fertilized is effectively used in some areas to improve fertilizer efficiency. Some farmers say that they have positive experiences with the use of green manures, but in the end there are not many farmers who accept these options, as they require high quantities of labour. With incentives provided by NGOs, some farmers applied some compost, but only on very small plots of land.

Poor seed quality

Seed systems in Africa are predominantly informal. These systems are based on collection, selection, crossing, testing, multiplication, and storage of seeds and vegetative propagation materials by local farmers, without institutional oversight or quality control[36].
The seeds produced within informal seed systems generally have a (considerably) lower potential yield than high-yielding varieties developed by research institutes or private companies. However, when taking into account the yield-limiting- and yield-reducing factor of production, they may generate higher yields, as locally produced seeds are designed to cope with, for instance, low input levels or drought. The potential of higher-yielding varieties can only be achieved when applying high input levels.
Besides the potential of genetic material, the reproduction, purity and storage of seed is also of importance when discussing seed quality. Purity is especially important when producing for a defined market, as impure seed produces different varieties with different crop requirements, cropping periods and finally crop characteristics. The quality of storage influences the quality of the seed and the crop in the following year.
The commercial seed sector has been slow to develop in sub-Saharan Africa. This is due to red tape, government, and donor projects that provide large amounts of free or subsidized seed, that further discourages seed enterprise development. Furthermore, research and development of indigenous African seeds/cropping systems has made little progress so far, because of general neglect and the high cost and the perceived low expected returns.

The farmers in our study see the limited quantity and quality of their seeds as a major constraint. Little knowledge about seed storage, a lack of seed storage structures, and a shortage of pesticides used when

storing, cause home-grown seeds to rot, according to many farmers. The first is caused by deficient extension services and the latter two by a lack of money. Seed shortage is exacerbated because farmers often have to sow several times as a result of the unpredictable weather. Many problems related to pests and disease can be mitigated by buying high-quality seeds. However, farmers in our study state that seeds and planting material are hardly available at the market. The available certified seeds are very expensive and the farmers lack the money to buy them.
Modern hybrid seeds are easily available, for maize and rice, but need predictable watering and specific chemical fertilizers to produce the high crop yields. Because rainfall is unpredictable, fertilizer and the hybrid seeds are very expensive and more often than not credit is unavailable, these hybrid seeds are hardly used by poor smallholders. Some farmers in the North of Ghana indicate that they are not allowed to use new hybrid varieties due to the "laws" prescribed by their ancestors and traditions. However, some of the farmers interviewed claimed that they are using new seed varieties.

Limited access to water

Many of the world's hungriest farmers are located in the seasonal sub-humid and semi-arid tropics. While soil health remains a problem in these zones, water availability is critical and in many places even more central. Various techniques of water harvesting and small-scale irrigation, combined with efficient water use, should be used to transform crop and livestock production. Building effective technical backstopping capacity in water harvesting, small-scale irrigation and efficient water use, is critical to achieving productivity increases.
Erratic rainfall is an unpredictable water source. Other water sources for agricultural production should/must be applied by farmers. However, in general, water harvesting techniques and irrigation systems are also not widely available to the poorer smallholder. Being a very scarce good, irrigation water costs money to acquire and that money is mostly not available. Irrigation projects have been sponsored by donor communities and governments for decades but are still not very common in rural sub-Saharan Africa.

Unanimously, the farmers interviewed indicated that because of erratic rainfall the lack of access to irrigation or water harvesting was one of their main constraints. The farmers indicated that if irrigation were to be available, they could produce year-round, focus more on the market and buy inputs. The irrigation systems visited were in poor condition due to mismanagement and too little attention paid to the user's requirements when designing the system. However, the farmers with access to irrigated land produced more for the market and used higher amounts of inputs.

Shortage of labour

In order to increase productivity, additional labour (apart from the labour potential of the farmer's direct family) might be required for weeding, harvesting or taking new land into production. Here the paradoxical situation occurs many times that on the one hand there are sufficient landless poor who can provide labour, but the farmer has often no money to pay them. On top of that, during peaks in the cropping seasons, all farmers need labour at the same time, resulting in an actual shortage of labour, irrespective of whether the farmers can pay or not.

In our study, farmers indeed indicate that they often faced labour shortages. Labour shortages cause problems with weeding and with land cultivation. Many farmers said that they could cultivate more land if they had more labour or labour-saving technologies at hand.
The farmers face the following challenges when employing labourers: 1) they have no money to pay for their wages; 2) labour is too expensive during peak seasons; 3) labourers are sometimes untrustworthy and may not deliver.

Lack of suitable agricultural technology

For the farming systems of poor smallholders in sub-Sahara Africa who mostly have to cope with challenging climatic zones and poor soils, little suitable technology has been developed. For cash crops like palm and cocoa, a lot of modern, high-yielding technology is available, but most of that technology is either too expensive or not suitable for the smallholder operations. Most of the methods offered by research and extension personnel, as being improved or 'superior' are, given the constrained resources of affected farmers, not more profitable than existing practices. In particular, little practical research has been conducted for typically African indigenous crops like yam, peppers, etc.
Research for improving dry land crops like millet, sorghum and other crops has not been very effective in improving the potential yield. New seed variants have to be resistant to droughts and pests as well as high-yielding to be successful. A positive example of such a crop is new rice for Africa (NERICA). In the semi-humid areas, new, high-yielding varieties that are more nutritious were successfully introduced.

The farmers in our study complain that for their systems, which are predominantly multi-cropping staple crops, little useful technology is available. Agricultural techniques that are currently proposed by NGOs, such as LEIA (Low External Input Agriculture) are seen by some of the interviewed farmers as labour- and capital-intensive, and ineffective. However, these techniques can be useful in the context of "coping strategies".

Limited access to agricultural knowledge

Most poor smallholders have little education. Primary education pays little attention to agriculture and definitely does not stimulate the children to become farmers. Secondary agricultural education hardly exists and only a few universities produce qualified agronomists.
The little higher agricultural education that does exist concentrates on cash crops and intensive agriculture and pays very little attention to smallholder farming. Thus smallholders are dependent for their knowledge on the traditions of their ancestors, extension services provided by government and NGOs, farmer field schools, one-stop information shops, and "on-farm" research. Over the last decades, extension services have deteriorated dramatically in quantity and quality through neglect and lack of money.
The effectiveness of farmer field schools in knowledge diffusion is unclear, with literature review indicating that farmer field schools are effective in changing practices of the participants but produce few spin-offs on non-participating farmers.
On-farm research, in which farmers and scientists perform participatory research at the plots of the farmers, is a good tool for finding suitable technologies. However, this approach is very costly as it implies sending a researcher to almost every village. For this reason, it is hard to scale up.

The farmers in our study say that the extension service is often of little help because it is unavailable to them. When there is an extension service, it is said that it only helps the better-off farmers that use modern farming methods. Other complaints about extension services are that extension workers arrive with preconceived ideas that are not commensurate with the local circumstances (climate, soil) or culture (e.g. do not speak the local language).
Positive comments were made about the Millennium Village farmer field school, which seems to be quite effective in spreading its knowledge, although it is hard to distinguish it from the other services offered by the Millennium Village Project (MVP). Farmers readily adopt the measures learnt, which include the use of fertilizers and pruning. The farmers that participated in the farmer field schools of the MVP were highly enthusiastic because they combined training with practice and enjoyed fertilizer subsidies.

Poor pests and diseases control

On a worldwide scale, losses in agriculture due to pest and diseases have always been high. In sub-Saharan Africa losses are generally higher due to poor storage conditions and limited use of pesticides. Pesticide use is limited because of its high price and the lack of knowledge concerning the right quality and quantity to apply.

The farmers interviewed also indicated that pests and diseases were important constraints to them. They said they had difficulties reducing these types of losses because they had no money for pesticides and pesticide sprayers, or pesticides were unavailable, they lacked labour to weed or spray, they lacked knowledge on pest management, and in some cases they did not have adequate crop rotation.

Inadequate tools and production technology

The poor smallholders use very few modern tools and technologies. A lack of technologies will constrain the increase of production, as labour productivity will remain low. The hoe, hack and plough are instruments that have not changed much since they were invented and are still in use in most smallholder communities. Apart from lack of money, traditionalism and education on the use of more efficient and/or ergonomic tools restricts their use. The lack of knowledge about, and use of, more efficient tools to increase productivity is another constraint to becoming more entrepreneurial.

The farmers in our study were generally still using traditional technology for production. However, many farmers indicated they would prefer to adopt more modern and less physically 'challenging' technology, if financially possible. When asked what equipment was predominantly lacking, farmers indicated that they missed methods and tools that would ease the tillage of the soil, and proper sprays for pest reduction. Farmers indicated the need for labour-saving techniques, especially for use during the "peak" season.

Lack of traction and transportation

A lack of possibilities to bring harvest to the market, buy inputs and plough the land is a constraint for the increase in production. Animal or motorized traction for ploughing and transport to markets is normally beyond the reach of poor smallholders. Thus their productivity is constrained as they have to plough by hand and travel by foot or, if they are fortunate, by bicycle.

In our study farmers indicated that labour-saving technologies like oxen or tractors could often not be used because they were said to be too expensive. In particular, they mention problems of transporting harvests from the fields to the house, and from the house to the markets, and vice versa for inputs. Bad infrastructure further increases the costs of traction in more isolated villages. Farmers indeed generally felt the constraint of the lack of traction and transportation. However, some farmers possessed animal traction (oxen, donkeys) or bicycle carts easing their transportation burden.

Weak physical and mental condition of workforce

In sub-Saharan Africa many poor smallholder communities suffer from prolonged periods of food insecurity. The generations long lack of calories, protein, vitamins and minerals resulted in poor physical health - and often mental health - of large proportions of the smallholder communities. This reduces their personal productivity and results in apathy and lethargy. The African farmer is not lazy, but often lacks the good health that is necessary to be productive and entrepreneurial.

The farmers interviewed do confirm that they face physical difficulties due to their heavy work and acknowledge that if they have insufficient food they are not able to do the heavy work. They confirm specifically that during the heavy planting and weeding seasons they have insufficient food for their daily needs.

7.2 (Perceived) risks and uncertainty

Unfavourable climate

Generally speaking, smallholder farmers produce within a rain-fed agricultural system. In rain-fed agriculture the variability and uncertainty of rainfall over time is an issue. Rains might not come at all, they might come too late, there may be too little or too much rain. This results in a great deal of uncertainty and risks connected to the investment in production. The poor smallholder can do nothing to influence the climate. However, it is possible to create more certainty and reduce risk through investment in irrigation.

Especially farmers inhabiting the more arid areas indicate that climatic circumstances are the main reason why they cannot increase production. Due to the great risk of not receiving a good return on their investment, farmers choose to reduce investment to a minimum. The climate also reduces the possibility to change to a different crop. Farmers indicate that they prefer crops that require less water and are less vulnerable to water shortages like for example sorghum and cassava. The same farmers indicated that they were hesitant to change to other crops unless the risks were more manageable or could be shared with outside parties. A major constraint to changing to new crops is the fear that if such crops are not successful, they might lose access to their preferred food for their own consumption.

Restrictive market forces

Smallholders have great difficulties reaching markets for the sale of their output or for buying their inputs. Most of them are producing in remote areas, they typically lack proper means of transportation, and roads, if any, are in poor condition. Thus for the sale of their produce they are dependent on middlemen. The middlemen buy the crops at prices well below market price in order to cover their own transportation costs, to cover the risks of investing their own capital in accumulating stocks, and of course to make a profit. As most of the smallholder farmers are not organized in farmer-based organizations (FBOs), they do not have the negotiation power to demand fair prices for their output (crops) or for their input factors (seed, fertilizer, etc). Poor smallholders have little choice. Taking their produce to the market themselves is often perceived as a bigger risk than selling to the middleman. Transportation is cumbersome and time-consuming. Prices do fluctuate at the market place, in particular during the immediate post-harvest period. Poor smallholders are also dependent on the middlemen for their inputs like fertilizers and seed. There is little competition among middlemen, which means that the producers have little bargaining power.

Most farmers interviewed indicate that they have insufficient access to the market. Relative distances are great because roads are bad or non-existent. The lack of transport means, whether cars, bicycles, motorcycles, or donkey carts, increases the relative distance even more. Local market days, where buyers from other areas could come, might help, but most small villages do not organize regular market days. Middlemen are perceived as unreliable, as they do not visit at regular intervals and the farmers often consider the prices they offer too low. Furthermore, the farmers say they lack cash and adequate storage capacity to sell their produce outside the major harvest season when prices are higher. Furthermore, they say that the prices they get from the middlemen are too low because very few middlemen come to their village, which means that they do not have a choice of whom to sell to. The middlemen sometimes cheat with the weighing and the farmers find it difficult to organize themselves into a better bargaining position. When bringing the product to the local market, farmers indicate that these are regulated by informal institutions, like market queens, who determine who can sell at what prices, and to whom. They indicate that this has an effect on their willingness to visit the market themselves and that they prefer selling to a trader (even if they get less money).
Additionally, farmers state that building storage facilities might help them to benefit from higher prices outside the harvest season, but they have no money to pay for construction and stock keeping. Although middlemen are accused of being exploiters and monopolists, some farmers admit that the food trade sector is

lean and efficient, given the constraints they face. Low prices are more likely caused by bad infrastructure than by the middlemen.

Picture 3; rural market in Ghana © picture Jenneke van Vliet

Limited access to information and means of communication

For increased production, access to accurate information on input/output prices and the weather is of great importance. Poor smallholders generally lack up-to-date information on input and output prices. This puts them in a disadvantaged position with regard to better organized market parties. Distant rural communities are still rather isolated and lack information on which to base their (production and marketing) decisions. This lack of information, on for instance the market price, generates uncertainty when planning production and marketing. The recent arrival of the mobile phone (and even Internet) communication is a major factor that might improve productivity and incomes through better information on actual prices and market circumstances. Ghana has a reasonably well-functioning agricultural information system that can be accessed by phone.

In our study farmers communicated rather easily with each other. Especially farmers in villages closer to market towns or villages with higher volumes of trade were rather well informed and experienced few problems in acquiring data. Generally, information was obtained from family members and other villagers who travelled to nearby towns and traders passing by. Although lack of information was mentioned, it should not be considered a main constraint, especially for communities closer to trade hubs. In villages further away from major trading hubs, information on required produce and price was lacking. Farmers produced what they could and generally directed produce to the market shortly after harvesting. The farmers in our study did not complain about lack of information. We witnessed the wide reach of mobile phone networks in North

Ghana and the wide availability of radio and TV communication. However, those farmers who owned a mobile phone used it mainly for phoning family members and friends. Generating market information via mobile phone or Internet was not common practice for the interviewed farmers. Thus accessing market information was seen as a constraint when considering uncertainty, but only for the farmers living in remote areas where trade was more incidental.

Omnipresence of corruption and crime

Poor smallholders live at the bottom of the social and income pyramids. They are quite powerless and experience this in day-to-day life. Injustice is an every-day experience. They know that they are badly protected against crime and corruption, which is another reason to avoid risk and exposure.

Some farmers in our study openly complained about corruption at all levels of society. They see this as a risk, and a reason not to invest. One farmer indicated that he would not increase production because if he did so, he would lose a part of his produce when trying to sell. In Northern Ghana farmers complained about increasing criminality through the theft of lifestock in their area. Theft of lifestock, which should be considered the most common means of saving in the north of Ghana, generates a reduction in the ability of farmers to cope with shocks and risks, reducing their willingness to take more risks.

Failing institutions, poor legislation, lack of "law & order"

Institutions to enhance democracy and "law and order" and give support to the poor are generally weak in sub-Sahara Africa. In the more remote rural areas, institutions hardly function at all. The lack of trust in "institutions", absence of honest law-enforcement, lack of personal and property protection, etc. constrains the smallholder from taking risks. Generations of experience with exploitation by pre-colonial traditional powers, the colonial- and post-colonial rulers and the prevailing "patron-client" systems, resulted in a situation where the poor live in fear of the "powers-that-be" and created a mindset of risk avoidance, apathy ("it is God's will") and survival strategies. After centuries of bad experiences, the poor have good reasons to mistrust government (national, regional, local) and the "traditional" leadership. The lack of functioning institutions results in more uncertainty and risks for smallholders.

Many farmers in our study, in particular in Northern Ghana, complained bitterly about the injustice that they have to endure in their day-to-day lives. They openly criticize their government for neglecting them and treating them badly, and confirm that they deeply mistrust the government and its institutions. They have more faith in traditional leaders but they also feel badly treated by them in many cases. The informal institutions generally are more conservative and not supportive to change towards other cropping systems. Furthermore, farmers indicate that they do not want to invest in their soil quality or other long-term investments like the planting of trees as they have little certainty concerning their land rights. They indicated that they harvest as much as possible in any given year, because the chief could reallocate them to other pieces of land. This was mainly the case on communal land. Another group of farmers complained about the difficulty they experienced in getting a loan or organizing themselves in cooperatives. They found the rules very complex and indicated that the procedures were incomprehensible, especially when they have little formal education and/or financial means. NGOs had assisted them, but even so they indicated that the rules for cooperatives were very complex, and making the procedure simpler would be a great step forward.

7.3 Lack of incentives

Input/output ratio is not beneficial

The basic principle for any entrepreneurial activity is that there should be a possibility to make a profit. In other words, the input-output rate should be beneficial. Apart from that, the marginal return on any extra investment should be positive. Within a system of subsistence production, the input-output ratio is of less importance as the smallholders convert their labour and other inputs they can miss into food for consumption

and survival. This is the case if no other productive use can be found for their labour. Although employment is not always available, most smallholder households do try to sell some of their labour. It is easy to identify reasons for the low input-output levels in macro-economic policy and the low investment in agricultural research, which is outside the scope of the farmer.
However, when considering production for a market, an essential aspect of entrepreneurship, a positive input-output rate is of tremendous importance and determines the major part of smallholder's willingness to become more entrepreneurial.

In our study, farmers complained that the input-output rate of their production was negative. Bad climatic conditions or an unexpected drop in prices are partly to blame for the low profitability. Furthermore, a large majority of the farmers complained about the ever-increasing price of fertilizers, which squeezed profits even further. Some farmers decreased the application of chemical fertilizers to all they could afford and remarked that this would be 'more economical'. Others switched to crops that are less demanding, like cassava. Overall, almost all the farmers indicated that their profit levels were low and extremely volatile.

Deficient road systems

Poor smallholder farmers live in the more remote rural areas where roads are bad or non-existent. This isolation constrains market access and increases cost of agricultural inputs. The longer the travelling time, the higher the transport costs. Long travelling times limits production to products that are less perishable and preferably less bulky. The deficient infrastructure is a clear disincentive for market-oriented production. Farmers with little access to markets will have a disincentive for entrepreneurship.

The farmers in our research voiced this disincentive. In one village in Northern Ghana, a bus came through once a week, travel on the bus to the main road cost more than eight times the trip from the main road to the next big city. 'The transport of products from our village is expensive due to the bad roads,' a villager complains. Farmers are aware of the costs of transporting their products and themselves to the nearest markets and take this into account when choosing what and how much to plant.

Unfavourable patron-client network

The poor farmer is always (a reluctant?) client in these powerful informal systems, which to a great extent regulate communities. The farmer has little power and lives at the bottom of the network to which he is forced to contribute as soon as he has something to offer, with little in return when he is in need, which is normally the case. Thus the poor farmer is easily abused by his formal and informal leaders and seldom benefits from such networks. An urban elite rules African countries and their clients live in the cities. The urban patronage serves its clientele by policies that favour inhabitants of cities, like low food prices and urban development projects. Low food prices lower profitability for farmers, whereas the urban bias on development funds increases the shortage of money for infrastructure in rural areas (Box 4).
In our study the interviewed farmers did not make this constraint explicit. Most probably because this is a theme that is normally not openly discussed. From our observations it became clear that these networks do exist and are generally not favourable towards increasing the entrepreneurship of the individual smallholder farmer.

Box 4; National neglect of peripheral regions enforces the need to survive with traditional subsistence systems resulting in continued poverty and political instability. Kees van der Geest

I believe that in sub-Saharan countries (including Ghana) political-economic processes are active that restrict development in peripheral regions (like Northern Ghana). These processes are difficult to turn around, and change is only possible when decided at the national level. That is not to say that it is useless to develop initiatives for improvement at the local level, but greater improvements will not happen if prior conditions are not changed at the national level. That is to say, that there must be the political will to really improve the situation in Northern Ghana. We then talk about investments with scarce money that probably can produce a better yield in South Ghana. This will only happen when politicians are incorruptible and politicians in South Ghana, where the economic and political power is, will accept that funds will flow to other regions than their own constituencies. Democratic development and international pressure to develop "poverty reduction strategies" that explicitly include the poor North is required.
However, given the lack of political and economic support at present, smallholders in Northern Ghana have to look after themselves for the time being in order to survive. In this respect it is worrying that "spreading of risks" - one of the main characteristics of Northern Ghanaian agricultural systems - is seen as something negative. The agro-economic context and market situation in Northern Ghana is so unstable that the question arises as to whether the systems that have been developed in the course of centuries, are not the most suitable under the prevailing circumstances. I believe that it is important to combine two production systems, one traditional system with traditional crops and methods, and one with a more modern market-oriented system. Production for the market should not compete with subsistence farming and should ideally take place in the dry season in intensive dry-season gardens.

Prohibitive taxation

Taxing agriculture is a favoured policy of African governments. Government policy of export taxes, which are as high as 30% for cocoa, also keeps prices low. Because of this, few crops are profitable. In particular, taxes on food processing can be high. Subsistence farmers pay little or no taxes, as long as they produce for their own consumption. However, as soon as they start to produce for the market (cash crops) or start processing and start selling processed food, the tax man knows where to find them.

Several farmers, especially those cultivating cash crops for processing, said that taxation was a serious constraint. For some, this is a reason not to increase production or to continue selling unprocessed produce as the proceeds of processing are particularly heavily taxed.

7.4 Mindset

Restrictive cultural/religious beliefs, habits and attitudes

The local cultures and their farming systems, in particular in Northern–Ghana, strongly depend on optimal use of the locally available (natural, human and spiritual) resources, as there has never been easy access to external resources. People highly value their cultural identity and traditional worldview/religion, which is focused on their ancestors. The ancestors may be against change, and they are consulted by soothsayers before any important decision is taken.
Farmers are constrained from entering the market economy because they are afraid of losing their culture and identity, which has helped them to survive for many generations under extremely difficult circumstances. They are afraid that by entering the market economy they might lose their social relations and that solidarity and reciprocity within the community will be lost. This is another reason for not taking risks and for reverting to coping strategies for long-term survival.[37]

Generally speaking, our study confirms that large groups of farmers are rather conservative in their decisions. This applies especially for the older and poorer farmers, who are reluctant to change their way of farming (Box 5). Smallholders indicate that they are doing what they have always done, and that it has always worked; "so why change?" Others indicated the advantages of their cropping methods over other newly-introduced generally higher-yielding crops. Especially the drought resistance, taste and cultural value are mentioned. This tendency to conservatism is not universal and should not be used as an excuse not to intervene. However, proposed interventions should be in line with beliefs and presented in such a way that even the 'ancestors' will approve them. Besides that, especially in villages closer to large roads and towns, the younger generation

feels less restricted in experimenting with new crops and livestock with higher risks and higher reward. Examples of this are farmers starting guinea fowl farms and large-scale production of soybeans as cash crop.

Box 5; Attitudinal Change in the Context of Rural Development
Dr.Toon van Eik

The process of rural development in low-income countries in sub-Saharan Africa leaves ample room for improvement. Although many factors at the macro-, meso- and micro-level are frequently mentioned in the literature on rural development as hampering this process, the ***factor of attitudinal change*** *remains largely absent in the discussion. Attitudinal change is key in the rural development process and some suggestions to facilitate such change are offered.*
Societal changes are rooted in the (collective) behaviour of individuals. At the end of the day, it is individuals who play a pivotal role in processes of rural development. In the sociology of rural development the 'actor-structure debate' is relevant in this context. This debate focuses on the relation between actors (human action) and structures, between micro-level behaviour and macro-level structures, and distinguishes two sets of variables that can have an impact on the adoption of new technology: structural variables (at the societal level) and socio-psychological variables (at the individual level). The non-adoption of new technology can be blamed on inadequate structural variables (e.g., an ill-functioning input delivery service) or on individual characteristics of farmers (e.g., 'conservative' or 'ignorant' farmers) or on both. On first thoughts it seems probable that the truth lies somewhere in between and that structural and socio-psychological variables play an equal role. The 'building blocks' of any structure, however, are individuals. The essence of the societal process is the individual. Progress is only possible when changes occur simultaneously in the economic and socio-political dimension (structural variables) and in the cultural dimension (socio-psychological variables), and a progress limited to one dimension is detrimental to progress in all dimensions. Changes in structural variables, however, are made by (a collective of) individuals.

To move beyond altruism, resource-poor farmers must organize themselves and gain the political and financial power to put pressure on public and private services for improved relevance and performance. Sub-Saharan smallholder farmers have hardly any countervailing power over change agents (including research and extension organizations, credit institutions, input suppliers, traders, government institutions, NGOs and their facilitators). The Government of Tanzania's decentralization policy, for example, implies more countervailing power to farmers and thus more efficient and effective implementation of rural development programmes. The actual implementation of this policy largely depends on the attitude of 'uppers' (formal and informal leaders/patrons). Robert Chambers argues that it is the attitude of 'uppers' that hampers development most. How likely is it that central and local government staff will relinquish power and funds? What instruments do we have to 'enforce' this (in the absence of strong farmer organizations)?

Inclination to consume rather than saving/investing

An important aspect of entrepreneurship is the willingness and ability to save and invest, instead of to consume. The extortive patron-client systems and obligatory sharing with the extended family stimulates immediate consumption of discretional money that is sometimes acquired through windfall or some entrepreneurial activity. Consuming the proceeds of personal efforts as fast as possible, in order to avoid the "fruit of your work" being taken away by more powerful actors in the system, or shared with the extended family, becomes an escape, which is unfortunately very detrimental for saving/investing.

The farmers in the study did not directly indicate their desire to consume rather than to invest. However, it became clear from observations and informal discussions that, more often than not, their spare cash is consumed. Farmers would consume and share their limited resources with family and village members, for instance for the payment of a funeral and receiving help in return when they required it. One farmer explained that he wanted to invest but preferred to consume, because if he invested now, he would have nothing to consume now. But when he made a profit on this investment later, many would come and claim a part of the profit.

Limited understanding of commercial/economic principles

The commercial concepts of planning, markets and profit in a setting of overall economic conditions are largely unknown to smallholder farmers. They have little or no formal education, and extension services that teach commercial skills do not reach the small farmer. Their knowledge is basically traditional and they make decisions based on past experience. This constrains the poor farmer from progressing to a level above subsistence farming.

Several farmers in our study showed very clear and thorough understanding of the commercial principles of choosing when to produce or not, and when to sell to whom. Nevertheless, many smallholder farmers with low marketable surpluses had difficulty in selling their output at a profitable price. Especially labour was not counted as an input. Some of the farmers interviewed stated that when they were trading they were not always sure if the sum of their output generated more than the sum of their input.

Limited social capital and a lack of trust

In literature, the lack of social capital, leading to limited solidarity among the poor, is mentioned. Poor people do not have the means to support anyone other than their immediate relatives. In the case of emergency (most of the time) they are on their own and revert therefore to survival strategies with minimal risk.

In our study we found little evidence for the lack of social capital as a constraint towards economic development. Nevertheless, farmers claimed to have little trust in other farmers, which hampers the formation of farmer-based organizations and cooperations (Box 6).
However, we found farmers that did work together within their social groups, working on each other's land and assisting each other in times of need.
In discussions with farmers and traders, it became clear that on many occasions a lack of trust played a role. Farmers do not trust traders and traders do not trust farmers, thereby leading to increased transaction costs.

Box 6; Global Agro-Industries Forum

Delhi, April 2008.Workshop on organizing smallholders: "On constraints of establishing and maintaining Producer-Organizations and Cooperatives".
The discussion began with a debate on the proposition statement: "The rapidly growing markets for high-value agricultural products in both developed and developing countries
opens up tremendous opportunities for smallholders. However, only if small-scale farmers come together in an organized way, can they engage profitably in the highly competitive agro-industrial sector". The statement was strongly supported by some of the participants, given the potential benefits of economies of scale and transaction cost savings. Some participants challenged the proposition by noting the often high costs of organization and their lack of sustainability. A question was posed if the upsurge of interest was more a result of a supply drive by NGOs and donors. A criticism was raised on the lack of evidence and the need for qualification in making the proposition statement. The discussion moved on to address the questions:

1. *What have been the reasons for past failure of farmer organizations in developing countries?*
2. *What are the business services most needed by small-scale farmers in developing and transition economies?*
3. *What support services are most relevant to enhancing smallholders´ profitability?*
4. *Are farmer organizations best placed to provide such services?*

The participants, whilst recognizing the importance of farmers´ organizations, proceeded to describe some of the reasons for the successes and failures. Some of the reasons for failure were: donor- or NGO-led group organization; social conflict; weak and ineffective leadership; lack of capacity and skills; failure to share benefits equitably amongst members; external environmental changes and an inability of leadership to adapt and respond; and difficulties in registering producer organizations and protecting them as legal entities. Weaknesses in creating viable apex organizations were also highlighted as stemming from the lack of human capacity to take producer organizations to a more professional level of management. The view was raised that Government had a responsibility to develop policy guidance to address these weaknesses. And key areas of attention were identified as effective management and leadership, capital formation and investment; distribution of profits amongst members; effective communication amongst members; transparency of transactions. The need to create a skilled and competent leadership was also mentioned as a critical factor to ensure financial sustainability

8. Appraisal of the results and opportunities for smallholder farmers

The constraints that were found in the desk research were all confirmed in the field research with the exception of "lack of social capital". However, the field research revealed many more constraints, most likely because an entrepreneurial perspective was guiding the interviews.

The most striking aspect of this study is the complexity of the situation the smallholders face in their day-to-day lives. This study confirmed that most subsistence smallholders live in a "poverty trap"[38] and will not be capable of escaping that trap on their own. Their soils are depleted, their seeds are poor, water is scarce and rainfall erratic. They are extremely vulnerable to external shocks and lack a **capital base** to weather these shocks. Besides the observation of this complexity and the lack of a capital base, other specific constraints for entrepreneurship are especially important as they have a universal character.

Lack of **trust** in "institutions", absence of honest law-enforcement, lack of personal and property protection etc., constrains the smallholder in taking risks. Many farmers do not take additional risks due to previous bad experiences. Generations of experience with exploitation by pre-colonial traditional powers, the colonial- and post-colonial rulers and the prevailing "patron-client" systems, resulted in a situation where the poor live in fear for the "powers-that-be" and a mindset of risk avoidance, apathy ("it is God's will") and survival or coping strategies is created. This **mindset** can only change if the poor smallholders feel protected by the institutions, become convinced that they are not powerless and that a reliable, honest environment sustainably protects their interests and integrity. Government must create an "enabling environment" before large-scale development can take off.
Without a mindset change, there is no room for sustainable improvement of the economic situation for poor rural populations. A mindset change will only take place when there is sufficient trust in the institutions, and incentives are clear and credible.

Related to the constraints of a "risk-avoiding mindset" and "lack of trust" is the fact that the smallholder acting in isolation will not be able to become a respected actor in the marketplace. Furthermore, it will be too complex and costly to reach individual, unorganized farmers with support. Many smallholders described the lack of organization in formal groups as a problem and many considered the option of organizing themselves, in particular because this would enable them to access inputs of new technology. Building "**countervailing power**" for the smallholder through farmer-based organizations (FBOs) like cooperatives, rural interest groups, credit unions, etc. is also a precondition for sustainable development. However, the building of this countervailing power is seriously constrained by lack of trust of the farmers in each other, or in their leaders, who often take the side of the ruling classes and neglect the interests of their constituencies. Or worse, join in the exploitation of them.[39] Overall the lack of (formal) organizations of farmers seems to be one of the main restrictions for entrepreneurship; limiting the incentives, increasing risks, limiting production. Furthermore, it may be one of the tools required to change the farmer's mindset, as FBOs are organizations designed for productivity increase and stimulating the formation of an entrepreneurial mindset.

Inadequate or absent **infrastructure**, like roads, warehouses, irrigation, ICT, efficient agro-dealer systems, etc. comprises another set of constraints that prevent smallholders becoming more entrepreneurial. A poor infrastructure is a disincentive and reduces the possibility to produce more, as input/output relations are directly and negatively influenced.

Current technology used by farmers, especially the poorer smallholders, will not enable them to gain sufficient increases in productivity. Farmers complain about the unavailability of labour, or the lack of cash to hire labour. They indirectly (and sometimes directly) link this to insufficient and inappropriate labour-saving technology. The present available agricultural **technology** is not sufficiently geared towards the needs of smallholders and the conditions they face in day-to-day life. Agricultural **education** does not reach them and

the extension services are defunct. This seriously constrains development and therefore appropriate education and research facilities are urgently necessary to improve productivity and develop products that can fetch fair prices at the marketplace.

Furthermore - and this is one on of the major problems smallholders that are potential agricultural entrepreneurs face - is that they are plagued by an unfavourable relationship between **input and output prices**. This, combined with a lack of appropriate technology makes farming, in particular in Northern Ghana, often a loss-making business with few opportunities. As long as these conditions persist and the constraints prevail, it makes sense to support only small-scale activities, like the production of speciality crops and the production of labelled (e.g. organic, fair trade) produce. This is most probably beneficial for some, but will not really change the fate of sub-Saharan African smallholder farmers in general, as the markets for such products are distant and relatively small. This is not to say that organic farming for subsistence cannot be sustainable.
Productivity increases and input- and output **markets** that really work for the poor are the only possible solution for achieving sustainable food security for the masses of the rural poor.[40]

However, the number and magnitude of the constraints is overwhelming and the rhetorical question arises: "Is there any hope for the African smallholder?" Our answer to this question is a modest yes!
Despite prevailing constraints, in our desk- and field research we found examples of successful interventions to stimulate small-scale entrepreneurship and successful smallholders that operate above the subsistence level.

At the micro-level we witnessed a promising development of cooperation-forming through the Association of Church Development Projects (ACDEP) in Ghana. ACDEP successfully organized farmer groups to produce marketable surpluses, to be marketed through a registered marketing company "Savannah farmers", owned by the farmers themselves[41]. Similar initiatives are supported by the Dutch organizations Agriterra and Agri-pro focus, with promising initial results in various countries.
Also the IFDC initiative: 'From Thousands to Millions"[42] could demonstrate significant progress in **organizing farmers** and the appropriate **production and processing chain** towards captive **markets**.

At the meso-level we found remarkable progress in the Millennium Villages. The underlying hypothesis is that the interacting crises of agriculture, health, and infrastructure in rural Africa can be overcome through targeted public-sector investments to raise rural productivity and, thereby, to increased private-sector saving and investments. This is carried out by empowering impoverished communities with science-based interventions. Seventy-eight Millennium Villages have been initiated in 12 sites in 10 African countries, each representing a major agricultural zone. In early results, the villages in Kenya, Ethiopia and Malawi have reduced malaria prevalence, met caloric requirements, generated crop surpluses, enabled schoolfeeding programs, and improved cash earnings for farm families.[43]
Our personal observation in the Millennium Village Bonsaaso in Ghana and Sauri in Kenya confirmed the progress claimed. We witnessed that **capital injections, knowledge transfer, trust and improved infrastructure** unlocked the entrepreneurial spirit of smallholder farmers.

Also at the meso-level, we found that the Business Alliance Against Chronic Hunger (BAACH) initiative in Kenya provided a **reliable market** for smallholders to produce ingredients for the local food industry.[44] Similar "outgrowing" schemes were found in Ghana to supply corn and soybeans to the World Food Program (WFP) and in a number of African countries of sorghum production for beer brewers like Heineken.

In Zimbabwe 10 years ago, soybeans were promoted with smallholder farmers to help offset problems of soil fertility, introduce diversity into cropping systems dominated by maize production, and increase incomes. A mix of soybeans can now be seen in most smallholder farming areas in suitable agro ecologies throughout the country. This success of this introduction is due to a solid multi-institutional effort that included establishment

of **local input facilities**, as well as **market and transport opportunities**[45]. After some of the main constraints had been limited and some farmers had been introduced to the crop, farmers copied each other and sufficient production was available to keep systems running. A remarkably stable production and processing chain was developed, that even survived the collapse of the Zimbabwean economy.

At the macro-level, the case of Malawi is worth mentioning (appendix 4). Emerging from the worst harvest in a decade, the Government of Malawi implemented one of the most ambitious and successful assaults on hunger in the history of the African continent. Through a national input subsidy program, coinciding with better rainfall conditions, maize production doubled in 2006 and almost tripled in 2007. Malawi achieved a 53% surplus in 2007, some of which is exported to neighbouring countries. Fertilizer subsidies in Malawi are correlated with national maize production during the past decades.[46] A proper **enabling environment** with clear rules and regulations, guaranteed markets, corruption control, formation of farmer-based organizations and tax waivers contributed considerably to this success.

These examples show that after decades of failures[47], lessons have been learned and the opportunities are there. However, in most cases, opportunities only emerge if governments provide an enabling environment for private sector entrepreneurial development and sufficient money for investing in agriculture is available.

Besides successful interventions set in motion from the outside, we see small leaps towards **entrepreneurship from within**. We witnessed that in every village there are farmers that are capable of "navigating through the constraints". Despite still being very poor in absolute terms, they are wealthier and smarter then their neighbours. Concentration of interventions on the "wealthier and smarter" among the poor gives a chance of development of a virtuous cycle. Supporting measures like credit, technological development, relevant extension services, improved infrastructure, and improved supply and marketing chains can help the more entrepreneurial farmers, their farms can employ the labour of farm families who have given up farming themselves.
Agricultural development of the smallholders with better chances will also give rise to a local processing and "service industry", like millers, blacksmiths, store keepers, tailors, transporters etc., who can also employ cheap rural labour. These small-scale processing and service industries will be suppliers to and clients of bigger companies in the cities, who see their business opportunities increasing, which in its turn will stimulate economic growth, employment and income. In this way, markets that work for the poor will be created. The formation of such agro-food chains is essential for a longer-term transition towards industrialization with sustainable solutions for hunger and poverty.

It can thus be argued that for "**the less poorer of the poor**", abundant opportunity to improve their unfavourable economic situation exists, once the major constraints can be overcome, for which in most cases external support is required. Most sub-Saharan countries are net importers of food and one third of the SSA population (>200,000,000 people) have a chronic lack of food, thus in principle the markets for increased productivity do exist.

However, from our study it also became clear that a considerable number of smallholder farmers cannot, or will not, become agricultural entrepreneurs. Many millions are forced to give up farming as a means to support their families, because they are too poor, their farms are too small, their formal education levels are too low or non-existent, and more often than not they are physically and mentally incapacitated due to prolonged periods of chronic hunger and malnutrition. For them, productive safety nets[48] are required in a longer-term perspective of industrial employment.

It is important to understand that Africa is very diverse and that between and within countries - and even within communities - constraints and opportunities can vary wildly. Generally speaking, subsistence farmers have at present few opportunities and we can easily conclude that the magnitude of the constraints is

daunting. However, if an entrepreneurial spirit can be awakened, and the "smarter of the poor" farmers see incentives and a chance to make a profit, they are usually capable (with some external starter support) of "navigating" through the constraints and finding the markets for their products. These farmers behave like entrepreneurs; they identify rewarding opportunities, take action to pursue these, are willing to take calculated risks, and are capable of managing uncertainty.

9. Conclusions

It can be concluded that sustainable food security in SSA can only be achieved through entrepreneurship of small farmers; farmers that are capable of moving beyond subsistence farming and of planning production for defined markets with a profit objective.

It can also be concluded that productivity increase through entrepreneurship, of a scale sufficient to seriously reduce hunger and poverty, can only develop if the major constraints for entrepreneurial development can be removed. However, the poor smallholder faces so many constraints to improving his/her economic situation (which also differs from individual to individual and community to community) that resolving one or two of these constraints will not be sufficient. It is therefore concluded that a **holistic or integrated approach** is required to identify and understand the whole set of constraints (or at least the most important) in a given situation and to remove the major constraints simultaneously. The holistic view has to embrace the whole agricultural system, from planning to production to market. The most important constraints in a given situation have to be properly defined and tackled in a concerted action.

When considering the results of the field research and the appraisal, a list of the constraints that most urgently need removing can be drawn up. Arguably it can be concluded that the most important constraints are:

- **Capital**: with money, soils can be improved, better seeds bought, water-harvesting projects financed, knowledge and technology provided, and labour and extension services paid.
- **Countervailing power:** with strong farmer-based organizations (FBOs), negotiation power with Governments and partners in the agro-food supply chain will be enhanced, and technology transfer made easier.
- **Good Governance**: with reliable governance and law and order, risk and uncertainty will be mitigated and formation of FBOs enhanced.
- **Technology and Education**: technology development and transfer is essential for productivity increases.
- **Infrastructure**: better roads and communication will be an enormous incentive for entrepreneurship.
- **Mindset**: understanding the mindset of smallholders will be essential for effective support and a change of mindset is essential for progress.

Capital, trust and incentives can change the mindset and stimulate entrepreneurship for most farmers except for the most traditional.

It is recognised, however, that in the short-term we might face a Catch-22 situation, as we can only hope but not realistically expect that sufficient capital, good governance and an acceptable rural infrastructure to appear in SSA in the near future.

However, the chronic and even acute hunger situation in particular in SSA is so severe that we must break through the vicious circle of hunger and poverty and the constraints that perpetuate this. The identified constraints need to be tackled now!

The overall conclusion remains that in order to reduce chronic hunger and poverty on a large scale, considerable capital injections are required for a prolonged period, in order to overcome the financial constraints smallholders face to improving productivity and moving towards an economic position above

subsistence level. However, money alone is insufficient. Many constraints cannot be solved by capital injections but require a mindset change and structural reforms at governance and infrastructural level. Thus there should be the understanding that a holistic or integrated approach to solving the constraints is required, including the understanding of cultural and religious habits, attitudes, norms and values of poor farming communities, which is necessary to facilitate a mindset change. Money combined with such an understanding will enable the "international development cooperation world" and local governments to support smallholder farmers effectively towards entrepreneurship and lift hundreds of millions of poor rural people out of their misery. Livelihood improvement programmes only make sense when they will really improve the profitability at farm level sustainably and that will only occur if the smallholders can become more entrepreneurial, having the skills and possibilities to plan production for defined markets with a profit objective. Honest and well-functioning institutions and an adequate infrastructure are equally required for sustainable development of the rural poor, which is the core responsibility of national, regional, and local governments.

10. Recommendations

Following the analysis and our conclusions, we propose here 12 actionable recommendations. It is hoped that actions are taken based on these recommendations, in order to have large numbers of smallholder farmers participate in commercial systems that are profitable for them.

1. Think entrepreneurial

The overriding recommendation following our study and its conclusions is that new initiatives to fight poverty and hunger should develop their action plans starting from an entrepreneurial point of view. This implies the understanding that entrepreneurship is more than just producing or processing. It is also about **markets, profit and fair trade**. This is very much the realm of business and interlocking agro-food chains, profitable in every link in the chain. Here the established national and multi-national agro-food industries should play a major role in providing incentives for smallholders to enter the chain. "Out grower" systems for supplying local food industries, and import substitution or export operations are opportunities that have been underdeveloped so far.

2. Be very generous with capital injections for a prolonged period

Capital injections to the tune of billions of dollars for a prolonged period are necessary[49]. Public and private donors should keep their promises to invest in agriculture. African Governments should live up to the UA agreement to spent at least 10% of BPP on agricultural development[50].

3. Carefully select priority areas for constraint-resolving solutions

Apart from capital injections, it is extremely difficult to recommend what would be the most serious constraints, that need to be tackled with priority. Different circumstances at different points in time at different places will demand a different priority setting. Albeit that an integrated approach of tackling different constraints simultaneously will always be necessary if there is to be any chance of success. Nevertheless, and arbitrarily, we recommend **4 areas for high-priority solutions**:

3.1 Build efficient and effective farmer-based organizations

- It is essential for **smallholder farmers to organize themselves** and create countervailing power on input- and output markets and become respected partners in negotiations with the governments. It is recommended to dramatically increase the support for farmers to organize themselves properly[51]. Local governments, NGOs, knowledge institutions, international donors and the private sector must facilitate the establishment of FBOs, with the highest priority.(appendix 3)

3.2 Increase vigilance on Good Governance

- Good Governance at national, regional and local level, that facilitates an enabling environment and a **positive business climate** for smallholders is at present more the exception than the rule. It is therefore recommended that in bilateral and multilateral discussions and negotiations, a lot of emphasis be placed on measures to provide incentives for smallholder farmers. Governments in the North, individually or through their organizations (EU, OECD) and the national and international private sector should use their influence and increase their pressure on governments in the South to accomplish this.

3.3 Enable a step-change in agricultural research and knowledge transfer

- **Agricultural research and knowledge transfer** is essential to stimulate productivity increase. It is strongly recommended to enable renowned knowledge institutions like WUR to make their skills and competencies available on a wide scale for smallholder development, in close cooperation with national institutions in the South. Governments in the South, private donors, and private companies and the knowledge institutions themselves should make ample funds available for agricultural research and knowledge transfer.

3.4 Improve rural infrastructures drastically

- An adequate infrastructure is a precondition for the successful marketing of agricultural products. It is recommended to place **rural infrastructure** improvements very high on every development agenda. Rural infrastructure projects are usually sustainable investments with a long lifespan and they also provide economic impulses by employing surplus rural labour. Governments in the North and international institutions (World Bank, IMF) should become much more generous with low-interest loans and grants to stimulate infrastructural development in rural areas.

4. Take a holistic approach in order to tackle constraints simultaneously

The (new) action plans to stimulate the agricultural development of the multitude of smallholders must take the constraints for entrepreneurial development in their holistic context into account; **an integrated approach is a must**. This is not to say that any individual support organization/donor has to solve all constraints, but that "orchestration" is required to tackle the main constraints in a cooperative way (unfortunately, cooperation is not the strong point of most development-assistance actors).

5. Place women at the core of every Development Cooperation programme

In any action plan for Africa, it would be an enormous mistake to overlook the African woman, as she is the backbone of society. Fifty percent or more of sub-Saharan smallholder farmers are women. Without **empowering** them, supporting them to organize themselves and obtain full democratic rights, which they can really exercise, very little progress will be made. Discrimination of women is one of the most important reasons for the perpetuity of hunger and poverty in Africa.

6. Build measures into development programmes to ensure that smallholders will benefit

Given the renewed international interest in support for agriculture, sizeable funds might (and should) be coming available to support smallholder productivity increase. However, based on the results of the study reported in this publication, two burning questions arise on the efficiency of the use of these funds.
Firstly, "How will external support funds (AGRA, bilateral Dutch support, Gates foundation, etc.) reach the intended beneficiaries?" Funds paid into the treasuries of African governments tend to be creamed off for political or personal benefit at various stages, on its way to the bottom of society. Checks and balances are required to avoid this.

Secondly, "How well will the market work for the smallholders to absorb the increased productivity profitably?" It is known that, more often than not, agro-food markets do not work well for the poor. New initiatives need to build measures into their programmes, to ensure profitable access to markets for smallholders. It is therefore strongly recommended to develop support programmes for smallholders bottom-up and not top-down. Public and private donors should take this into account.

7. Realise that fair trade sometimes means protection

In order to create a dynamic farming society, it is necessary to have **stable output price relations**, for which (temporary) protection from cheap imports is required and taxation on agricultural products is minimized. It is recommended that governments that want to stimulate smallholder productivity take this into account. Governments in the North and in the South and their institutions (EU, AU, OECD, WTO) should be more aware of the fact that development of markets that also work for the poor (smallholders) are essential for the economic development of developing nations, which are dependent on agriculture to feed and employ the urban and rural poor.

8. Do not reinvent the wheel

In recent years a series of authoritative reports[52] were issued, all stressing the importance of improving smallholder productivity, in particular in SSA, to fight hunger and poverty, and to achieve the MDG of halving poverty and hunger by 2015. The analyses and recommendations in these reports are sound and address the overall problem of hunger and poverty. The importance of these reports is also that they place agricultural development and research again high on the international development agenda, after decades of shameful neglect. This neglect is regarded a major cause of the current food crisis.

It is therefore recommended to **take these reports seriously** and avoid "reinventing the wheel". Governments in the North and in the South, NGOs and UN agencies must take this into account.

9. Ensure marketing drive and set operational action criteria

However, the reports indicated above also have major shortcomings that limit their practical use in problem solving. In the first place, the reports devote little attention to the entrepreneurial development of the small-scale agricultural sector, on which up to 80% of rural populations is dependant for employment. The reports pay a lot of attention to governance and technical issues, but are not marketing driven. In the second place these reports grossly lack realistic operational action criteria and barely include the smallholders' own perspective on development. An extensive analysis by WUR[53] of these reports basically confirms these shortcomings.

It is thus recommended that all plans and interventions to increase smallholder productivity contain **realistic action criteria on** "how" to achieve this in a sustainable way and to put major emphasis on the profitable marketing of increased or improved production. Local governments, knowledge Institutions and international donors should act to limit these shortcomings.

10. Avoid and roll-back fragmentation in development cooperation

It is acknowledged that all over Africa, private (national and multi-national) companies, universities, agricultural research institutes, NGOs and even governments are running excellent small-scale projects. Doing good by doing well should continue. However, the **fragmentation** in development assistance is enormous and therefore development funds are often wasted and/or inefficiently used.

It is recommended that whoever is planning new support programmes makes a thorough analysis of whether such a programme can create sufficient added value to be justified. All development actors should force themselves to stop fragmentation.

11. Join forces to create development synergy

It is absolutely necessary that development cooperation actors (governments, private sector, knowledge institutions, NGOs, international institutions) start to investigate much more seriously and urgently how and where they can **join forces**. Unlocking synergies by honestly banking on each other's skills and competencies in public-private-partnerships (PPPs) should become the rule instead of the exception. The whole Development Cooperation world (public and private donors) and the private sector should strongly increase the willingness to work in concerted action.

12. Avoid unfruitful polemics about sustainability of development programmes

In recent years some major smallholder support programmes with considerable capital injections have been initiated. These programmes as diverse as the Alliance for a Green Revolution for Africa, the IFDC programme "From Thousands to Millions", the Millennium Village Project, and the interventions of the Government of Malawi to increase national corn production, can teach us some valuable lessons. While these programs are showing tangible results, they are being criticized as programmes that are costly and require heavy professional supervision and therefore, are not sustainable and scalable. Some of these concerns are well founded, others are not.

Despite the ongoing polemics, it is recommended to **judge these programmes on their potential benefits and not their potential failures**. In particular, knowledge institutions, parliamentarians and government officials should be more reserved in pronouncing insufficiently founded criticism.

In summary:

An entrepreneurial approach, addressing constraints in their holistic context and defining realistic operational action criteria is necessary to ensure that (new flows of) development money reach the bottom of society to help the real poor out of their "poverty traps". Stimulating the entrepreneurial spirit of smallholders and avoiding situations in which the "upper classes" benefit disproportionately from money intended to help the smallholders to improve their economic situation is key to reducing poverty and hunger in Africa.

IV. Epilogue

In his public lecture on June 6th, 2007, Hans Eenhoorn[54] proposed to investigate not only the constraints that poor smallholders face in improving their dismal situation of poverty and hunger, but also to propose together with potential agricultural entrepreneurs, ways and means to overcome the constraints and to exploit opportunities (support them to become entrepreneurs).

It was also envisaged to develop an evidence-based model for small-scale agricultural entrepreneurial development and producing a "source book", useful for the farmers themselves and all institutions that wish to promote rural development. The magnitude of the constraints and their interactive complexity has prevented any more being done than investigating the constraints up till now. However it is strongly recommended to WUR to use the outcome of the present study and to take the next steps towards supporting smallholder farmers to become entrepreneurs, completing the tasks envisaged.

The plea made in the same public lecture*; "to place agricultural development very prominently on the development cooperation agenda both within the ministry of Agriculture and the ministry for Development Cooperation in the Netherlands",* might have contributed to the joint memorandum of both ministries on 'agriculture, rural development and food security', send to Parliament in February 2008.[55]

Hans Eenhoorn will retire from his position at WUR in June 2009 and hopes and expects that the chair "Food security and Entrepreneurship" will continue to function and provide insights that will benefit poor and hungry people in this world.

V. Acknowledgements

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VII Appendix

Appendix 1. The questionaire

id: | date | name researcher |

kind of interview |

region |
district |
community |

name interviewee |

m/f | age | time in community | household size |

What jobs do household members have? |

What do you produce on your farm? (in order of importance)	To whom do you sell the producst? (e.g. consumers/ sales-men/ market (wo)man/ others/ OR not sold (used within household))
1	
2	
3	
4	
5	

Do you know to whom the middle men sells the product?: |

What is limiting you from producing more? (in order of importance)

note: Vraag eerst open stellen. Daarna lijst afgaan om te vragen of speciefieke factor een rol speelt en hoe belangrijk die factor is.

order of importance:		Remarks on the issues mentioned as main problems
	land access:	
	irrigation:	
	rainfall/ climate:	
	fire:	
	soil quality:	
	education or knowledge:	
	technology of farming systemss:	
	price:	
	capital:	
	labour:	
	social network:	
	traditions/ culture/ religion:	
	transportataion:	
	others:	

Ga hierna verder met de balgrijkste remmende factoren (lijst van open-vragen in het word document). Dit antwoord kan je kort samenvatten bij de bovenstaande 'remarks'.

ID:	Date:	Village:	Name:

Notes:
These questions are just a guideline. Keep an open mind and let people tell what they consider as problems and opportunities.

Some specific notes:

- *Text in italic mentions issues which are related, they can be useful in order to keep the informants talking.*
- **Market access** mentioned as a single topic. Market access is reflected by issues concerning prices, transportation, information on demand, information on farming technologies, etc.)
- Corruption is not mentioned as a topic, but be aware that more might happen than people tell at first. It's only up to you to find out what is happing, not to condemn it. Free your mind and find as much information as you can. Minimize your own projection on what you thinks is happening or what should happen; what you think is 'good' is not relevant.

1. Land access

-How much land do you own?
-Is the land yours (or your families?) or do you hire it from someone (a tenure system)? Do you pay in kind or money?
-Is it possible to acquire more land? How? Can you lose land?
-Do you have crops on all your lands?

2. Rainfall/ Climate

-Can you describe the problem related to rainfall?
(*Is there an uncertainty about the timing of rainfall (irregular rainfall)? Is there an uncertainty about the quantity of rainfall? Or is the rainfall destructive (erosion risks)? Do you have this problem now more than in the past?)*
-Do you take special activities to decrease this risk? *(E.g. rainfall harvesting techniques, soil conservation measures, planting strategies, different crops, pumps, etc)?*

3. Irrigation

-Can you describe you irrigation system?
(pumps, channels, dams, reservoirs, by hand('gieter'))
(ownership, management, maintenance, costs)
(which crops)
-How is the amount and timing of the water supply decided upon?
-How could the irrigation system be improved? *(e.g. improvement of ownership, maintenance, costs, management, water quantity, timing, and water quality)*

4. Fire

-Can you describe how fires occur?
-Has intensity and/ or frequency of fires changed?
-What problem do fires cause and what could prevent this?

5. Soil

-What is typical for the soil you farm on? Do you have different kind of soils?
-Do you use the different soils in a different way? Do certain soils give more problems than others?
-Are there things happening which decreased the productivity of the soil? *(E.g. fires, ploughing, grazing, different rainfall patterns, others?)*
-Do you take measures to decrease soil degradation?

6. Education and Knowledge

- What would you like to know better? What type of knowledge is limiting you? Could you produce more if you had the knowledge? *(Related to; farming systems, prices for products, prices for inputs, market demands, etc.)*
- How could this situation become better? *(Better schooling, courses for farmers, access to telephones/internet, larger social network, etc.)* Are there places you can go to for advice on crop production? Who advises?

→ If **schooling** is mentioned as a limiting factor:
- Did you go to school? Until what age? Can you still go to school?
- Are your children going to school??
- What would you like (your children) to learn at a school? Do people learn those things at school?

7. Technology of the farming system

- How do you farm? *(Ploughing techniques, type of plants varieties, how do you plant the seeds, prevention of weeds, diseases, harvesting techniques, processing techniques, storing techniques, others)*
- What part of the farming cycle causes the most problems? Why does this cause a problem?
- Do you use chemical fertilizers? Who explained this to you? Could/ has this improved your production?
- Do you have access to improvements for the issue(s) mentioned as a problem *(e.g. for improved seeds, fertilizers, ploughing, weeding, harvesting, processing)*? y/n → If yes: How is this arranged? If no → What is limiting this access?
- How could this be solved? Where do you go for advice?

8. Price

- What price do you get?
- Do you know your price before going to the market/selling to somebody? How do you know the price?
- Does the price change? *(How? Why? Between different years? Between seasons?)*
- Do you get a good price? *(When do you consider a price to be 'good'?)*
- What is the problem of the prices?
- How can this be solved?

9. Capital

-If you earn some extra money, where would you use it for? *(Answer indicates if people can invest in activities, or that they want to use the money for what they perceive as urgent shortages)*
-Can you get extra money? *(From whom/ where? What arrangements? Consequences? Problems? Why not?)*
-Would you like to have a loan? Why (not)? *(investment source? High interest? Unreliable source? Unreliable money?)*

10. Labour

- If you have extra time or extra person who can work, what do you want him/her to do?
- If you have extra labour, would this increase your harvest? how? To what extent?
- Do you have an urgent shortage of labour at any time during the year?
- Where can you get extra labour if you need it? *(nowhere, (more) children, family, (schooled) labourers, labour saving technologies, others)*

11. Social network

- Are you member of a farmer organization? Which one?
- What does that organization do for you? What do you have to do for the organization?
- Is it a problem for you to get information and/or advice *(on prices, farming techniques, other things)?* Why? *(E.g. access to courses, internet, telephones, farmers organization, others)*

12. Tradition/ cultural/ religious (only relevant for animals why?)

-Are you part of a religion? Which?
-Do you sell/buy products to/from your religious organization?
-Do you they provide help *(loan, labour, inputs etc.)*?

Note: There might be cultural norms or stories that impose certain behaviour which inhibit entrepreneurship. It is difficult to directly ask in this direction so be open to this possibilities from all stores you hear!

13. Transport/ *infrastructure*

-Does transportation cause any problem? Why, what, how *(costs and/or presences of roads, cars/bikes/busses/lorries)*?

14. Other factors !

Appendix 2. The Bellagio Declaration

The Bellagio Working Group for the African Green Revolution
February 22, 2008

Fund for the African Green Revolution

1. To achieve the MDGs, now at the critical halfway mark, Africa will need a substantial boost in agricultural productivity. Higher agricultural productivity will directly support:

(1) the reduction of poverty (MDG-1)
(2) the reduction of hunger (MDG-1)
(3) child survival (MDG-4)
(4) gender equity (MDG-3)
(5) school completion (MDG-2)
(6) greater resilience to climate change and other natural hazards (MDG-7)

2. The African Union and bold African leaders and governments have recognized this priority in the Comprehensive African Agriculture Development Programme (CAADP), which provides the overall framework for agricultural development in Africa. A breakthrough in African agriculture is feasible first and foremost because of Africa's vigorous efforts to accomplish that breakthrough. The opportunity and urgency has also never been higher, since the heightened policy leadership is now accompanied on the negative side by soaring world food prices and increased climate risks, and on the positive side by high export commodity prices and therefore new economic opportunities through agricultural transformation.

3. Higher agricultural productivity is only a part of the solution to any of these challenges. The fight against hunger, for example, depends not only on increased food supplies and higher rural incomes, but also on gender equity, micronutrient sufficiency, de-worming, community awareness and capacity building, safety nets and early-warning systems, and targeted programs aimed at pregnant mothers, young children (especially under two years), and school-aged children.

4. The focus on the African Green Revolution should be on Africa's smallholder farmers, with croplands typically below 2 hectares (though possibly somewhat higher in marginal areas), or those engaged in subsistence pastoralism. Africa's smallholders are among the world's poorest people. Their crop yields are low in comparison with the rest of the world, roughly one third of the rest of the developing world. Pastoralists facing grave threats of famine, extreme poverty, and climate change. Throughout sub-Saharan Africa hunger is rife, and survival is constantly under threat from droughts, pests, and climate shocks. Women play a central role in smallholder food production, and therefore bear a special vulnerability. Moreover, with 96 percent of African croplands dependent on rainfall rather than irrigation, there are chronic risks of droughts and dry spells and a remarkable vulnerability to anthropogenic climate change.

5. In most of Africa, entire villages, and indeed regions, are characterized by subsistence smallholder farming. Whole communities, therefore, live in extreme poverty and relative economic isolation, with a low degree of commercialization of economic activity and a lack of access to basic infrastructure (roads, power, irrigation, safe water and sanitation) and market services (such as financing of agricultural inputs, formal marketing of output, post-harvest storage, and transport to markets). By 2010, there will be around 540 million rural Africans, and approximately three-quarters of these will live in part-time or full-time smallholder farm households, amounting to around 400 million people in 80 million households. Most of these will be extremely poor.

6. The main goal of the African Green Revolution is to help impoverished smallholder communities to make the transformation from subsistence farming to a mixed rural economy of commercial farming and small-scale industry and services. This transformation will raise incomes, reduce poverty and hunger, and unleash self-sustaining private-sector-led economic growth. This transformation should occur as part of other broad changes in society, including a dynamic urban economy, the development of national-scale infrastructure, the scaling up of public health and education, and the increased resilience and adaptation to climate change.

7. The African Green Revolution is feasible. Current technologies, if properly scaled up, would allow Africa to achieve a dramatic increase in food production and a powerful diversification of the rural economy, including greatly increased and diversified agricultural exports, and a reduced dependence on external food aid. As one dramatic example, Malawi has more than doubled its food production in the past three years compared with annual averages of the preceding decade, following the introduction of a bold smallholder input program. Ethiopia has similarly expanded agriculture at a dramatic rate, thereby fueling double-digit economic growth, and a boom in commodity exports. These countries, and others, have directed an increasing share of national budgets to agriculture, a sine qua non of an agricultural breakthrough. Nonetheless, a major problem confronting African governments is a lack of a large- scale grants-based facility to allow them to take their successes in agriculture to scale.

8. The transformation of subsistence smallholder communities to a commercial rural economy will require approximately [15] years to allow such communities to become self-sustaining, with three distinct conceptual phases, though ones that will inevitably overlap in actual time. The first phase will be the rise of food productivity and food security, roughly a doubling of food yields by 2013 (five years) or earlier, linked to improved market access to bolster farm incomes; the second will be the build-up of market linkages and market institutions in an increasingly diversified rural economy; the third will be the emergence of private-sector market-based growth without the need to rely on continued donor financing for agricultural transformation.

9. The first two phases will require a significant increase in donor financing, directed to community-based investments in agriculture, small-scale infrastructure (e.g. feeder roads, electricity, storage), and rural institutions (e.g. micro-finance institutions, agro-dealers, producer organizations, agricultural services such as extension and veterinary care, and small-scale agro-processing). Much of this donor financing will be in the form of public financing of public-private partnerships, of the sort outlined below.

10. Total external (donor) financing needs will be grant support on the order of $5-10 billion per year, and probably closer to the higher end in view of the recent surge in the world prices of fertilizer, energy, and other inputs to transformation. This will be around 15-20 percent of the total external aid to Africa (of at least $50 billion by 2010) committed by the G-8. Current aid to African agriculture is probably no more than $1.5 billion per year, and probably closer to $1 billion. Domestic contributions by African countries should adhere to the Maputo Commitment of 10 percent of budget revenues directed to agriculture.

11. The international financial institution (IFI) which currently comes closest to the mandate and experience with financing of community-based rural investments and smallholder transformation in Africa is the International Fund for Agricultural Development (IFAD). IFAD's direct funding activities in sub-Saharan Africa are currently expected to be on the order of [$500] million per year in the coming three years.

12. Many other institutions and special funds contribute to financing community-based programs in agriculture, nutrition, and small-scale infrastructure in Africa, including the World Bank, UNICEF, the World Food Program (WFP), IFAD, the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP), and the African Development Bank (ADB). Each has its distinctive mandates and areas of

focus. Most recently, the Alliance for a Green Revolution in Africa (AGRA), initiated and funded by the Gates Foundation and the Rockefeller Foundation, adds a major new institutional supporter of the African Green Revolution, with new programs on seeds, soil health, markets, water management, policy, and extension.

13. There should be a new funding modality to support the rapid and effective scale-up of donor financing for smallholder transformation, from around $1 billion per year to around $10 billion per year in the anticipated 15-year period, starting with sufficient scale. Much of this, perhaps [$5 billion per year] should be provided in a new Fund for the African Green Revolution (FAGR), and the rest should come as increased flows through existing multilateral institutions including the World Bank, the African Development Bank, IFAD, FAO, WFP, the UNDP, and relevant institutions in Africa. AGRA should establish close institutional links with the new FAGR, and perhaps even to constitute the FAGR itself, if AGRA's donors and other donors choose to proceed in this manner.

14. The FAGR will have the following core modalities, building on successful precedents such as the Global Alliance for Vaccines and Immunizations (GAVI) and the Global Fund to Fight AIDS, TB, and Malaria (GFATM). It would:

- Invite country-led proposals in two or three funding rounds per year
- Review those proposals by an independent technical committee
- Commit to financing all scientifically and managerially sound proposals
- Operate on performance-based funding and results-based programming
- Ensure reliable medium-term financing for approved programs
- Monitor and evaluate all funded programs, including their potential environmental consequences
- Provide transparent internet-based records of all programs
- Fund governments, NGOs, private-sector institutions, and partnerships, in the context of national programs

15. The FAGR will fund programs such as (but not limited to) the following:

- Market institutions (for inputs and outputs) that provide incentives for smallholder farmers
- Smart subsidies for agricultural inputs (improved seeds, fertilizers, small-scale irrigation) to improve access and affordability for farmers
- Sustainable land and water management
- Local infrastructure (feeder roads, electricity)
- Agro-processing, including storage
- Multiplication of improved seeds
- Local nurseries for crop diversification
- The uptake of livestock and poultry in local farm systems
- Start-ups of aquaculture
- Veterinary services for livestock
- Vegetable gardens and community nurseries to promote improved nutritional content of local foods
- School feeding programs
- Risk management through new market-based financial instruments, such as weather-linked insurance and bonds
- Food transfers for vulnerable groups (e.g. people living with AIDS, the elderly, widows, orphaned children) using locally produced foods
- Agricultural extension services
- Training of community-based agricultural officers

- Adaptive research on new technologies
- Funding for producer organizations such as farmer cooperatives
- Credit guarantees for microfinance units
- Capital investments for agro-dealers and small-scale agricultural processing enterprises

These types of interventions, appropriate to specific local conditions, will be grouped in synergistic packages, to facilitate rapid uptake and effective management, and to benefit from the powerful inter-linkages among these measures. Note that the delivery of these interventions must be accompanied by programs of "adaptive research" to develop and test new seed varieties and new agronomic techniques as they are introduced and scaled up in new locations.

16. As with the GFATM and many IFAD programs, country submissions to the FAGR will reflect a consortium of national governments, civil society institutions, farmer associations, and other key stakeholders. (In the GFATM, this consortium is called the "country coordinating mechanism," or CCM, and a similar procedure would be followed here). Farmers groups will be afforded active participation and leadership throughout, to ensure that they are the ultimate beneficiaries of the gains in this effort.

17. All FAGR programs will be quantified, performance-and-results-based, and subject to independent review and audits. Consistent with the Paris Declaration on AID Effectiveness, the fund will respond to and be streamlined with national priorities and country leadership, to ensure the highest possible distribution of funding directly to intended recipients with the lowest overhead.

18. The FAGR will be created in a manner to support a rapid start up of operations. The FAGR will be created during 2008, with the first funding round opened no later than December 2008, and the first grants approved by the end of March, 2009. To facilitate the rapid and reliable quick disbursement of funding, the donors should consider locating the FAGR as a special fund within an existing IFI.

19. One possible location would be as a special independent program housed at IFAD, and with close links to CAADP, though with an independent FAGR Board (perhaps based initially on the AGRA Board with an expanded group of partners). IFAD would be the executing agency, and the FAGR would rely on IFAD administrative and financial systems. This co-location of the FAGR within IFAD would have several desirable implications, including:

- Location of the FAGR among the agriculture-based Rome institutions (FAO, WFP, IFAD)
- Rapid operational reach of the FAGR in all of Africa, based on IFAD's programmatic presence throughout all of sub-Saharan Africa
- Ability to tap into IFAD's extensive network of collaborating institutions, including the African Union (and CAADP), the World Bank, the other Rome-based institutions, and the African Development Bank

Of course such a decision would depend upon IFAD's management and board decisions as well as those of other potential donors and stakeholders.

20. The Governing Board of FAGR will include:

- Relevant international institutions, such as the World Bank, ADB, IFAD, FAO, WFP, and UNDP
- AU/NEPAD
- Major bilateral donors
- AGRA
- Private foundations

- Representatives of smallholder farmer associations and civil society organizations
- Private-sector businesses

21. In addition to increased funding via the FAGR, other complementary funding increases are urgently needed to complete the rural transformation and to achieve the MDGs in Africa. These include the following.

Nutrition programs overseen by WFP and UNICEF, including:

- Nutrition programs for children under 2 years
- Emergency feeding and safety net programs
- Nutritional supplementation for pregnant women and lactating mothers
- Nutritional fortification and supplementation of micronutrients
- De-worming
- School feeding programs (by WFP)
- Local procurement of food for strategic grain reserves and safety nets (by WFP)

Note there are enormous opportunities for linking the large-scale food-aid mechanisms in WFP to the support of smallholder transformation, through creative approaches to contracting and procurement for food and distribution.

Capacity building of local governments, communities, and rural institutions by UNDP, World Bank, and the Rome-based agencies,

Infrastructure investments, especially roads, power generation, broadband connectivity, and watershed management, by the World Bank and African Development Bank

The African Fertilizer Financing Mechanism, hosted in the ADB, designed to lower unit costs of fertilizer throughout Africa. The Fertilizer Facility will coordinate closely with the FAGR given their complementary roles.

22. While the FAGR will focus on the scale up and delivery of existing technologies, a parallel effort must be sustained and expanded for research and development. This should include R&D directed at new crop varieties and new agricultural technologies, as well as institutional innovations. Both kinds of R&D will have enormous social returns.

23. Areas for special attention in scaled-up R&D on agricultural technologies include:

- Crop varieties robust to climate change (temperature-resistant and drought-resistant varieties)
- New low-cost technologies for the use of fertilizer (e.g. micro-dosing), improved efficiency of use of organic and mineral nutrients and small-scale irrigation
- New tree crops and perennials for improved local nutrition
- Improved livestock breeds
- Improved aquaculture
- Integrated pest-control strategies
- Biofuels that are sustainable and non-competing with food production
- Water conservation and recycling
- Conservation farming
- Veterinary services

24. Areas for special attention in scaled-up R&D on institutional and policy design include:

- Financing for inputs for smallholder farmers
- Risk management through financial instruments
- The formation and design of producer organizations to facilitate market linkages
- Design of extension delivery systems
- Data management
- Methods of infrastructure finance
- Design of smart subsidies
- Design of contract farming
- Market intermediary systems designed for smallholder benefit
- Land contracting design

25. Donor-supported R&D for African agriculture is approximately [$X] million per year. We recommend that this sum at least [double] by 2010, and be channeled through a variety of institutions, including the CGIAR, NARs, and African Universities. The CAADP process can help to guide African research priorities.

Appendix 3. Integrated Rural Development

Integrated Rural Development and Institution Building as a Participatory Learning Process to enhance development effectiveness (by Gabriel Ferrero y de Loma-Osorio, Ph.D. [1])

A long has been learnt during the past decades about the success and failure of rural development and agricultural development programmes. The experience with Integrated Rural Development projects during the 70s and 80s has been a fruitful source of learning.
We now acknowledge that a comprehensive approach is needed; that a strong role from states is necessary; that development can no longer be considered as blueprint. A "new" integral concept[2] is needed, considering a territorial approach, a different role of states –including local authorities-, a broader partnership including private sector, CSO and communities, and development as a process in all its complexity.

In promoting rural development several territorial levels should be considered, where public policies and programmes are developed and where social interactions–including partnerships between several stake and shareholders- take place (and in consequence social capital is developed or erased). Those are: a) Household, community and local level; b) Territorial or regional –sub national in any case- level; and c) National level.
In the local and territorial level agriculture production, diversified rural development and social protection networks can be linked adopting a territorial approach to rural development, so several strategies should be considered simultaneously:

a. Enhancing local and community partnerships for agriculture production and development.
b. Enhancing Local governance and empowering participation -especially of the poor- in decision-making[3], including the decision of what to produce and what to eat.
c. Promoting Grassroots organizations and their articulation (community committees, cooperatives, trade unions …)[4].
d. Valuing and mobilizing local knowledge –locally owned generation, sharing, application, dissemination- using community and local based social networks and farmer-to-farmer practices[5].
e. Creating or supporting locally adapted mechanisms of association, but also mechanisms for redistribution, access to assets –including land, finance, knowledge and technology and services-, addressing inadequate patron-client relationships.
f. Take into account social relationships, institutions and the potential of social capital[6].

Four principles can synthesize the local dimension of rural development[7]:

- **Local specificity** (context-adapted programmes and policies)
- **Empowerment** (related to voice, power relationships, Rights, access to assets, participation of the poor, governance and local knowledge, accountability)
- **Comprehensive approach to agriculture** (related to sustainable livelihoods, gender, culture diversity, intermediate technologies, non-farm income, diversification, nutrition and rural-urban linkages)-.
- **Learning Process Approach** (related to the complexity of rural development, rural production and uncertainty, to the need for adaptation in the programmes and policies, and to knowledge management)

[1] Professor of Development Management at the Technologic University of Valencia, Spain. Currently Deputy Director for Development Policies and Aid Effectiveness. D.G. of Planning and Evaluation of Development Policies, Secretary of State of Development Cooperation. Government of Spain.
[2] As named by de Janvry, 2004
[3] Blackburn, *et. Al,* 2000; Chambers, 1997; 2005.
[4] Uphoff, 1993; Krishna, Uphoff & Easman, 1997
[5] Leach & Scoones, 2006.
[6] Dasgupta & Serageldin, 1999.
[7] Korten, 1984; Mosse, *et. Al.,* 1998.

Aid Effectiveness principles (Paris Declaration plus Accra Agenda for Action) constitute an excellent basis for implementing adequately aid-supported strategies at the national level, and synthesizes a more comprehensive framework for achieving development results than coordination considered in an isolated manner –coordination is a necessary condition but not enough.

But Ownership, Alignment, Harmonization, Managing for Development Results and Mutual Accountability must be considered also at local and regional level as principles for an effective rural or agriculture development. They can be synthesized in a "**local and democratic ownership**" principle if a participatory bottom-up process approach as described previously is adopted. For doing so, and both for national or local level, it is necessary to support public policies, national and local governments, without creating parallel programmes or parallel implementation units, in order to generate adequate bottom-up processes and supportive country level public policies.

Appendix 4. Malawi

A National Programme with High-Productivity Quick Impact (Prepared by Glenn Denning of the MDG Center for East and South Africa, Nairobi)

The smallholder sub-sector of Malawi comprises about 2.4 million households with an average farm size of 1.2 ha. Maize, the staple food crop, is grown by 97% of farming households on about 1.6 million ha of smallholder farms and contributes 60% to total calorie consumption. Over decades of intensive cultivation in the absence of significant fertilizer use, soils in smallholder fields have been depleted of nutrients, particularly nitrogen. National yields of smallholder maize have averaged 1.2 MT/ ha during the last 20 years. More than half of the farming households operate below subsistence. Only 20% of maize producers sell their product and most households purchase maize at much higher prices when stocks are exhausted.

In the 2004/5 rainy season, many parts of the country went without rain for up to one month during January and February 2005. This dry spell had a devastating effect on maize production: the national average yield dropped to 0.81 MT/ha, one of the lowest on record. Total maize production for the 2004/5 season was just 1.22 million MT -- a decline of 24% from the previous year, and just 57% of the estimated national maize food requirement. The UN issued a "flash appeal" for food aid and agricultural inputs. Donors responded with food aid but were unwilling to support an input subsidy.

The Government of Malawi responded in mid-2005 with a national scheme to subsidize improved seed and fertilizer. The scheme involved the distribution of fertilizer vouchers (not more than two per household) and seed vouchers that enabled most smallholder farmers to purchase fertilizer and seed at about one quarter of the market cost. Drawing on $58 million from its national budget in 2005, $65 million in 2006, and an estimated $80 million in 2007, the programme reached most of Malawi's smallholder maize farmers. Resulting harvests in 2006, 2007, and 2008 have dramatically improved the level of national and household food security (see below). In the past two seasons, the country's smallholders have recorded a 50% increase over the 2003-2007 average. The surplus of over a million MT in 2007 enabled the country to export 300,000 MT maize to Zimbabwe and contribute to regional food security through World Food Programme procurements.

	2003	2004	2005	2006	2007	2008 (est)
Production (mil MT)	1.98	1.73	1.22	2.58	3.44	3.28
5-year av. (mil MT)	2.19	2.19	2.19	2.19	2.19	2.19
% above av.	-10%	-21%	-44%	18%	57%	50%

Malawi's experience demonstrates the feasibility and value of investing in food crops grown by smallholders as a first step towards sustained economic growth. In a country where agriculture employs 78% of the national labour force and provides food security and livelihoods for over 10 million people, agricultural productivity growth is having a direct positive effect on the broader achievement of the MDGs. The number of Malawians at risk of hunger decreased from 5 million in late 2005 to just over 500,000 in late 2007. Beyond the most obvious impacts on reducing hunger, the maize surpluses reduced the risks of disease and increased school attendance. Communities also report increased economic activity in areas were productivity increases have been most pronounced. Moreover, at a time when many country experienced food riots, Malawi's surplus over the past year has buffered the population from the recent food price increases.

Appendix 5. Achieving MDG1

A Comprehensive Framework for Action (CFA); July 2008. UN High-level task force on the global food security crisis.