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A Poor Agriculture and an Organic Uganda?

Views on current Challenges and Issues of rural Uganda and the Role of Organic Agriculture

Final Thesis

by

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Abstract

There is growing evidence, that Organic Agriculture (OA) is a contributory tool to face current challenges of rural Uganda and to create various opportunities for millions of small scaled subsistence farmers. Rural challenges of Uganda include a stagnation of yields per hectare of most important food crops, human induced land degradation on large scale, massive deforestation and this led to a continuous expansion of agricultural area during last 40 years. An annual population growth rate of approximately 3% enforces these issues and may lead to a depletion of available land for agricultural expansion within the next ten years. Additionally poverty is wide spread in Uganda, where in 2005 about 75% of the total population was living with less than 2 US$ per day. Especially small-scaled subsistence farmers are affected by poverty. This report examines findings on the questions of *what* OA may contribute to reduce poverty in rural Uganda and to solve current challenges and future problems of land scarcity and land degradation as well as deforestation? And in a second step: *How* OA possibly contributes to a solution? A third question addresses the organizational and structural environment of OA and its effects on OA.

While the government of Uganda and other organizations involved like World Bank are deeply committed to facilitate a modernization of agriculture by the means of higher external inputs (fertilizers, pesticides, etc.) into agricultural systems and hence to eradicate rural poverty by drawing farmers out of agricultural subsistence mode towards commercialization and non-farm activities, OA is likely to concentrate on local available resources and inputs to enforce self-reliance of the agricultural system and hence of the farmers themselves. An asset-based model of agriculture with five different types of capital explains the potential benefits of OA. During the organic production process natural, human and social capital (and in the longer run physical and financial capital) is accumulated and thus positively affects agricultural outputs (foods, fibres, fuels, etc.). So OA facilitates a sustainable production, which ensures higher and more stable yields than conventional agricultural systems in Uganda, while environment benefits and land degradation may reversed. Following Sen's Capability Approach OA is the base for a natural and socio-economic environment, which assists to the creation of capabilities. These capabilities lead possibly towards a range of certain functionings aspired by farmers. In composite index such as the HDI, OA positively influences various compounds either directly or indirectly and is a strategy to reach objectives of the international community such as the MDG. As the implementation of OA follows strictly guidelines, an operationalization towards objectives such as the MDG or the improvement of HDI maybe could follow these guidelines in coherent topics and issues to be successful.

Key words: Organic Agriculture; Uganda; poverty reduction; land scarcity; land degradation; deforestation; rural development; Capability Approach; Green Revolution.

Kurzfassung

Es mehren sich die Anzeichen dafür, dass die Ökologische Landwirtschaft (ÖLW) ein geeignetes Mittel darstellt, das beiträgt, den momentanen Herausforderungen im ländlichen Uganda zu begegnen, und gleichzeitig vielfältige Möglichkeiten für Millionen von subsistenzorientierten Kleinbauern und Kleinbäuerinnen bietet. Die letzten 40 Jahre ging eine beständige Ausweitung der landwirtschaftlichen Nutzfläche einher mit stagnierenden Erträgen (pro Hektar) der wichtigsten Kulturpflanzen für Nahrungsmittel, einer von Menschen verursachten Degradation weiter Teile des Landes und einer massiven Abholzung der bewaldeten Flächen. Eine jährliche Bevölkerungswachstumsrate von etwa 3% verstärkt diese Trends und kann innerhalb der nächsten zehn Jahren zu einer Erschöpfung der für eine weitere Expansion der landwirtschaftlichen Nutzfläche nötigen Flächen führen. Zusätzlich ist Armut weit verbreitet in Uganda: Im Jahr 2005 etwa lebten 75% der Bevölkerung mit weniger als 2 US$ pro Tag. Subsistenzorientierte Kleinbauern und Kleinbäuerinnen sind von Armut besonders betroffen. Die vorliegende Arbeit ging folgenden Fragen nach: *Was* kann die ÖLW zur Armutsreduktion im ländlichen Uganda und zur Lösung der momentanen Herausforderungen und zukünftigen Problemen der Landverknappung, Degradation des Landes und der Abholzung der bewaldeten Flächen beitragen? Und weiteres: *Wie* kann die ÖLW u.U. dazu beitragen? Eine dritte Frage richtet sich an die strukturellen Rahmenbedingungen der ÖLW und deren Auswirkungen auf diese.

Während die Regierung Ugandas und andere involvierte Organisationen, wie die Weltbank, ihr Engagement dahingehend ausrichten, die Landwirtschaft durch vermehrten Einsatz von externen Inputs (chem. Dünge- und Pflanzenschutzmittel, etc.) in die landwirtschaftlichen Systeme zu modernisieren und durch eine Verschiebung von subsistenzorientierter Landwirtschaft in Richtung Kommerzialisierung eine Armutsreduktion zu erreichen, zielt die ÖLW durch die Nutzung von regional verfügbaren Ressourcen und Inputs darauf ab, die Eigenständigkeit des landwirtschaftlichen Systems und dadurch der Bauern und Bäuerinnen zu stärken. Ein Asset-based-model der Landwirtschaft, bestehend aus fünf verschiedenen Arten von Kapital, erklärt den potentiellen Vorteil der ÖLW. Während des Produktionsprozesses in der ÖLW wird natürliches Kapital, Human- und Sozialkapital (und längerfristig physisches Kapital und Finanzkapital) akkumuliert und der Output (in Form von Nahrungsmittel, Fasern, Energieträgern, etc.) positiv beeinflusst.

ÖLW unterstützt daher eine nachhaltige Produktion, welche höhere und stabilere Erträge als die konventionellen landwirtschaftlichen Systeme ermöglicht, während die Umwelt geschont wird und die Landdegradation reversiert wird. Nach Sens Capability Approach (Befähigungsansatz) macht die ÖLW eine Basis für eine Umwelt (im Sinne von Natur und sozioökonomischem Umfeld) möglich, welche die Schaffung von *capabilities* unterstützt. Diese *capabilities* führen möglicherweise zu einer Reihe von verschiedenen *functionings*, welche von den Bauern und Bäuerinnen erzielt werden wollen. In zusammengesetzten Indexen, wie dem HDI, kann die ÖLW unterschiedliche Bestandteile direkt oder indirekt in eine positive Richtung beeinflussen und stellt so eine Strategie dar, um die gesteckten Ziele der Internationalen Gemeinschaft, wie die MDGs zu erreichen. Da die Implementierung der ÖLW strikten Richtlinien folgt, könnte eine Operationalisierung hinsichtlich der MDGs und einer Verbesserung des HDI in kohärenten Betätigungsfeldern und Themen zu einem Erfolg werden.

Schlagwörter: Ökologische Landwirtschaft; Uganda; Armutsreduktion; Landverknappung; Degradation der Landschaft; Abholzung; ländliche Entwicklung; Capability Approach; Green Revolution

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Abbreviations and Acronyms

ACS	Alley Cropping System
AFS	Agroforestry system
AGRA	Alliance for a Green Revolution in Africa
AIDS	Acquired Immunodeficiency Syndrom
AKST	Agricultural Knowledge, Science, and Technology
A2N	Africa 2000 Network
BOKU	University of Natural Resources and Applied Life Sciences, Vienna (Universität für Bodenkultur Wien)
Bt	Bacillus thuringiensis
CA	Capability Approach
CBTF	Capacity Building Task Force on Trade, Environment and Development
CGIAR	Consultative Group on International Agricultural Research
CoA	Conventional Agriculture
DAC	Development Assistance Committee
DDT	Dichlordiphenyltrichlorethan,
EAOM	East African Organic Mark
EAOPS	East African Organic Products Standard
EPOPA	Export Promotion of Organic Products from Africa
ESA	Department of Economic and Social Affairs of the United Nations
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
GNI	Gross National Income
GoU	Government of Uganda
ha	Hectare (unit of area; equal to 10.000 square metres)
HDI	Human Development Index
HDR	Human Development Report
HIPC	Heavily Indebted Poor Countries
HIV	Human Immunodeficiency Virus
IAASTD	International Assessment of Agricultural Science and Technology
IBRD	International Bank for Reconstruction and Development; World Bank
ICS	Internal Control System
ICT	Information and Communications Technologies
IDP	Internal Displaced Persons
IEC	International Electrotechnical Commission
IFPRI	International Food Policy Research Institute
IFOAM	International Federation of Organic Agriculture Movements
IMF	International Monetary Fund
IMO	Institute for Market Ecology
IOAS	International Organic Accreditation Service
ISO	International Organization for Standardization
JAS	Japan Agricultural Standard of Organic Agricultural Products
LOFP	Lango Organic Farming Promotion
LRA	Lord Resistance Army
MAAIF	Ministry of Agriculture, Animal Industries and Fisheries
MDG	Millennium Development Goals
MEMD	Ministry of Energy and Mineral Development (of Republic of the Uganda)
MFPaED	Ministry of Finance, Planning and Economic Development (of the Republic of Uganda)
Mio.	Million (10^6 = 1.000.000)
MOH	Ministry of Health (of the Republic of Uganda)
MWLE	Ministry of Water, Lands and. Environment (of the Republic of Uganda)
NAADS	National Agricultural Advisory Service (of the Republic of Uganda)
NDP	National Development Plan
NEMA	National Environment Management Authority
NGO	Non Governmental Organization
NOGAMU	National Organic Agricultural Movement of Uganda
NOP	National Organic Programme

NRM	National Resistence Movement
OA	Organic Agriculture
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OTP	Organic Trade Point
PEAP	Poverty Eradication Action Plan
PEEST	Poverty Eradication through Evironmentally Sustainable Technologies
PMA	Plan for Modernisation of Agriculture
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
SaB	Slash-and-Burn
SIDA	Swedish International Development Co-operation Agency
t	Tonne/Tonnes (10^3 = 1000kg)
UBOS	Ugandan Bureau of Statistics
UgoCert	Uganda Organic Certification Ltd.
UK	United Kingdom
UN	United Nations
UNBS	Uganda National Bureau of Standards
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UOS	Ugandan Organic Standard
USA	United States of America
Ushs	Ugandan Shillings
WDR	World Development Report
WHO	World Health Organisation

> The greatest of evils and the worst of crimes is poverty.

George Bernard Shaw [1]

1. Introduction

Recently agriculture got in scope of international development organisations as a driver of rural development issues. In 2007 World Bank (IBRD) published its yearly *World development report 2008: Agriculture for Development* and considers agriculture[2] as a "vital development tool" and "as the basis for economic growth in the agriculture-based countries" which "requires a productivity revolution in smallholder farming." (IRBD 2007:V/1). United Nations Development Programme (UNDP) positively experiences and highlights agriculture in its "*Uganda human development report 2007 – rediscovering agriculture for human*

[1] In: Sen 2007.

[2] So IBRD for first time since early 1980ies places agriculture and the productivity of small-scaled farmers at the centre of a global agenda to reduce poverty.

development" as it "has a direct bearing on human development through the provision of basic food for the population as well as the required raw materials for industrialisation." (UNDP 2007:2) So, after concepts such as *sustainable development*, *good governance*, *participation* or *culture* and *civil society* (Faschingeder 2003) it might be the turn of *agriculture* to be an essential part in the merry-go-round of "development-business" once again, like it was in the 1970ies. Then agriculture had been focused as one response to overwhelming modernisation theories (which considered agriculture as an initial *engine of growth* (Morris et al. 2007)[3] of a development in stages (Rostow 1960)) as a means for rural development (Nohlen 2003). Global financial turmoil and present economic crisis – or shall one call it a next full speed deflating bubble bursting of capitalism – combined with remarkable fluctuation of prices for agricultural commodities on world market last two years drove us into a return to the old theme for development: Currently agriculture as a means for development in general seems to be *en vogue*.

This report queues up with international development organisations to mount agriculture as a main issue related to the improvement of livelihoods of million rural living people and to face current environmental challenges. Though agriculture is not agriculture - as Achim Steiner, Executive Director of United Nations Environmental Programme (UNEP) stated[4]: "Agriculture is not just about putting things in the ground and then harvesting them. It is increasingly about the social and environmental variables that will in large part determine the future capacity of agriculture to provide for eight or nine billion people in a manner that is sustainable." Agriculture is a multi-faceted topic and one cannot consider it as a panacea for development challenges, especially if there is no reference on what is meant by agriculture. Or how World Bank wants to acquire "productivity revolution in smallholder farming…" (IRBD 2007:1). Is it a hidden agenda of World Bank to favour a "2nd Green Revolution" after the first attempt failed, at least in Sub-Saharan Africa? Is it World Bank's next shot in the dark to introduce "modern" agro-techniques (such as genetically modified crops combined with agrochemicals) after stagnation or decline of most crop yields in Sub-Saharan Africa last 40 years to boost "antiquated" African small-scaled subsistence farming systems?

However, multi-faceted agriculture is the heart of this paper with Organic Agriculture (OA) as its pacemaker, on which this paper is focused on!

So the purpose of this report is to provide views on the concept of OA as a promising tool to improve rural people's life and as a possible solution for environmental challenges directly corresponding with agriculture such as land degradation or soil fertility. On the one hand the report focuses on the situation of OA and its effects on livelihood of rural dwellers in the Democratic Republic of Uganda. It highlights poverty reducing efforts of the Government of Uganda and its interlinkages with OA. On the other hand the paper tries to analyse the structural and organisational environment OA is embedded in and how this environment affects forming OA in Uganda.

However, it is not the objective of this report to discuss how knowledge-transfer on the issues of OA is done, neither if OA as an "European" idea is a justifiable or suitable tool to effect rural population in Uganda, nor to rehash the issue of neo-Malthusianism reflected on OA or discuss the distribution of land and resources among the population of Uganda.

The paper consists of five parts: The first introductory part offers some basic information about Uganda and wants to deepen the understanding of recent socio-economic and

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[3] This publication of World Bank was written in year 2007 and there curiously still are remains of Rostow´s assumption of agriculture as an "*engine of growth* during the early stages of country's economic development" (Morris et al. 2007:15). However, this report does not assume development as a gradual process with agriculture as an initial *engine of growth* leading towards *take off*.

[4] It was stated at the intergovernmental plenary meeting from 7-12th April in Johannesburg, South Africa of International Assessment of Agricultural Science and Technology (IAASTD). On 15th of April 2008 IAASTD released its final report on the future of agriculture (UNEP 2008).

environmental challenges it's facing. This part covers an overview of trends in natural resources (as they provide the basis for all agricultural production) and selected features about population dynamics and poverty in Uganda. It displays background information, dealing about retrospective and prospective challenges of population growth in Uganda and supplying it with food while ensuring maintenance of biodiversity and ecosystems. The first part concludes with key questions on these issues: What is the role and what could be the role of OA in rural Uganda? How OA targets socio-economic and environmental challenges and how OA affects rural people? And: What is the institutional environment OA in Uganda is embedded in?

The second part focuses on the central methodical matters of the report and examines the research framework. It highlights the bias on traceability and transparency during the process of research and therefore ensures a comprehensible report.

The third part explains definitional issues surrounding the concepts of OA and poverty, before moving on to the fourth part: the results and findings of research on the issues of OA and its influences on rural population respectively environment in Uganda, as well as the analyses of the structural surrounding of OA. Part four is the main part of this report and examines the answers to the research questions stated in part two.

The report ends in part five in a conclusion and outlook. It reflects the findings of the report and looks forward paying attention on issues to be addressed in future research concerning the topics of OA and poverty eradication.

1.1. Personal Approach

In my opinion OA is an exiting and demanding issue to research on. As I am examining to live a beady-eyed life I recognise many challenges world is facing. OA is a multifaceted topic and in my opinion it needs to be approached in a transdisciplinary manner of research. OA may appear like a simple or somehow ancient style of agriculture, but in my opinion it may contribute to solve agriculture related problems and constraints with modern techniques and integrated research perspectives on complex societal-environmental configurations.

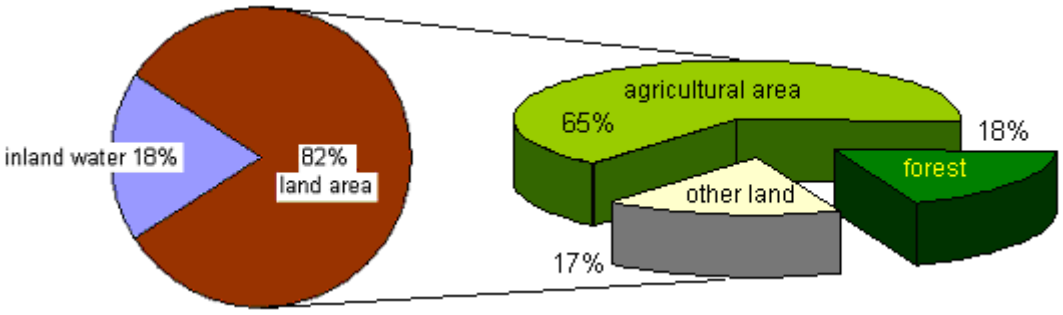
1.2. Natural resources in Uganda

Uganda is a landlocked country located in East Africa and covers an estimated total area of about 241.020 km². About 18% of country's surface is inland water (Lake Victoria, Lake Albert, Lake Kyoga, etc.) and approximately 82% (197.636,4 km²) land area[5] (see Figure 1.1; page 4). In year 2004 land area comprises around 65% agricultural area[6], 18% forests/other wooded land and 17% other land (such as grassland, infrastructure, urban areas etc). In total agricultural area accounts of 128.468,66 km² (or 12,84 Mio. ha), forests of 35.574,5 km² (or 3,55 Mio. ha) and other land of 33.598,1 km² respectively 3,35 Mio. ha (FAO 2005; FAO 2009).

[5] For comparison reasons: Land area in Uganda is around 2,5-fold than land area in Austria.

[6] FAO defines agricultural area as: arable land, permanent crops and permanent pastures

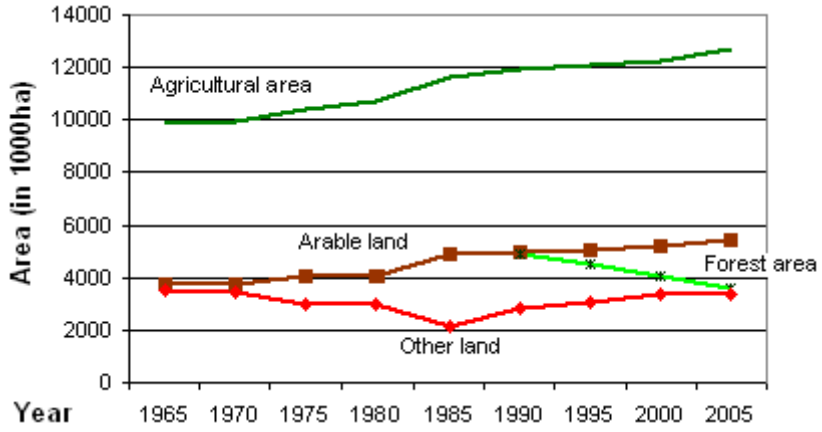
Figure 1.1: Area and land cover of Uganda (2004)



(Source: own figure; data from FAO 2005; FAO 2009b)

Last 40 years agricultural area (including arable land) continuously had been extended in Uganda. In 1965 around 45% percent of land area (or in total around 9 Mio. ha) had been used for agricultural purposes (see Figure 1.2). So until year 2005 agricultural area increased more than 42% (see chapter 1.2.2.2; page 8). At the same time there had been a decrement of land covered by forest (see chapter 1.2.1; page 4).

Figure 1.2: Trends in share of agricultural area, arable land, forest area and other land in Uganda (1965 - 2005)

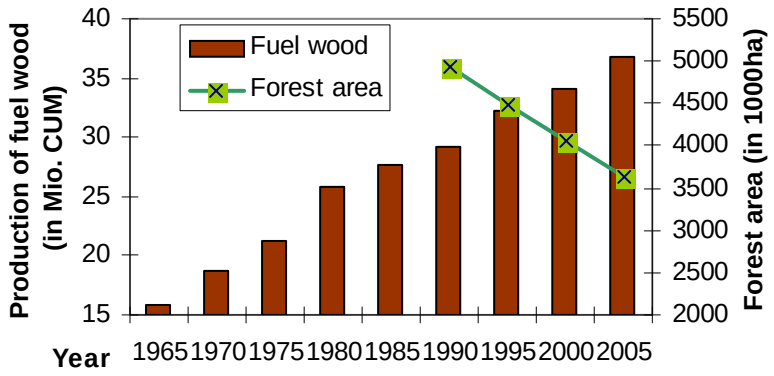


(Source: own figure; data from FAO 2009b)

1.2.1. Trends in forest resources in Uganda

Official data of the decrement in forest resources in Uganda are available from FAO only since year 1990. In year 1990 forests are accounted for 4,9 Mio ha (Figure 1.3), which was approximately 25% of total land area. During last 15 years (till 2005) forests have been reduced for 1,35 Mio. ha or by 28% to 3,55 Mio ha forested area or approximately 18% of land area (FAO 2009b). In general there has been a decline in all forms of forest cover. However, the major declines were observed in woodlands, broadleaved forests and plantations (pine). In areas were cattle production dominates (the so-called “Cattle Corridor”; it runs across the country from the northeast to the southwest) the forest area had been declined by more than 50 percent. Concerning NEMA a decline in forest cover in Uganda is expected to increase coming years (NEMA 2007).

Figure 1.3: Production of fuel wood and forest area in Uganda (1965/1990 - 2005)



(Source: own figure; data from FAO 2009b)

The main produce of Uganda's forests is fuel wood (consisting of firewood and charcoal). More than 90 percent of the total energy consumed in Uganda is obtained from fuel wood removed from forests in Uganda (MEMD 2002). Fuel wood provides many people, especially poor and rural households with a primary source of energy. "It provides almost all the energy used to meet basic needs of cooking and water heating in rural and most urban households, institutions and commercial buildings. Biomass is the main source of energy for rural industries. Trading in biomass energy, especially charcoal contributes to the economy in terms of rural incomes, tax revenue and employment. It saves foreign exchange, employs 20.000 people and generates 36.000 Mio. UShs.[7] per year in rural incomes. Fuel wood requirements have contributed to the degradation of forests as wood reserves are depleted at a rapid rate in many regions. Charcoal consumption increases at a rate close to that of urban population (6% per annum). Charcoal is generally produced on non-state land." (MEMD 2002: 19) The average distance to collect fuel wood in rural areas increased in the years 1992 – 2000 from 0,06 to 0,73 km (MEMD 2002; in: Buyinza et al. 2008a).

Since year 1965 production of fuel wood in Uganda increased notably (Figure 1.3). Estimated production of fuel wood in year 1965 was around 16 Mio. CUM[8] and nearly doubled during 35 year (until year 1990) to around 30 Mio. CUM. Recently (in year 2006) Uganda is facing a removal of 36,7 Mio. CUM fuel wood from forests with a value of around 70 Mio. US$ (FAO 2009b).

In 2005 the removal of fuel wood amounted for 90% of all removed wood products in Uganda (Table 1.1; page 6). At all (together with 10% industrial round wood of all removals) it intends to be 29,8%[9] of growing stock in Uganda (in year 2005). Consumption of fuel wood per capita and year in rural Uganda is assumed to be around 49 - 53kg. Buyinza et al. predict a rise in demand on fuel wood of around 2,2% each year in between year 2004 to 2020 (Buyinza et al. 2008b). FAO predicts 3% per annum (FAO 2001). Factors affecting the

[7] 1 Euro = 2610 UShs (March 2009)

[8] 1 CUM (solid volume unit) = 1,54 m³

[9] For comparison reasons: In Austrian forests the percentage of wooden removals of growing stock (in year 2005) accounted of 1,7 (FAO 2005). Remark: Wooden removals of growing stock (growing stock = Volume of all living trees) and decline in forest area mean different issues: "Changes in total growing stock reflect the combined effects of changes in forest area and in growing stock per hectare. However, for many countries, changes in growing stock reflect only the changes in forest area, because their estimates of growing stock are based on a single figure per hectare determined at one point in time." (FAO 2005:30)

pressure on fuel wood use are (i) type and quality of wood, (ii) technology of stove, (iii) population growth and (iv) availability of substitutes (Buyinza et al. 2008a).

Table 1.1: Removal of wood products (1990 - 2005)

Year	1990	2000	2005	Industrial roundwood		Fuelwood	% of growing stock 2005
Removals (in 1000m³)	35 909	42 936	46 449	= 4 408	+	42 041	29.8

(Source: FAO 2005, modified)

FAO Global Forest Resources Assessment 2005 listens 37 countries and areas with an estimated net negative change rate of 1 percent or more per year of forest area. Uganda ranks with a loss of forest area of 2.2%[10] each year among those ten countries with the largest annual net negative change rates for 2000–2005 (FAO 2005). Deforestation favours land degradation by water erosion of soils due to loss of buffer capacity of forests (NEMA 2006).

HDR describes the situation of Uganda's forest and the state of environmental degradation as alarming: "Ugandan forests are disappearing at an alarming 2 per cent per year. Six thousand hectares of trees are being cut down every month, at 72,000 hectares in 2006. At this rate Uganda forest will have gone 50 years hence, and 70 per cent of the 506 forest reserves in the country are at risk of destruction. The number of people encroaching (for farming, grazing and settlement) on the forests went up from 180,000 to 220,000 between 2005 and 2006, an increase of 24 per cent.

Eastern Uganda has the highest environmental degradation in the country, where three quarters of all forests and wetlands in the Eastern have been degraded. The central region is second, with 10 per cent of the forests and wetlands destroyed. Mukono, Rakai and Luwero districts scored the worst in wetland destruction in the region. The western region ranked the third, with 8 per cent of all forests decimated, followed by the North with 7 per cent." (HDR 2007:93)

Reduction in forest cover over last years was caused due to a number of factors, but mostly by (i) the conversion into agricultural and grazing land and (ii) forest resource degradation due to firewood collection, pit sawing and charcoal burning (Kayanja/Byarugaba 2001).

1.2.2. Agriculture in Uganda

Beside the range of tropical landscapes and the diversity in species, natural resources seem to be favourable agricultural production in Uganda. Fertile soils and good climatic conditions determine a huge agricultural potential. Thus in 2006 nearly 35 per cent of the country's gross domestic product (GDP; Table 1.2; page 7) and moreover 70 - 80% of export revenues was contributed by agricultural production (see BOX 2; page 17). Agricultural share of GDP and growth of agriculture continuously declined since year 2000. With an average growth rate of 2,25% (between year 2001 and 2006) contribution of agricultural sector to GDP-growth was falling behind average growth rates of other sectors (industry: 7,8%; service: 5,6%). Despite the decrease in growth rates agricultural contribution on GDP, percentage contribution of agricultural exports (cash crops) to total export was growing in the same period (Figure 1.4; page 8; UNCTAD/UNEP 2006).

Agriculture offers nearly all domestic food requirements and most of the raw materials required in local industries. Crop and livestock farming and the extraction of aquatic and forestry resources are mostly dependent on nature and the ecological integrity of the environment. Agricultural activities employ around 75% of the working population (between 14 - 64 years) and thus agriculture is the key primary economic activity of the

[10] Kayanja/Byarugaba 2001: estimated loss of forest between 1-3% per year

Ugandan people.[11] The overwhelming majority in Uganda are subsistence and smallholder farmers mainly using labour and land as the most significant inputs. Other inputs are generally insignificant in agricultural production, which is heavily resource-based. Share of big cash crop farms in the agricultural sector is negligible (HDR 2007; UNCTAD/UNEP 2006).

Table 1.2: Share and percentage growth of GDP by Agriculture (2000 - 2005)

Year	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Share of GDP (in %)	40,8	39,9	39	37,4	35,6	34
Agriculture sector GDP growth (in %)	4,6	3,9	2,3	0,8	1,5	0,4

(Source: own table; data from UNCTAD/UNEP 2006)

1.2.2.1. Climate and Soils

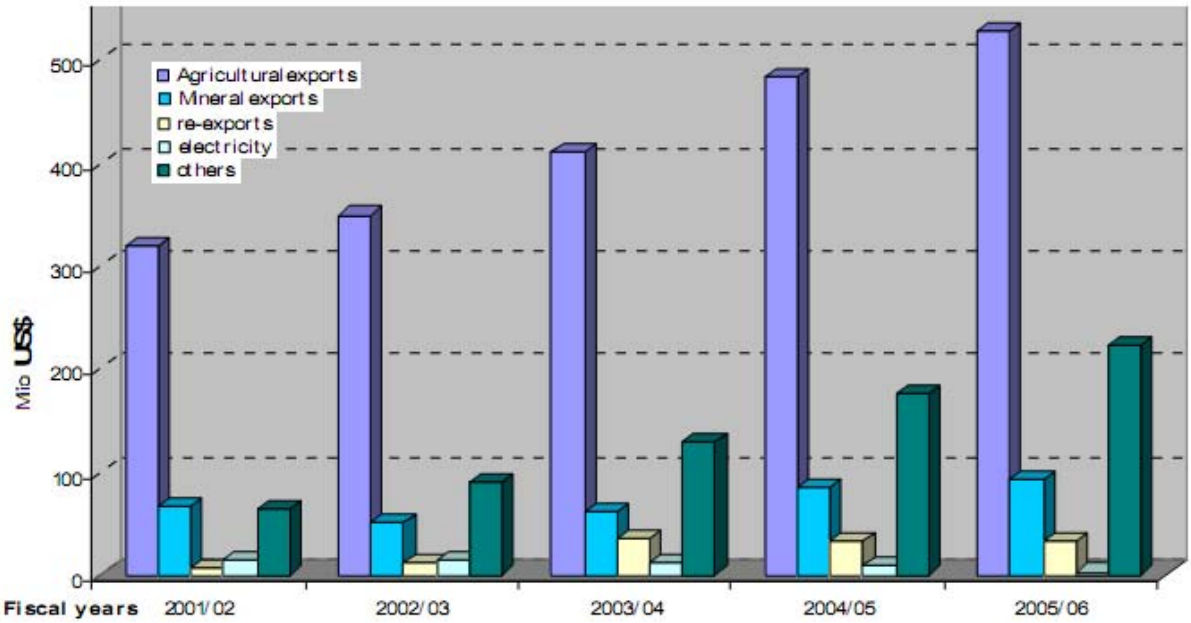
The climate in Uganda is generally tropical and favourable for agricultural production with a temperature ranging between 16° and 29° C. Mean annual rainfall is approximately 1180mm. In the south of Uganda there are two rainfall peaks occurring in March-May and August-November without a dry season in between, whereas in the northern part of Uganda between November to March it is dry season. Mild climate allows two or three harvests of crops during one year under rain fed conditions (FAO/AQUASTAT 2009; NEMA 2006).

Uganda is underlain by some of the oldest rocks (3000 – 6000 million years ago) worldwide, which have been degraded by weathering and mountain-building activity respectively tectonic plate movement. The most widely prevailing soil types are ferrallitic and to a lesser extent ferruginous soils (occurring in both forest and savannah ecosystems in Uganda). In a small rest of the country there are found highly productive volcanic soils.

Soil's average topsoil layer is around 20-30 cm followed by profound (5-10 m) subsoil. As a result of prolonged weathering, mineral content of these soils is very low. Hence organic matter and nutrients are strongly concentrated in the topsoil layer. Texture of soils range from clay loams to sandy loams although red clay loams can be found in wetter regions of Uganda (FAO/AQUASTAT 2009).

[11] For comparison reasons to agriculture where around 66% of the male working population is employed and around 81% of the female working population is engaged: Men 5,8% in industry and 28% in services; Women: 3% in industry and 16% in services (HDR 2007).

Figure 1.4: Value of agricultural exports, mineral exports, re-exports, electricity and others (2001 - 2006)



(Source: UNCTAD/UNEP 2006; modified)

"A number of parameters define the soils of Uganda and these include parent rock, age of soil and climate. The most dominant soil type is ferrallitic soil, which accounts for about two-thirds of the soils found in the country. Based on studies carried out in the past, Uganda's soils are divided into six categories according to productivity: a) very high to high productivity; b) moderate productivity; c) fair productivity; d) low productivity; e) negligible productivity; and, f) zero productivity. The high productivity soils cover 8 per cent of the area of Uganda (MWLE, 2001). Considering the country's size, this is indeed a small area. Therefore, fair and low productivity soils must be effectively managed in order to sustain Uganda's agriculture." (NEMA 2006:36)

1.2.2.2. Trends in agricultural areas

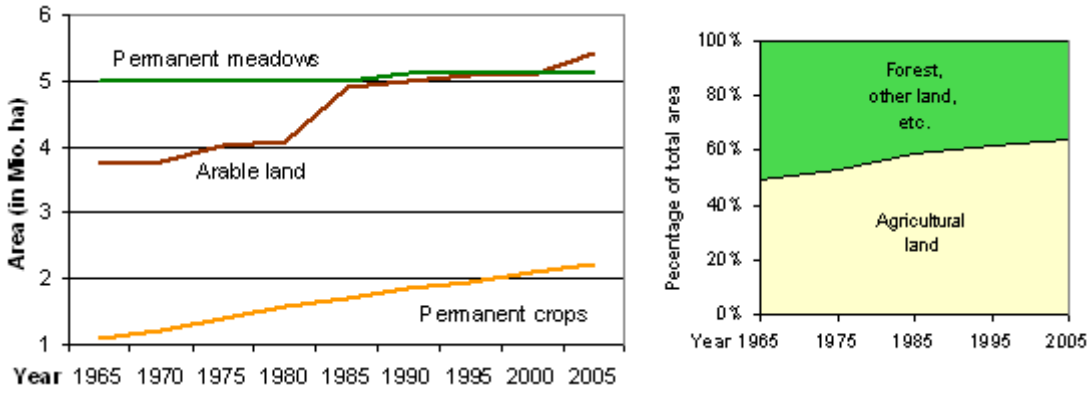
Last 40 years there had been a continuous expansion of agricultural area (including arable land, permanent crops and permanent meadows). Share of land used for agricultural purposes increased from 45% percent in 1965 to more than 65% in year 2005 (see Figure 1.5; page 9). This growth mainly was due to expansion of arable land and permanent crops. Permanent meadows contributed only a little because of its slightly extension. Permanent meadows remained regularly at a level of around 5 Mio. ha within the last 40 years, whereas arable land experienced a heavy expansion during 1980ies and still is likely to expand beyond the current 5,4 Mio ha. Permanent crops (with an extension over 2,2 Mio. ha) recorded a stable growth with an ongoing tendency (FAO 2009). Further expansion of agriculture is rather limited to an expansion of livestock production than of an extension of arable land in frontier areas due to marginal conditions of soil. Almost all good agricultural land is already fully arable utilised, therefore an increased crop production in future will be challenging. To increase agricultural output and to sustain food production per capita in a growing population generally two strategies are seen by the most of the commentators (Freyer 2007; Rundgren 2002; Pretty 2002; Borlaug 2004):

i. Conversion of non-agriculture land into arable land
ii. Increasing agricultural productivity of existing agricultural systems

The first strategy results in loss of ecosystems and diversity. The second strategy could bring hope to solve these problems especially if the improvement of agricultural productivity occurs

in regions, which most need the food. The paper focuses on the second strategy, because of the limitations of potential expansion of arable land in Uganda particularly in the western and eastern regions where population densities are high and land is increasingly becoming a constraint. Therefore an increment of agricultural productivity has to occur due to intensification of production techniques (HDR 2007).

Figure 1.5: Trends in share of agricultural areas (1965 - 2005)



(Source: own figure; data from FAO 2009b)

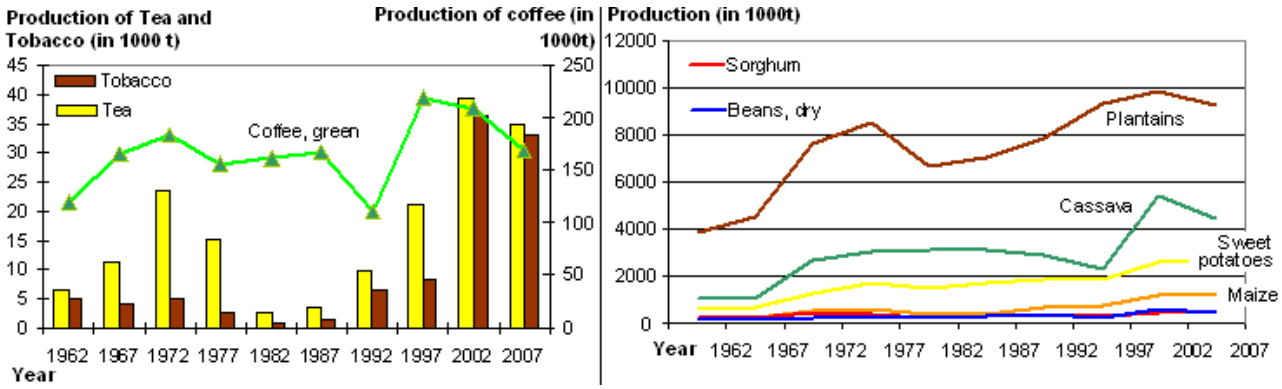
1.2.2.3. Trends in Agricultural Production: Food Crops vs. Cash Crops

In year 2003 food crop production predominated the agricultural sector in Uganda and contributed around 71% to agricultural GDP, while export crop production contributed only for around 5%.[12] About 42% of agricultural GDP consists of subsistence crops for home consumption and is non-monetised. Around one third of food crops are marketed compared with two thirds of livestock products. Traditional cash crops in Uganda are coffee, tobacco, tea and to a fewer extend cotton. Most important food crops are plantains, cassava, sweet potatoes, beans and sorghum. Production quantity of food crops for domestic consumption is much higher than cash crops for export (Figure 1.6; page 10). Quantity of tea and tobacco production (for export) was strongly growing during last 20 years (but slightly decreasing last 7 years). Among food crops plantains (from 4 Mio. t up to nearly 10 Mio. t) and cassava (from 1,5 Mio. t up to 5,5 Mio. t) indicate same tendency during last forty years (PMA 2003; FAO 2009a).

In year 2005 around 28% of the total agricultural area was planted with bananas/plantains, 24% with cereals, 16% with root crops (cassava; sweet potatoes, etc.) and 14% with pulses and 8% with oilseed. Share of traditional cash crops (and other newly introduced cash/export crops) of agricultural area is only around 8-10% of the total cropped area (PMA 2003; HDR 2007).

[12] Livestock products account for 17%; fisheries 4% and forestry 3% percent.

Figure 1.6: Trends in the production of most important cash crops and most important food crops in Uganda (1962 - 2007)



(Source: own figure; data from FAO 2009b)

Since 1965 yields per ha in plantains have decreased for more than 20% and the yields of cereals have stagnated below 1,5t/ha. Yields in cassava increased[16] and finally harvest per ha is tree-fold compared with forty years ago (Figure 1.7; page 12). Recently the food crops sub-sector of agriculture has not performed as well as the livestock and cash crops' sub-sectors last years. Livestock and cash crops have shown a more consistent positive annual rate of growth. Recent decline in performance of food crop mainly can be attributed to the occurrence of drought conditions. As small-scaled farmers produce the majority of food crops in rain-fed cultivation systems the impact of a drought might be tremendously (HDR 2007; PMA 2003).

Food production is decreasing more rapidly than total agricultural production (Table 1.3). Fast growing population has resulted in a increase of the decline of food production per capita nearly last three decades (FAO 2009a).

Table 1.3: Average annual growth rates (in %) in agricultural and food production Indices

Years	1980 – 1990	1990 - 2000	2000 - 2004
Agricultural production	3,0	2,5	2,2
Agricultural production, per person	-0,4	-0,6	-1,0
Food production	3,1	2,1	2,0
Food production, per person	-0,3	-0,9	-1,2

(Source: own table; data from FAO 2009a)

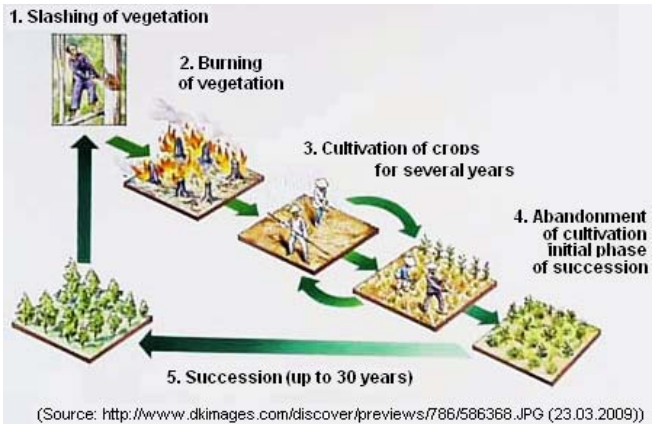
1.2.2.4. Challenges of agricultural land in Uganda

In Uganda's agriculture the huge challenges are soil nutrient depletion, land degradation[13] and declining agricultural productivity while population growth occurs. 63% of total land area (or 12,3 Mio. ha in total) is currently suffering from human induced degradation: 9,6 Mio. ha of land (48,5 % of land area) are severely degraded and around 2,7 Mio ha. (13,7% of land area) very severely degraded. Main type of degradation is occurring by water erosion (FAO/TERRASTAT 2009; FAO/AGL 2009; Nkonya 2008).

[13] Land degradation is understood as a wide range of negative changes of land area, such "(...) a loss of land productivity, quantitatively or qualitatively, through various processes such as erosion, wind blowing, salinization, water logging, depletion of nutrients, deterioration of soil structure, and pollution." (Dudal 1981:4; cited after Jayasuriya 2003:119).

BOX 1: Slash and Burn practices in Uganda

Slash-and-Burn (SaB) methods combined with fallowing the land thereafter is a commonly used cultivation practice with a long tradition in Uganda. Nowadays SaB agriculture is used by several million of farmers around the world, mostly in subtropical and tropical regions. SaB agriculture is based on the production of crops that are alternated with periods of fallow (figure). The two key elements of SaB agriculture are the use of fire to prepare fields for cultivation and the abandonment of those fields when productivity declines. Fallow periods are in range of 1 and more than 20 years, depending on several natural (soil, vegetation, climate…) and socio-economic factors (population density, land tenure, etc.). Positive effects of SaB are: (i) releases of nutrients (P, K, Mg, Ca,…); (ii) reduction of soil acidity; (iii) interruption of lifecycles of pest and diseases; (iv) less labour necessary. In areas with low density of population SaB is a sustainable agricultural practices, which is based on natural succession, whereas SaB utilized in areas with dense population negative impacts are getting predominant. Most important negative impacts of SaB practice on agro-ecological are: (i) reduction of nitrogen availability and content of organic matter is reduced; (ii) disturbance of soil structure, which causes negative impacts on soil micro-organism and texture of soil; (iii) high risk of nutrient leaching. Because of these negative impacts SaB-practices are not compatible with the principles of OA. There is raising evidence that in some regions in Uganda a combination of increasing population density and decreasing periods of fallows are driving forces of the decline of agricultural productivity and human induced land degradation. (Kaizzi/Wortmann 1998; Kleinmann et al. 1994; Altieri/Nicholls 2004)



(Source: http://www.dkimages.com/discover/previews/786/586368.JPG (23.03.2009))

Unsustainable agricultural practices are the cause of land degradation of more than 3 Mio. ha agricultural area (or 23,5% of total agricultural area or 16,25 of total land). Degradation of agricultural area consists of 2,5 Mio. ha (or 19,5% of agricultural land or 13,7% of total land area of Uganda) severely degraded area and of 0,5 Mio. ha (or 4% of agricultural area or 2,5% of total land area) very severely degraded area. At all unsustainable agricultural practices are the cause of 24,4% of total land degradation in Uganda (FAO/TERRASTAT 2009).

Land degradation can appear in various forms including soil compaction, surface crusting, water logging, leaching and declining vegetative cover or simply nutrient depletion. With an estimated annual loss of more than 60 - 70 kg of nutrients Uganda (nitrogen -21kg, phosphorous[14] -8 kg and potassium -43kg) is among those countries with the highest nutrient loss rates in Sub-Saharan Africa (nitrogen -22kg, phosphorous -2,5 kg and potassium -15kg; Nkonya 2008; FAO/AGL 2009).

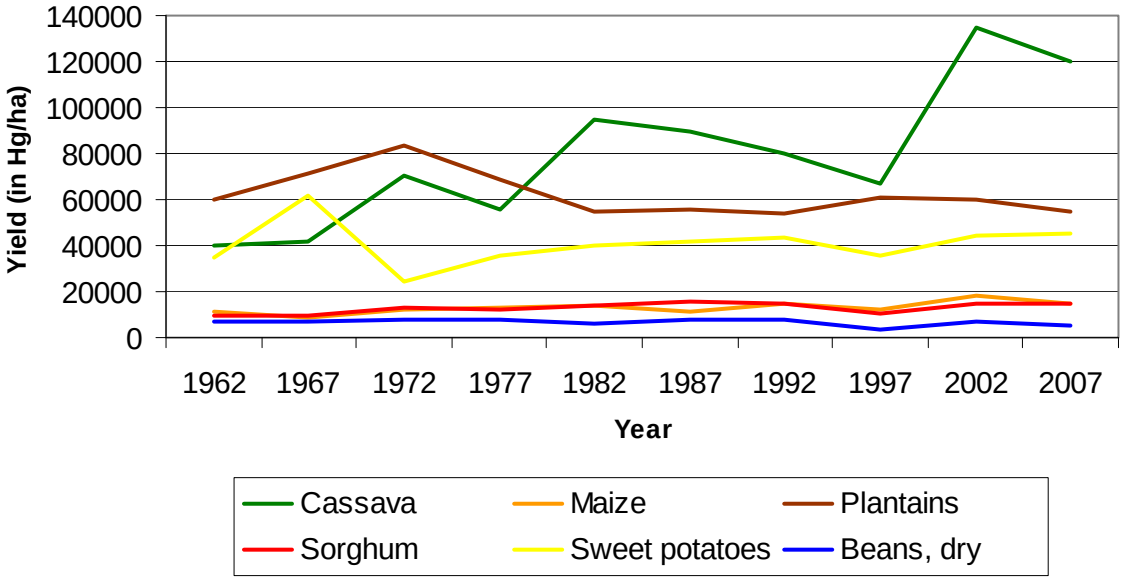
Land degradation leads towards decreasing soil fertility and though to declining agricultural productivity in Uganda. Yields (in Hg/ha)[15] of most major crops have been stagnant or declining since 1990ies in Sub-Saharan Africa (Morris et al 2007; Pender et al. 2001; NEMA 2006; HDR 2007; FAO 2009). In Figure 1.7; page 12 are shown the trends in yields of

[14] Phosphorus is a major constraint in tropical regions with highly weathered soils. “Such soils have a significant capacity to sorb large amounts of phosphorus, taking them out of the soil solution. This limits the availability of inorganic phosphorus for plants, whether it is already contained in the soil or added as fertilizer. Further, some tropical soils contain only small amounts of total phosphorus, with a relatively large proportion of this present in organic forms. This makes biological processes vitally important for enhancing phosphorus availability to crops in tropical soils, especially those that are receiving organic amendments as their major nutrient source.” (Oberson et al. 20050:531f)

[15] In hectogram (Hg) = 10^2 g = 100g per ha like it is most salient in recent publications of FAO (FAO 2009).

five most important food crops in Uganda. In all major food crops, except cassava,[16] there is a stagnation or decline in crop yields within the last 40 years (FAO 2009; Nkonya 2008).

Figure 1.7: Yields (in Hg/ha) of five most important food crops in Uganda (1962 - 2007)



(Source: own figure; data from FAO 2009)

Land degradation is the result of deforestation, overgrazing/overstocking[17] and mainly by unsustainable agricultural practices.[18] Recent studies illustrate a large decrease in grasslands and land cover caused by pastoralists' activities. In some districts in the "cattle corridor" like Nakasongola district (situated in the central region) nearly 50% of all grasslands have disappeared since 1990 due to the activities of pastoralists. As a result the amount of bare land has increased as well as pressure on the available productive land (NEMA 2006). Unsustainable agricultural practices comprise among other things constant nutrient mining by crops without any measures to replenish those nutrients, inadequate erosion control, poor soil tillage, abandonment of soil and water conservation practices such as terraces, embankments, strip cropping or in general a lack of proper soil fertility management with the aim to restore organic matter content in topsoil layers. Declining soil fertility and therefore

[16] Cassava was introduced to Uganda after the year 1862 and then rapidly spread to most parts of the country, because of its comparative advantage (relatively high productivity per unit land and labour compared to other food crops). Currently cassava plays a major role in both household and national food security contributing up to 40 - 50 per cent of the basic food requirements in Uganda and is second most important food crop after plantains. The growth of yields during last 40 years in cassava production is attributed particularly to the introduction of new high yielding varieties through the efforts of national research institutes and farmers' initiatives as a response to a pandemic occurrence cassava mosaic diseases, which massively affected production of cassava. Volatility of growth in yields of cassava is mostly attributed to the temporarily occurrence of cassava mosaic diseases and other more complex causes as: poor extension services, acute shortages of agricultural inputs, political and socio-economic strifes, etc. (Bua et al. 2000)

[17] Overstocking takes place when the stock levels exceed the rangelands' carrying capacity (NEMA 2006).

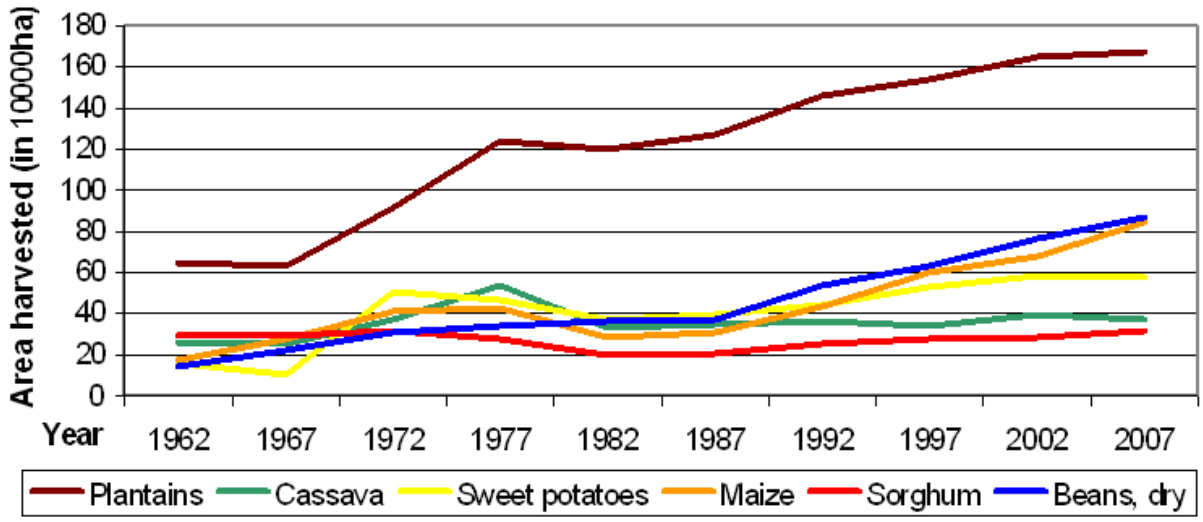
[18] Farmers in Uganda consuetudinary use a system of shifting cultivation, in which cropping periods of 1 to 4 years in duration are alternated with fallow periods of up to 15 years. In this time soil is able to regenerate and restore soil organic matter (nutrients) due to accumulation of biomass (above- and belowground) and woody secondary vegetation. Recently there is a decline in the time of restoration and periods of fallow last only one or two growing seasons (one half to one year). This period of time is too short for enough biomass production to replenish soil organic matter, which was lost during the cropping periods. Many farmers are not able to fallow their land at all, or only infrequently. Reasons are found in high population densities and scarcity of adequate arable land for crop production (see BOX 1; page 11 and chapter 1.3.2; page 21; Freyer 2008; Oberson et al. 2005).

decreasing agricultural productivity for most farmers leads to expansion of the agricultural area and to open up less favourable soils for cultivation (NEMA 2006; Morris et al. 2007).

Land degradation results in estimated losses of GDP in the range of 1300 Mio. US$ to 3800 Mio US$ representing approximately 17% of total GDP in year 2004 (UNCTAD/UNEP 2006).

In Figure 1.8 the trend in expansion of harvested agricultural area of the five most important food crops is documented. There was an increment in harvested area in plantains, beans, maize and slightly in sweet potatoes. Area planted with plantains has doubled during ten years between year 1967 and 1977. From then until today (30 years) growth rate slowed down a little and increment of area (in total) cultivated with plantains experienced the same magnitude like the period in between year 1967 and 1977 (FAO2009).

Figure 1.8: Harvested agricultural area of five most important food crops (1962 - 2007)



(Source: own figure; data from FAO 2009)

"The most critical problem in Uganda's drylands like in many parts of the country is that the majority of farmers have inadequate knowledge or few opportunities to learn about improved farming methods. For example, with most of the farmers growing the same crops on the same piece of land year after year, crop rotation is often not practiced; a situation that leads to serious soil degradation. The situation is worsening because improved agroforestry practices capable of renewing and regenerating the soil are still lacking in most farming systems." (NEMA 2006:63)

Table 1.4: Use of agricultural inputs (in % of parcels)

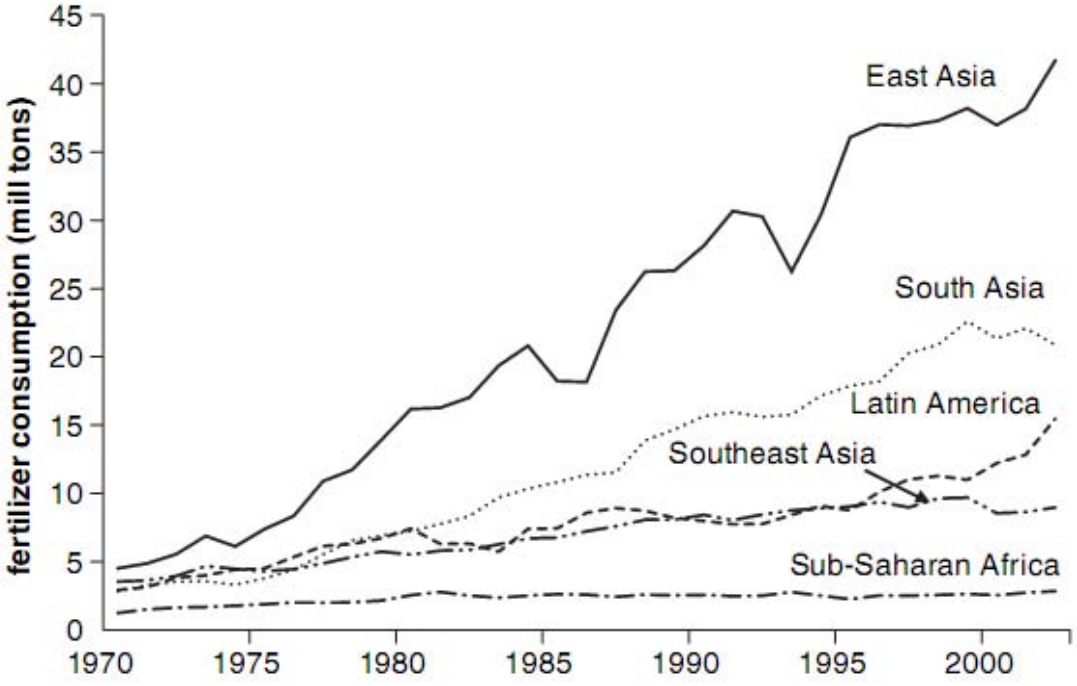
Region	Improved Seeds	Manure	Chemical Fertilizers	Agro-chemicals
Central	5.5	8.7	1.3	4.8
Eastern	11.9	4.1	1.1	4.7
Northern	7.6	0.5	0.7	2.6
Western	2.2	9.6	0.6	1.5
Total	6.3	6.8	1.0	3.4

(Source: HDR 2007:73)

Use intensity of inorganic fertilizer (also called "mineral" or "chemical" fertilizers) in general is very low in Sub-Saharan Africa. During the last 30 years consumption in East Asia, South Asia and Southeast Asia as well as in Latin America was expanded. In Sub-Saharan Africa there was a stagnation at a low level in the application of inorganic fertilizers (Figure 1.9).

During the period from year 1996 - 2002 mean annual use intensity of inorganic fertilizer in Uganda was 0.6 kg/ha (Morris et al. 2007; Walaga 2001). HDR states that in year 2006 only 1% of the parcels of agricultural land were applying inorganic fertilizers (Table 1.4; page 13) in relation to 6,8% of the parcels of agricultural land were manure was applied (and only 3,4% of the parcels of agricultural land used agro-chemicals (pesticides, hormones, growth agents, etc.) and 6,3% of the parcels of agricultural land used improved seeds; HDR 2007). The percentage of holdings applying inorganic fertilizers (1%) is nearly the same as the share of commercial farms in Uganda, which is 0,8% (Table 1.5; page 6). However, inorganic fertilizers mainly are used in the production of cash crops (such as coffee, tea, cotton) and only a negligible small number of subsistence farmers are applying them (Walaga et al. 2005; Parrott/Marsden 2002; Parrott et al. 2006). Low input of inorganic fertilizer among subsistence farmers is likely to remain so under the current socio-economic and agro-ecological conditions (Walaga et al. 2005). In general, the principles of Green Revolution agriculture have only rarely been adopted by smallholder farmers in Uganda (Halberg et al. 2005a). Low fertilizer use in sub-Saharan African can be explained by demand-side factors (no incentives to buy costly inputs for crops with low level yielding and high variability each harvest) as well as by supply-side factors (high level of fertilizer prices relative to the prices of crops and other goods, weak infrastructure; general lack of market information about the availability and cost of inorganic fertilizers, etc.; Morris et al. 2007).

Figure 1.9: Fertilizer consumption in East Asia, South Asia and Southeast Asia, Latin America and Sub-Saharan Africa (1970 - 2004)

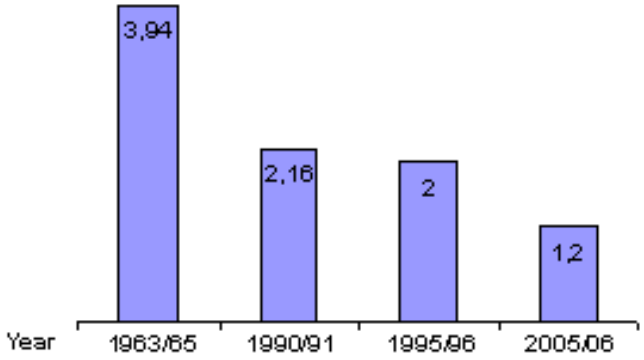


(Source: Morris et al. 2007:18)

1.2.2.5. Farm Size and Land Use in Uganda[19]

According to Taylor colonial land occupation in Uganda was never prolific and farm size therefore remained small, with smallholder farmers as the backbone of agricultural production. This situation is still largely reflected in the contemporary agricultural sector (Taylor 2006). Referring to the Ugandan Bureau of Statistics (UBOS) Uganda's agriculture is predominantly small-scaled and nearly total agricultural production is carried out by smallholder farmers: Eighty percent of the holdings are smaller than 1 ha agricultural area and 99,2% of total agricultural area is cultivated predominantly in a non market-oriented subsistence way (Table 1.5). Beside the both categories of farms (subsistence and commercial type), there exists a third category of farms in between: semi-commercial farms.[20] Less than 1 percent of agricultural holdings exceed 20 hectares of land. As a result of increasing population average farm size is decreasing: In year 1963/65 average size was 3,94 ha, in year 1990/91 average size accounted for 2,16 ha and in year 2005/06 average size of farms was 1,2ha.

Figure 1.10: Average farm size (in ha) selected years



(Source: own figure; data from UBOS 2003; HDR 2007; UNCTAD/UNEP 2006)

Only bigger farms with more agricultural area are producing sugarcane, tea, cotton and (as a emerging trend) cut flowers in a large scale (UBOS 2003; HDR 2007; UNCTAD/UNEP 2006).

Table 1.5: Share and distribution of agricultural area by farm type (in km^2)

Region	Central	Eastern	Northern	Western	Uganda	% Share
Total area	16,698	19,210	29,147	19,639	84,694	
Subsistence	16,468	19,050	29,116	19,376	84,010	99,2
Commercial	230	160	31	263	684	0,8

(Source: HDR 2007:72; modified)

[19] Agricultural statistics are rarely available and sometimes there are gaps in data sets, which can be misleading. However, last published comprehensive agricultural census carried out in Uganda was done in year 1965. More recently (in the 1990ies) some attempts were made to get new data of Uganda's agriculture (FAO 2006). For more detailed information please refer to: Mukasa, M. and Apuuli, M. 2001. Development of Food and Agricultural Statistics within the Overall Framework of the National Statistical System: Example of Uganda. http://www.fao.org/es/ess/meetings/WorkShop01/CountryPaper/SAW-01-1-5-E.pdf [23.03.2009]

[20] It is not easy to draw a distinction between subsistence and semi-commercial farms. It might be the case that subsistence farms irregularly selling surpluses in staple foods to local markets and are producing cash crops especially coffee) in small amounts, as well as that semi-commercial farms do not supply markets constantly (UBOS 2003; HDR 2007).

1.2.2.6. Livestock Sub-sector

Livestock production is an important component of the agricultural sector in Uganda. Almost one-third of farmers depends on livestock for the major part of their income. So the contribution of livestock to household food security is considerable. For UNDP livestock is one of the major sources for potential growth of the agricultural sector in future. However, livestock production has declined during the last 30 years considerably.[21] Contribution to total GDP has declined from about 25 per cent three decades ago to only 5 per cent in 2001/02 - 2005/06. Its share of agricultural GDP has declined from 30 per cent to 12.7 per cent in the same period. Available supplies of currently livestock production is very low: measured in animal units as well as in per unit area of land utilised (Figure 1.11; left side). In year 2005 there were estimated 6,8 Mio. head of cattle and around 9,4 Mio. head of small ruminants in Uganda's agriculture. National supply and demand balance of milk and beef as well as of poultry was negative in year 2005 (Figure 1.11; right side; HDR 2007; FAO 2006).

Figure 1.11: Livestock numbers (in 1000 animals; 2001 and 2005) and national supply and demand balance of livestock products (2004/05)

Category	2001	2002	2003	2004	2005
Cattle	6144	6328	6519	6567	6770
Sheep	1108	1141	1175	1552	1600
Goats	6620	6852	7092	7566	7800
Pigs	1644	1710	1778	1940	2000
Poultry	29671	32639	35903	31622	32600

Product	Supply	Demand	Balance
Milk (mill. Litres)	408.0	540.0	-132
Beef (000t)	102.0	148.0	-46
Goat/Mutton (000t)	24.0	20.0	4
Pork (000t)	28.0	15.0	13
Poultry (000t)	38.0	43.0	-5

(Source: HDR 2007:76; modified)

1.2.2.7. Gender Dynamics in Agriculture in Uganda

Women play an important role in Uganda's agricultural production. HDR estimates that around 70% of smallholder subsistence farmers are woman and contribute to 70-75% of agricultural production. Just as well women are much more engaged in agricultural production than men are: women contribute over 80 per cent of agricultural labour. Women contribute an average 55% per cent of labour for land preparation; 65% for planting; 85-90 per cent for weeding; and over 95% of food processing. While women (70-80%) mainly are responsible for the production of food crops (mostly for family consumption) and activities concerning harvest and post-harvest (ranging from crop preservation to processing and storage), men tend to care about the cultivation of cash crops (HDR 2007). "Despite the fact that women provide the bulk of labour for agricultural production, they have not benefited as much as men from the decreases in absolute poverty noted in recent years. The incidence of poverty is highest among the food-crop producing category, declining slowly among female-headed households. Women have limited opportunities for social and economic development, particularly those living in the rural areas." (HDR 2007:92). Despite women account for the largest share of agricultural production, they have much less access to own land than men and often women have only insecure tenure rights on the land they use. About 97% of women have "relatively easy access" to land (in terms to use it as a basis for agricultural production), but in fact own only 5 - 7 percent of the land (IBRD 2006; IBRD 2007).

[21] Contribution of livestock production to total GDP has declined from about 25% in the 1970ies to only 5% in the period between 2001/02- 2005/06. Livestock's share of agricultural GDP has declined from 30% to 12,7% per cent during last 30 years (HDR 2007).

BOX 2: Key trends in Uganda's macro economic

In Year 1986 after years of war and several head of states[1] NRM under Museveni captured power in Uganda. Since then the country has made tremendous steps in overcoming economic breakdown, which was the result of political authoritarianism combined with erroneous socio-economic measures and „civil war" in the period from the 1970´s to mid-1980´s. A significant issue was to stabilise macro economy in the first years and recover from the to long period of chaos and stagnation which preceded it (IBRD 1998). In the early years NRM-government launched a *Self-reliance* approach and austerity programmes with strictly budget discipline to achieve stability. High rates of inflation, deprivation of Ugandan Shilling followed and led to a change in economic orientation: towards the structural adjustment programmes of IMF respectively advises of IBRD (Schicho 2004: 305)

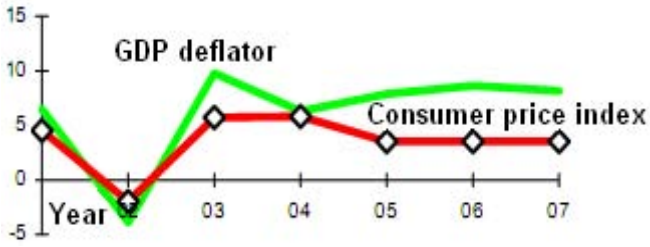
Recently Uganda's economy is one of the fastest growing economies in Sub-Saharan Africa. In year 2000 GDP accounted for 5930 Mio. US$ and continuously rose with an average growth rate of 7.8 (until 2007) to an amount of 11.210 Mio in year 2007 (see Table a). GDP growth rates from year 2000 - 2007 underline these up warding trend of Uganda's economy. Last years Inflation was (after years of turmoil in 1990´ies) moderate (Figure a) and stable (IBRD 2008; IBRD 2009a).

Table a: GDP and GDP growth rates of Uganda

Year	1987	1997	2000	2005	2006	2007
GDP US$ (in 1000 Mio)	6,3	6,3	5,93	8,74	9,50	11,21
GDP annual growth rate (%)	4	5,1	5,6	6,6	5,0	6,4

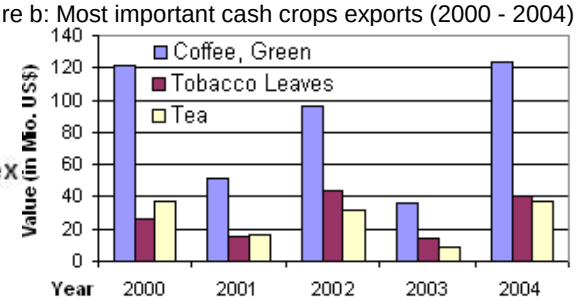
(Source: own figure; data from IBRD 2008; IBRD 2009a)

Figure a: Inflation (%)



(Source: IBRD 2008)

Figure b: Most important cash crops exports (2000 - 2004)

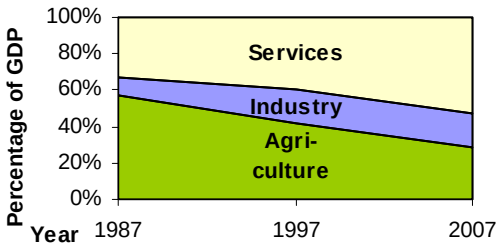


(Source: own figure, data from FAO 2009b)

In World Bank Atlas-classification Uganda is listed in year 2007 among those countries with *Low-income economies* (GNI per capita: $935 or less, IBRD 2009b). GNI per capita (Atlas method) accounted in year 2000 of 260 US$ rose to 360 US$ in year 2007. Total GDP accounted in year 2000 of 5.926 Mio. current US$ and in year 2007 of 11.214 Mio. current US$ (IBRD 2009a).

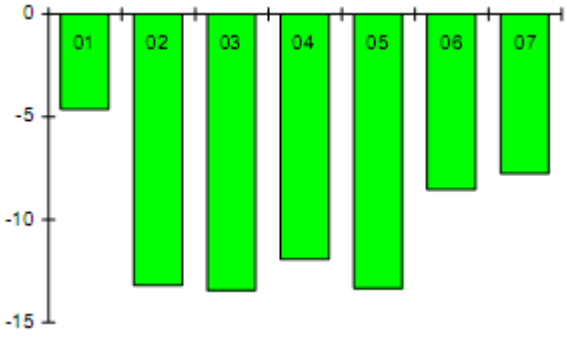
During last 20 years there was a changing in the composition of GDP: The Value added by agriculture decreased from nearly 60% below 40% and the share of services ran up from around 30% to nearly 45% (see Figure c). Share of Industry and Manufacturing of GDP slightly grew up (from 15%) to around 20% of GDP. Agriculture is the most important sector of the economy and absorbs over 80% of national paid labour force (13% in services and 7% in industry (UN 2009). Coffee accounts for the bulk of export revenues. Average revenue of coffee between year 2000 and 2004 was around 85,9 Mio. US$ (IBRD 2009a) Traditional cash crops beside coffee are cotton, tea and tobacco. Recently their predominate status is falling and non-traditional exports are increasing.

Figure c: Value added to GDP (1987-2007)



(Source: own figure; data from IBRD 2008)

Figure d: Current account balance to GDP (%)



(Source: IBRD 2008)

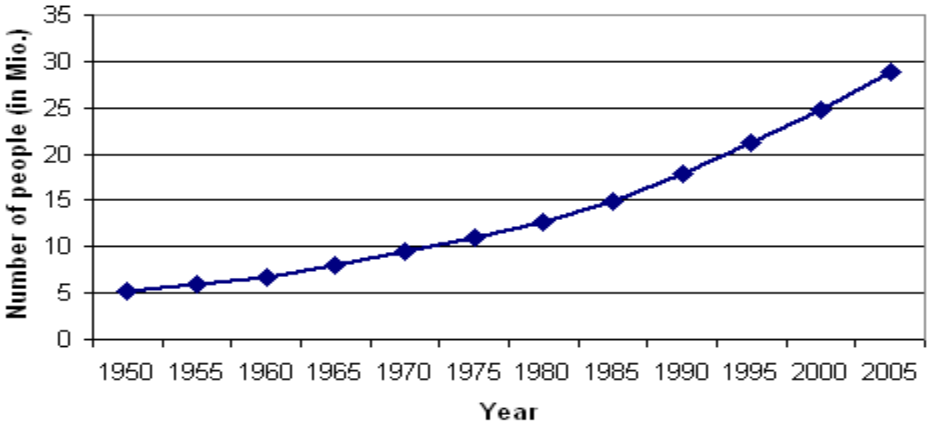
However, population growth rate in Uganda most likely will exceed 3% next 20 years (UN/ESA 2009). So growth in GDP has to be sustained in order to avoid a lowering of per capita income beyond the current (2007) 370 US$ (IBRD 2009a).

[1] Milton Obote 1966 - 1971 and 1980 – 1985; Idi Amin 1971 – 1979 a.o. (Schicho 2004: 287)

1.3. Population dynamics in Uganda

In 1950 population in Uganda counted of about 5,158 Mio people and increased constantly to 28,947 Mio in year 2005 (see Figure 1.12). This is a total increment of nearly 24 Mio. in 55 years. So in 2005 the number of Ugandan population was 4,5-fold compared to year 1950 - Uganda's population doubled nearly every 20 years (UN/ESA 2009).

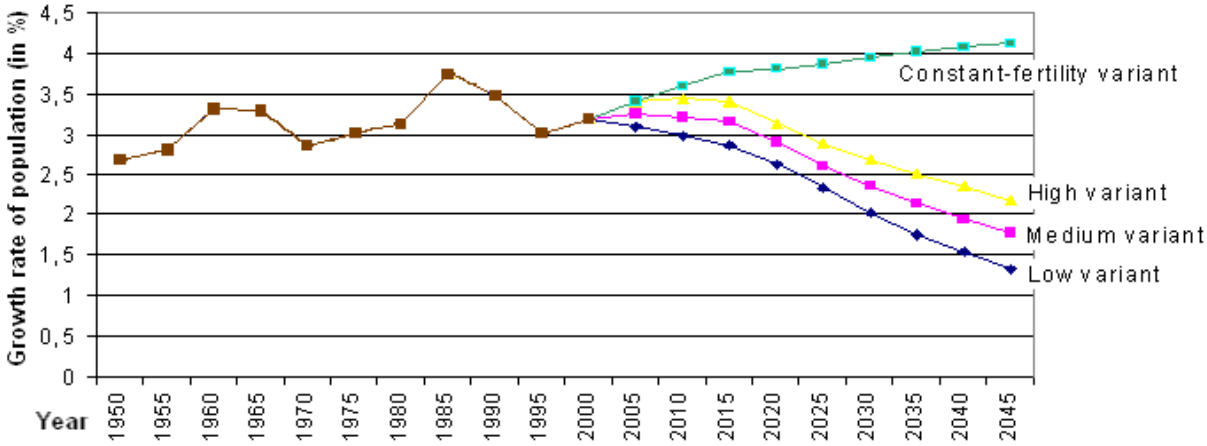
Figure 1.12: Number of people in Uganda (1950 - 2005)



(Source: own figure; data from UN/ESA 2009)

Annual population growth rate recently (last ten years) was between estimated 3 and 3,5 percent (see Figure 1.13) and before between estimated 2,7 and 3,8. Predictions of future annual population growth rate are diverse. Most likely annual population growth rate will level off around 3,2 percent for next 15 years and allay constantly thereafter (UN/ESA 2009).

Figure 1.13: Population growth rate in Uganda (1950 - 2050)



(Source: own figure; data from UN/ESA 2009)

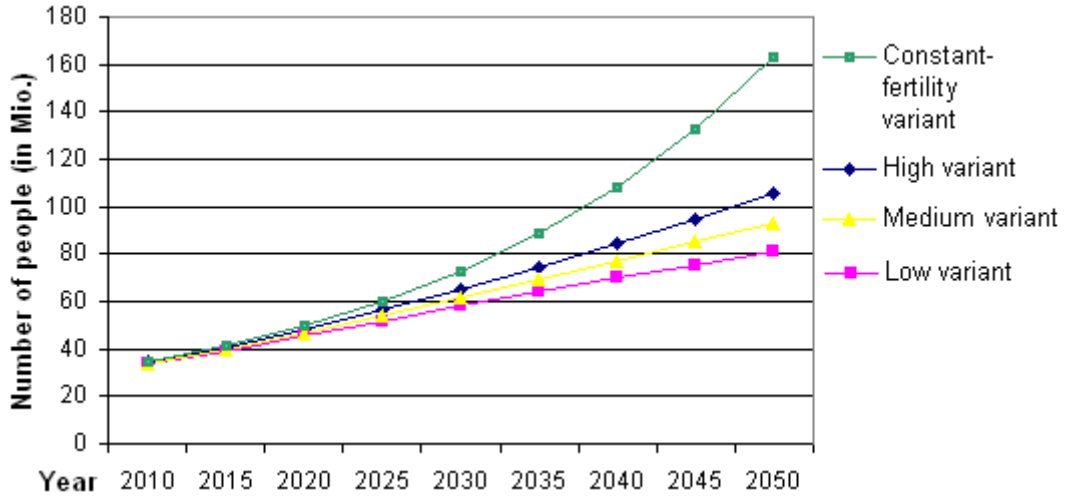
UN provides four projections to the year 2050: *Constant fertility rate*,[22] *high variant*, *middle variant* and a *low variant* in increase of Ugandan population. Growth rate depends on several assumptions, which differ in these variants (e.g. fertility respectively changes of birth rate, death rate or migration).[23] For the *constant fertility variant* UN predicts a population in Uganda in year 2050 of about 160 Mio. people and about 80 Mio. people for the lowest variant (Figure 1.14). In between there is a *medium variant* (about 90 Mio. people) and a *high variant* with approximately 105 Mio. People in year 2050 (UN/ESA 2009). UNDP states that

[22] Assumption: Fertility as constant as of 2000-2005

[23] For more detailed information please refer to: http://esa.un.org/unpp/index.asp?panel=4

the high population growth rate is attributed to high fertility rate, low prevalence of family planning methods, young marriage age for women (17 years of age on average) and the high influx of refugees (HDR 2007).

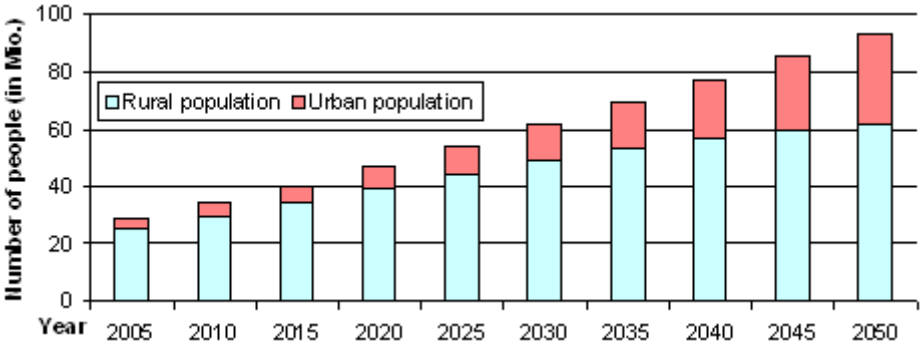
Figure 1.14: Prospected growth of total population in Uganda (2010 - 2050)



(Source: own figure; data from UN/ESA 2009)

In 2005 about 87,5% (or 25,33 Mio. in total) of Uganda's population lived in rural areas. Prospects of UN determine a trend towards urbanisation in future Uganda (Figure 1.15). In 2015 about 15% of population will live in cities. This trend will continue and the share of urban population will increase towards nearly one third in year 2050. So in 2050 total population in rural areas will count (in the medium variant of growth prospects) around 62 Mio people. Approximately 31 Mio. people will live in urban areas. (UN/ESA 2009).

Figure 1.15: Growth prospects in urban and rural population, medium variant (2005 - 2050)



(Source: own figure; data from UN/ESA 2009)

The highest concentration of population traditionally is indicated in the central region (see Table 1.6; page 20) followed by eastern and western part of Uganda. In 2006 population nearly equally was distributed across Uganda's regions. However, currently the northern region has the highest population growth rate followed by the eastern region. So future population density will be higher in the northern region than in the others. These regional differences in population density and population growth have long-term implications to poverty, access to land, service delivery and human development in general (HDR 2007).

Table 1.6: Regional distribution of population in Uganda in (1991 - 2006)

Region	Year 1991	% of total	Year 2002	% of total	Year Mid-2006	% of total
Central	4,843,594	29	6,575,425	27	7,245,900	26
Eastern	4,128,469	25	6,204,915	26	7,063,800	26
Northern	3,151,955	19	5,148,882	21	6,050,300	22
Western	4,547,687	27	6,298,075	26	6,996,900	26
Total	16,671,705	100.00	24,227,297	100.00	27,356,900	100.00

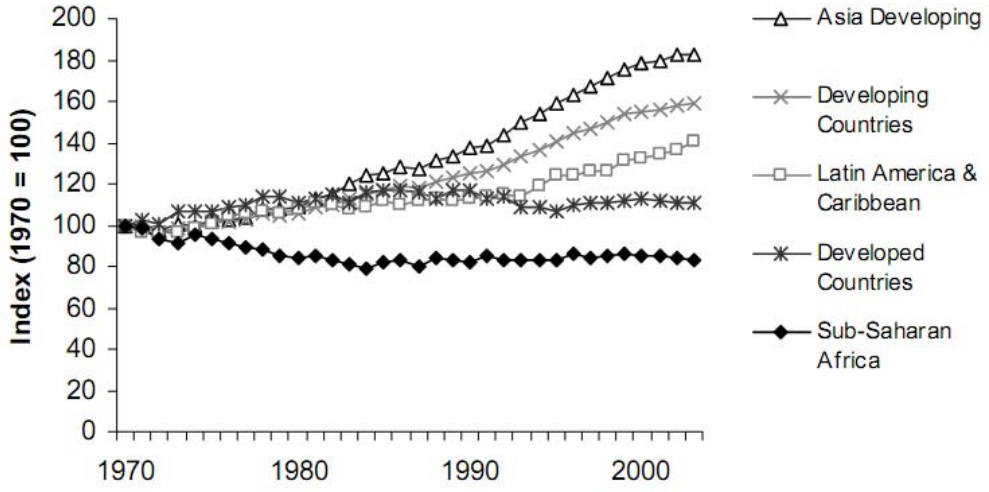
(Source: HDR 2007:22)

The analysis of the country's regional distribution of the total rural and urban population shows the pressure on land (population densities) and overall land availability (household availability). It further reveals that 88% of the population are rural dwellers, with both the eastern and western regions having the highest proportion of the population (93%) living in rural areas. The central region with 75% of the total population in rural areas is the most urbanised of all the regions followed by the north with 86 per cent of the total population in rural areas (HDR 2007). "Population growth is a major issue for poverty reduction, with implications for agricultural productivity, putting pressure on landholdings and other natural resources, reducing productivity in crops, livestock and fisheries, and rendering many farming households food-insecure. Population growth is most rampant among the poor population where the future is uncertain, perpetuated by low literacy rates, huge disparities in income and non-existent property rights." (HDR 2007:97)

1.3.1. Trends in Food production

Since 1970 food production has increased in all regions due to introduction of Green Revolution technologies except Sub-Saharan Africa where food production per capita declined (Figure 1.16). Introduced Green Revolution technologies included improved varieties, inorganic fertilisation, the use of pesticides, etc. (Halberg et al. 2005a; Pender/Mertz 2005).

Figure 1.16: Food production per capita (1970 - 2005)



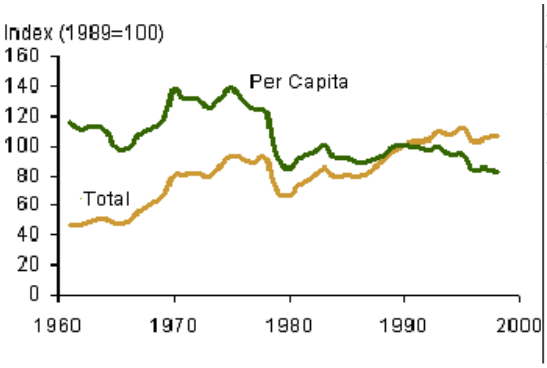
(Source: Pender/Mertz 2005:2)

Globally seen, food security is still a challenge, despite enormous growth of overall food production since 1970. Beside the rise in food demand due to population growth, in future will be a shift in food demand as a result of: (i) economic growth, which increases people's purchasing power and change their food demand; (ii) growing urbanisation encourages people to adopt new diets and iii) climate change challenges production and threatens natural resources such as land and water (Hine/Pretty 2007).

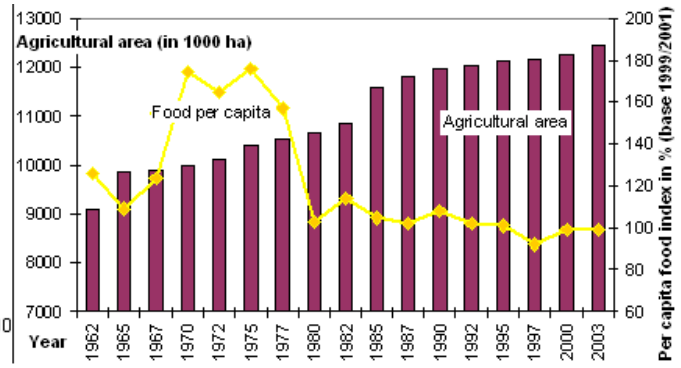
In Uganda there is a declining tendency indicated too (Figure 1.17). Nevertheless, generally Uganda's agriculture is producing enough food for population needs. Occurrence of food shortages affect only parts of the country, but as a whole Uganda currently is self-sufficient in food staples not heavily dependent on the import[24] of grain staples (such as rice or wheat) to ensure food security (HDR 2007).

However, expansion of agriculture area[25] led to an increasing agricultural production of crops for food last 40 years. An index of Uganda's food production indicates an increasing trend (Figure 1.17) of total food production. Index of food production per capita shows a decreasing trend due to higher population growth than increment of agricultural food production during last 40 years (WRI 2009; FAO 2009). "The rate of growth of Uganda's population is undermining agricultural growth by putting more pressure on land through land fragmentation and on the environment in general. The actual number of people living in abject poverty has increased to 10.6 million from 7.5 million because of the rapid population growth. This means that the agriculture sector needs to grow fast enough to provide more food to feed the increasing /growing population." (HDR 2007:94) In 2005/06 statistics indicated that the agriculture sector experienced with 0.4% its lowest annual growth rate in over a decade. These numbers indicate that monetary and non-monetary food crops (comprising two thirds of agriculture value added output; see chapter 1.2.2.3; page 9) were estimated to grow only 0,3%. In the same year it was estimated that Uganda's population growth was around 3,3%. So population growth has outstripped agriculture output by a factor of 4 to 1 per year over the last three years (UNCTAD/UNEP 2006).

Figure 1.17: Index of food production in Uganda (in total and per capita; 1960 - 2000) and expansion of agricultural area in total (1962 - 2003)



(Source: WRI 2009; modified)



(Source: own figure; data from FAO 2009)

1.3.2. Land area projected on population growth

Jørgensen provides a projection for regional labour force density until year 2030: highest growth will be in northern region of Uganda due to high population growth rates in this area. For a sampling area Jørgensen projected and calculated dynamics of population growth and

[24] Significant food imports are especially vegetable products and cereals (rice and small amounts of wheat). For instance in year 2005 (when cereal imports accounted for nearly 7% of total imports and for 62% of food imports) total food imports represented around 11% of total imports bill (HDR 2007).

[25] Recently about 90 per cent of the total national planted area is devoted to food crops (HDR 2007).

demand on agricultural area for food production. In Table 1.7 there are the results for a defined area of 469,81km^2 with 27,69% of population involved in agricultural production and a given plot size for farmers of 0,7 ha. In years 2002 - 2004 there were around 150km^2 of abandoned and potential agricultural land. As a result of population growth, low presence of non-agricultural livelihoods and nearly no out-migration (Walaga/Hauser 2005), more people compete for the same area of land. In 2030 free agricultural land area would count –228km^2. So his interpretation of demographic projections by districts indicates that Uganda, as a country, will be depleted of available land for farmers by around year 2022. Already in year 2010 eastern Uganda will run out of available agricultural land, while western and central Region will follow some years later. Despite the expected early depletion of agricultural area in the northern region (due to the high population growth rates) land area for farmers will be available as late as around year 2020, because of the relatively large unexploited agricultural land area in this region (Jørgensen 2006; NEMA 2006).

Table 1.7: Projections of the correlation between population growth and land availability (2002 - 2030)

	2002	2003	2004 ///	2029	2030
population	34.766	37.230	39.868	220.793	236.440
population density	74	79	85	470	503
implied land area (sq km)	469,81	469,81	469,81	469,81	469,81
% of population in agriculture	27,69%	27,69%	27,69%	27,69%	27,69%
population in agriculture	9.626,71	10.308,90	11.039,43	61.137,72	65.470,21
used land area for agriculture (sq km)	66,90				
plot size per farmer (sq km)	0,007	0,007	0,007	0,007	0,007
- assumed decrease in %	0%	0%	0%	0%	0%
necessary land area for agriculture(sqkm)	66,90	71,64	76,72	424,87	454,98
free agricultural land area(sq km)	160,10	155	150	-198	-228
population in labour force	14.456	15.480	16.577	91.806	98.312

(Source: Jørgensen 2006:1; modified)

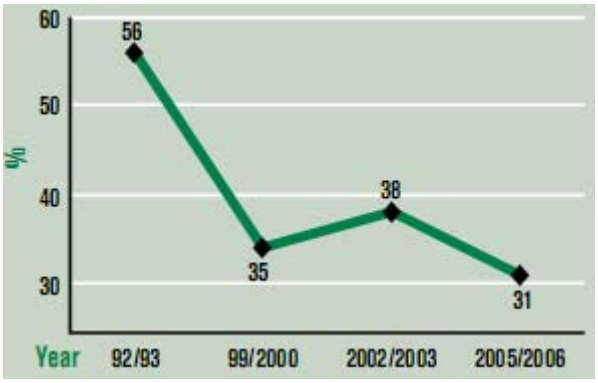
NEMA states a number of 16,8 Mio. ha of total potential arable land in Uganda. Currently around 7,2 Mio. ha[26] of arable land are under cultivation, which is less than 50% of total potential arable land area. According to UNDP fertile land is almost fully utilized and agriculture only may expand into marginal sites where rather livestock is possible than crop production (HDI 2007). Nevertheless, rapid decline in available land resource is attributed to high population growth rate. Additionally applied cropping practices mostly encourage high soil erosion and increased reclamation caused by the introduction of new crops such as rice, will also lead to the decline in the quality and quantity of the available land and soil resources (NEMA 2006). As the growth rate of population in Uganda is faster increasing than agricultural production and therefore increasing abject poverty the government has to undertake various measures to affect this trend. “It is also necessary for the government to enhance labour productivity, faster diversification of the economy for industry and services to absorb the excess population from agriculture and take other measures to curb unemployment, which is the main cause of poverty.” (HDR 2007:94)

[26] This number differs from FAO estimations for arable land in year 2005 which is 5,4 Mio. ha. UNDP sees in its interpretation of the potential of arable land more challenges than abilities for expansion (HDR 2007).

1.4. Poverty in Uganda[27]

Despite the remarkable achieved improvements in overall economic growth and poverty reduction in the past decades Uganda remained one of the poorest countries on the globe. However, Uganda has registered a decline in income poverty last years. Share of population living below national poverty line (less then 50 percent of the median adjusted household disposable income) was falling from 56% in 1992/93 to 35% in year 1999/00. Then proportion of population living below national poverty line increased in year 2002/03 to 38% and finally decreased to 31% in 2005/06 (Figure 1.18 and Figure 1.19; page 24). So 31% of Uganda's population (in total nearly 9 Mio. people) are below the national poverty line and cannot meet their consumption requirements (HDR 2007). The reasons for volatile patterns include a slowdown in agricultural growth during the period between year 2000 and 2003; declines in world market prices reflecting in farmers' income; high population growth rate and morbidity related to HIV/AIDS (PEAP 2004).

Figure 1.18: Proportion of Ugandans living below the national poverty line over the years



(Source: HDR 2007:47; modified)

In relation to international poverty lines in year 2002 about 57,4% of population was living with less than 1,25 US$[28] per day and about 79,8% of population was living with less than 2 US$ per day. Between years 2002 and 2005 percentage was falling. In 2005 about 51,5% of population was living with less than 1,25 US$ per day and about 75,6% of population was living with less than 2 US$ per day (HDR 2007).

Despite growing population GDP per capita was increasing recently due to higher growth rates of economic than of population. GDP per capita (measured in terms of Purchasing Power Parity (PPP)) in year 2002 amounted to 1390 US$ and went up consequently[29] to 1626 US$ in year 2005 (HDR 2006). Although GDP improved and there was a growth of the share of agricultural exports (in traditional and non-traditional crops) contributed to total exports last years, there generally has been a decline in the growth rate of the agricultural sector and its overall contribution to GDP (see BOX 2, page 17). On the one hand there was a declining contribution of agriculture to GDP, but on the other hand national income per capita was growing simultaneously. UNDP states that, "this phenomenon is not a true reflection of the majority small rural farmers who are agriculture-based, and who are still engaged in producing traditional crops especially food crops. This has continuously affected the majority of Ugandans (72%) who are employed and draw their livelihoods directly or

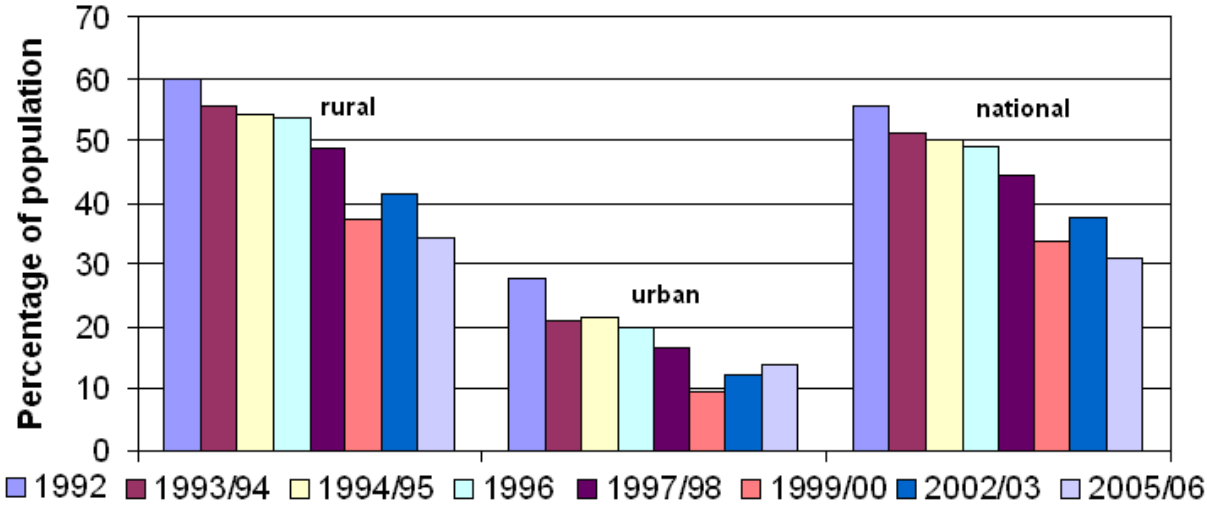
[27] For conceptual issues concerning poverty please refer to chapter 3.2 (page 46). This chapter attempts to provide a short overview about poverty in Uganda. It is not the objective of this chapter to analyse concepts of poverty and put criticism on it.

[28] In year 2005 1,25 US$ around had been 930,77 Ushs; 2 US$ had been 1489,24 Ushs

[29] In year 2003: US$ 1457 and 1478 US$ in year 2004

indirectly from the agricultural sector. Overall, one would have witnessed a much higher per capita income had the agricultural sector performance been on the increase than is the case. This in turn would have generated a higher GDP index and consequently improved the HDI even further." (HDR 2007:48)

Figure 1.19: Share people living below the national poverty line (1992 - 2006)

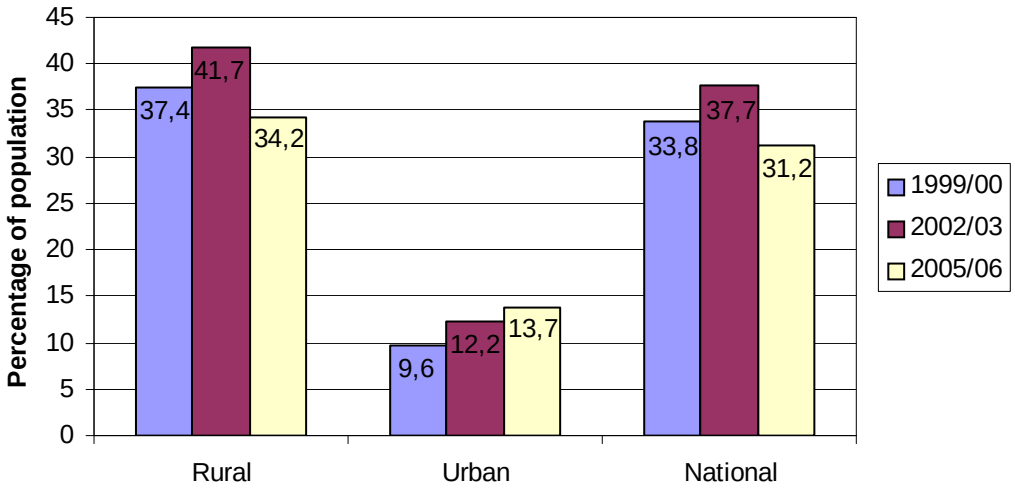


(Source: own figure; data from PEAP2004; IBRD 2007)

1.4.1. Urban and Rural poverty

Prevalence of poverty in Uganda is much higher in rural area than it is in urban areas. In year 1999/00 around 37,4% of rural population and 12,2% of urban population was living below the national poverty line. So because of tremendous differences in the share of total population living in rural respectively in urban areas in year 1999/00 around 96% of poor people (in total) were living in rural area. Between year 1999/00 and 2002/03 (survey years) Uganda has experienced a steady growth in inequality. Poverty growth rate in rural areas (+4,3%) excited that of urban areas (+2,6%) and in year 2002/03 around 41,7% of rural population was poor concerning the national poverty line (Figure 1.20; page 25). In year 2005/06 poverty in urban area increased (relatively) more than in rural areas. This might probably be due to migration as a result of the LRA activities that drove a large number of rural residents into urban areas. (Nkonya 2008) However, the gap in mean income in rural and urban areas (in total) has expanded. Inequality within both (urban and rural areas) has grown as well. So the income gap between the Central Region and other regions (especially the Northern and the Eastern) is widening as well as inequality is widening within the Central Region (IBRD 2006; NEMA 2006).

Figure 1.20: Share of rural and urban people living below the national poverty line (1999/00 and 2002/03



(Source: own figure; data from IBRD 2007)

In all regions of the country most poor people are rural subsistence farmers with limited access to infrastructure. In the rural areas income is growing at a slower rate than in urban areas (Nkonya 2008). “The lowest consumption quintile is 97 percent rural, while the richest is more than 40 percent urban (the urban share in total population is less than 20 percent). Much of the difference between the poorest and the richest quintiles over the decade was driven by the rural/urban income and services gap.” (IBRD 2006: iii) Both areas, rural and urban areas, are experiencing growing inequality between the top and bottom income quintiles. Income inequality, as measured by the GINI-coefficient, stagnated during several years (1992 - 1998) at a value of around 0,36. Then it increased from 0,35 in 1997/98 to 0,43 in 2002/03, but it decreased slightly to 0,408 in 2005/06 (Table 1.8). Between year 1999 and year 2003 the upper income quintile was the only income bracket that registered a significant welfare improvement (PEAP 2004; Nkonya 2008). For the GoU a method in which macroeconomic stability is combined with growth in GDP per capita is a solution to change the ways in which people can earn incomes (especially poor rural households). So households are able to move out of a reliance on merely one (cash-) crop farming into non-agricultural enterprises and so diversify their livelihood and generate income. But still wage employment in rural areas is expanding slowly and increasing agricultural incomes (due to higher world market prices) result in a return to agricultural activities (PEAP 2004).

Table 1.8: Uganda’s GINI-Coefficient (1992 - 2005/06)

Year	1992	1993/94	1994/95	1996	1997/98	1999/00	2002/03	2005/06
GINI- Coefficient	0,36	0,35	0,36	0,37	0,35	0,39	0,43	0,408

(Source: own figure; data from PEAP 2004; Nkonya 2008)

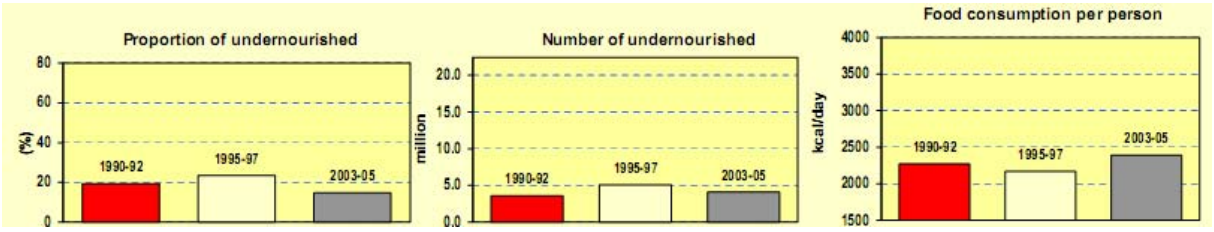
1.4.2. Hunger and Food security in Uganda

Despite an apparent satisfactory overall food supply situation, access to food is limited by low purchasing power for a large number of people in Uganda. Nevertheless, with 4,1 Mio. undernourished people Uganda (in global context) had a moderate level of undernourishment in 2003/05 (the latest period available; (Figure 1.21 and Table 1.9; page26). These are 15 per cent of undernourished people of the total population. The number of undernourished increased from years 1990/92 (as it is the indicated benchmark period of the Millennium Development Goals (MDG) to years 1995/97 followed by a period of

decline until 2003/05. Proportion of undernourished was decreasing between years 1995/97 and years 2003/05 in a higher extend, but due to high population growth total number of undernourished not experienced same decline. Food consumption in kcal/day shows a similar tendency during these 15 years between 1990/92 and 2003/05 (FAO 2008).

“According to the Uganda Demographic Survey carried out in 1995, 45 percent of the children below 5 years old were stunted as a result of malnutrition. The share of stunted children in rural areas is twice as high as in urban areas (MOH 1995). NEMA (2002) reports that, despite intra-annual variations, this ratio has been relatively stable over the last ten years.” (Walaga/Hauser 2005:68)

Figure 1.21: Proportion and number of undernourished people in Uganda



(Source: FAO 2008:1)

The average consumption of food per year and per person was estimated by FAO in 2006 for recent years as follows: 75 kg of cereals; 26 kg of pulses; 210 kg of roots and tubers; 161 kg of plantains (Matoke; FAO 2006).

Table 1.9: Food consumption, prevalence and number of undernourished people in Uganda

Year	1990-92	1995-97	2003-05
Food consumption (kcal/person/day)	2270	2170	2390
Number of undernourished (in Mio.)	3,6	5,1	4,1
Prevalence of undernourishment			
Uganda	19	23	15
East Africa	45	44	35
Sub-Saharan Africa	34	34	30

(Source: own table; data from FAO 2008)

The Ministry of Finance, Planning and Economic Development reports (in its Participatory Poverty Assessment Report from year 2000) some of the causes on farm level of food insecurity: ”Shortage of arable land; lack of skills and knowledge resulting in poor farming methods and low yields; Crop diseases and pests destroying crops; inability to store sufficient food for times of hardship due to sale of stored food to meet needs, fear of theft from granaries and lack of processing means, post-harvest loss in storage due to pests and poor storage techniques; many dependants relying on meagre household resources for survival; seasonality times of scarcity and times of abundance in produce and funds.” (MFPaED 2000:28)

BOX 3: Uganda's National Poverty Reduction Plans

The Poverty Eradication Action Plan of the Ministry of Finance, Planning and Economic Development.

The first Poverty Eradication Action Plan (PEAP) was elaborated during the years 1995 to 1997, was launched in year 1997 and revised in 2000 and 2004. The PEAP is the over-arching guiding framework in which all poverty eradication efforts and activities of the GoU and the different institutional actors at national level are handled in Uganda. Published Versions of PEAP served as Uganda's Poverty Reduction Strategy Paper (PRSP), which are necessary to benefit from debt release of International Monetary Fund (IMF) and IBRD.[1] Aim of the PEAP is to eradicate poverty in next two decades: GoU has resolved to reduce the proportion of the population living in absolute poverty to 10% and in relative poverty to 30% by the Year 2017. (PEAP 2004; IBRD 2009c)

In PEAP (version 2004) four core challenges are stated: (i) Restoration of security (dealing with the consequences of conflict and improving regional equity); (ii) Restoration of sustainable growth in the incomes of the poor people; (iii) Investment in human development; (iv) Transparent and efficient use of public resources to eradicate poverty. To face these challenges the PEAP is designed in five pillars: (i) Economic management: ; (ii) Production, competitiveness and incomes; (iii) Security, conflict-resolution and disaster-management; (iv) Good governance and (v) Human development (PEAP 2004). All five pillars are within the context of continuing macro-economic stability and broad-based economic growth. PEAP "aims to promote the following: (i) Increased incomes of the poor by supporting the modernisation of agriculture to improve food security and productivity; improving land laws; providing an adequate road network; improving rural market infrastructure; strengthening rural financial services; enhanced productivity of the labour force; promotion of micro- and small-scale enterprises; improving telecommunications; and rural electrification; (ii) Improving the quality of life of the poor by improving access to health care, education and clean water, as well as effective management of natural resources and disaster preparedness; (iii) Strengthening governance through mechanisms that improve security, increase accountability and transparency, decentralisation, enhanced flow of information, and the democratic principles of consultation and popular participation." (MFPaED 2000:4)

Having in mind that over 70% of Uganda's labour force and the majority of poor people is engaged in agriculture GoU takes great efforts to support the agricultural sector to reduce poverty among vulnerable subsistence farmers. Hence the modernisation of agriculture in Uganda is an integral part of the PEAP and formulated in the Plan for Modernisation of Agriculture (PMA) in Uganda.

PILLAR	FOCUS
1. Economic management	Macro-economic stability, fiscal consolidation and promotion of private sector investment
2. Enhancing production, competitiveness and incomes	Modernisation of agriculture; preservation of the natural resource base; and development of infrastructure, including roads, power and railways
3. Security, conflict resolution and disaster management	Ending rebel insurgency and cattle rustling, handling internal displacement in conflict areas and managing natural disasters
4. Governance	Human rights and democratisation; development of a better legal system; transparency, accountability and elimination of corruption
5. Human development	Primary and secondary education; health, including family planning; community empowerment; and adult literacy

(Source: HDR 2007:98; modified)

Plan for Modernisation of Agriculture (PMA)

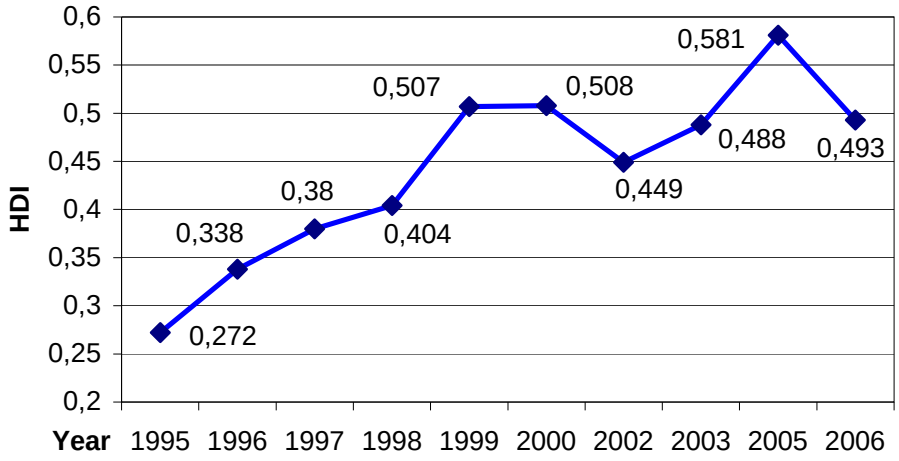
The PMA is an outcome-focused set of principles based on a multi-sectoral intervention strategy to reduce poverty and improve people's livelihood in a sustainable manner. With the PMA launched in year 2000 GoU aims to modernise agriculture and to achieve four main objectives: (i) increase incomes and improve the quality of life of poor subsistence farmers through increased productivity and increased share of marketed production; (ii) improve household food security through the market rather than emphasizing self sufficiency; (iii) provide gainful employment (in on-farm and off-farm activities)through the secondary benefits of PMA implementation such as agro-processing factories and value-adding services for agricultural goods in rural areas and (iv) promote sustainable use and management of natural resources by developing a land use and management policy and promotion of environmentally friendly technologies. The focus of PMA concerning poverty is based on information received from poor people's perspectives and perceptions of poverty obtained through a participatory poverty assessment project (which was carried out in 67 communities in 9 pilot districts of Uganda) PMA is implemented with the focus on seven main fields of intervention: (i) National Agricultural Advisory Service (NAADS); (ii) Agricultural research and technology development; (iii) Agro-processing and marketing; (iv) Rural finance to facilitate rural off-farm activities; (v) Natural resource use and management; (vi) Physical infrastructure; (vii) Agricultural education (PMA 2004).

[1] In year 1998 Uganda was the first country undergoing the Initiative for Heavily Indebted Poor Countries (HIPC) achieving a debt relief of some US$700 million (in nominal terms), of which about 50 percent was from the World Bank. As well Uganda was among the first countries fulfilling the specification for debt relief under the Enhanced HIPC Initiative: Uganda's Poverty Reduction Strategy Paper (PRSP) was one of these necessary specifications. PRSP's were a response of IMF and IBRD to growing criticism by the international civil society on their macroeconomic focus. Then PRSP's were designed (guided by IRBD and IMF) under a consultative process involving civil society in the formulation of the PRSP, and the authorities' continued commitment to macroeconomic stability. In year 2000 Uganda completed the Enhanced HIPC Initiative and a relief of around 2000 Mio. US$. (IBRD 2009c; IMF 2009; Schicho 2004)

1.4.3. Trends in Ugandan Human Development Index by UNDP

According to UNDP there has been an upward trend in Ugandan Human Development Index (HDI) since year 1995 when the Human Development Report firstly has been published. HDI looks beyond GDP or economic development and consists of multiple indicators to achieve a broader definition of well-being (HDR 2007). (For more detailed information about the concept of HDI by UNDP please refer to chapter 3.2.2; page 47). So HDI for Uganda has been progressively increasing during the last ten years and Human Development Report (HDR) illustrates that Uganda has made tremendous strides in eradicate poverty. In 1995 HDI measured 0,272 and went up for more than 110% to a value of 0,581 in 2005. In 2002 and most recently (in 2006) there were temporary declines measurable in HDI by UNDP since year 1995 (Figure 1.22). The HDI value of 0,493 in year 2006 gives the country a rank of 156th (out of 179 countries with available data). So it is a demotion of two grades in relation to year 2005 (HDI: 0,505) when Uganda was on 154th position. According to UNDP classification, a HDI-value higher than 0,5 characterizes a country with a Medium Human Development and lower than 0,499 as a country with Low Human Development (UNDP 2009a).

Figure 1.22: Human Development Index (1995 - 2005)



(Source: own figure; data from HDR 2007)

HDI in Uganda differs by region and especially by urban and rural area: HDI (in year 2003 - 2005) was higher with a value of 0,643 for the urban dwellers than for the rural areas (0,508). So in year 2005 (HDI: 0,570) and in year 2003 (HDI: 0,547) the central region around Kampala had the highest HDI of all other regions. “The western region came second to the central region with its indices standing at 0,487 and 0,539 for 2003 and 2005 respectively. The eastern region was ranked third in 2003 with HDI of 0.459, showing a slight improvement in 2005 with its HDI standing at 0,532.” (HDR 2007:57) The northern region had the lowest HDIs of 0,418 (in 2003) and 0,436 (in 2005). Low HDI in the northern region is the result of long lasting armed conflict of rebellious Lord Resistance Army (LRA) with Ugandan Central Government. During the last 30 years more than 1,7 Mio. people of local communities have had to leave there native places and since than are living as Internal Displaced Persons (IDP) in camps for refugees with low future perspectives (HDR 2007).

HDR explains the differences in Urban and Rural HDI: “Looking at the major components of the HDI namely the Combined Education Index, Life Expectancy Index and GDP per Capita Index, the rural areas are not scoring high as compared to the urban areas. This explains consistent differences in the 2002, 2003 and 2005 rural/urban HDI. In addition to the above factors, the economy has experienced a major drive in private sector investment, which has

been more attracted to urban areas because of the existence of better infrastructure and other services. This has kept the gap between the rural and urban areas in terms of their HDIs." (HDR 2007: 8)

Beside the HDI UNDP provides the Human Poverty Index (HPI), which measures deprivations in the three basic dimensions of the HDI. (For more detailed information about the concept of HPI by UNDP please refer to chapter 3.2.2; page 47). HPI improved (falling value) last years. In 2003 it was estimated at 36 and falling to 25,21 in 2005 (HDR 2007).

This improvement could be explained because of (i) declining adult illiteracy rate (from 32,3% in 2003 to 30,8 per cent in year 2005), (ii) increased number of (both rural and urban) people with access to safe water (increased from 63 per cent in year 2003 to 68% in 2006) and (iii) the nutritional status of children improved (share of malnourished children has declined from 23% in year 2001 to 16 per cent in 2006; HDR 2007).

There are regional differences in HPI. "The HPI for central region was estimated at 20,19, which put the central region as the best performing region in terms of poverty reduction. The eastern region with HPI of 27,11 followed central region, while northern region had the highest HPI of 30,70, and hence the worst in terms of welfare status. Northern Uganda shows the lowest probability of one living up to age 40; with the highest level of illiteracy, and the highest percentage of children who are under weight for age. This is mainly attributed to the continued armed conflicts in the area that has kept the region in continuous deprivation. Western Uganda with HPI 29,56 was third. Limited safe water coverage was the main factor that contributed to this high level of HPI. When HPIs for rural and urban areas are compared, urban areas performed better than the rural areas. The HPI for rural areas stood at 28,0 as compared to that of urban areas, which were 12,8 in 2005.

Comparing the rural and urban HPI for 2005 and 2003, showed a significant improvement for 2005. For both rural and urban areas, there was a reduction in poverty levels in 2005 as compared with 2003. However, for both periods under review, rural areas recorded and still exhibit comparatively higher poverty levels than urban areas." (HDR 2007:61)

1.5. Organic Agriculture in Uganda

Organic Agriculture in Uganda appears in two major forms: certified OA and uncertified OA.[30] Some sources in literature (Okaasai et al. 2007) argue that nearly all small-scaled agricultural holdings in Uganda are practising OA, as there is mostly a lack of external inputs such as inorganic fertilizers or pesticides. In this way of thinking traditional agricultural production in Uganda is *organic by default* (Elzakker/Leijdens 2000). This paper considers OA as more as only the absence of potentially harmful and costly external inputs. OA is considered to follow and implement all principles of the guidelines of the International Federation of Organic Agriculture Movements (IFOAM; see chapter 3.1.3; page 44). In this way of thinking traditional agriculture in Uganda may contain elements of OA and there may be a hidden potential because of the similarity in between these agricultural systems, but one cannot consider that small scaled farmers in traditional subsistence agriculture are producing organically (see chapter 3.1; page 43; Freyer 2007; Freyer 2009a).

However, there is nearly no information available about the numbers of farmers practising uncertified OA in Uganda. It is only assumed that much organic production without certification takes place in Uganda (Parrott/Elzakker 2003). Collection of data concerning OA production in Uganda has only started in recent years. So it is somehow difficult to get a clear sense of the scale of OA production in Uganda and therefore it might be that figures are sometimes approximate and little incomplete. It is hard to determine employment in OA

[30] Almost all organically certified products are certified according to EU, US or JAP regulations respectively certified from bodies accredited against IFOAM-norms and the ISO/IEC Guide 65 (see chapter 3.1.4; page 45; Taylor 2006)

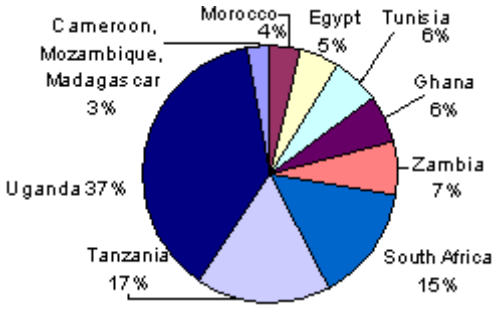
sector in Uganda, because OA sector is small-scaled and many people are directly involved, without formal recognition. Nevertheless, this chapter will examine most important numbers, which are available on certified (and in conversion to certified) OA in Uganda.

BOX 4: Organic Agriculture in Africa

Distribution of OA in Africa

In year 2007 about 3% of certified organic area of total world was in Africa. In total this are 870.329 ha agricultural area. In the same year around 44% (or in total numbers 529.986) of all organically certified farmers were producing on the African continent. In year 2004 approximately 37% of all organic certified land in Africa was in Uganda. Therefore Uganda is Africa's leading country concerning OA and the export of organic products (Parrott et al. 2007).

Figure 1: Percentage of organically certified land in Africa in year 2004



(Source: own figure; data from Okaasai et al. 2007)

Existing five types of OA in Africa

1. *Commercialised, certified organic agriculture* — without any significant development or donor funding. This is practised on large-scale farms and is often oriented towards organic markets in developed countries. Examples include some large farms in Malawi, South Africa and Zambia, as well as north Africa. An outstanding example is Sekem in Egypt, which won the Right Livelihoods Award in 2003.
2. *Export-oriented certified organic agriculture* — supported by development or donor funding. This is aimed mainly at improving the incomes and livelihoods of smallholder farmers. For example, Uganda currently has 28,000 certified farms covering 122,000 ha of land, and Tanzania has 1,000 certified farms covering 5000 ha.
3. *Poverty and environmentally oriented agriculture (agro-ecology) based on organic principles* — assisted by development agencies and NGOs. This involves many initiatives that address soil degradation, water capacity, land-use management, biodiversity conservation, agroforestry, desert control, and food and seed security. These initiatives are often designed to enhance local initiatives.
4. *Local organic agriculture innovations* — developed by farming communities and local organisations. These constitute a means of addressing pressing social, economic and environmental problems. Such initiatives are most developed in Kenya, South Africa and Zimbabwe.
5. *Organic research* — conducted by local, national and international institutions. Egypt has a well-developed national research system for organic cotton. International research institutions include the World Agroforestry Centre (ICRAF) and the International Centre of Insect Physiology and Ecology (ICIPE).

(Source: IFOAM. 2003. Organic and Like-minded Movements in Africa. IFOAM: Bonn, Germany. In: Walaga 2002:18).

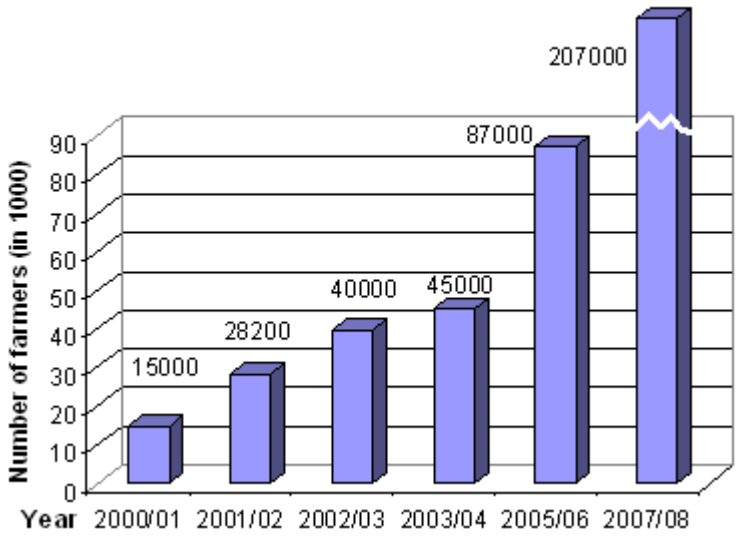
1.5.1. The Organic Agricultural Sector in Uganda

In general certified OA takes places in Africa (and Uganda) in two main forms: (i) single owned relatively large farms or plantations producing export oriented and (ii) small holder groups who collectively organise training, extension, inspection, certification and marketing activities. Most of the smallholder groups have been supported (at least initially) by development cooperation programmes (such as the Swedish financed EPOPA

programme).[31] A majority of these small-scaled farmers participating in these programmes produce only a small amount of cash crop for export and use the land mostly to produce staple food for household consumption and local markets. Some times 'hybrids' of these two forms exist, who are called *out-growers*. This is the case when a large plantation buys additional to its own harvest products from certified small-scaled farmers. This report mainly focuses on small-scaled farmers and farmers group practicing OA, than on single owned export oriented plantations.

In Uganda over 90% of organic production is carried out by smallholder farmers with a farm size of between 1 - 3ha. Mostly around 1 ha is used to produce organic produce for the market. So a majority of farmers produce their own food from their farms and hence the close link between farm productivity and food security (Parrott/Kalibwani 2004; Taylor 2006). Number of farmers certified and linked to export market has been growing strongly from 28.000 by end of year 2002 to a total of over 200.000 by the end of year 2007 (Figure 1.23; page31). Beside the certified farmers there are many farmers existing who are engaged in organic production but are not certified and are only supplying the local and regional markets through other forms of Guarantee Systems (NOGAMU 2009).

Figure 1.23: Number of organically certified farmers in Uganda (2000 - 2006)



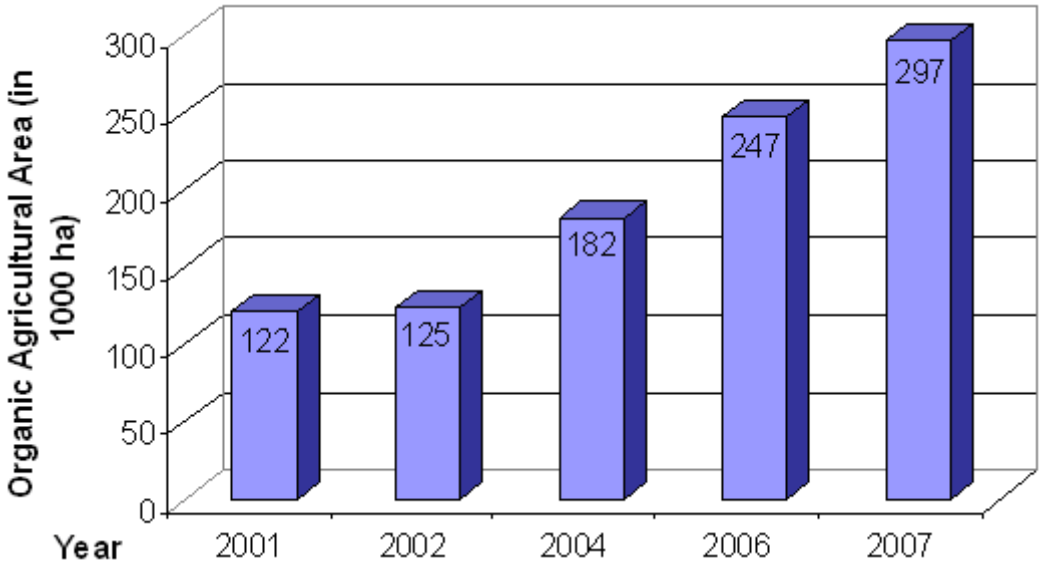
(Source: own figure; data from Bouagnimbeck 2008; NOGAMU 2008; In: Bouagnimbeck 2009; Parrott/Kalibwani 2004; Okaasai et al. 2007; NOGAMU 2009)

In 2005 in total around 23.672 ha agricultural area was certified organic in Uganda. One year later (in 2006) total certified organic area increased to around 88.439 ha. It comprises around 0,71% of Uganda's total agricultural area. 86.952 certified organic farmers were producing around 7877t of organic export commodities. Average landholding of organic farms in year 2006 was around 1,02 ha (which is slightly more than the average landholding of traditional farms in Uganda; see chapter 1.2.2.5; page 15). In 2006 additionally (to 88.439 ha certified organic land) there was an area of 158.328 ha certified as forest and *wild harvest* area. By the end of year 2007 total organic area and wild harvest area of around 300.000ha was certified (Figure 1.24; page 32). It comprises around 2,3% of total agricultural area of Uganda, which is a strong growth in agricultural area, compared to year 2001 (0,95%). As in conventional agriculture women are the main workers in OA, who are supported by family

[31] Export Promotion of Organic Products from Africa (EPOPA) programme was running from mid 1990ies to 2008 founded by the Swedish International Development Co-operation Agency (SIDA) and has implemented a programme to promote exports of organic products from Africa, especially from Uganda and Tanzania. For more detailed information please refer to: http://www.grolink.se/epopa/

members, and men generally own the land. The monetary benefits resulting from the farm (in form of cash crops, such as coffee) are controlled by the men. And, finally, if a farm is organically certified it is registered in the name of the man (Taylor 2006).

Figure 1.24: Certified organic area (includes wild harvested area) in Uganda (2001 - 2007)



(Source: own figure; data from NOGAMU 2008 cited after Bouagnimbeck 2009; Okaasai et al. 2007)

The most important Ugandan organically certified produce comprise bananas, cocoa, coffee, cotton, dried fruits, honey, other tropical fresh fruits, processed fruits incl. juices, sesame, spices (culinary), tree nuts (cashew, shea), tea, other forest products and wild catch fish (Bouagnimbeck 2008; Taylor 2006). Some available numbers on organic area: In year 2001 on an area of around 8980 ha certified organic cotton was produced. In year 2004 around 600 t certified cocoa was harvested on an area of around 2082 ha and certified coffee was produced on an area of around 18.135 ha. Main use of land under organic management in 2004 was: arable land 8980 ha; unknown/other crops 92.803 ha; permanent crops 20.217 ha (Parrott et al. 2006).

Largest markets for agricultural products (and so for OA products) from Africa are within the European Union. Certification costs for OA are high due to the lack of domestic but international accredited certification bodies[32] (see also chapter 3.1.4; page 45). Costs for foreign certificate in Uganda are between 500 and 3000 US$. However, costs can be lowered for small-scaled farmers in an Internal Control System (ICS) low as a few US$/farmer in a big group[33] (Rundgren 2007). Domestic market strongly drags behind export markets. The National Organic Agricultural Movement of Uganda (NOGAMU) established in year 2002 a shop[34] in Kampala next to its office and some supermarkets in Kampala are selling organic produce. In early years expatriates bought most of the organic products. During last five years Ugandans have started appreciating the organic products and the number of local buyers has overtaken that of expatriates (Okaasai et al. 2007).

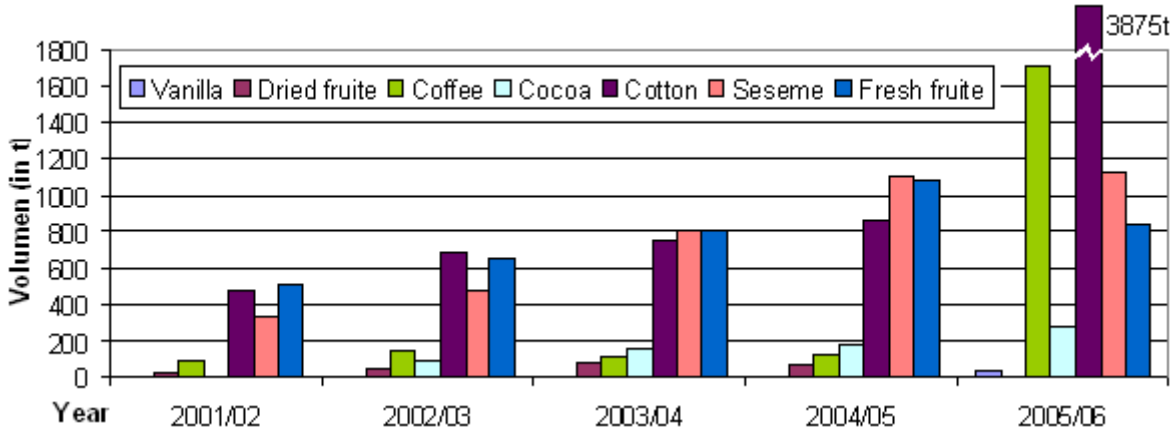
[32] Accreditation of UgoCert (the only domestic certification body in Uganda) aimed for accreditation in 2008 and finally was accredited in spring 2009.

[33] In a ICS-group with around 500 farmers costs are likely to be in the range of 10 US$/farmer and for smaller ICS-group it will be around 100 US$ Dollars/farmer. Additionally there are substantial costs involved in the operation of the ICS itself (Rundgren 2007).

[34] Information about the NOGAMU-shop in Kampala available under: http://www.nogamu.org.ug/newcms/userfilesnogamu/file/orgshop.pdf [13.03.2009]

Between the years 2001 and 2003 value of organic exports increased from 4,6 Mio. US$ to 7,7 Mio. US$. In 2003/04 exports of certified organic products were estimated to have total value of around US$ 7.5 Mio. Growth strongly continued in the following years until recent with an average of 67% per annum for the last 3 years. Exports in year 2006 in total amounted to 7877 t (Figure 1.25). With a total volume of 3785 t organic cotton was the most important produce (concerning volume of exports in t) followed by organic coffee (1705 t) and organic sesame (1124 t; Bouagnimbeck 2008; Walaga et al. 2005; Okaasai et al. 2007; NOGAMU 2009).

Figure 1.25: Volume of organic exports from Uganda (2001 - 2006)



(Source: own figure; data from Bouagnimbeck 2008; Parrott/Kalibwani 2004; NOGAMU 2007)

1.5.2. Development of the Organic Agricultural Structure in Uganda

Since the late 1980s Ugandan civil society has promoted sustainable agricultural systems based on OA principles among smallholder farms to reverse declining agricultural productivity and to increases income and food security of farmer families. Agricultural systems based on OA were regarded to be suitable for small-scaled farmers since they rely on local resources and build on indigenous knowledge (Walaga et al. 2005; Taylor 2006).

Organic certification in Uganda started in 1993 and from year 1994 commercial companies started to engage in OA with an focus on the export markets with the facilitation of EPOPA. Since than export markets have been the driving force behind the organic agricultural movement in Uganda and have led to an steady increase of involved people and organisations. So since 1994 range of certified organic exports from Uganda has expanded rapidly from pineapples and sweet bananas to include coffee, cotton, cocoa, sesame, vanilla, mangoes, ginger and papaya. Last years more organic export projects are being developed (e.g. for essential oils, spices, honey and hibiscus tea; Walaga et al. 2005; Taylor 2006).

In 2001 NOGAMU was formed (see Figure 1.26; page 35). From then NOGAMU was an umbrella organization unifying organic producers, processors, exporters, NGOs and other institutions and organizations that are involved in the promotion and development of the organic sector in Uganda. NOGAMU's vision is to achieve "increased incomes and improved livelihoods in Uganda through the adoption of OA" (IFOAM 2009). NOGAMU by mid-2005 already had attracted over 300 individual members and over 80 corporate members. Many of the corporate NOGAMU members have thousands of members, meaning that NOGAMU is linked to around 25.000 stakeholders in the organic sector in year 2005. Recently NOGAMU cooperates with designated partner organizations in different localities, thereby spreading its influence nationwide. In the north of the country (in the region of Lira) NOGAMU works with

the Lango Organic Farming Promotion (LOFP)[35]; in the east with Students Partnership Worldwide[36] and in the west with the Sustainable Agriculture Trainers Network[37] (NOGAMU 2009; Taylor 2006).

NOGAMU is democratically organised and a deliberate policy ensures the influence of the farmers on the directives and direction of the organisation. Participation of members is possible in the election of the Central Committee (every two years by all members) and additionally in the four activity committees of marketing, training, lobbying/advocacy and organic standards (NOGAMU 2009).

Main objectives of NOGAMU include:

(i) The building of capacities in organic research, training, education and extension in Uganda;
(ii) Promotion of local and international marketing of organic products from Uganda;
(iii) Increment of the application of organic standards and certified organic production in Uganda;
(iv) Growth of awareness and to attract support for organic agriculture in Uganda (IFOAM 2009f).

At national level NOGAMU is representing both processors/exporters and producers and is involved in advocacy activities and lobbying aimed to increase awareness and to attract support to the OA sector in Uganda, such as to lobby the government for a policy on organic agriculture.[38] As well NOGAMU has intervened against such policies that are seen as having negative impact to OA sector in Uganda and hence to the members of NOGAMU. So NOGAMU has been lobbying against the proposed use of DDT in the control of Malaria by the Ministry of Health (MoH) and the introduction of Genetically Modified Organisms (GMO) in Uganda. Other fields of work of NOGAMU are: (i) Presence at international OA trade fairs as a body, slowly carving out a solid reputation for Uganda in the international organics market; (ii) Development of several guides concerning the practice of OA in Uganda (training guide; organic seed production guide; etc.); (iii) Development of a gender strategy (iv) Development of organic standards and (v) Involvement in the process of setting up of UgoCert, Uganda's certifying body (NOGAMU 2009; Taylor 2006).

Straight from the beginning in 2001 NOGAMU was a driving force to establish a Ugandan Organic Standard (UOS).[39] In 2004 UOS was adopted by NOGAMU and UgoCert (the national organic certification body, which was founded in the same year) in line with the IFOAM Basic Standard. In year 2008 UgoCert (Figure 1.26; page 35) was accredited by the International Organic Accreditation Service (IOAS) against IFOAM & ISO/IEC guide 65.[40] Beside UgoCert the most important (international) certification bodies are Institute for Market Ecology (IMO) from Switzerland, Ecocert from France and Soil Association from UK (Taylor 2006; NOGAMU 2009). Around two years ago NUGAMO has established an Organic Trade Point (OTP) to serve as a one-stop-centre for organic market information and related

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[35] Under the umbrella of LOFP about 12 000 farmers are organized with the aim to facilitate the production of organic crops. LOFP works with farmers and is responsible for quality control through an ICS, while it also monitors the marketing of organic cotton and sesame and endures lobbying for issues concerning OA in the region (Walaga et al. 2005). For more information please refer to: Tulip, A. and Ton, P. 2009. Organic Cotton: Uganda Case Study. Available under: http://cdouga.org/index2.php?option=com_content&do_pdf=1&id=8

[36] For more information please refer to: http://www.spwusa.org/programs_uganda.aspx

[37] For more information please refer to: http://www.satnet.org.ug/

[38] In year 2003 the Organic Policy Development Committee was created in the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF). A process of countrywide consultations has engaged many stakeholders since 2004 and is now in advanced stages, but until now there is neither an organic market regulation existing in Uganda nor an official policy of MAAIF concerning OA (NOGAMU 2009).

[39] It is considered that the Uganda National Bureau of Standards (UNBS) is adopting the UOS (Taylor 2006).

[40] See also chapter 3.1.4; page 48. For more detailed information please refer to: http://www.ioas.org/accredit.htm

enquiries to local farmers and exporters as well as importers looking for organic products from Uganda (NOGAMU 2009).

The role of the Government/MAAIF regarding OA policies is confined to “provided a conducive policy environment for organic agriculture development” (Okaasai et al. 2007). In the opinion of the MAAIF a favourable environment of policies include: privatisation, liberation, decentralization, environment management policy (Okaasai et al. 2007).

Figure 1.26: The NOGAMU logo, the UgoCert certification mark for organic products and the East African Organic Mark

(Source NOGAMU 2009; UgoCert 2009; IFOAM 2009d)

The development of a considerable OA sector in Uganda and its neighbouring countries (especially Tanzania and Kenya did some efforts to spread its organic production) during last ten years made it necessary to achieve a regional harmonization and alignment in organic standards and regulations. The East African Organic Products Standard (EAOPS) and the associated East African Organic Mark (EAOM; see Figure 1.26) therefore were developed by a public-private sector partnership in East Africa supported by IFOAM and the UNCTAD-UNEP Capacity Building Task Force on Trade, Environment and Development (CBTF; which is a joint initiative of the United Nations Conference on Trade and Development and the United Nations Environment Programme; IFOAM 2009d; Bouagnimbeck 2008).

In May 2007 the Prime Minister of Tanzania officially launched EAOPS and EAOM at the East African Organic Conference. The EAOPS aims to unite organic regulations and markets in Kenya, Tanzania, Uganda, Rwanda and Burundi. Both, the EAOPS and the EAOM, combined with a consumer awareness campaign will contribute to the development of a regional market for organic produce in East Africa (Bouagnimbeck 2008).

1.6. Conclusion

Against the background that agriculture currently seems to be *en vogue* as a means for development in general, this chapter wants to review challenges and issues rural Uganda currently is facing and examine them once again in a condensed way. This report agrees with UNDP that agricultural in common highly influences human development through the provision of basic food for the population as well as required raw materials, such as fibres, fabric, etc. In Uganda in 2005 about 87,5% of population was living in rural areas, 42% of them were living below the national poverty line and over 70% of all Ugandans were employed in agriculture, contributing 35% to GDP. So agriculture is not only fundamental for the livelihood of a majority of the Ugandan people (as they mainly rely directly on the earnings of the small agricultural holdings of about 1 ha in average), but also important for Uganda’s future development in general.

During the last 20 years Uganda was facing a massive decline in forested areas. With an annual net negative change rate of 2,2% of total forest area FAO listens Uganda among those ten countries with the largest annual change rates. Deforestation is mainly due to the

fact, that more than 90% of total consumed energy in Uganda is gained through fuel wood from domestic forests.

Agricultural area is increasing: In 1965 around 45% of land area in Uganda was used for Agricultural purposes. Recently agriculture occupies around 65% of total land area; mostly to produce food crops.[41] Further expansion of agriculture is rather limited to an expansion of livestock production than of an extension of arable land in frontier areas due to marginal conditions of soil. Almost all good agricultural land is already fully arable utilised, therefore an increased crop production in future will mainly rely in an increment of agricultural productivity (intensification of production techniques) rather than on an expansion of agricultural area.

Yields per hectare of all main food crops (except Cassava, which yield per hectare tripled last 45 years) were stagnating or falling last 40 years. A fertilizer input in agriculture is very low (only 1% of agricultural land; mostly done in industrialised plantations). Generally, smallholder farmers in Uganda have only rarely adopted the principles of Green Revolution agriculture. Total agricultural production was increasing only due to expansion of harvested areas. Up to now, growth in harvested area (and so growth of total agricultural production) was (almost) enough to meet domestic demand on food in Uganda even though food production per capita constantly was decreasing. The level of undernourished people of total population retained between 15-20% during the last 15 years. Agricultural share of GDP[42] was decreasing and growth of agriculture was slowing down as well since year 2000 whereas growth in food production decreased more rapidly than growth in total agricultural production. In 2005/06 agricultural sector experienced with 0.4% its lowest annual growth rate in over a decade.

63% of total land area in Uganda is currently suffering from human induced degradation. Unsustainable agricultural practices are the cause of land degradation of more than 23,5% of total agricultural area. Additionally deforestation and overgrazing/overstocking favours land degradation, which causes nutrient depletion, erosion, etc. and finally a declining agricultural productivity. Declining agricultural activity therefore might be the reason for further land degradation and so on. In monetary means land degradation results in estimated losses of GDP in the range of 1300 Mio. US$ to 3800 Mio US$ representing approximately 17% of total GDP in 2004.

Population was growing from year 1950 (5,158 Mio. people) continuously to its 5,6-fold in 2005 (28,94 Mio.) and is predicted to increase until year 2050 up to a total number between 80 and 160 Mio. people. Although there is a tendency to urbanisation, in 2050 rural population will contribute the majority of total population in Uganda – only one third will live in cities then. If the current trends in expansion of agricultural area and population growth will continue as predicted Uganda, as a country, will be depleted of available agricultural land by around 2022. In some regions depletion of available land will be reached earlier: In 2010 eastern Uganda will run out of available agricultural land.

Uganda has made tremendous strides in eradicate poverty, but still Uganda remains on of the poorest countries in relation to monetary means: In 2005 about 51,5% of population was living with less than 1,25 US$ per day and about 75,6% of population was living with less than 2 US$ per day, mostly in rural areas. In 2005/06 around 31% of total population was living below the national poverty line. Mean income is unevenly distributed between rural and urban areas. Urban population has more financial means than rural and this gap is likely to expand in future. According to UNDP the HDI-value of Uganda was improving last 15 years and reaches about 0,493 in year 2006, which gives the country a rank of 156th (out of 179

[41] Recently about 90 per cent of the total national planted area is devoted to food crops.

[42] In year 2003 food crop production predominated the agricultural sector in Uganda and contributed around 71% to agricultural GDP, while export crop production contributed only for around 5%.

countries with available data). HDI as well differs by regions and especially by urban and rural areas, with higher HDI in cities than in rural areas.

Despite all agricultural problems such as land degradation, stagnating yields, shortage in agricultural area, etc. OA in Uganda appears like a rising sun. As OA in Uganda is existing in two major forms (certified OA and uncertified OA) this paper may only provide an overview and concentrate on certified OA, because of availability of data on certified OA.[43] Sustainable agricultural practices and OA was promoted since 1980s by Ugandan civil society as a response to emerging threats like declining soil fertility, decreasing productivity etc. Since 2001 and the constitution of NOGAMU a strong growth in all numbers concerning OA in Uganda occurred. OA has become a flourishing sector in Uganda and EPOPA boosted the connection of small-scaled farmers to international markets that they may benefit from this upward trend. As a result the number of small-scaled farmers certified and linked to export markets has been growing strongly from 28.000 by end of year 2002 to a total of over 200.000 by the end of year 2007. Certified agricultural area in 2007 was 2,5-fold compared to year 2001 and comprised around 300.000ha or 2,3% of total agricultural area. Around 37% of all organic certified land in Africa in 2004 was in Uganda. Between the years 2001 and 2006 the value of organic exports increased strongly as well. Last major stride forward of OA was the launch of EAOPS and EAOM in 2007, which contribute to the development of a regional market and awareness for organic produce in East Africa.

What makes OA so flourishing? Is OA a contributory means to face the current rural challenges and issues in Uganda? Does OA favour well being of rural people? And if agriculture in general is *en vogue*: What is the official position of World Bank or UN according OA in especial? How is the structural environment OA is embedded in?

[43] Whereas it might be more interesting to analyse the trends in uncertified OA on which no data is available.

> “For some, talk of sustainable agriculture sounds like a luxury the poor can ill afford. But in truth it is good science, addressing real needs and delivering real results”

New Scientist [44]

2. Research framework

This second part of the paper focuses on the central methodical matters of the report and examines the research framework. It highlights the bias on traceability and transparency during the process of research and therefore it should ensure a comprehensible report. This paper integrates information and knowledge from various sources and disciplines to holistically approach the topics of interest and archive diversified results. It combines peer-reviewed articles from scientific journals with the information obtained from additional sources like other literature (books, unpublished PhD and MsC. theses, lecture notes, etc.) or

[44] Parrott/Marsden 2002

personal communications with people involved in the topic of research like Univ.Prof.Dipl.-Agr.Biol.Dr.Ing. Bernhard Freyer or Dr. Charles Walaga and makes use of the empirical data collected during the whole process of research.

This chapter starts with the key questions, following with objectives, which should be reached due to applied methods during process of research.

2.1. Key questions of Research

1. Organic Agriculture and Poverty/Land degradation

(i) Does Organic Agriculture contribute to reduce poverty in rural Uganda?
→ If it does: How Organic Agriculture contributes to reduce poverty in rural Uganda?

(ii) Is Organic Agriculture a contributory means to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?
→ If it is: What are the contributory features/effects of Organic Agriculture to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?

2. Organic Agriculture and its structural environment

(i) What is the structural and scientific environment Organic Agriculture is embedded in and how does this environment facilitates Organic Agriculture?

(ii) What are the official positions of the most important multinational, international and national organisations/institutions concerning Organic Agriculture and its implementation in Uganda?

(iii) What are the most important factors and issues influencing Organic Agriculture in Uganda?

2.2. Objectives

The aim of the research was to audit the structure of OA in the Democratic Republic of Uganda and to analyse the possible influences on rural people's life by the means of OA. Another important issue of this paper is the Ugandan as well as the international socio-economic context OA is embedded in and how organic agriculture is influenced by it.

There is growing evidence that OA is well suited for countries like Uganda with a majority of smallholder farmers constituting the agricultural sector. In such countries OA may provide the basis for an increase of agricultural productivity and so ensure food security and improve livelihood in general of smallholders in rural communities while environment is handled in a sustainable manner with a reduction of harmful inputs.

The first objective of this report therefore is to analyse the current situation of OA in Uganda and how OA may interact with the currently prevalent smallholding subsistence farming system. The paper is intended to provide a better understanding of the current state of the OA sub-sector (the actors and stakeholders, the status of production and marketing and the key constraints the OA sector is facing) to analyse if OA is interlinked with the reduction of poverty in rural areas and how OA may affect rural poverty in Uganda. This report is not intended to be an exhaustive description of OA methods in an Ugandan context. It highlights the approach and features of OA as a practicable strategy to influence small scaled farming systems positively and maybe to have an impact on the reduction of rural poverty in Uganda, while reducing pressure on ecosystems, which are deteriorating or in danger of deteriorating in the near future and enhances biodiversity.

Secondly the paper attempts to provide views on Uganda's OA and the institutional/structural environment it's embedded in. The objective is to examine in a systemic approach the

positions and policies of institutions and organisations involved in development issues concerning OA. The analysis of the position and policies then reflects the environment of OA and further determines opportunities, challenges and constraints OA in Uganda is facing on international, national and regional level. A comprehensive appraisal of Organic Agriculture's structural environment should lead to a better understanding of the current situation of OA and contribute to future changes in agriculture policies to favour OA.

2.3. Methods

This report tries to broaden its attention on agriculture beyond the general frontiers of different scientific fields and disciplines. A transdisciplinary approach attempts to answer the key questions in a holistic manner. So this modality of research presupposed qualitative and quantitative data from literature and other sources, which were used to analyse the relationships between OA and poverty and the institutional environment OA is embedded in.

2.3.1. Preparations

At the beginning of the research for this paper it was useful to know people, who worked on similar topics before to get in a "soft approach". So Univ.Prof.Dipl.-Agr.Biol.Dr.Ing. Bernhard Freyer (BOKU), Dr. Charles Walaga and Univ. Ass. Dipl. Ing. Dr. Michael Hauser (BOKU) provided the author with first names of important scientists and literature concerning the topic of research. Equipped with this information the author fed various online catalogues with names. This search period took place from June 2008 until the beginning of March 2009.

2.3.2. Data Sampling

Search for data and data collection was done in cycle to achieve a diversified picture of the field of interest. What does it mean to search "in cycle"? From the key questions of research some key words like Organic Agriculture; Uganda; Poverty; World Bank policies, etc. were derived to search for usable information. Obtained data (from articles; books; files from homepages; etc.) were used to modify key words for a further search-cycle to get more in touch with the topic and to achieve a diversified in-deep information of the variables of research question. All gathered information concerning the topic was collected and there was no theoretical base or hypothesis existing to sort out data.

2.3.2.1. Search for Books and Scientific Articles

At the library at BOKU as well as at the library of the Department of Sustainable Agricultural Systems respectively Iföl (Institut für ökologischen Landbau/Institute of Organic Farming) the search for books started (with the keywords: Organic Agriculture, Uganda, Organic Farming; East Africa, Poverty (Reduction), Food Security etc.). At the same place there was access to the catalogues of international editors (consortia such as: SCOPUS, ScienceDirect, Blackwell Synergy, SpringerLink, etc.) to search for articles in various scientific journals (with the same keywords).

Articles´ references from authors such as Pretty, J./Hine, R., Parrott, N./Marsden, T. or Pender, J.; Jagger, P.; Nkonya, E.; Sserunkuuma, D. were used for a searching circle once again.

2.3.2.2. Search the Internet

To get an first overview and more information about the current results of research as well as about the official position in the field of (Organic) Agriculture and its structure respectively poverty and poverty reduction measures in the Republic of Uganda at the beginning several websites were visited such as the homepages of FAO (Food and Agriculture Organisation of the United Nations), IFOAM (International Federation of Organic Farming Movements);

WBRD (World Bank for Reconstruction and Development), Ministry of agriculture of the Republic of Uganda, UNDP (United Nations Development Programme) etc.

Search engines (such as Yahoo and Google) were fed with the same keywords mentioned above to search the web for more diversified information.

2.3.3. Analysis and Evaluation / Assessment

Literature was evaluated in a text hermeneutic approach having discourse analysis and reflexivity in mind. A text analysis was based on coding the collected information to get the core message of all kind of sources. It was done in three steps/levels: (i) content summarising and paraphrasing; (ii) descriptive analysis and (iii) interpretation. These steps were done in an inductive manner of research (from particular facts to a general conclusion) as well as (later in the process of research) in a deductive way (from valid premises in series of logical steps to conclusions) to achieve considerable results as synthesis (Kruse 2008).

2.3.3.1. Evaluation of information

As a next step received articles and books were evaluated, if they are useable as a source for this paper. Especially homepages and other information received from the Internet were proofed for their validity (source of information, cited literature, authors, etc.) as they may utilized as a source for a scientific paper. As a consequence there was no use of information from articles/files published as so called popular science, which do not follow the rules of scientific writing (citing, methods, etc.).

2.3.3.2. Analysis and Assessment of Information

Collected information was compared to avoid mistakes, misunderstandings or misinterpretations. At the same time the author tried to evaluate and valuate collected information with the help of existing literature concerning the topic. As a result of the permanent comparison there were found some variations in numbers or information by different sources. The author decided to draw the whole volume of audited information/numbers and to state it at the place of occurrence in the paper.

> “Starvation is the characteristic of some people not having enough food to eat. It is not the characteristic of there being not enough food to eat.”

Amartya Kumar Sen [45]

3. Concepts and Definitions

Straight from the beginning it is necessary to provide an operational definition of the key concepts used in this report. So this part of the report focuses on the definitional issues surrounding the concepts of OA and poverty and wants to dispel frequent misconception on OA and poverty. It highlights the issues, which are behind theses terms and what they mean within the report.

[45] Sen 1983:1

3.1. Sustainable Agriculture and Organic Agriculture

Around the world many types of sustainable agricultural systems are existing. All of them are in a certain way sustainable agricultural systems and are more holistic than conventional or industrialized agricultural systems. The main differences in between these agricultural systems are the use of energy intensive external inputs and the attention is paid to natural re-cycling systems. In sustainable agricultural systems the incorporation of natural re-cycling systems into the agricultural production process ensures a (much) lesser use of energy intensive external inputs and positively affects the agro-ecosystems. Therefore sustainable agricultural systems maintain or improve soil fertility, enhance soil structures, conserve water and ensure the conservation and sustainable use of (agro-) biodiversity while producing healthy food or fibres (IFOAM 2009a).

3.1.1. Key principles of sustainable agriculture

There are four key principles in which most sustainable agricultural systems differ from conventional agricultural systems. These key principles are:

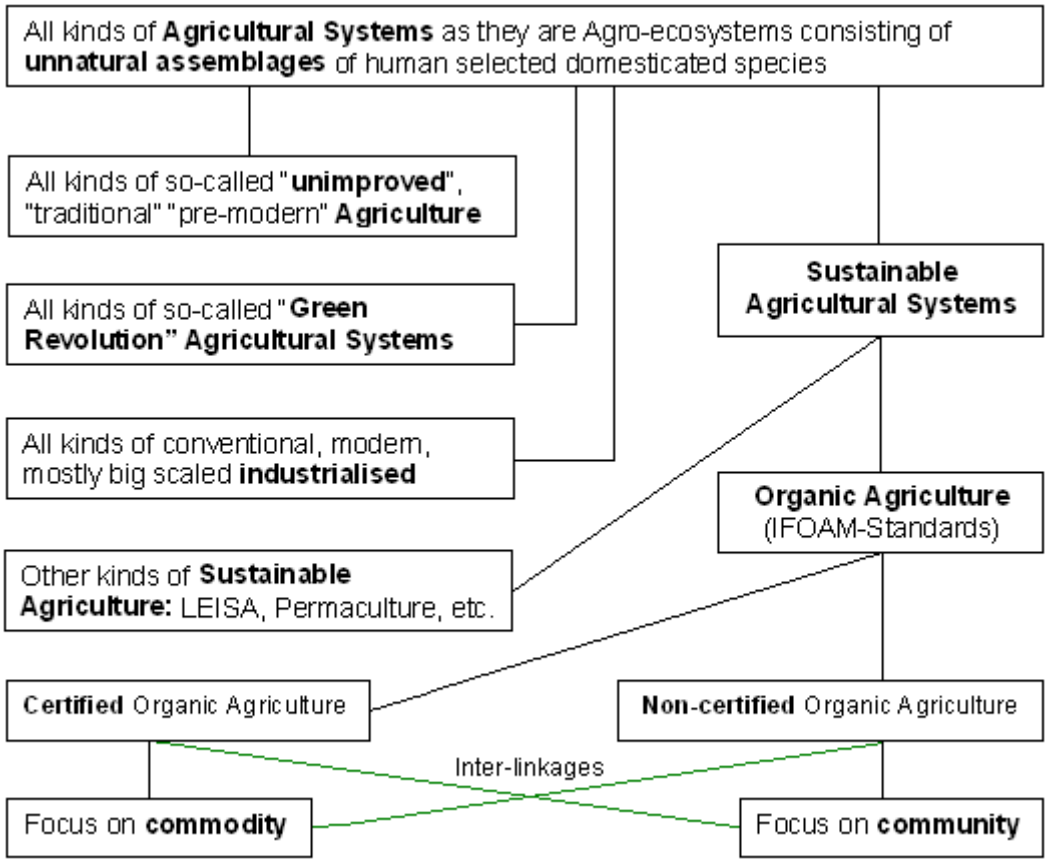
i. Integration of ecological/biological processes into food production processes: nutrient cycles, nitrogen fixation through legumes, use of beneficial organism…
ii. Productive use of farmers´ skills and knowledge to substitute costly external inputs and improve self-reliance.
iii. Minimisation or exclusion of non- renewable and/or harmful inputs and strategies such as pesticides, inorganic fertilizers, monoculture, etc.
iv. Productive use of peoples collective capacities to work together and solve common agricultural and resources problems, such as pests, forest, irrigation, credit management… (Pretty/Hine 2006:7)

Various types of agricultural systems make use of the key principles. Some agricultural systems only partly implements one or more of the principles. An agricultural system is sustainable if it puts into practice four principles out of four. However, there are various kinds of agricultural systems existing. On the one hand there are the heavy mechanized conventional, industrialized agricultural systems with the use of costly inputs mostly in the developed world. On the other hand there are the so-called “traditional” or “unimproved” farming methods of the developing world with only a small amount of costly inputs. And in between there are the so-called Green Revolution farming systems (Pretty 1999). So where to situate sustainable agriculture and OA?

3.1.2. Positioning of Sustainable Agriculture and Organic Agriculture

Figure 3.1 (page 47) tries to answer this question. The figure emphasizes on sustainable agricultural systems, especially on organic farming. On the left side up there are the industrialized *high input – high output* farming systems and the so-called *unimproved* or *traditional* systems, as well as the Green Revolution farming system. On the right side there is sustainable agriculture with a lot of various kinds of appearances. In chapter 3.1.3 (page 44) there is a description of what is meant by “IFOAM – Standards” in the figure below.

Figure 3.1: Positioning of (sustainable) agricultural systems and Organic Agriculture



(Source: Freyer 2007; Hauser 2005; Altieri/Nicholls 2004; Pretty 1999;modified)

An agricultural system may contain elements out of one or more than one type of agricultural systems described in Figure 3.1. For example there may an agricultural system existing which mainly rely on natural resources as the base for its production and therefore is classified as traditional or unimproved. Such a system may use external inputs (such as improved seeds, inorganic fertilizers or pesticides) for a single crop or several crops. In Uganda this may be the case for tobacco, which is grown under contract of (international) enterprises. So such a typology of agricultural systems only provides an overview of main types of agricultural systems. In the field there may exist many kinds of mixed systems (Freyer 2007).

3.1.3. IFOAM-Standards and Principles of Organic Agriculture

There is existing a frequent misconception that OA is a step back from modern high tech farming methods to a primitive and simple mode of farming. In fact OA is an innovative approach including traditional knowledge and practices. So OA offers a modern, ecologically intensive farming system that can perform successfully without any synthetic fertilizers or pesticides (Freyer 2007; Scialabba 2007).

The International Federation of Organic Agricultural Movements (IFOAM) defines Organic Agriculture as “(…) a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.” (IFOAM 2009b) So Organic Agriculture is a whole system approach including the sustainable use of ecosystems, to achieve safe food, good nutrition, animal welfare and social justice. Therefore this approach is more than a system of

production that includes or excludes certain inputs. Agricultural systems only are Organic Agriculture systems (whether they are certified or non-certified) if they fulfil certain requirements and follow the IFOAM-standards. The IFOAM-standards and values behind them were developed in a participatory process involving stakeholders from all around the world. This process led to a consensus, the IFOAM-principles, which have a theoretical significance and guideline function, but there are doubts that they are already overall established in practise into concrete structures. Luhmann would argue: they have a status of functions but actually with a low relevance into practise while the guidelines itself have a concrete function and are transferred into concrete structures (Luhmann 1984).

However, the whole IFOAM-standards are listened on the IFOAM-homepage.[46] The four key principles of organic agriculture set down by IFOAM are:

i. **Principle of health:** Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.

ii. **Principle of ecology:** Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.

iii. **Principle of fairness:** Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.

iv. **Principle of care:** Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment (IFOAM 2009c)

3.1.4. Organic premium, Organic sector, Organic Certification / Standard

In literature about OA often is used *premium price* or *organic premium*. There is an extra price paid for an organic product compared to a similar non-organic product. This difference in price is called *premium price* or *organic premium*. They are not regulated, but are determined by the market actors in negotiation (EPOPA 2008). Differences in prices for organic products ranging between 10% and 30% (Walaga/Hauser 2005).

The term *organic sector* is used to describe all the participating stakeholders and their organizations. *Organic sector* includes not only the farmers, processors and traders. It includes as well the agricultural extension service, certification bodies, NGOs and those governmental agencies, which are somehow involved in the OA (EPOPA 2008).

An organic produce can be certified or non-certified, but has at least to follow the IFOAM-principles and standards. Certification is necessary if the product is market organically and wants to achieve a premium price. Implementation of certification by third-party certification bodies guarantees an organic standard. This certification bodies have to be accredited against the IFOAM-norms and the ISO/IEC Guide 65[47]. If an organic product is exported, it is necessary to ensure the validity of the certification in this region. Certification has strictly to fulfil all requirements of these standards. In European organic standards are defined in Union Council Regulation (EC) No 834/2007[48]; in Japan the Japan Agricultural Standard of Organic Agricultural Products (JAS)[49] or in USA the National Organic

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[46] For more detailed information please refer to: http://www.ifoam.org/about_ifoam/principles/index.html

[47] ISO/IEC Guide 65 is an accreditation for certification bodies. For more detailed information please refer to: http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=26796

[48] Union Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products was repealing the former regulation (EEC) No 2092/91 on production and labelling of organic products. For more detailed information please refer to: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF [19.03.2009]

[49] The JAS has been effective since November 26th, 2006. For more detailed information please refer to: http://www.maff.go.jp/soshiki/syokuhin/hinshitu/e_label/specificJAS-organicStandard&Criteria.htm [19.03.2009]

Programme (NOP)[50]. National or regional organic standards in Africa like the Uganda Organic Standard (UOS)[51] or East African Organic Products Standard (EAOPS)[52] are currently used to promote regional trade in East Africa (EPOPA 2008).

3.2. Poverty

By defining the concept of multidimensional poverty this report refers to several sources. One main source is the Capability Approach (CA) by Sen. To define poverty related indicators the Human Development Index respectively the Human Poverty Index by UNDP (UNDP 2009b) was used as they are most suitable for operational issues concerning OA and its relations to poverty in this report. Another source to define these issues are the *Development Assistance Committee (DAC)-guidelines* of the Organisation for Economic Co-operation and Development (OECD) since they are the theoretical basis for most organisations involved in development cooperation.

3.2.1. The Capability Approach

The CA was developed mostly by Amartya Sen during last 30 years and is the theoretical basis for several indices (such as the HDI by UNDP) concerning poverty since 1990ies. Initially there was Sen's question "Equality of What?" The answer on this question resulted in the CA (Clark 2006). In the CA poverty is defined "as a deprivation of capabilities as a lack of multiple freedoms people value and have reason to value." (Alkire 2007:i) "The Capability Approach (…) is basically a normative framework for assessing alternative policies or states of affairs or options. According to the Capability Approach, social arrangements should primarily be evaluated according to the extent of freedom people have to promote or achieve the plural functionings they value. Thus, it follows that the Capability Approach views poverty as a deprivation of these valuable freedoms and evaluates multidimensional poverty according to capabilities." (Alkire 2007:2) So what is meant by *capabilities and functionings*? "A *capability* reflects a person's ability to achieve a given functioning (doing or being) (…). For example, a person may have the ability to avoid hunger, but may choose to fast or go on hunger strike instead. (…) A *functioning* is an achievement of a person: what she or he manages to do or be.[53] It reflects, as it were a part of the state of that person (…). Achieving a functioning (e.g. being adequately nourished) with a given bundle of commodities (e.g. bread or rice) depends on a range of personal and social factors (e.g. metabolic rates, body size, age, gender, activity levels, health, access to medical services, nutritional knowledge and education, climatic conditions, etc). A functioning therefore refers to the use a person makes of the commodities at his or her command." (Clark 2006:4)

So since Sen started his pioneering work on poverty and after the launch of his CA in the indices by UNDP, most commentators (related to poverty issues and poverty analyses accept (at least in theory) the fact that poverty is a multi-dimensional phenomenon and not just a lack of financial incomes (like it commonly was considered before). In this sense

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[50] The NOP was launched in year 1990. For more detailed information please refer to: http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5060370&acct=nopgeninfo

[51] The UOS has been established and has been operational since year 2006. For more detailed information please refer to: http://www.nogamu.org.ug/docs/uos.pdf [19.03.2009]

[52] The EAOPS was launched in May 2007. For more detailed information please refer to: http://www.unep-unctad.org/CBTF/events/geneva5/East%20Africa%20Organic%20Standards%20_%20Musa_Geoffrey_Geneva_031007.pdf [19.03.2009] and http://www.unep-unctad.org/cbtf/events/geneva7/Briefing-OA%20CBTF-24-9-08withBooks3.pdf [19.03.2009]

[53] Functionings (respectively capabilities) somehow are strongly connected with human capital. So change processes (e.g. towards OA from "traditional" agricultural practices, or other changes in a person's life in general) are depending especially on a person's ability to act corresponding to its (i) reflexivity, (ii) practices and (iii) knowledge. Thus it leads to increased awareness of a person (see chapter 4.1.2; page 62 and chapter 4.1.3.; page 64).

poverty is not just a problem of low incomes, but also a deprivation in a variety of basic capabilities or functionings (literacy, health, security, political strength etc.; Younger 2003).

Several authors argued on the CA, especially on how the selection on capabilities/freedoms should be done[54] (Alkire 2007; Clark 2006). However, capabilities and functionings in this report are selected because of operational reasons according to HDI respectively HPI by UNDP.

3.2.2. The concept of Human Development by UNDP – Poverty is more than a lack of financial means

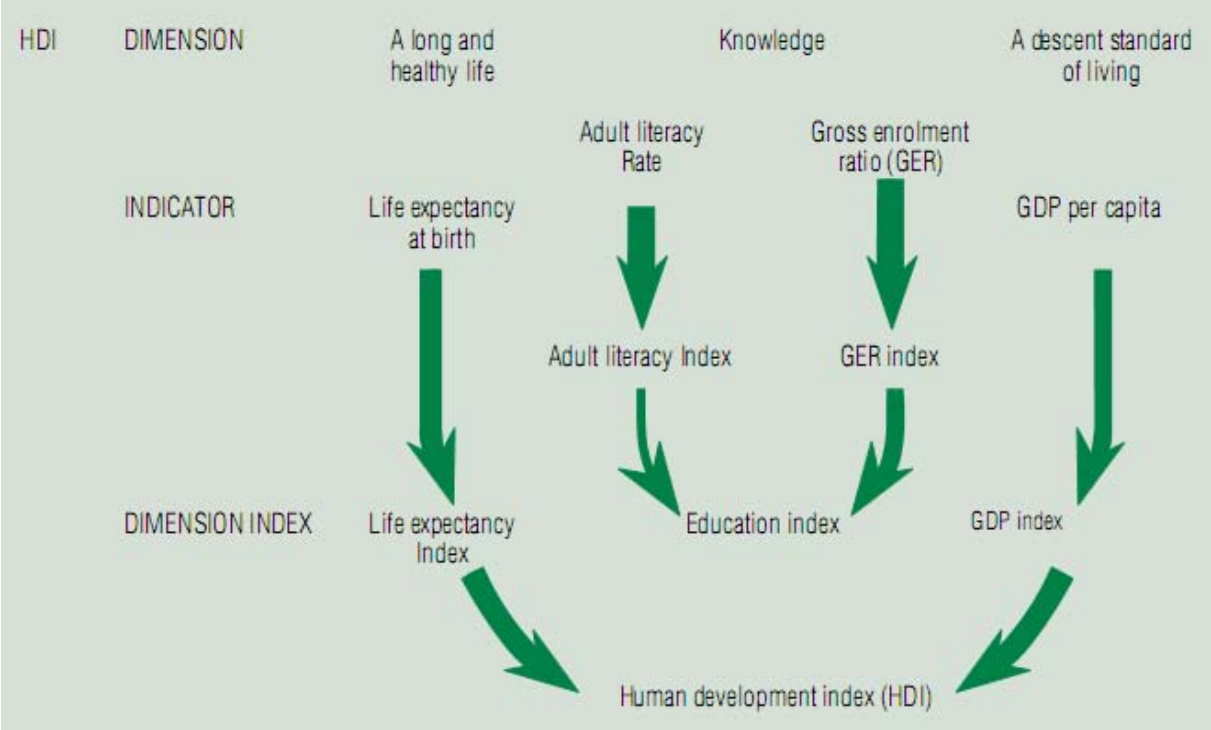
"Human development, as an approach, is concerned with what I take to be the basic development idea: namely, advancing the richness of human life, rather than the richness of the economy in which human beings live, which is only a part of it." (Sen at UNDP 2009b). UNDP firstly introduced the CA approach to indicate Human Development not only by financial means: Human Development is measured in the Human Development Index respectively in the Human Poverty Index.

3.2.2.1. The Human Development Index

Each year since 1990 UNDP has published the Human Development Report indicating the Human Development Index (HDI). Basic idea of HDI was to look beyond GDP to achieve a broader definition of well being respectively poverty (measured in the Human Poverty Index (HPI); see chapter 3.2.2.2; page 51). For UNDP poverty is "a fundamental cause of deprivation in the critical elements of human progress, namely, a decent standard of living, a long and healthy life, and knowledge." (HDR 2007: 71). HDI is measured in a composition of three dimensions of human development: (i) living a long and healthy life (measured by life expectancy and counted as the life expectancy index); (ii) being educated (measured by adult literacy and enrolment at the primary, secondary and tertiary school level and counted as the education index) and (iii) having a decent standard of living (measured by purchasing power parity, PPP, income and counted as the GDP index; Figure 3.2 (page 51); UNDP 2009c; Nohlen 2003). A comparison between HDI and GDP per capita may result in different ranking: Uganda has a much higher GDP/capita than Madagascar, but Uganda drags behind concerning HDI (Figure 3.3 (page 52)).

[54] In Sen's CA capabilities "should be selected in light of the purpose of the study and the values of the referent populations and that their selection should be explicit and open to public debate and scrutiny" (Alkire 2007:i), while Nussbaum argues that for practical implementation there should be somehow a 'list' of core capabilities. (Alkire 2007)

Figure 3.2: Computation of the Human Development Index



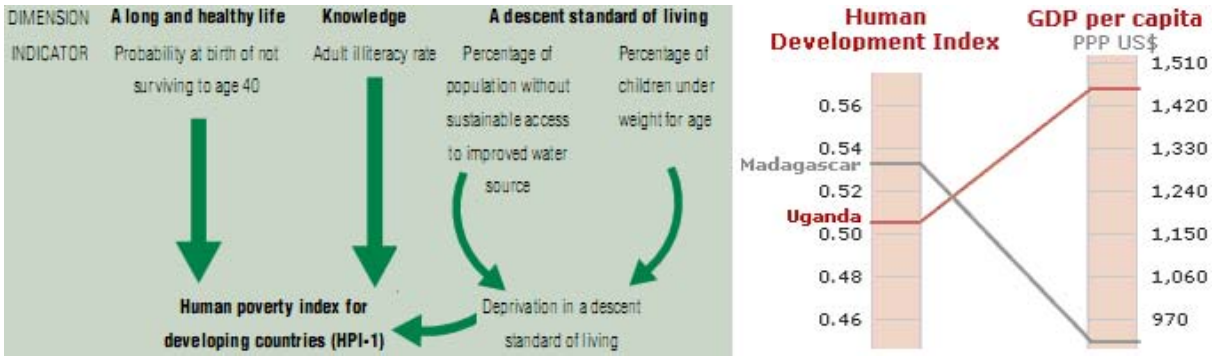
(Source: own figure; data from HDR 2007)

UNDP added some critical words concerning the computation of HDI (as a response to former political and methodical criticism from several sides): “The index is not in any sense a comprehensive measure of human development. It does not, for example, include important indicators such as gender or income inequality and more difficult to measure indicators like respect for human rights and political freedoms. What it does provide is a broadened prism for viewing human progress and the complex relationship between income and well-being.” (UNDP 2009c; Nohlen 2003)

3.2.2.2. The Human Poverty Index

The HDI measures progress in human development. The HPI measures deprivations in the three basic dimensions of the HDI: (i) A long and healthy life in HPI than is measured as *being vulnerable to death at a relatively early age as measured by probability at birth of not surviving to age 40*; (ii) Knowledge in HPI than is measured as *being excluded from the world of reading and communication as measured by adult illiteracy rate*; and (iii) A decent standard of living in HPI than is measured as *being lack of access to overall economic provisions* (measured as the un-weighted average of two indicators: the percentage of the population without sustainable access to an improved water source and the percentage of children under-weight for age; Figure 3.3 (page 52); UNDP 2009c).

Figure 3.3: Computation of the Human Poverty Index and comparison between HDI and GDP per capita



(Source: HDR 2007; UNDP 2009c)

3.2.3. The DAC-Guidelines concerning Poverty Reduction of OECD

For OECD poverty[55] is multidimensional and encompasses different dimensions of deprivation related to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work. In general poverty is the inability of people to meet economic, social and other standards of well-being. "An adequate concept of poverty should include all the most important areas in which people of either gender are deprived and perceived as incapacitated in different societies and local contexts. It should encompass the causal links between the core dimensions of poverty and the central importance of gender and environmentally sustainable development (…)." (OECD 2001:38)

These areas are (OECD 2001):

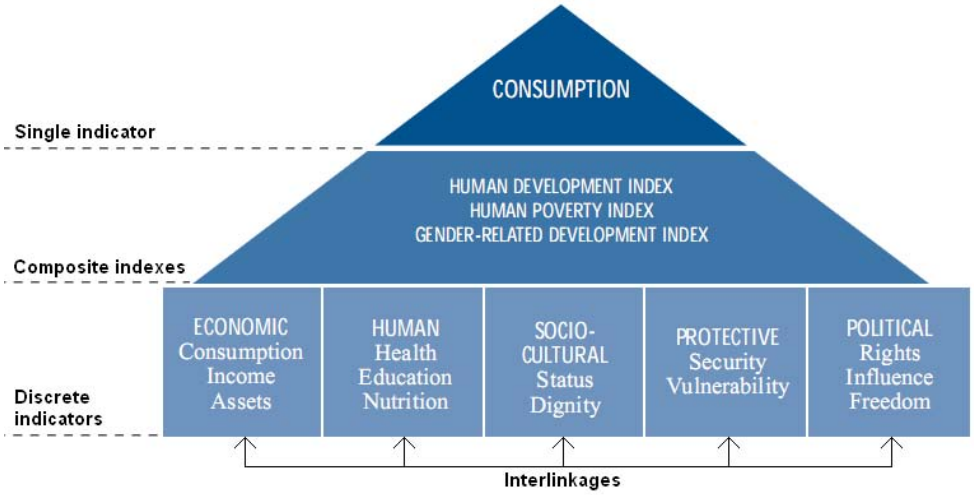
(i)	Economic capabilities	include income, consumption, assets, etc. to obtain food security, material well-being and social status
(ii)	Political capabilities	include human rights, some influence over public policies and political priorities
(iii)	Socio-cultural capabilities	include social status, dignity and other cultural conditions for belonging to a society and to participate as a valued member
(iv)	Protective capabilities	enable people to withstand economic and external shocks
(v)	Human capabilities	include core elements of well-being as well as essential means to improve livelihoods such as health, education, nutrition, clean water and shelter

In Figure 3.4 (page 50) these five areas are in the bottom line and form the basis of well being. On this level (close to the local community level) measurement (in discrete indicators) for HDI takes places. In the middle section of Figure 3.4 composite indexes are represented and the top illustrates well-being (or poverty) in its crudest form: in income or consumption.

[55] In the opinion of OECD poverty has to be reduced with *pro-poor* growth measures in the context of environmental sustainability and gender equality as a key to all dimensions of poverty. Sustainable *pro-poor* growth requires further "good governance, prudent macroeconomic management, competitive markets and a vibrant private sector, efficient institutions and sustainable use of natural resources. Making growth pro-poor requires equitable participation by poor men and women in generating and benefiting from growth. It also requires reforms to reduce inequalities regarding human capabilities and access to assets and productive resources such as land, training and credit."(OECD 2001:11) An pro-poor approach in the sense of OECD with catchwords such as sustainability, good governance, etc. does not fit into the definition of poverty issues in this report, but is necessary to mention to get an holistic view about the attitudes of OECD.

Nevertheless consumption and income are the easiest data to measure and collect and therefore mostly available (OECD 2001).

Figure 3.4: The pyramid of poverty: different aggregation levels and dimensions of poverty and well-being



(Source: OECD 2001:39/41; modified)

3.2.4. Food security

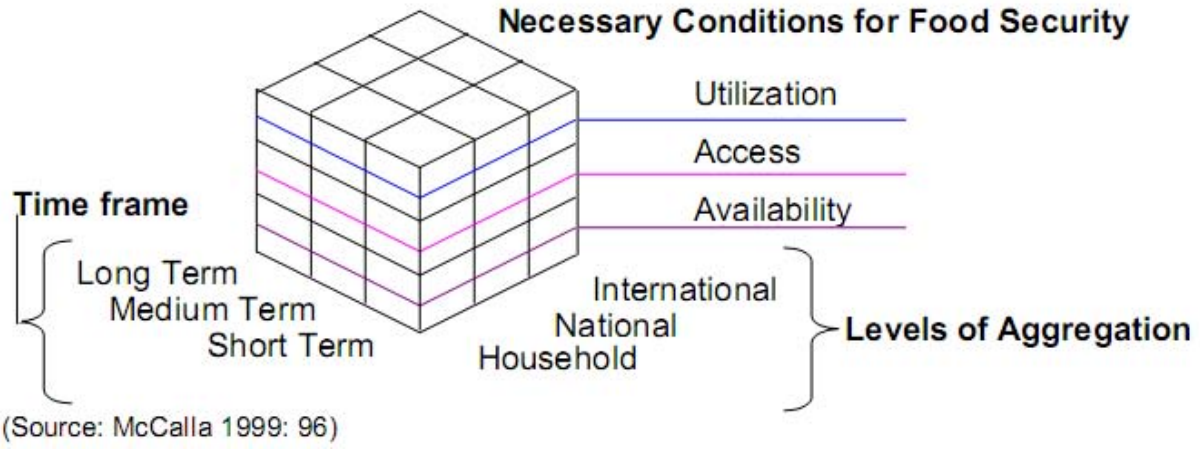
Food security is a very important functioning and therefore integral part of well being respectively poverty. On household level food security in Uganda is strongly linked with agricultural productivity (Walaga/Hauser 2005).

"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life (World Food Summit Plan of Action, §. 1)" (FAO 1996).

Food security involves four conditions: (i) Adequacy of food **supply** or **availability**; (ii) **Stability** of supply, without fluctuations or shortages from season to season or from year to year; (iii) **Accessibility** to food or affordability; (iv) **Quality** and safety of food (FAO 2009b).

Several authors (FAO 1996; McCalla 1999; Murphy 2005) stated three dimensions of food security. McCalla adds a time frame and levels of aggregation, presented in a food security cube (McCalla 1999) in Figure 3.5 (page 54):

Figure 3.5: Dimensions of food security



(Source: McCalla 1999: 96)

BOX 5: Factors contributing to food insecurity in Africa

1. Availability of food Lack of consistent access to food	• Enough food may be produced in a region overall, but food insecurity may persist for those who do not have the resources to buy or produce it. • Farmers may be able to produce or buy enough food for their families after harvest but may be food insecure at other times of the year.
2. Natural capital Degraded natural resources Practice of mono-cropping	• A degraded natural environment, such as poor soil quality, eroded landscapes or inadequate water resources, will compromise food production in an area. • Monocropped systems are less likely to promote food security than diverse agricultural systems, which are more resilient to stresses.
3. Social capital Community and group issues	• Where there are poor links within and between communities, with limited networks, partnerships, trust and collective action, credit and responsibility, communities are less likely to cope with and to be able to help each other in times of hardship such as droughts, food shortages and conflict. Food insecurity and ill-health is likely to be greater in areas with lower social capital.
4. Human capital Lack of education and knowledge Ill-health and diseas	• Lack of education and agricultural/nutritional knowledge can affect farmers' capacity to adapt to change or to cope with food production stresses. • Malnourished people are not able to produce food as effectively as those who are well fed. • The prevalence of diseases such as HIV/AIDS has had serious impacts on food security and nutrition. When family members become ill or die from the virus, households are less able to produce or buy food. In sub-Saharan Africa, 11 million children are orphaned by HIV/AIDS. Mortality and morbidity in HIV/AIDS-affected households has led to decreased farm sizes, loss of income at household level, a higher dependency ratio and a general increase in food insecurity.
Gender issues	• In many regions women are the major agricultural labour force. However, as they are not always recognized for this, they may not control household budgets and often have poor education. • In areas where men are in control over the household income, less money is spent on food when compared to those where women have control over incomes.
5. Physical capital Poor infrastructure Lack of access to appropriate technologies	• Poor infrastructure (roads, communications and markets for example) affects food security. • Lack of appropriate agricultural knowledge, technologies, methods or inputs can affect food security.
6. Financial capital Poverty Lack of access to markets	• Poverty remains the root cause of hunger and malnutrition in the world. • Lack of access to markets means that farmers and communities can neither sell their surplus nor purchase food in times of shortage. This leads to inconsistent food availability thus contributing to food insecurity.
7. Other external factors Land-tenure issues	• Land-tenure issues can contribute to food insecurity in a number of ways which vary depending on the context. For example, in some areas if a husband dies, the wife cannot continue to farm the land and the land goes to other members of the family. In East Africa, all of the male children of a man inherit his land between them on his death, which means that each person owns increasingly smaller farm plots, making it hard to sustain enough food for the household.
Political issues	• Political problems, including corruption, collusion and nepotism, can significantly inhibit attempts to tackle food insecurity.
Climate and natural disasters	• In areas prone to drought or unreliable rainfall, food security can be particularly challenging. • Plagues of natural pests such as locusts can decimate crops. • Natural disasters may destroy lives, crops, homes and landscapes. • In the last 20 years, the average number of deaths from natural disasters has been more than the average for the preceding decade.
Armed conflicts and wars	• Political unrest, armed conflicts and wars contribute to food insecurity and prevent food from being produced or accessed. • Political conflicts are often associated with food insecurity as both a cause and an effect.

(Source: UNCTAD/UNEP 2008:4f)

> “If this issue is not handled, at some time, this problem will come knocking on people’s doors. And those who think this is not their problem, they might be surprised one day, when the problem comes knocking on their door.”
>
> Abdul Kasim [56]

4. Results

There is a wide range for research done on the issues of agriculture and rural development in general and on how rural poverty could be reduced and agricultural productivity increased at the same time. On the one hand there is a diverse assortment advocating the Green Revolution and its techniques (see chapter 4.2.1.1; page 80). Some commentators already see an upcoming *Gene Revolution* following the long successful story of the Green Revolution (FAO 2004) – successful at least in some parts of the world and in their opinion. Among them there are researchers like the Nobel Prize Laureate from 1970, N. Borlaug, the

[56] Abdul Kasim is the founder of a free secondary school for girls in the Kibera slum in Nairobi, Kenya. IRINfilm portrays him in the documentary „Slum Survivors“. IRIN (Integrated Regional Information Networks) is part of the UN Office for the Coordination of Humanitarian Affairs (OCHA).

so-called father of the Green Revolution. Contemporary his “daughters” and “sons” like D. Connor, A. Trewavas and several other scientists are trying to spread his knowledge about “real” agricultural technologies supported by organisation like the Alliance for a Green Revolution in Africa (AGRA), which actually has Kofi Annan[57] as its chairman of the board or FAO (at least in some publications).

On the other hand there is a vital scientific community (like Badglay et al.; Halberg et al. C. Walaga; G. Rundgren; J. Pretty; R. Hine; Parrott, N. and T. Marsden and many others) and ambitious civil society favouring OA as a contributory mean to solve current challenges of agriculture in Uganda (see chapter 4.1.1; page 54ff and chapter 4.2.1.2; page 81).

On what all scientists do agree is that neither OA nor any other agricultural system uniquely is a panacea for a complete solution of challenges and issues rural Uganda currently is facing. Nevertheless, this paper focuses on the second school of thinking, where there is growing evidence that the methods of OA positively influences livelihood of small scaled subsistence farmers in certain ways to approach the key questions.

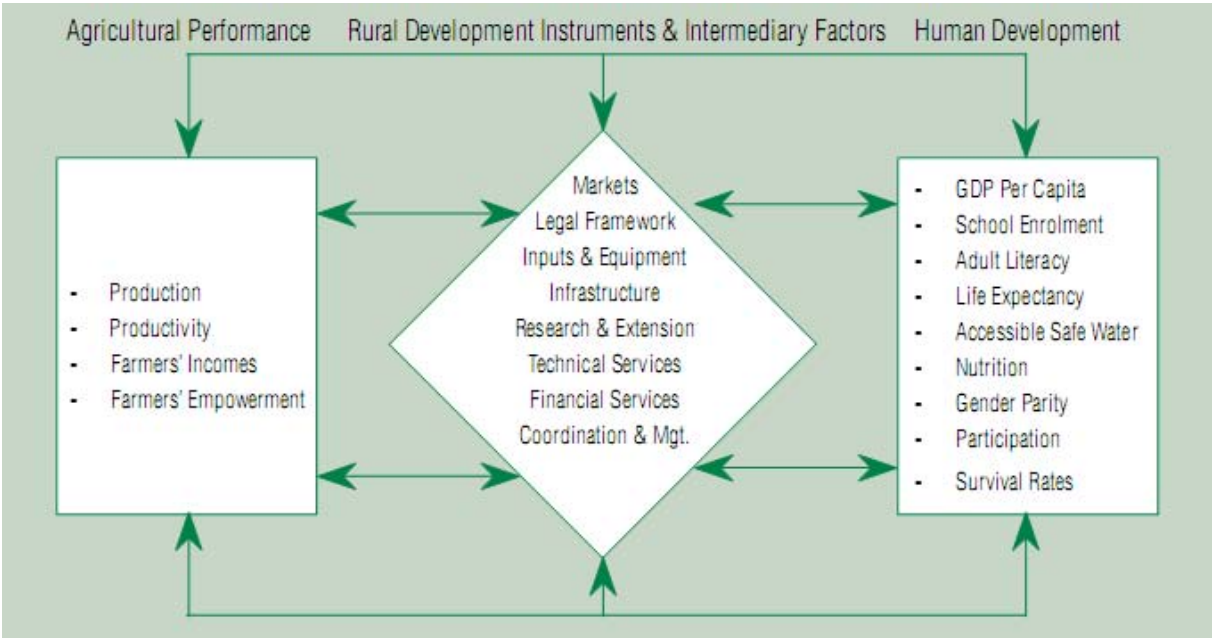
This chapter consists of two main parts examining the results of the two issues of research concerning, firstly, OA and poverty respectively OA and land degradation and secondly OA and its structural environment.

4.1. Organic Agriculture and its Relations to Poverty and Land Use

To approach the answers to the questions of research it is necessary to know what is the roll of agriculture (and further especially of OA) in Uganda. As stated before (chapter 1.2.2; page 6 respectively chapter 1.6; page 35), livelihood of most people in Uganda directly relies on agriculture; hence agriculture plays a vital roll for economic development as well as human development. UNDP provides us with Figure 4.1 (page 54) where there are the connections indicated between agricultural production and rural development in general and how it influences human development (HDR 2007). This figure maybe is a little incomplete and reduces agricultural to agricultural performance with four issues only, whereas these issues were selected somehow irreproducible. However, this part of the paper wants to examine the beneficiary effects of OA inside this framework and on its surrounding and Figure 4.1 demonstrates how agriculture generally is embedded in its environment as well as how agriculture influences intermediary factors and finally human development.

[57] Secretary General of the United Nations (1997-2006), Nobel Peace Prize Laureate in 2001

Figure 4.1: A conceptual linkage provided by United Nations Development Programme: The role of rural development in achieving human development through improved agricultural performance



(HDR 2007:35)

4.1.1. What favours Organic Agriculture rather than other Agricultural Systems for Ugandan Smallholders?

Primarily OA influences and benefits its surrounding in various manners. In literature there is found a bulk of beneficiary effects of OA. Key benefits of OA are grouped in five categories: (i) agriculture (in the meaning of agricultural production); (ii) environment/natural resources; (iii) economic conditions; (iv) social conditions and (v) institutional/organizational conditions. For some of the potential benefits of OA a strictly classification to one group was not possible – so it might be that some benefits would match more than one category, but are listened in one category only. (Crucefix 1998; Walaga 2000; Parrott/Marsden 2002; Walaga/Hauser 2005; UNCTAD/UNEP 2006; Lyons/Burch 2007; Hine/Pretty 2007; Kilcher 2007; Freyer 2007 and 2009b; Bouagnimbeck 2008)

4.1.1.1. Benefits of the Methods of Organic Agriculture on the Agricultural Production in Uganda

This part of the report focus on the potential effects of OA on the agriculture production system in Uganda.

4.1.1.1.1. Increment and stabilisation of yields

The fact that Ugandan agricultural production mostly is not based on high energetically and costly external inputs, but mainly rely on the use of local available resources and inputs makes it suitable to convert to a sustainable agricultural system such as OA. A shift to OA from industrialized agricultural systems which use high external inputs regularly results in a decline of yields of about 30% in average. Such a decline in yield may occur in Austria, when inorganic fertilizers had been used extensively and organic fertilizers such as manure or compost have to supply nutrients for crops. In Ugandan farming systems where mostly no inorganic fertilizers are used (or in general in those agricultural systems that may have been by-passed by the Green Revolution) a successful shift to OA may result in an increase of yields by 200 to 300%. In the

long run the output of a successful OA system is stable and often exceeds those yields of more conventional input intensive systems after some time (Freyer 2008; Bolwig/Gibbon 2009; Hine/Pretty 2007; Pretty et al. 2006; Walaga/Hauser 2005; Parrott/Marsden 2002).

4.1.1.1.2. Enhancement of soil fertility

In OA soil fertility plays a major roll. Soil should react like a sponge for water; like a hungry dog for non-living organic material; like a dinner table for plants; like a living room for micro organism, etc. Maintenance of soil fertility in a OA system is a specific and complex issue, involving a wide range of variables.[58] OA provides an ample assortment of methods to improve soil fertility and address specific issues such as the shortage of plant-available phosphorus in most soils in Uganda. Measures to increase soil fertility include mulching, selected crop rotations, intercropping, multidimensional cropping, use of compost and green manure, use of shrubs, trees[59] and especially legumes etc. (Freyer 2008). One main component of OA is to pay attention on the recycling of nutrients to ensure soil fertility techniques of OA for "improving soil fertility have a number of competing attractions: they often can be made on the farm (thus obviating the need to purchase inputs), their effects last for more than one year, they help improve the moisture retaining capacity of the soil and improve soil structure." (Parrott/Marsden 2002: 76)

4.1.1.1.3. Assistance with the restoration of degraded or abandoned land

If methods of OA are followed an improvement of soil fertility will be the result. Soils, which suffer from nutrient depletion and/or have unfavourable texture, can be restored by the means of OA. Increasing yields and enhanced productivity may be the result in former marginal, traditional agricultural systems (Parrott/Marsden 2002; see chapter 4.1.6.2; page 75).

4.1.1.1.4. More Biodiversity

OA leads to more diversity such as the introduction of various spatial and temporal plant combinations or the introduction of additional species/varieties to ensure nutrient cycling and sustainable use of natural resources. Introduction may comprise leguminous trees for nitrogen fixation, as a source of fodder for livestock and in the longer run as a source of energy. Generally, there are three kinds of biodiversity found in OA systems: (i) the cropping system (crop rotation in OA is diverse and includes a balanced rang of different species and varieties); (ii) the weed-system (OA is able to manage weeds within the cropping systems and ensures diversity of plants, animals and micro organisms) and (iii) habitat function of OA (OA ensures a diversity of biotopes due to its wide range of included elements, which not necessarily have to be directly beneficiary for crop production. However, these elements give habitats to beneficial organisms and increases crop pollination by insects, hence indirectly influence the agricultural production process positively (Freyer 2008).

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[58] Natural variations in soil types, age of soil, climate, mineralisation rates and cropping systems affect levels of soil fertility and trends of nutrient depletion or accumulation (Parrott/Marsden 2002).

[59] Trees, shrubs and other woody biomass play an important roll in an OA system in a tropical environment. Multipurpose trees have various functions: (i) protect soil against heavy precipitation and sun radiance; (ii) provide shadow for crops which have to grow under the canopy; (iii) restore nutrients in soil; (iv) provide food for farmers or fodder for livestock; (v) provide woody products (timber, fuel wood, poles, etc.) and (vi) provide other by-products of trees (mats, baskets, plant materials for medicine, etc.). Typical multipurpose trees are Acacia ssp., Albizia spp. Calliandra spp., Gliricidia sepium, ect. (Freyer 2008).

4.1.1.1.5. Reduction of pests and diseases and lower crop failure

OA leads to more diversity in the agricultural system. More diversity ensures a higher resilience of the system. Increased number of species and more diversity promotes fuller use of resources (nutrients, radiation, water, etc.), enables protection from pests and compensatory growth and provides habitats for beneficials (Altieri/Nicholls 2004). Site- and crop adapted crop rotations reduce pest problems and a high level of soil organic matter enables crops to withstand drought periods due to increased water-holding capacity of soil.

4.1.1.1.6. Promotion of the use of local seed varieties

OA focuses on locally available resources. Locally bred plants and animal varieties are adapted on their environment and therefore are able to develop capacities to resist or tolerate against harmful impacts. OA utilizes local resources and combines it with contemporary breeding techniques to ensure robust varieties with adequate yielding potential. Whereas high yielding industrialized varieties mostly are more vulnerable and therefore not suitable for OA production (Bouagnimbeck 2008).

4.1.1.1.7. Intensification of production

More intensive cultivation is possible (e.g. irrigation, crop care, etc.) due to improved financial situation (see also chapter 4.1.1.3; page 57), which results in a feedback loop to an intensification of agricultural production (Kilcher 2007).

4.1.1.1.8. Production of healthier food

OA does not use harmful inputs as industrialized agriculture is applying it extensively. Foods from OA production therefore contain lower amount of pesticide residues or other disadvantageous substances than conventionally grown foods. However, there are many reasons beyond the control of the organic farmers why organic foods generally are not free of pesticides. This might be due to pesticide spray drift from adjacent fields or soil or irrigation water contamination or the introduction of substances, which are released from chemical processes around the globe (Kilcher 2007).

4.1.1.2. Benefits of Organic Agriculture on the Environment / Natural Resources

OA affects its environment in various ways. In this chapter the report describes the potential effects of OA on the environment and natural resources in Uganda.

4.1.1.2.1. Reduction of environmental pollution:

OA is based on the use of natural cycles for its production. Inputs have to be locally available and consist of natural compounds. Environmentally harmful inputs are rarely used in OA production. So there is a reduced dependency of farmers on artificial inputs and a reduction of the exposure of rural populations and environments to their side effects. Run-off of poisonous or other harmful substances into environment is prevented. For example the recycling of livestock wastes is a means to reduce environmental pollution while benefiting the agricultural production system (Parrott/Marsden 2002:76).

4.1.1.2.2. Reduction of soil erosion

OA favours soil protection measures in direct and indirect way: (i) Direct measures have immediate consequences on soil, such coverage of mulch, cover crops etc.; (ii) Indirect measures are all measures which influences soil, soil fertility, soil texture, etc. in the long run. Such measures are crop rotation, intercropping, use of compost, etc. (Altieri/Nicholls 2004).

4.1.1.2.3. Mitigation of climate change and reverse of desertification

On the one hand OA is based on the use of natural cycles and local inputs for its production and therefore only uses smaller amounts of inputs based on fossil energy than other agricultural systems. On the other hand OA accumulates Carbon: (i) in the biomass (above- and belowground) of permanent crops, trees and crop rotation, etc, and (ii) in the soil in form of higher contents of humus, than in conventional agricultural systems. A high humus content in soil is crucial in OA production systems and is related with many very important variables in agricultural production. Methods of OA allow a reverse of desertification (Bouagnimbeck 2008).

4.1.1.2.4. Promoting of resource conserving technologies

"Organic agriculture emphasizes the functional integration of locally available resources with resource conserving technologies. Such technologies and practices comprise the use of cover crops to protect the soil from rains, physical soil erosion measures such as trenches and terraces, the spatial and temporal integration of nitrogen fixing legumes to enhance soil fertility, or the use of plant tea and fermented animal urine as crop protection agents. The integration of livestock systems with crops plays a major role. All this results in a reduction of soil nutrient losses and increase the nutrient use efficiency." (Walaga/Hauser 2005:74)

4.1.1.3. Benefits of OA on Economic Conditions

Many commentators examine the effects of OA on the economic condition of farmers. This chapter of the report summarizes the potential effects of OA on the economic conditions of farmers in Uganda.

4.1.1.3.1. Increment of farmers´ incomes[60]

A shift to OA may lead to a stabilisation of economic performance and results in increased profit margins and achievement of higher returns from the sale of organic produce. As OA is based on locally available resources, expensive external inputs (including fertilizers, seeds, pesticides) are replaced with organic inputs generally produced on the farm. For example organic fertilizers including compost, green manure and animal manure are steadily produced and utilized in OA to maintain and enhance soil fertility and hence total productivity. Lyons and Burch report that "for some farmers, entry into organics also created new opportunities for on-farm income generating activities, by supporting the diversification of farming activities (e.g. poultry rearing supplied both manure for the farm as well as income through the sale of eggs and meat)." (Lyons/Burch 2007: 5) Certification of organic farms increases income observably e.g. certification of organic coffee growers is associated with an increase in net coffee revenue of around 75% on average, which is equivalent to 12,5% of mean (total) household revenue. Methods of OA increase revenue of coffee as well, compared to other agriculture production systems (Bolwig/Gibbon 2009).

4.1.1.3.2. Augmentation of local economy and employment

OA positively influences employment of local/regional people due to the creation of capacities along new value added chains of produce from OA (Crucefix 1998).

[60] One may argue that farmers' increment in income is secondary compared to the growth of its most important treasure, which is the base of production and all future harvests: humus. So richness in terms of humus accumulation in soil in the long run may amount to more than sudden/short term rise in financial income.

4.1.1.3.3. Strengthening of self-reliance

OA positively influences the self-reliance for food and other external inputs of the farmers, due to higher yields and more stable production system (Crucefix 1998).

4.1.1.3.4. Lowering of risk

AO generally enables a stabilisation of the agricultural production system: crop yields are improved and stabilised; yield failure of crops is reduced and returns are stabilised due to relatively stable markets with guaranteed process under the fair trade regime and for products from OA (Kilcher 2007).

4.1.1.3.5. Lowering of financial investment

OA utilizes locally available low cost resources in the place of expensive costly external inputs (including fertilizers, seeds, pesticides etc.; Lyons/Burch 2007).

4.1.1.3.6. Tapping of new markets

OA can create new market opportunities for organically certified farmers, because OA offers internationally recognized and demanded products. Products of certified OA can be linked to markets that offer premium prices for organically produced and certified commodities (Freyer 2007). There was a reported turnover of organic products of 14.309 Mio € in year 2006 in the European Union only and 38.600 Mio € globally. (Willer et al. 2008). Conversion to organic farming methods creates also new opportunities to participate equitably in international trade covered under the *fair trade* regime (Walaga 2004). Therefore OA strives for economic justice between the trade partners (Freyer 2007). The launch of EAOPS and the associated EAOM in 2007 increased the regional market opportunities for organic products. Increased incomes and urbanization favours organic products on domestic markets in Uganda as well (NOGAMU 2009).

4.1.1.3.7. Enabling of knock-on effect on conventional prices

“It is the ‘gross earnings’ rather than just the ‘margin of the premium’ that represents the true benefit of organic farming. The premium offered on organic products, however, has a knock-on effect on the prices offered in local conventional markets by creating competition as the local non-organic traders seek to maintain their supply base. Thus, the benefits of organic farming become more diffuse and more widespread.” (Walaga 2004:21)

4.1.1.3.8. Reduction of migration to urban areas

OA may reduce migration from rural to urban areas due to the creation of potential for farmers to enhance their livelihoods (Crucefix 1998).

4.1.1.4. Benefits of Organic Agriculture on Social Conditions

There are various benefits of OA on social conditions. This chapter of the report focus on the effects of OA on the social conditions.

4.1.1.4.1. Improvement of health

The uptake of OA can improve health of humans, animals, plants and soil. Human health is beneficiary influenced by the production of healthy food. Methods and techniques of OA generally enable farmers to avoid exposure to hazardous agricultural chemicals (Parrott/Marsden 2002).

4.1.1.4.2. Strengthening of social issues

The strengthening of social issues includes the strengthening of group formation and communities; the improvement in education; the enforcement of gender

equality and the support of the most vulnerable social groups. OA has influences on social life in involved farming households. OA and interventions "address intra-household decision-making processes about goals, labour sharing arrangements and allocation of resources. Gender sensitisation, conflict resolution training, HIV/AIDS awareness raising, and nutritional education go along with technology interventions. The degree to which some or all of these mechanisms take effect depends on the principal orientation of the organic initiative. In Uganda, these initiatives are highly heterogeneous. The leverage towards increased food security can vary greatly, notably by disaggregating organic agriculture in its certified and non-certified strand." (Walaga/Hauser 2005:75)

4.1.1.4.3. Motivation for investments

It is reported, that farmers, who adapted OA are more motivated to invest in their farming systems, in other capacity-building activities, in issues concerning production, processing and marketing, in manpower and finally in their families (Kilcher 2007).

4.1.1.4.4. Promotion and valorisation of local knowledge

"The goal of organic agriculture is not to replace local knowledge by modern scientific knowledge, but to design farm management strategies that build on the experiences, cultures and institutional arrangements of farmers and farming communities. Local knowledge is an important source of information in organic agriculture. Farmer and community participation in technology development and experimentation enhances local innovativeness and the ability to adapt technologies and practises to rapidly changing environments." (Walaga/Hauser 2005:75) As OA builds on local knowledge it enforces self-confidence of involved farmers and groups and offers space for the integration of traditional and modern elements of "close-to-nature" methods from different land use systems. Constraints of traditional farming systems, like the shifting cultivation without shifting/fallow period strictly have to be avoided to ensure sustainability of the OA system (Freyer 2007).

4.1.1.5. Benefits of Organic Agriculture on Institutional/Organisational Conditions[61]

This part of the report focuses on the effects of OA on the surrounding institutional and organisational conditions.

4.1.1.5.1 Empowering farmers

Farmers converting to OA receive various levels of support during the process of conversion to the methods of OA. For example farmers are participating in organic training programs and become members of local and/or national OA lobbying groups (NOGAMU) that provide a range of supports (including growing advice, market information etc) and have strong networks and links with partners from government, other NGOs and traders of organic produce respectively their representatives. By joining an organic group for the purposes of organic group certification (via an ICS), it might be that farmers also gain access to communal equipment as well as to transport for their produce, etc. Certification by an ICS might also provide new opportunities for collective bargaining power with buyers (Lyons/Burch 2007).

[61] Benefits of OA on institutional/organisational conditions differ enormous if it is certified OA or uncertified OA. See at the end of this section below.

4.1.1.5.2. Creation of new partnerships and enhancement of human capacities

OA involves a lot of different stakeholders and creates new partnerships within the whole value chain as well as strengthens the self-confidence and autonomy of the farmers within it (Kilcher 2007). Strong networks and links with partners from government, NGOs and organic support organisations (NOGAMU) help farmers to organize for organic certification, to access export and domestic organic markets and to gain knowledge of sustainable organic techniques, crops and markets.

4.1.1.5.3. Promotion of democratisation (of organizations)

OA is based on the activities of its stakeholders. Participation is a very important means to ensure the functioning of organizations like NOGAMU. NOGAMU is democratic organized and a deliberate policy ensures farmers´ influence on the directives and direction of the organization. Participation of members is possible in the election of the Central Committee (every two years by all members) and additionally in the four activity committees of marketing, training, lobbying/advocacy and organic standards (NOGAMU 2009).

4.1.1.5.4. Promotion of innovations by scientists and farmers

"Organic agriculture is not a return to some backward form of low technology agriculture. It pursues a blend of innovations that originate from scientists and farmers and uses only those traditional practices that are sustainable and useful. These practices have often, themselves, undergone a lot of innovation. Organic farming emphasizes management over technology, and biological relations and natural processes over chemically intensive methods. Most importantly, it is a process of learning and adaptation, combined with an institutional and policy framework that drives this process." (Walaga 2004:22)

4.1.1.5.5. Promotion of internationality

OA disposes over internationally accepted instruments and structures such as guidelines, control, counselling, information material, research etc. and enable international exchange (Freyer 2007).

4.1.1.5.6. Promotion of a holistic cosmóvision (world view) – beyond trade

"OA is an agricultural system that enhances and manages the complexity of the entire ecosystem, rather than reducing and simplifying the biophysical interactions on which agricultural production depends. It recognizes people as an important part of this ecosystem, and deliberately integrates and takes advantage of all naturally occurring beneficial interactions." (Walaga 2004:22)

4.1.1.6. The Correlations of the Benefits of Organic Agriculture and the Principles of Organic Agriculture

OA is based on the four principles (by IFOAM) stated in 3.1.3 (page 44) and adapted on local conditions to ensure the concept of multifaceted sustainability. In Table 4.1 (page 61) there are the benefits of OA ordered concerning its primarily[62] correlations to one or more of the four principles of OA.

[62] As OA is based on these four principles, it is necessary to fulfil all of them in practices. So the ordering of the effects/benefits of OA is done in respect to their primarily correlation to one or more than one principle.

Table 4.1: The benefits of Organic Agriculture and its correlations to the four principles of Organic Agriculture

Type of condition	Specific Benefit of the Methods of Organic Agriculture	Principle of health	Principle of ecology	Principle of fairness	Principle of care
Agricultural Production	Increment and stabilisation of yields	X	X	X	
	Enhancement of soil fertility	X	X		
	Assistance with the restoration of degraded or abandoned land	X	X		
	More Biodiversity	X	X		
	Reduction of pests and diseases and lower crop failure	X	X		
	Promotion of the use of local seed varieties				X
	Intensification of production		X		
	Production of healthier food	X			X
Environment Natural Resources	Reduction of environmental pollution	X	X		X
	Reduction of soil erosion	X	X		
	Mitigation of climate change and reverse of desertification	X	X		X
	Promoting of resource conserving technologies	X	X		X
Economic Conditions	Increment of farmers´ incomes			X	
	Augmentation of local economy and employment			X	
	Strengthening of self-reliance		X		X
	Lowering of risk			X	X
	Lowering of financial investment		X	X	X
	Tapping of new markets			X	
	Enabling of knock-on effect on conventional prices			X	
	Reduction of migration to urban areas			X	
Social Conditions	Improvement of health	X			X
	Strengthening of social issues			X	X
	Promotion and valorisation of local knowledge			X	X
	Motivation for investments				X
Institutional Organisational Conditions	Empowering farmers				X
	Creation of new partnerships and enhancement of human capacities			X	X
	Promotion of democratisation (of organizations)			X	X
	Promotion of innovations by scientists and farmers			X	X
	Promotion of internationality			X	X
	Promotion of a holistic cosmovision (world view) — beyond trade			X	X

(Source: own table)

In an OA system these principles (IFOAM 2009d) are the base and are followed during the production process. Certification of such an OA system may ensure a certain quality of the goods produced within these systems. This certification shall include the principles of IFOAM and has to follow certain guidelines of export-markets (see also chapter 3.1.4; page 45). Beside the certified outputs, there are occurring a lot of different other changes and improvements in an OA system, on which a certification is not possible. These outputs of OA

are less measurable than organic goods and so it is not easy to quantify and verify. These processes include group activities (and its outputs) or the utilization of commonly used natural resources (and its improvement), etc. So a certification for organic products (for export) is somehow limited on measurable and countable data and cannot comprise these mentioned possible outputs of an OA system. (Freyer 2009b; see also chapter 4.1.3; page 64 and especially in Table 4.3; page 65).

4.1.1.7. Summary of the Benefits of Organic Agriculture

There is found are a lot of different descriptions in literature (by various commentators) about the effects of OA on its environment. The effects of OA on all five condition types may differ enormous if the agricultural system is certified OA or uncertified OA. Uncertified OA in Uganda is concentrated mostly on the constant production of staple food (for own consumption and possible surpluses for selling on local markets) rather than on the production of cash crops, such as fruits for export in certified OA. In Table 4.2 there are the most important differences listened. Initial point of uncertified OA maybe is found in an "endogenous" initiative of a local NGO (see also 1.5.2; page 33) rather than in certified OA, where mostly international NGO´s (at least initially) had been the driving forces (Freyer 2009b). In between these two main types of OA (certified and uncertified) there may exist a broad range of different attitudes concerning the motivation, aims and outputs, etc. of its farming system. So mixed types may exist where the concentration of farm output is mostly on the production of food crops for own consumption, but the farming system is (partly) certified OA and produces export crops as well.

Table 4.2: Differences in certified and uncertified Organic Agriculture in Uganda

	Production	Markets	Concentration mostly on	Food security due to
Uncertified OA	staple food	own consumption; local Markets	stable yields of food crops; health of household members; minimization of risks due to a more stable agricultural system	increased production of food
Certified OA	cash crops	international Markets	financial means; income	increased purchasing power

(Source: Freyer 2009b)

4.1.2. Five types of Capital as the Basis of Organic Agriculture

OA is an inherently multifaceted agricultural production system and provides a wide range of possible positive effects on its environment and benefits its surrounding in many ways. OA itself is shaped by contextual factors in various ways (see Figure 4.1; page 54). Contextual factors, such as legal framework, infrastructure, etc., in the long run can be influenced by OA (e.g. policy for OA, etc.) as well.

However, OA is a socio-economic system such as livelihood, communities and national economies and rely for its success or for its failure on value of services flowing from the total stock of five types of capital: (i) natural capital; (ii) social capital; (iii) human capital; (iv) physical capital and (v) financial capital. Among all economic sectors uniquely agriculture is directly affecting many of the very assets on which it relies for its success. OA and all other agricultural systems at all levels rely on the value of services flowing from the total stock of assets that they influence and control. Generally theses capitals are defined as:

i) **Natural capital:** Nature's free goods and services – food (cultivated or wild), wood and fibre; water regulation and supply; nutrient cycling and fixation, climate, wildlife habitats, pollination…

ii) **Social capital:** Cohesiveness of people in their societies – relations of trust that lubricate co-operation; the bundles of common rules, norms and sanctions for behaviour; reciprocity and exchanges…
iii) **Human capital:** The status of individuals – stock of health, nutrition, education, skills and knowledge of individuals; access to services that provide these, such as schools, medical services, adult training; the ways individuals and their knowledge interact with productive technologies; the leadership quality of individuals…
iv) **Physical capital:** Local infrastructure – housing and other buildings; roads and bridges; energy supplies; communication; markets; and air, road, water and rail transportation…
v) **Financial capital:** Stocks of money – savings, access to affordable credit; pension; remittances; welfare payments; grants and subsidies… (Pretty 1999; Pretty 2008)

Contextual factors influence these mentioned assets: "These five assets are transformed by policies, processes and institutions to give desirable outcomes, such as jobs, welfare, economic growth, clean environment, sustainable use of natural resources, reduced crime, better health and schools, and so on. If achieved this desirable outcomes they feed back to help build up the five capital assets. Where they are undesirable, such as pollution or deforestation, or increased crime or social breakdown, they reduce the asset base." (Pretty 1999:255)

In Figure 4.2 (page 64) there is an asset-based model for agricultural systems. On the left side there are the contextual factors, which influence these five kinds of assets (next to them). In an agricultural system, such as OA the five assets are the source for success if there are enough outcomes, or for failure if they are to less. The rural communities or farmers take the assets, whether a renewable input or a non-renewable input, and transform it to desirable raw materials, food or marketable values. Inputs of the five types of capital comprise various forms of assets. In an agricultural system these assets could be (Pretty 1999; Pretty 2008):

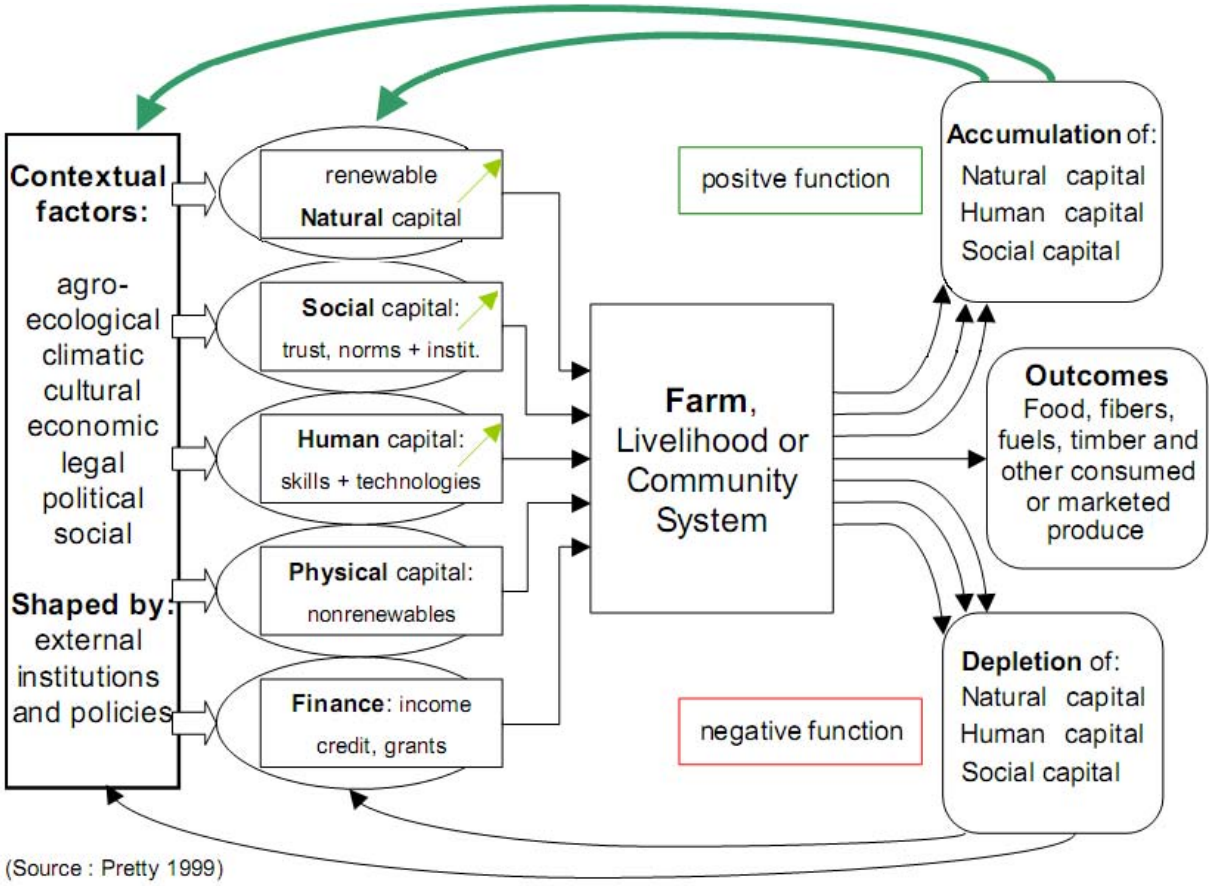
i) Renewable natural capital includes assets such as soil and soil fertility, water, air, diversity in species and crops, and regenerative technologies (the use of legumes to fix nitrogen, beneficiary use of natural predators, etc.…), etc.
ii) Social capital[63] includes assets such as locally embedded and externally induced social capital, partnerships and linkage between external organisations, and renewable through a range of participatory processes, etc.
iii) Human capital includes assets in form of skills and knowledge – both technical (indigenous and externally-derived) and social (e.g. leadership)
iv) Physical capital includes assets such as non-renewable technologies (hybrid seeds, machinery), fossil-fuel derived inputs (fertilizers, pesticides); investments in roads and infrastructure, etc.
v) Financial capital includes assets in form of credit, income from sales and grants, etc.

How the five assets could be utilized depends on the surrounding environment in form of the wide range of contextual factors.[64]

[63] Social capital in groups often is distributed unevenly among the participants. A study carried out among smallholder groups concerning farmers´ investments in and benefits from social capital in Mozambique by Gotschi resulted in (Gotschi 2008): (i) social capital organized in groups enables participating farmers to access markets or provide public goods for the community and (ii) individual benefits (like diversification of social relations, increased likelihood of accessing help, information and services) are not equally distributed among participating farmers. Group "leaders" may use social capital more for own benefits than other members of the group (Gotschi 2008).

[64] The contextual factors are an important issue strongly influencing farming systems in general (such as land distribution, etc.) but are not objective of this report.

Figure 4.2: An assets-based model of agriculture



An agricultural system is sustainable if the five assets are sustained and accumulated during the process of agricultural production. In the beginning especially the first three kinds of assets are influenced positively in OA. Accumulation means an increase of the assets. Further accumulation influences the contextual factors and indirectly the five assets: a vital feedback loop occurs from outcomes to inputs (positive function).

Generally, sustainable agricultural systems tend to have positive effects on environment, in opposition if there is a depletion of assets. As already stated, OA has many benefits (chapter 4.1.1; page 54). Occurs a depletion of assets the system is not sustainable; and pollution of the environment, loss of soil fertility, or increasing of erosion (land degradation in general) would be the consequence (negative function). If depletion of assets continuously occurs a decline of this kind of capital (and its assets) would be the result, including lesser assets as a remains for future generations (Pretty 1999; Pretty 2008).

The basic principle is, therefore, that OA is able to accumulate stocks of these five assets. If the methods of OA were applied properly an increase of the capital base over time would be the result. A depletion of assets would occur if the methods and technologies of OA were applied improperly – so it actually would not be OA, but any other unsustainable agricultural system. In such a case a run down of capital is the further consequence, because the stock of capital is used like it would be an income, resulting in liquidating assets and leaving less for future generations.

4.1.3. How Organic Agriculture influences these five Kinds of Capital

In Table 4.3 (page 65) there are selected (but not the whole range of) beneficial effects of OA classified related to the five types of capital of the asset-based model of agriculture.

Table 4.3: Potential influences of Organic Agriculture on the five types of capital

Type of capital	Beneficial effects of Organic Agriculture
Natural capital	• Soil related improvements: (i) accumulation of humus/improved organic matter retention in soils; (ii) increased nutrient capacity and content (due to leguminous crops, etc.); (iii) increased water holding capacity; (iv) increased soil stability and reduced soil erosion and (v) visible improvements in the topsoil • improvements in the water table (with more drinking water in the dry season) • increased agro-biodiversity and diversity in general
Social capital[65]	Individual and farmers group level: • new rules and norms for managing collective natural resources • improvement of people's capacity to work together on common resource management problems • co-operatives and marketing groups make it: (i) easier to share knowledge and good practice; (ii) easier to share the costs of organic certification; (iii) easier to meet the demands for large quantities of organic produce required at one time for some export companies and (iv) easier to establish stronger networks among individual smallholders Institutional level: • more and stronger social organisations at local level • stronger links with partners from NGOs and organic support organisations (NOGAMU; gain knowledge and skills of sustainable organic techniques, crops and markets, certification etc.) Societal level: • better connectedness to external policy institutions • stronger links with partners from government (support to access export and domestic (organic) markets and provide data about crops and markets)
Human capital	Individual level: • improvements in knowledge and skills (more local capacity for farmers to experiment and solve their own problems) [66] • improvements in health • increased education (possibility to pay school fees) Group level; social relations/composition: • increased self-esteem in formerly marginalized groups • increased status of women Local level: • reversed migration • more local employment
Physical capital	• improvements in infrastructure (to get access to markets)
Financial capital[67]	more income, because of: (i) no costly external inputs; (ii) selling the surpluses in food production; (iii) premium price for certified organic products; (iv) value adding due to processing activities; (v) improvement in purchasing power brings many associated benefits to the farmers, farmer families and local communities

[65] In this table there a listened mostly positive effects of OA. In the case of social capital it might be that it inhibits the spread of OA. For example if one single farmer in an Austrian village becomes organic, it might be that there are existing resentments against OA in the beginning of a conversion process by the surrounding social environment. Therefore social capital might rather positively influence the spread of OA and inhibit it as well (Freyer 2009b).

[66] "The ability to manage more complex systems (for example to farm for beneficial insects) requires a higher level of human knowledge and skills than is needed to spray a pesticide. This increased knowledge of natural pest and predator relationships increases farmers' resilience and capacity to implement changes in times of pest infestation." (Hine/Pretty 2007: 21)

[67] Beneficial effects of OA on financial capital may occur like it is listed, but the listed beneficial effects assume "best practices" and therefore mostly are objectives to reach in the medium to long term (Freyer 2009b).

(Source: own figure; data from Freyer 2009b; Hine/Pretty 2007)

All this mentioned positive effects may occur in an OA system, if the basic principles of OA are followed (IFOAM 2009c). Despite the commonly stated opinion that OA is an "alternative" agricultural system, which is easily introduced and implemented into practices, OA is knowledge and training based and therefore one may not underestimate efforts to be undertaken.[68] If any other agricultural system (like "traditional" system of agriculture, which is prevalent in Uganda) wants to benefit from these effects, it has to undergo at least one of ten types of improvements occurring in a process of conversion towards OA.[69] These ten types of improvements occur in practices or attitudes of the farmer. Improvements and mechanism are listed in Table 4.4.

Table 4.4: Potential improvements occurring in a shift to Organic Agriculture

Improvement	**Mechanism**
Natural capital	1. Better use of locally available natural resources (water, compost, …) 2. Intensify microenvironments in farm system (gardens, orchards,…) 3. Diversify by adding new regenerative components 4. Removal or better use of non-renewable inputs and external technologies
Social capital	5. Social and participatory processes leading to group action
Human capital	6. Human capital building through continuous learning programmes[70]
Physical capital	7. Access to markets and infrastructure
Financial capital	8. Access to affordable finance (credit, grants, etc.) 9. Added value through processing to reduce losses and to increase returns 10. Added value through direct or organized marketing to consumer

(Source: Pretty/Hine 2006:21f; Hine/Pretty 2007)

"Each type of improvement, by itself, can make a positive contribution to raising production in an agricultural system but as the case studies show, when a combination of different improvement types are used the dividend of synergistic effects are seen (where the whole is greater than the sum of the parts). For example, soil and water conservation that emphasizes terracing and other physical measures to prevent soil loss is much more effective than when combined with biological methods that seek to increase the productivity of the system, such as with green manures and cover crops, or with finance for credit groups that reduces indebtedness of households." (Hine/Pretty 2007:26)

However, improvements of food production in an OA system are occurring through one or more of five mechanisms:

i. **Intensification of a single component** of farm system, such as home garden intensification, vegetables on rice bunds, and introduction of fishponds or a dairy cow.

ii. **Addition of a new productive element** to a farm system, such as fish in rice or trees on boundaries or as a canopy for shadow, which provides a boost to total farm food production, but which do not necessarily affect productivity of a single component.

iii. **Better use of natural capital,** especially water (by water harvesting, irrigation

[68] OA is based on complex ecological cycles and principles and therefore often is considered knowledge intensive as opposed to input intensive agricultural systems. It is an important factor to consider, that farmers need wide range of skills and knowledge for a successful implementation of an OA system (Halberg et al. 2005a).

[69] A process of conversion towards OA may occur because of endogenous and exogenous stimuli. An successful implementation of an OA system highly depends on its adaptation to side-specific conditions and the integration of local particularities. If OA is established and it is was successful, there are following various further adaptations, which develop and improve the OA system during time. The question is, how a (endogenous or exogenous) stimuli has to be facilitated to activate this sequential development of OA as an internal process (Freyer 2009b).

[70] Accumulation of human capital occurs definitely. The remaining question is only in which extend the accumulation of human capital happens.

scheduling, water stressing), and land (by reclamation of formerly unproductive land, improvement of soil fertility, etc.).

iv. **Improvements in per hectare yields** of staple food through introduction of new regenerative elements into farm systems (legumes).

v. **Improvements in per hectare/unit yield** through introduction of new and locally-adopted crop varieties and animal breeds. (Pretty/Hine 2001)

4.1.4. Interlinkages of Organic Agriculture and Poverty

RQ1: (i) Does Organic Agriculture contribute to reduce poverty in rural Uganda?

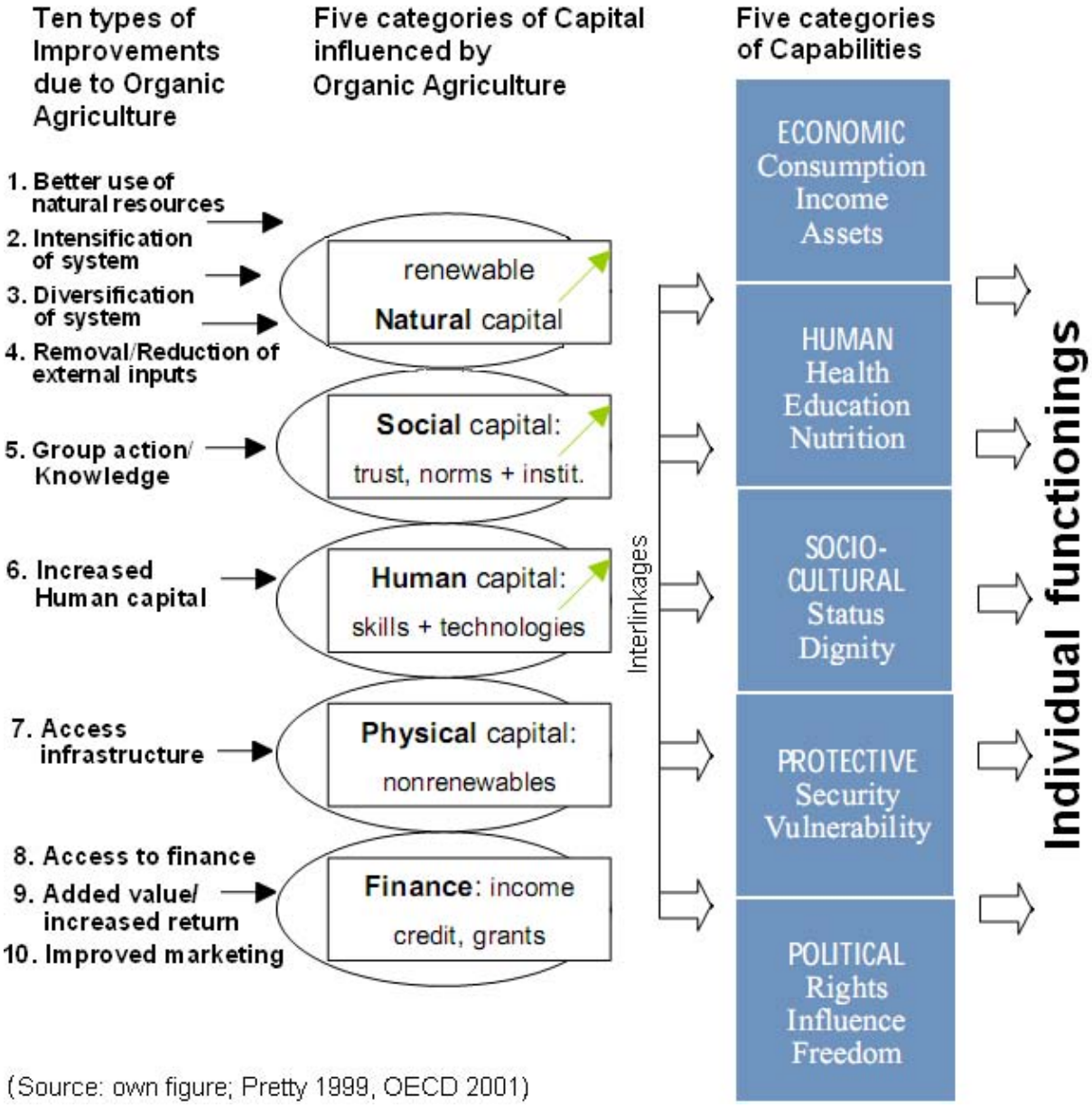
→ If it does: How Organic Agriculture contributes to reduce poverty in rural Uganda?

To answer this question, firstly there has to be determined on what the contribution of OA should be indicated. As stated in chapter 3.2.1 (page 46) poverty is a multidimensional issue defined as a deprivation of capabilities and as a lack of multiple freedoms people value (Clark 2006; Alkire 2007). If there is a deprivation of capabilities certain kinds of functionings cannot be achieved. So the contribution of OA to reduce poverty in rural Uganda has to be indicated in the influence on the five categories of capabilities (see chapter 3.2.3; page 49). In a second step contributory effects of OA on capabilities may result in a gain of essential functionings and therefore in a reduction of poverty. As food security is an important functioning and therefore integral part of well-being, contribution of OA on poverty will be examined on the example of food security. Beyond the effects of OA on capabilities and functionings there is an analysis on the contribution of OA on composed indexes, such as the HDI (with its three main compounds; see chapter 3.2.2.1; page 47). OA positively effects the five types of capabilities due to the accumulation of five types of capital. In

Figure 4.3 (page 68) there is the process of influences demonstrated schematically. On the left side there are the effects of OA in form of improvements. In an OA system one or more improvements (listened in Table 4.4) might occur, which then influence the assets of a certain kind of capital respectively this kind of capital in general. These improvements then result in an accumulation of capital. The output of capital then influences in a positive feedback loop the accumulation of capital again (see also Figure 4.2; page 64). As the kinds of capital are interlinked with each other beneficiary effects may occur. In a further step the accumulation of the interlinked five forms of capital (which are influenced by OA due to the ten improvements) have various effects on the capabilities of involved people. Deprivation of capabilities is reduced and the freedoms people value are increased. On the far right side of

Figure 4.3 (page 68) there finally are the effects on individuals of OA in the form of various functionings. Individuals, who have a lot of capabilities have the ability and the freedom to choose and achieve several alternative functioning combinations and hence are able to achieve various lifestyles. For example a person with a lot of capabilities (a rich person) has the ability to celebrate the act of fasting for religious reasons (e.g. the Lenten period in catholic faith prior to Easter in spring). A person who is affected by deprivation of capabilities (a poor person) maybe is not able to eat regularly neither, but does not have the freedom to choose, because of a limited set of capabilities. So the rich person may achieve the functioning of eating or may not (if he/she decides to do so), a poor person is forced to starve and cannot choose any alternative.

Figure 4.3: Influences of Organic Agriculture on the five types of capabilities



(Source: own figure; Pretty 1999, OECD 2001)

The interlinkages of OA and poverty are various. As stated in chapter 3.2.3 (page 49) and especially in Figure 3.4 (page 50) it is possible to indicate the aggregation of poverty respectively well-being in different levels (discrete indicators; composite indexes and single indicators) and dimensions (five types of capabilities). As food security is an important set of functioning which requires several capabilities therefore constitute an integral part of well being, contribution of OA on poverty will be examined on the example of food security on household level.

BOX 6: Evidences from Organic Agriculture in Uganda – two case studies

Case study I: Sustainable agriculture/Uncertified Organic Agriculture in Uganda

Poverty Eradication through Environmentally Sustainable Technologies (PEEST) is a project, which is situated in the east Ugandan District of Iganga and has been implemented since 1997 through Africa 2000 Network. The aim of the project is to defeat the struggle of environmental degradation and promote sustainable agriculture by increasing agricultural productivity and sustainable natural resources management to improve the livelihoods among the smallholder farmers in the District.

Starting position: Since the 1970s natural and agro-ecosystems in the area have been suffering degradation and poverty among the farmers´ families following rapid population growth. Due to the population growth natural forest and woodland were cleared to use for agriculture, fuel wood, timber or human settlements. This mass clearing of forests, woodlands and wetlands has resulted in an increasing scarcity of fuel wood, timber and drinking water from natural wells and springs. In former times during dry season springs and wells did not dry up so fast than nowadays. "By 1997, many farmers in the Iganga District were faced with a problem of increasing vulnerability characterized by high poverty levels (above the national average of 45% living below the poverty level of one dollar per day) and food insecurity.

Implementation and effects: The first phase of the project used participatory methodologies and raised environmental awareness in the community, equipped farmers with knowledge and analytical skills about their environment and skills to manage their natural and agricultural resources more sustainable. Improved productivity of natural resources was the result. The technologies and practices, which were adapted and adopted, reduced soil erosion, conserved soil water, helped prevent soil nutrient loss, improved soil fertility resulting in improved agriculture productivity. By improving soil fertility the demand of for more land from forests and wetlands has been eliminated for those participant farmers. The new agroforestry technologies increased the supply of fuel wood and fodder and contributed to increasing the fertility of the soils, while the improved cook stove reduced the demand for fuel wood as well. The promotion of indigenous crop varieties contributed to improving the food security of the community and to the conservation of the local agrobiodiversity. Of the 10.000 farmers reached in the first phase of the project, 99 percent reported increased food supplies and many reported increased income." (Pretty/Hine 2006:19)

In a second phase of the project the aim is to reach over 50.000 households in the district. "With many farmers replicating organic farming practices and technologies, positive contributions of organic agriculture to the ecosystem of the district are being multiplied. The adoption of sustainable agriculture techniques has also improved the livelihoods of rural farm households. They are particularly suitable to small and resource poor farmers and scaling-up should be facilitated to benefit many more."(Pretty/Hine 2006:19)

Key benefits of case studies:

Improvement to:	Mechanism:	Case study 1	Case study 2
Amount of available food	• Increase in food produced • Increase in yields of food crops/ livestock	√	
Natural capital	• Benefits to natural environment – soils, water, fertility etc	√	√
Social capital	• Builds partnerships between groups • Increased community cohesion and co-operation	√	√
Human capital	• Increase in knowledge and skills of farmers • Health and education benefits to farmers, households and community	√	√
Physical capital	• Improvements to infrastructure and markets		√
Financial capital	• Increased incomes to farmers		√

(Source: Hine/Pretty 2007: 30/39)

Case study II: Certified Organic Agriculture (Organically certified cotton) in Uganda

In 2000 about 24.000 cotton growing farmers become organic. "The majority of cotton producers are small-scale resource-poor farmers. Soil fertility and pest management is maintained through traditional cultural practices such as fallowing, crop rotations and natural pest control. Although agricultural policy generally promotes the use of pesticides, some areas of Uganda are now exempt from pesticide promotion campaigns and some districts are now promoting organic agriculture. Organic cotton production achieves yields of 1000-1250 kg/hectare of seed cotton giving approximately 300-320 kg of cotton lint. Recent studies have reported that organic farmers have started to obtain high cotton yields compared to conventional farming systems. In addition organic cotton receives premium prices, on average a 20% organic premium on export, which relates to a 15-20% premium over farm-gate prices. Organic cotton farming is therefore economically viable and this has tempted many farmers into organic production. Organic cotton production is mainly a private-sector market driven, business activity organized by exporters while the conventional system is under government promotion. Organic cotton production is therefore well structured and received extensive support from EPOPA." (Hine/Pretty: 29f)

4.1.4.1. Organic Agriculture and Food Security

Despite the fact that Uganda currently is producing enough food on national level (see chapter 1.3.1; page 20), food insecurity affects around 15-20% of Uganda's population (see chapter 1.4.2.; page 25) temporarily or permanently in some regions on household level.[71] (Walaga/Hauser 2005). In Uganda where the overall majority of farmers produce in a subsistence system, the unavailability of food at household level is strongly correlated with a low agricultural production respectively low agricultural productivity. Inaccessibility of food is related to low purchasing power: In year 2005 about 51,5% of the population was living with less than 1,25 US$ per day and about 75,6% of the population was living with less than 2 US$ per day mostly in rural areas (see chapter 1.4; page 23). People with a purchasing power of less than 2 US$ per day mostly are not able to access staple food for a balanced diet. "The inability of households to earn income through agriculture is related with the poor market orientation (...). This often results in low financial returns and farmers are therefore not able to save and to invest. For example, due to households demands for instant cash farmers sell their products soon after harvest when prices are lowest. If this happens, then farmers have to sell more of their produce to meet their financial needs than they would have had to sell off-season, which contributes to the depletion of their food stocks. This in turn increases food insecurity during the dry season and towards the beginning of the rainy season. This problem is further exacerbated by weak farmers' organisations which are unable to mobilize production and marketing of their members for better prices." (Walaga/Hauser 2005:71)

Table 4.5: Simplified illustration of links between food security dimension and outcomes achieved through certified and non-certified Organic Agriculture in Uganda

Food security dimension	Principle outcomes	Certified Organic Agriculture	Non-certified Organic Agriculture
Availability of food	Agricultural intensification	Focus on cash crops, moderate management changes, moderate to no yield increase	Focus on food crops, pronounced management changes, moderate to high yield increase
Access to food	Economic specialisation	Premium price, substantial increase of household income, possible reinvestments in food	No premium price, moderate / no increase of household income, questionable reinvestments in food

(Source: Walaga/Hauser 2005:76)

To analyse the influences of OA on food security on household level, one has to distinguish between certified and uncertified OA, because of the different kinds of outputs they are delivering. In certified OA revenues mostly are in form of financial means and therefore influence purchasing power of the farmer, whereas in uncertified OA revenues occur in the form of higher yields and therefore in more staple food. (Table 4.5). Agricultural intensification and economic specialisation due to OA therefore addresses the availability and accessibility of food in the mentioned ways: (i) certified OA farmers mostly gain (beside the moderate availability of own food from subsistence production) more financial means and hence a increased accessibility of food on markets, whereas (ii) uncertified OA farmers gain a higher amount of own produced food (increased availability of food) due to higher yields of OA, but there is no increase of income as purchasing power (Bolwig/Odeke 2008; Walaga/Hauser 2005; Halberg et al. 2005a).

[71] There are many factors contributing to food security, such as land tenure and political issues; climate/natural disasters or the armed conflict in northern Uganda (see BOX 5; page 51). This paper focuses on the potential of OA and its contributory effects on households.

BOX 7: Evidence on Organic Agriculture and Food availability in Africa

For one of the largest analyses of the effects of Organic Agriculture/sustainable agriculture about 286 projects of Organic Agriculture or sustainable agriculture were evaluated, covering 37 Mio. ha agricultural land and 57 countries. This excerpt is focused on East Africa and Uganda.

Agricultural productivity performance of organic and near organic agriculture in Africa

Region	Number of countries represented	Number of projects analysed	Number of farmers in projects (million)	Number of hectares under organic and near-organic agriculture (million ha)	Average change in crop yields compared with beginning of projects (per cent)
Africa (all countries with data)	24	114	1,900,000	2.0	+116
East Africa (Kenya, Malawi, Tanzania, Ethiopia, Uganda, Zambia)		71	1,600,000	1.4	+128
East Africa (countries focused upon within this study)	3 (Kenya, Tanzania and Uganda)	44	1,300,000	1.2	+120
Kenya	1	18	1,000,000	0.5	+179
Tanzania	1	9	27,000	0.06	+67
Uganda	1	17	241,000	0.68	+54

Key improvements shown by case studies

Improvement to:	Mechanism:	Number of case studies which showed improvement (out of a possible 15)	Per cent
Amount of available food	• Increase in food produced • Increase in yields of food crops/ livestock	12	80
Natural capital	• Benefits to natural environment – soils, water, fertility etc	14	93
Social capital	• Builds partnerships between groups • Increased community cohesion and cooperation	14	93
Human capital	• Increase in knowledge and skills of farmers • Health and education benefits to farmers, households and community	15	100
Physical capital	• Improvements to infrastructure and markets	6	40
Financial capital	• Increased incomes to farmers	13	87

(Source: UNCTAD/UNEP 2008; 16/33)

4.1.4.2. Contributory effects of Organic Agriculture on the Human Development Index

The HDI has three dimensions. All three dimensions are influenced indirectly by OA (see also BOX 7). In Table 4.6 (page 72) most important effects of OA on HDI are listened.

Table 4.6: Influences of Organic Agriculture on the Human Development Index

Dimension & Index	Mechanism of Organic Agriculture
1. Living a long and healthy life *Life expectancy index* (Life expectancy)	- improvements in human capital (the holistic world view of OA leads towards more consciousness) - increased and stable yields in staple food allows a more adequate diet - no use of synthetic agro-chemicals; less/no pollution
2. Being educated *Education index* (adult literacy and enrolment at the primary, secondary and tertiary school level)	- improvements in human capital (OA needs a lot of knowledge and skills) - more income allows more expenditure education (school fees, etc.)
3. Having a decent standard of living *GDP index* (purchasing power parity, PPP, income)	- higher yields: in 87% of case studies after becoming organic - Increased income due to higher yields and maybe organically certified and export - group activities lowers cost of expenditures

(Source: own table; data from UNCTAD/UNEP 2008; Bolwig/Gibbon 2009)

Contribution of OA enables an improvement of the three dimensions of HDI. Beneficiary effects are possible through various indirect linkages.

4.1.4.3. Organic Agriculture and Millennium Development Goals of the United Nations Development Programme

As described in chapter 0 (page 1) and especially in

Figure 4.3 (page 68) OA is affecting involved people positively in the accumulation of capital and thus to create capabilities/freedoms to reach functionings. This part of the paper the focuses is in a comparison of OA and the Millennium Development Goals[72] (MDG) of UNDP. For this comparison the MDGs with the most important relations to the principles of OA production were selected. These are number 1: Eradicate extreme hunger and poverty; 7: Ensure environmental sustainability and 8: Develop a global partnership for development (UNDP 2009d). In Table 4.7 (page 73) on the left side there are the MDGs and on the right side the principles of OA.

[72] There are many concerns (by various commentators) about the validity of the MDGs and their consequences on international development business. On the one hand there is criticism regarding the content and feasibility of the MDGs. On the other hand there is criticism on the dominance of them in the international discourse, covering and concealing the structure of other important and urgent issues. However, this report focuses on OA and its role in rural Uganda. It does not focuses on the efforts are undertaken by international development organisations and to put criticism on it.

Table 4.7: Comparison of the principles of Organic Agriculture and the Millennium Development Goals from United Nations Development Programme

General MDG Target	MDG Sub-targets	Principles of Organic Agriculture
1. Eradicate extreme hunger and poverty	Target 1a: Reduce by half the proportion of people living on less than a dollar a day Target 1b: Achieve full and productive employment and decent work for all, including women and young people Target 1c: Reduce by half the proportion of people who suffer from hunger	**Principle of fairness:** "Fairness is characterized by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings. This principle emphasizes that those involved in organic agriculture should conduct human relationships in a manner that ensures **fairness at all levels** and to all parties - farmers, workers, processors, distributors, traders and consumers. OA should provide everyone involved with a good quality of life, and contribute to **food sovereignty** and **reduction of poverty**. It aims to produce a sufficient supply of good quality food and other products. (…) Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs."
7: Ensure environmental sustainability	Target 7a: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources Target 7b: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss**.** Target 7c: Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation Target 7d: Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020	**Principle of ecology:** „OA should attain ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity. Those who produce, process, trade, or consume organic products should **protect and benefit the common environment** including landscapes, climate, habitats, biodiversity, air and water." **Principle of care**: "OA should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment." **Principle of health:** "OA should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible. (..)The role of organic agriculture, whether in farming, processing, distribution, or consumption, is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings."
8: Develop a global partnership for development[73]	Target 8a: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system Target 8b: Address the special needs of the least developed countries	**Principle of fairness: "**Organic Agriculture should build on relationships that ensure **fairness with regard to the common environment and life opportunities**.(…) Natural and environmental resources that are used for production and consumption should be managed in a way that is socially and ecologically just and should be held in trust for future generations. Fairness requires systems of production, distribution and trade that are open and equitable and account for real environmental and social costs."

(Source: own table, data from UNDP 2009d; IFOAM 2009c)

These indicated targets and sub-targets of the MDGs are all addressed in the principles of OA. The implementation of OA methods goes in line with the MDGs while it gives a strictly guideline to follow, which ensures sustainability in various ways. The methods of OA may provide techniques to achieve these aspired targets of UNDP and the international community.

[73] This MDG includes more sub-targets than indicated in Table 4.7.

4.1.5. Conclusion on Organic Agriculture and Poverty

RQ1: (i) Does Organic Agriculture contribute to reduce poverty in rural Uganda?

→ If it does: How Organic Agriculture contributes to reduce poverty in rural Uganda?

OA undoubtedly (see BOX 7; page 71) contributes to the creation of capabilities of involved people. Farmers and their families, groups and communities can achieve more freedom to choose, because of the accumulation of natural, human, financial, physical and social capital. Hence the deprivation in capabilities of involved people is positively influenced by OA and it is possible to gain several functionings.

In practices these changes are manifested in increased yields, increased resilience of the agricultural production system, increased income, group building, capacity building, increased skills and knowledge about ecology in general, reduced risks etc. Improvement of livelihoods of farmers and their families through OA seems to be possible in Uganda. How much OA affects involved people and their livelihoods, is not measurable yet and hence not visible in national statistics. It needs more research on these issues.

Further there is assumed, that there is a significant elasticity of consumption on household respectively community level. Most of additional surplus of produced food is directly consumed in farmer's families or (probably in a less proportion) locally marketed without notices in national statistics.

4.1.6. Organic Agriculture and Land Use

RQ1: (ii) Is Organic Agriculture a contributory means to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?

→ If it is: What are the contributory features/effects of Organic Agriculture to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?

This chapter of the paper approaches answers to these questions. Benefits of OA (already stated in chapter 4.1.1; page 54) and influences of OA on five types of capital (see chapter 4.1.3; page 64) will be the base for further explanations. But before a short review of some facts mentioned in the introductory part (Chapter 1; page 1).

Land scarcity will be the major challenge Uganda is facing coming decades (chapter 1.3.2; page 21). The size of farms continuously decreased during the last forty years and pressure on cultivated land increased due to population growth and unsustainable farming practices (BOX 1; page 11), which leads to land degradation. As already highlighted before (chapter 1.2.2.4; page 10 and 1.6; page 35) land degradation is wide spread in Uganda and results in estimated losses of GDP in the range of 1300 Mio. US$ to 3800 Mio US$ representing approximately 17% of total GDP in year 2004 (UNCTAD/UNEP 2006). FAO states that 63% of total land area is suffering from human induced land degradation and approximately 25% of agricultural area is degraded due to unsustainable agriculture practices (FAO/TERRASTAT 2009; FAO/AGL 2009). Land degradation appears in several forms: soil compaction, surface crusting, water logging, leaching and declining vegetative cover or simply nutrient depletion. Main type of degradation in Uganda is water erosion (Nkonya 2008). Annual loss of nutrients (N,P,K) in Uganda is estimated of about 60-70 kg.

4.1.6.1. Scarcity of agricultural land and Organic Agriculture

Implementation of methods of OA is leading, among other things, to an increase and stabilisation of crop yields. In Table 4.8 (page 75) there is the increment in average crop yield of selected sources. Crops and regions differ. Most voluminous study (with a dataset comprising 286 cases (projects/initiatives) from 57 countries with approximately 12,6 Mio.

involved farmers and 37 Mio. ha agricultural area (cultivated either with OA or sustainable agricultural practices and technologies; see also BOX 7; page 71) was done by Pretty et al. 2006. After the adaptation of sustainable agricultural techniques there was an increment of crop yields in average of approximately 79% (in comparison to the initial situation; Pretty et al. 2006). For Uganda the number was stated with 54% (Pretty et al. 2006).

Table 4.8: Increment of crop yields after conversion to Organic Agriculture or agro-ecological farming, several sources

Yield increase	Region	Source
20-250%	Latin America	Altieri 2001, cited in Parrott/Marsden 2002
20%	Latin America	Rist 2000, cited in Parrott/Marsden 2002
23-38%	Mexico	Soto-Pinto et al. 2000, cited in Parrott/Marsden 2002
25%	Pakistan	Wai 1995, cited in Parrott/Marsden 2002
54%	Uganda	Hine/Pretty 2005
79%	57 countries	Pretty et al. 2006

To supply Uganda's population with food, as a consequence of land scarcity yields have to increase if population is growing. Population in Uganda is expect to grow with an annual rate of approximately 3% next 15 years and slightly allay thereafter (Chapter 1.3; page 18 and Figure 1.13; page 18). There is evidence that OA is able to increase crop yields (see BOX 7; page 71). So smallholders may benefit from methods of OA (Chapter 4.1.1; page 54) to increase yields and to contribute to the problem of land scarcity in Uganda.

4.1.6.2. Land degradation and Organic Agriculture

Major processes causing land degradation include: (i) plant cover degradation and deforestation; (ii) wind erosion; (iii) water erosion; (iv) physical deterioration (soil crusting, sealing and compaction); (v) reduction of soil organic matter and other biological degradation; (vi) chemical degradation (accumulation of excessive toxic substances, salinization); (vii) unsustainable cultivation practices and improper land management (e.g. SaB practices, see BOX 1; page 11; FAO/AGL 2009). Environmental problems such as land degradation, caused by agricultural activities are listened in Table 4.9 (page 76).

FAO states that "soil erosion by water is the most serious and widespread form of land degradation in Uganda. It derives from people's interaction with the basic national resource, the land. It is particularly pronounced in the highland areas, which are themselves the more favoured agricultural areas, and in rangelands. Water erosion is particularly severe in the districts of Kotido, Moroto, Mbarara and northern Luwero, where fragile vegetation cover has been destroyed by overstocking and overgrazing. Severe water erosion has also occurred in Mbale, Kabale, Kabarole, Kapchorwa, Bundibugyo and Kasese districts where high altitude mountain slopes have been greatly deforested for crop production. Wind erosion is a less serious form of soil degradation in Uganda than water erosion. It occurs mostly in areas with low and unreliable rainfall where the soil remains exposed during the long dry seasons. Wind erosion occurs mainly in districts of the north-eastern Uganda." (FAO/AGL 2009).

Table 4.9: Agriculture's environmental problems onsite and offsite

	Onsite effects	Offsite effects (externalities)	Global effects (externalities)
Intensive agriculture (high-potential areas)	Soil degradation (salinization, loss of organic matter)	Groundwater depletion Agrochemical pollution Loss of local biodiversity	Greenhouse gas emissions Animal diseases Loss of in situ crop genetic diversity
Extensive agriculture (less-favored areas)	Nutrient depletion Soil erosion onsite effects	Soil erosion downstream effects (reservoir siltation) Hydrological change (e.g., loss of water retention in upstream areas) Pasture degradation in common property areas	Reduced carbon sequestration from deforestation and carbon dioxide emissions from forest fires Loss of biodiversity
Level of cooperation typically required	None (individual or household)	Community, watershed, basin, landscape-level, regional, or national	Global

(Source: IBRD 2007:181)

As soil erosion is mostly the "outcome of the interaction of land management decisions with factors such as climatic conditions, the state of technology, the level of information available to cultivators, government policies and financial conditions. While most of these factors are basically beyond the control of individual cultivators, it does not mean that the current levels of soil erosion are predestined or uncontrollable. Land management decisions determine the impact that changes in these factors have on the stock and quality of soil as well as the extent to which any negative impact of soil erosion is rectified." (Jayasuriya 2003:122)

This part of the report focuses now on the abilities a farmer has to influence degradation of land due to land management following OA during the production process on farm level.[74] Farmers mostly are facing the effects of land degradation in decreasing soil fertility and hence in decreasing crop yields and declining agricultural productivity in general (FAO 2009; Nkonya 2008). During last 40 years there was a decline or stagnation of all major crops in Uganda (Figure 1.7; page 12) except cassava, due to the introduction of better yielding varieties. Declining soil fertility and therefore decreasing agricultural productivity for most farmers leads to expansion of the agricultural area wherever it is possible and to open up of less favourable soils for cultivation.

So there is the raising question what measures OA provides to replenish nutrients, to protect soil from harmful impacts of erosion and so in the long run to face land degradation? As stated before (chapter 4.1.1.1; page 54 and chapter 4.1.1.2; page 56) there are many measures of OA to positively influence the agricultural production system and hence the surrounding environment. The holistic approach of organic farming provides several elements, which can be used to obtain soil fertility and plant available nutrients in the long run under tropical conditions like in Uganda. In Table 4.10 (page 77) there is a list of selected mechanism and effects of OA related to soil fertility replenishment and to avoid erosion.

[74] (i) Possible interaction and effects of OA on land degradation are mainly examined on the example of crop production rather than on livestock and the problem of overgrazing. (ii) Land degradation is influenced by various issues such as the tenure security or other socio-economic factors which reduces land degradation.

Table 4.10: Measures of Organic Agriculture to face land degradation

Most important measures	Primary effects
Adequate recycling of nutrients (Use of green manure, farmyard manure, compost, legumes, etc.)	- enrichment of soil with humus and organic matter in topsoil layers - contributes nutrient replenishment → soil fertility
Avoidance of blank soil (Permanent soil cover with the crops themselves or with the utilization of cover crops, residues, mulch or in combination with trees or shrubs)	- Reduced soil erosion (water, wind) - Reduced exposition to solar radiance - Improved soil moisture
Appropriate tillage (Loosened deep layers and mixed shallow layers of soil)	- Improved soil structure
Water conservation (Terraces, embankments, strip cropping, contour planting, etc)	- Reduced soil erosion by water
Addition of woody species in agricultural system (trees, shrubs, etc.)	- Reduced loss of water (due to wind breaking effects) - positive effects on soil fertility (deep roots) - reduced erosion (wind and water)
Balanced and diversified crop rotation (adequate and side-adapted sequences of crops, intercropping and/or mixed crops)	- Enriched humus content - Reduced soil tillage density (different root types may structure subsequent soil layers) - higher soil cover (see above)

(Source: own table; data from Freyer 2008; Freyer 2009; Parrott/Marsden 2002; NEMA 2005)

So theoretically OA has a wide range of mechanisms to positively influence land degradation in Uganda. About the current extension of applied methods in OA in Uganda and its influences on land degradation no data are available yet.

4.1.6.3. Forests and Organic Agriculture

Uganda's forest cover is declining rapidly with an annual loss of more than 2,2% (between year 2000 - 2005; FAO 2005). During last 15 years (till 2005) forest area had been reduced for 1,35 Mio. ha or by 28% of forest area (FAO 2009b; see 1.2.1; page 4).

There are many causes of the decline in forest areas in Uganda. "The most important include the loss of the forest areas through conversion into agricultural and grazing land, and forest resource degradation due to firewood collection, pit sawing and charcoal burning. Currently there are high rates of forest clearance on private land, for agriculture and charcoal production. This is now a serious threat, as 70% of Uganda's forest cover is on private land, much of which is not regulated or managed. Population growth (estimated at 2,5% per year) is leading to an increase in the demand for land, food and energy. Institutions such as schools, prisons among others, rely almost exclusively on firewood for cooking, as does over 90% of the population. Many areas are already experiencing shortages of firewood, and hence rising costs and increased burdens on women and children who collect firewood." (Kayanja/Byarugaba 2001:943).

It seems that OA may contribute to a lowering of the deforestation rate in Uganda in two ways. Both of these contributions have indirect effects on forest cover in Uganda:

(i) With the methods of OA it is possible to achieve higher crop yields and hence a higher agricultural productivity in a sustainable manner. Higher productivity may lead to a lowering of land shortage and therefore to a decrease in pressure on forest areas in Uganda.

(ii) Increased introduction of trees into the agricultural production system may lead to an increased production of fuel wood on household level, influencing forest cover positively

due to decreasing demand on fuel wood from forests.

OA in tropical environments is inherently connected with the use of trees and other woody species. Freyer stated the importance of trees in the farming system: “Agroforestry system (AFS) is a combination of a wide spectrum of plants and animals where both – plant production in arable land and livestock production/pastoral farming, shrubs and trees is carried out. The main idea of AFS is to use the organism diversity to lower the ecological, economic and social risk, and to strengthen the resilience of the system. If climate, pests, or market prices are unfavourable for one crop or type of livestock, another may be more successful and the risk is shared. (…) Trees contribute to the microclimate stability; they are providing habitats for beneficials and are besides the humus the second reservoir for soil fertility. Nutrient cycles and carbon cycles are closed as far as possible, based on the site-specific potential of nitrogen fixing and producing plants.” (Freyer 2008:46)

Trees can easily be introduced into the farming system. This may happen in the introduction of single multipurpose trees or with an Alley Cropping System (ACS). An ACS is a specific type of AFS. “Alley cropping is growing field crops or horticulture crops or forage crops between rows of fruit trees or shrubs on arable land. It consists of nitrogen-fixing species of trees or shrubs. Their specific interaction with the soil is that they recycle nutrients from deeper soil layers.” (Freyer 2008:46) Freyer distinguishes between: (i) nutritional orientated functions (food crops (vegetables, fruits, herbs, etc.), fodder crops, medicinal crops, etc.) and (ii) raw material function: crops for energy, fuel or other use (Freyer 2008).

Edwards describes the wide range of functions of trees in a farming system as following: “In windy areas the windbreak effect of trees can significantly reduce the loss of water through evapotranspiration. Trees also maintain and restore soil fertility and control erosion. Their leaves can be used as fodder as well as for composting. They provide soil cover when the pruned branches and leaves are left on the soil. These increase soil nutrients, suppress weeds and improve soil structure. Tree roots help bind the soil together and promote the infiltration of water. The deep rooting systems of trees help recycle nutrients by returning leached cations to the soil as leaf litter. The ability of certain species to survive the dry season and maintain their green leaves means that there will be active roots in the soil when there is a flush of mineralised nitrogen at the start of the rains. The roots act as a safety net capturing the nitrogen that would otherwise be leached away.” (Edwards 2000; in: Parrott/Marsden 2002:68)

However, trees are an integral part of OA in tropical regions like Uganda and have many functions. Trees on farms in agricultural production systems can contribute to meet demand on fuel wood respectively charcoal, but they are no solution for deforestation on large scale. The question is still open to which extend trees on farms can contribute to meet demand on fuel wood, at least in rural areas.

4.1.7. Conclusions on Organic Agriculture and Land Use

RQ1: (ii) Is Organic Agriculture a contributory means to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?

→ If it is: What are the contributory features/effects of Organic Agriculture to solve current challenges and future problems of land scarcity and land degradation as well as deforestation in Uganda?

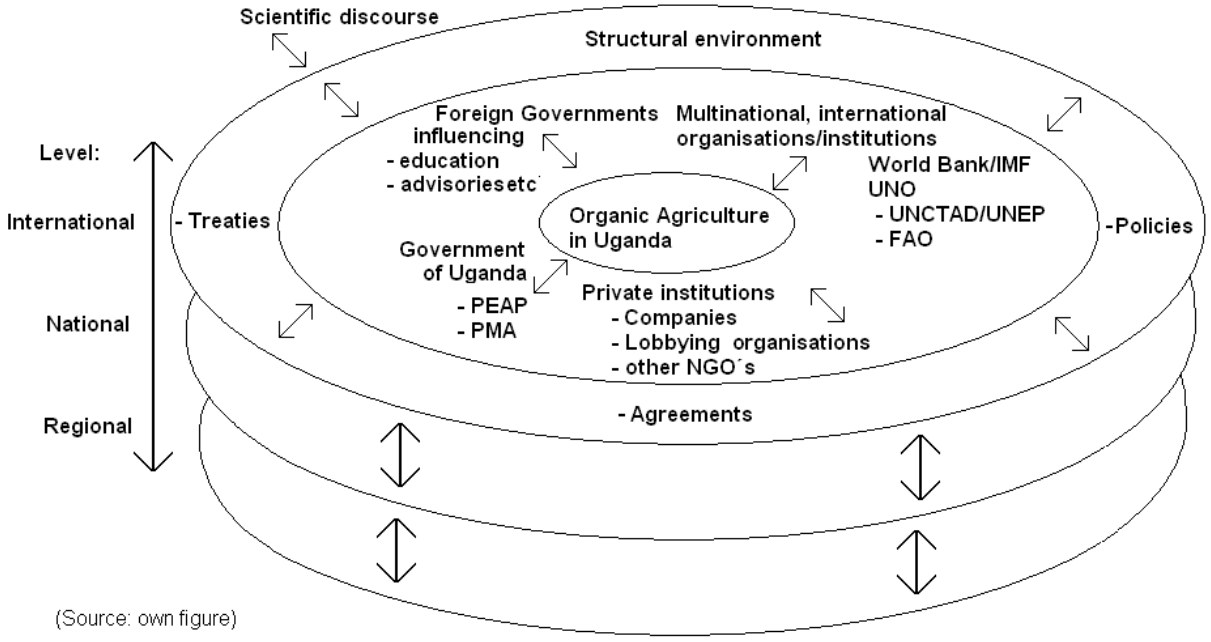
This question is rather difficult to answer. The issues of land scarcity, land degradation and deforestation are strongly interlinked with each other in a complex way. On farm level OA may contribute to solve these emerging issues. Contribution of OA is possible due to the application of the sustainable methods of OA, which accumulate the five types of capital. In this case the accumulation of natural capital is important. Accumulation of natural capital occurs due to the (i) better use of locally available natural resources (water, compost, etc…);

(ii) intensification of microenvironments in the farm system (gardens, orchards…); (iii) diversification by adding new regenerative components like trees, animals, etc. and (iv) remove or better use of non-renewable inputs and external technologies (see also Table 4.4: Potential improvements occurring in a shift to Organic Agriculture; page 66 and Table 4.3: Potential influences of Organic Agriculture on the five types of capital; page 65). Natural capital is primarily accumulated in form of humus content in soil as well as in form of other soil related improvements, such as increased nutrient capacity and content (due to leguminous crops, etc.), increased water holding capacity, increased soil stability and reduced soil erosion and visible improvements in the topsoil. Beside soil features natural capital is accumulated due to improvements in the water table (with more drinking water in the dry season) or due to increased agro-biodiversity and diversity in general. Accumulation of natural capital in the long run leads to more soil fertility and hence to more agricultural productivity generally or to possible restoration of degraded or abandoned land. Higher crop yields take pressure from other lands and forests, due to the lesser necessity to expand agricultural area for crop production.
As trees are an integral part of OA with many functions in tropical regions like Uganda, utilization as fuel wood may take even more pressure from forest. So in theory OA has a wide range of mechanisms to influence land scarcity, land degradation and deforestation in Uganda positively. How this can implemented into common practices is another issue for research.

4.2. Organic Agriculture and its Structural Environment

OA is embedded in a diverse and heterogeneous environment. This part of the paper concentrates on the most important stakeholders influencing OA in Uganda (Figure 4.4). These stakeholders may operate on international, national or/and regional level and are surrounded by a structural environment, such as (international, multilateral, bilateral) treaties policies, agreements etc. Scientific discourse is influencing them all in a certain way and somehow overlaps with stakeholder operations or covers them. There is a wide range of research done on the issues of agriculture and how it affects (rural) population generally. The position concerning OA of most important organizations and scientists at present is to approach the questions of research.

Figure 4.4: Environment of Organic Agriculture



(Source: own figure)

RQ2: (i) What is the structural and scientific environment Organic Agriculture is embedded in and how does this environment facilitates Organic Agriculture?

RQ2: (ii) What are the official positions of the most important multinational, international and national organisations/institutions concerning OA and its implementation in Uganda?

RQ2: (iii) What are the most important factors and issues influencing OA in Uganda?

4.2.1. Scientific Discourse about Organic Agriculture

Research done on the issues of agriculture is diverse and in general deals with the question if OA is able to feed the world (with a growing population) and if OA is a suitable agricultural system for smallholder farmers in countries like Uganda, who mostly were bypassed by Green Revolution technologies.

4.2.1.1. The Lobby and Advocates of Green Revolution

Scientific discourse is heterogeneous. This part of the report presents most concise and controversial opinions of selected scientists, who favour techniques of Green Revolution and other biotechnology for agricultural production.

4.2.1.1.1. Borlaug

In Borlaug´s opinion (Borlaug 2004) reduction of poverty and food security could only be ensured in current and in future times by further intensification of agricultural production especially in those regions, where there is a low agricultural productivity by now or decreasing agricultural productivity like in the sub-Saharan Africa (McCalla 1999). Intensification and improvement of agricultural productivity for Borlaug is seen in the widely application of Green Revolution techniques or/and in the use of "either already available or well- advanced agricultural technology in the research pipeline" (Borlaug 2004:97), such as GMOs (Genetically modified organisms) and other biotechnological methods. Why there still is stagnating agricultural productivity and no food security after 40 years of Green Revolution and increased net world food production? The failure in Borlaug´s view is the missing infrastructure "to deliver modern inputs – seeds, fertilizers, crop-protection chemicals – and market output must be established. If this is done, subsistence farmers, who constitute more than 70 percent of the population in the most countries there [Sub-Saharan Africa] can have a chance to feed their people." (Borlaug 2004:101) "From our experiences over the past decade, I am convinced that if there is political stability and if effective input supply and output marketing systems are developed (including a viable agricultural credit system) the nations of Sub-Saharan Africa can make great strides in improving the nutritional and economic well-being of their desperately poor populations" (Borlaug 1997:4) Still the question remains of how this requirements could be established to realise all the "If-sentences" Borlaug stated.

OA in Borlaug´s opinion is only feasible in industrialized, developed countries for elitists, but no solution to combat hunger and ensure food security in the whole world: "Agriculturalists must not be duped into believing that future food requirements can be met through continuing reliance on… the new complicated and sophisticated "low-input, low-output" technologies that are impractical to adopt." (Borlaug 1992; in: Pretty 1999:261)

4.2.1.1.2. Trewavas

For Trewavas (Trewavas 2008; Trewavas 2002) conventional agriculture is successful and sustainable and there is a "cult of the amateur in agriculture" which "threatens food security" (Trewavas 2008:475). After several decades with increasing yields and the provision of food security in many countries Trewavas complains about "a few scientists who are marginal to agriculture" and about "a variety of unqualified groups", who "have used fear and anxiety and have greatly exaggerated minor problems to persuade an unqualified public of supposed

dangers in food and to try and change agricultural policy. Fear and emotion do not lead to good policy, and the cult of the amateur that has developed could have serious repercussions on vital food security and future agriculture in developing countries; it must be soundly rejected." (Trewavas 2008:475)

4.2.1.1.3. Connor

For Connor (Connor 2008) OA is not a practicable strategy to feed a growing world population and to face the future challenge of land shortage for agricultural production, like Badgley et al. claimed it. For them OA seems to be possible strategy to feed world population (Badgley et al. 2006). Connor "does not support the proposition that large-scale OA productivity would be sufficient to feed the world or that legume cover crops could replace N fertilizer use without disrupting current food production." (Conner 2008:198) He further argues that "the biggest losers are likely to be resource-poor farmers in developing countries." (Conner 2008:198) and "that organic nutrients can increase the now low yields of nutrient-limited crops is not in dispute. What is in dispute is the promotion of a transient OA solution as the sustainable solution when fertilizers, that can provide a complementary route to increasing yields now, will be essential for the high productivity that will be required in future" (Conner 2008:198) because of population prospects (Conner 2008:198).

4.2.1.2. The Lobby and Advocates of Organic Agriculture and Sustainable Agriculture

In opposition to the Green Revolution lobby there are various scientists favouring OA as a contributory tool for smallholder farmers in countries like Uganda. Indian scientist Shiva for example is putting criticism on the "myth of higher productivity of chemical and capital-intensive monocultures" for a long time (Shiva 2002:40).

4.2.1.2.1. Pretty/Hine

Pretty and Hine worked on the "SAFE-World" research project (The Potential of Sustainable Agriculture to Feed the World). "The aim of the project was to audit the recent worldwide progress towards sustainable agriculture, and asses the extent to which such projects/initiatives, if spread on much lager scale, could feed a growing world population that is already substantially food insecure." (Pretty/Hine 2001:11) The dataset contains information on 286 cases from 57 countries. In these projects/initiatives, approximately 12,6 Mio. farmers have adopted sustainable agriculture practices and technologies on 37 Mio. ha. Some results are listened in BOX 7 (page71). The most important number of this study is the average crop yield increase. After the adaptation of sustainable agricultural techniques yields in crops increased in average approximately 79% (in comparison to the initial situation; Pretty et al. 2006).

4.2.1.2.2. Badgley et al.

Badgley et al. modelled in 2006 (Badgley et al. 2006) current world production of food with OA and conventional agriculture (CoA) as there are the two principal objections by many commentators that with the methods of OA it might not possible to meet global food demand, because of low yields and because of insufficient quantities of organically acceptable fertilizers, especially nitrogen from N-fixation by leguminous cover crops. In their results of comparison of this models for most food categories, the average yield ratio between organic : non-organic was slightly <1.0 for the developed world and >1.0 for studies in the developing world. "With the average yield ratios, we modelled the global food supply that could be grown organically on the current agricultural land base. Model estimates indicate that organic methods could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base." (Badgley et al. 2006:86) As a second result Badgley et al. (2006) estimated that there is enough amount of potentially available nitrogen from fixation by leguminous cover crops to replace currently used nitrogen-fertilizer by the methods of OA to

meet demand in agricultural production (Badgley et al. 2006). “Our results suggest that organic methods of food production can contribute substantially to feeding the current and future human population on the current agricultural land base, while maintaining soil fertility. In fact, the models suggest the possibility that the agricultural land base could eventually be reduced if organic production methods were employed, although additional intensification via conventional methods in the tropics would have the same effect. Our calculations probably underestimate actual output on many organic farms. Yield ratios were reported for individual crops, but many organic farmers use polycultures and multiple cropping systems, from which the total production per unit area is often substantially higher than for single crops. Also, there is scope for increased production on organic farms, since most agricultural research of the past 50 years has focused on conventional methods. Arguably, comparable efforts focused on organic practices would lead to further improvements in yields as well as in soil fertility and pest management. Production per unit area is greater on small farms than on large farms in both developed and developing countries; thus, an increase in the number of small farms would also enhance food production. Finally, organic production on average requires more hand labour than does conventional production, but the labour is often spread out more evenly over the growing season. This requirement has the potential to alleviate rural unemployment in many areas and to reduce the trend of shantytown construction surrounding many large cities of the developing world.” (Badgley et al. 2006:94) Meanwhile, after several criticism on their methodology, Badgley et al. added to their work: “These results are controversial, partly from prejudice and vested interests in the current agricultural system and partly from disputed aspects of the analysis. While this study claims that organic yields and nitrogen fertility methods could feed the world, it does not forecast yields for any particular crop or region, nor does it claim that a global organic food system would necessarily increase food security anywhere. Food security depends on policies and prices as much as on yields.” (Badgley et al. 2007:81)

4.2.1.2.3. Halberg et al.

Similar to Badgley et al., Halberg et al. asked what would be the effect to global food security if there would be a conversion from CoA to OA on a large scale (a conversion of approximately 50% of agricultural area) in Europe, North America and Sub-Saharan Africa (Halberg et al. 2005). Their model[75] resulted in a drop of 20-45% in high-input-high-output agricultural systems and in an increase of prices (6-10%) on world market for (non-meat) agricultural products. “The indirect effect on food security in Sub-Saharan Africa would be very small. Upscaling experiences from case studies into scenarios for conversion of 50 % of agricultural area in Sub-Saharan Africa result in increased self-sufficiency and decreased net food import to the region. Given the assumption of higher relative yields in most organic crops compared with existing low input agriculture, there is potential for improving local food security in Sub-Saharan Africa if non-certified OA is supported by capacity building and research. More knowledge is needed, however, to confirm that these optimistic results of non-certified OA apply to large areas in Sub-Saharan Africa and other regions with low input agriculture.” (Halberg et al. 2005:2)

4.2.2. Government of Uganda

The government of Uganda could be a major player affecting OA positively and to spread it throughout Uganda. However, it is not the case. Government of Uganda mostly recognizes OA *as more of the same* – in the meaning, that nearly all agriculture in Uganda is *OA by default*. Nevertheless OA (and especial export of certified OA produce) is appreciated as a growing niche market. Up to now there is no special OA policy formulated by the Ugandan Government. Initial point of an OA policy was in year 2003, when the Organic Policy Development Committee was created in the Ministry of Agriculture, Animal Industries and

[75] Halberg et al. 2005 used the food policy model IMPACT

Fisheries (MAAIF). A process of countrywide consultations has engaged many stakeholders at central and local government level since then and is now in advanced stages, but until now there is neither an organic market regulation existing in Uganda nor an official policy of MAAIF concerning OA (Mugisa 2008).

4.2.2.1. The Roll of the Plan for Modernisation of Agriculture (PMA)

The PMA was launched in 2000 with the aim to support the Poverty Eradication Action Plan of the Ministry of Finance, Planning and Economic Development (PEAP) of the GoU (for more detailed information, please refer to BOX 3: Uganda's National Poverty Reduction Plans; page 27) PEAP soon will be replaced by Preparing a 5-year National Development Plan (NDP; Mugisa 2008).

As the overall objective of PMA is to improve agriculture productivity due to a transformation of subsistence agriculture to commercial agriculture. "The PMA aims to accelerate agricultural growth in Uganda by introducing profound technological change throughout the sector. This technological change will keep downward pressure on real food prices, thereby raising the real incomes of the poor, including those in urban areas who are not direct producers of food but spend more than 60 percent of their incomes on food purchases (…)Farmers will spend more on farm inputs, on processing, marketing, and transporting farm outputs, and on household goods and services. These increased expenditures of farm households will stimulate growth in the enterprises that produce and sell the things that farm households want, which are mainly produced in small, labour-intensive enterprises, concentrated in rural areas." (PMA 2004:vii) The priority areas for PMA to reach subsistence farmers are: "(i) Access to credit and financial services; (ii) Control of crop and livestock pests and diseases; (iii) Improved market access; (iv) Access to affordable inputs; (v) Improved access to arable land—soil fertility, maximal land use and increased access to land; (vi) Extension services that reach the people and offer advice, information and training on more productive methods, marketing and alternative income generation activities and (vii) Improving access to storage and processing facilities." (PMA 2004:16)

Despite the great potential of OA in Uganda to increase yields, PMA is focused to increase inputs of inorganic fertilizers and pesticides in subsistence farming systems, to succeed in the transformation of the farming system. With PMA respectively NAADS the government of Uganda also intents to facilitate the private sector in the rural areas in order to push non-farm activities. The Government is not directly involved in production, processing or marketing the agricultural products, but tries to enable farmers to re-orient their production towards the market by themselves. So Government of Uganda aims with PMA (beside the above mentioned areas) through advisory service to provide farmers with skills and knowledge to achieve the PMA goal of a modernised agriculture (PMA 2004).

4.2.2.2. The Roll of the NAADS

NAADS is a operational unite of PMA and was launched in March 2002 with the primary role to facilitate formation of farmer groups at the local level and farmer forums at sub county, district, and national levels. NAADS consists of eleven components: (i) Advisory and information service to farmers, (ii) Technology development and linkages with market; (iii) Quality assurance of services; (iv) Private sector institution development; (v) Programme management and monitoring; (vi) Programme management and coordination; (vii) Planning, monitoring and quality assurance; (iix) Capacity development for service provider; (ix) Agri-business development market linkages; (x) Advisory service and information for farmers and (xi) Farmer institution development (NAADS 2009). NAADS is guided by the idea to shift farmers from subsistence level to produce for markets. This commercialisation should be done in a process disaggregating the needs of different farmer types and having different approaches for providing them with agricultural advisory services. OA is no special field in their advisory activities.

“Farmer groups are expected to articulate their needs and purchase technical services from private service providers, paid for by the public sector through the decentralized (subcounties) government. The ability of farmers to make effective demands for advisory services, and implicitly therefore for government funds, will depend upon their ability to organize themselves in groups.” (Bahiigwa 2005:481)

4.2.2.3. Uganda in Context of Structural Adjustment Programmes and other Efforts of IBRD/IMF

Uganda often is called model country or *cause célèbre* when debates focusing on international cooperation activities (Bahiigwa et al. 2005; Schicho 2004). And indeed Uganda was in the first place to implement structural adjustment programmes, privatisation, de-regulation, and in the opening of its economy to international trade. In a recent examination of Uganda’s economic development since 1986, Dijkstra and van Donge comment that ‘‘Uganda is often seen as an African show case for the beneficial effects of structural adjustment. High growth rates have been combined with a high degree of ownership of the reforms’’ (2001, p. 841). Others have drawn more pessimistic conclusions, however, notably that structural weaknesses in the Ugandan economy persist and that agricultural supply response to reforms has been weak.” (Bahiigwa 2005:481) As many other indebted countries the Government of Uganda introduced structural adjustment programmes for the agricultural sector led by IBRD/IMF “The rationale of the adjustment programmes Uganda has undertaken since 1987, and particularly since 1992, has been that economic growth, especially in the agricultural sector, would result from liberalization and privatization.” (Bahiigwa 2005: 481) The marketing of agricultural products was liberalized, export taxes abolished and other market distortions were removed and regulatory and promotion-agencies were established for key export crops, quality control and market information dissemination (PMA 2004). “The major adjustment reforms in the late 1980s and the early 1990s directly affecting agriculture were the devaluation of the Uganda Shilling (UShs) in 1987 followed by liberalization of agricultural input and output prices and the dismantling of the commodity boards which had dominated trade in produce such as coffee and cotton. Other reforms which affected agriculture less directly, but still significantly, encompassed reform of the financial sector including the sale of the Uganda Commercial Bank, reform of the transport, education, and health sectors and (…) decentralization of government structures.” (Bahiigwa 2005:481)

4.2.3. Multinational/International Organizations and Institutions

A lot of different multilateral/international organizations and institutions are affecting OA in Uganda on different levels. Selected most important multilateral/international organizations and institutions are presented and analysed concerning its effects on OA in Uganda.

4.2.3.1. United Nations Organisation

UN has many different bodies affecting OA on different levels. Below there is an analysis of the effects of FAO and CBFT of UNCTAD and UNEP.

4.2.3.1.1. Food and Agriculture Organisation of the United Nations

FAO states on its homepage to lead “international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO is also a source of knowledge and information. We help developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. Since our founding in 1945, we have focused special attention on developing rural areas, home to 70 percent of the world's poor and hungry people.” (FAO 2009d)

So FAO publishes a bulk of articles and series concerning agricultural productivity, rural development and food security and is involved in a lot of different activities. On the one hand FAO facilitates OA through a own programme[76] (Chapter 4.2.3.1.1.1.) and has some vital commentators working in the programme, like El-Hage Scialabba, on the other hand it promotes biotechnology for agriculture (Chapter 4.2.3.1.1.2.). Hence, to evaluate FAO concerning its effects on OA in Uganda is a rather difficult task. Last years there is maybe a slightly tendency to accept OA as a contributory means to ensure food security in many parts of the world. However, to illustrate the diversity of FAO there are selected examples of its activities.

4.2.3.1.1.1. FAO I – THE ORGANIC AGRICULTURE PROGRAMME

The Organic Agriculture Programme FAO aims long-term "to enhance food security, rural development, sustainable livelihoods and environmental integrity by building capacities of member countries in organic production, processing, certification and marketing." (FAO 2009c) In 2007 there was hold the International Conference on Organic Agriculture and Food Security" in Italy by FAO. In the publication of the conference is written "Organic agriculture offers insights towards a paradigm shift in food security (…)". (FAO 2007: 1) As OA is not an agricultural system, which is restricted to it application to Europe or the USA, FAO wants to analyse its potential as a contributory means to ensure food security in countries like Uganda. Therefore FAO analysed opportunities and constraints of OA concerning food security and found many benefits of OA. To encourage OA, which can address local and global food security challenges, it was proposed to establish at FAO a Global Ecological and Ethical Food System Initiative, which should: "(i) develop the global information base, including data collection and analysis; (ii) facilitate the establishment of a conducive policy environment, including both international normative instruments and national strategies, based on public-private partnerships and networking and (iii) promote organic agriculture research, through the CGIAR system and twinning arrangements between different national institutions." (FAO 2007). So for El-Hage Scialabba OA is a "neo-traditional food system" which combines modern science and indigenous knowledge (FAO 2007).

At the Conference on Ecological Agriculture: Mitigating Climate Change, providing Food Security and Self-Reliance for rural Livelihoods in Africa held in Ethiopia by FAO and the government of Ethiopia FAO was "called to assist the African Union in developing an African Action Plan on Ecological Agriculture that will guide member countries in implementing relevant policies and action plans, as a matter of urgency." (FAO 2008a: 4) So FAO somehow facilitates the integration among several governments in Africa concerning OA.

Recently FAO is an active part providing Background Papers of the International Task Force on Harmonization and Equivalence in Organic Agriculture (e.g. in 2008: Harmonization and Equivalence in Organic Agriculture).

At the homepage of the Organic Agriculture Programme (of FAO) there is a wide range of publication available concerning OA.

[76] On the homepage of FAO´ Organic Agriculture Programme there is a wide range of publications available concerning OA (http://www.fao.org/organicag/en/).

4.2.3.1.1.2. FAO II - FROM GREEN REVOLUTION TO GENE REVOLUTION?

In 2004 there was published the State of Food and Agriculture with the title "Agricultural Biotechnology **-** Meeting the needs of the poor?" (FAO 2004). In this publication FAO argues that "some applications of biotechnology, such as fermentation and brewing, have been used for millennia" and "farmers and pastoralists have manipulated the genetic make-up of plants and animals since agriculture began more than 10.000 years ago." (FAO 2004) So for FAO (in this Publication) as a consequential stride forward modern biotechnology with "other applications [GMO´s], which are "newer but also well established" (FAO 2004), has to be used "to address problems in all areas of agricultural production and processing. This includes plant breeding to raise and stabilize yields; to improve resistance to pests, diseases and abiotic stresses such as drought and cold; and to enhance the nutritional content of foods. Biotechnology is being used to develop low-cost disease-free planting materials for crops such as cassava, banana and potato and is creating new tools for the diagnosis and treatment of plant and animal diseases and for the measurement and conservation of genetic resources." (FAO 2004) On the one hand for FAO biotechnology is a clear promise that can contribute to meet current challenges of decreasing agricultural productivity and shortage of agricultural land. On the other hand biotechnology "is not a panacea. It cannot overcome the gaps in infrastructure, markets, breeding capacity, input delivery systems and extension services that hinder all efforts to promote agricultural growth in poor, remote areas." (FAO 2004)

FAO concludes that "biotechnology can benefit the poor when appropriate innovations are developed and when poor farmers in poor countries have access to them on profitable terms. Thus far, these conditions are only being met in a handful of developing countries." (FAO 2004). To reach the *poor farmers* "biotechnology should form part of an integrated and comprehensive agricultural research and development programme that gives priority to the problems of the poor. Biotechnology can complement but not substitute for research in other areas [of agricultural production]." (FAO 2004)

FAO sees a problem in the fact, that the Means of Green Revolution in 1960ies were disseminated freely as international public goods, whereas many of the modern technologies, by contrast, are under private licenses and so access to them is restricted. To spread access and knowledge in general about biotechnology for agriculture "the public sector - developing and developed countries, donors and the international research centres - should direct more resources to agricultural research, including biotechnology." (FAO 2004) This should result in the building of capacities concerning biotechnology, that "developing countries have the knowledge and skills necessary to make their own decisions about the use of biotechnology." (FAO 2004) So for FAO (in this publication) biotechnology for agricultural purposes may deliver economic benefits to farmers in some areas of the world and "it suggests that small farmers have had no more difficulty than larger farmers in adopting the new technologies. In some cases, transgenic crops seem to simplify the management process in ways that favour smaller farmers." (FAO 2004)

4.2.3.1.2. Capacity Building Task Force on Trade, Environment and Development

The Capacity Building Task Force on Trade, Environment and Development (CBTF) was launched in March 2000 by UNEP and UNCTAD and "aims to strengthen the capacities of countries, particularly developing countries and countries with economies in transition, to effectively address trade-environment-development issues." (UNCTAD/UNEP 2009) CBTF has five fields of activities: (i) thematic research; (ii) country projects; (iii) training; (iv), policy dialogue and (v) networking. "CBTF aims to help beneficiaries, in developing countries and countries with economies in transition, to effectively address trade-environment-development issues at the national level and to participate effectively in related deliberations at the international level." (UNCTAD/UNEP 2009)

OA is seen as an agricultural system, which "offers a range of environmental, social and economic benefits for developing countries.

On the economic side, growing world markets for OA products offer interesting export opportunities for developing countries who may have some comparative advantage in OA due to relatively abundant labour and lower use of agrochemicals.

In addition, OA production has been shown to have a positive effect on the local environment, biodiversity and soil fertility, and has the potential to increase the yields and incomes of subsistence farmers in developing countries who are not currently using agrochemicals, thus contributing to poverty reduction and sustainable rural development.

The CBTF supports interested countries through country projects and thematic research studies aimed at developing win-win policy options through promoting OA and easing access of organic products in overseas markets." (UNCTAD/UNEP 2009)

So there is a clear focus of CBTF to facilitated the spread of OA in countries like Uganda. CBTF has published a bulk of information about OA in East Africa on its homepage (http://www.unep-unctad.org/cbtf/). It represents its effort to promote OA in this region. The main activity to promote OA is the project Promoting Production and Trading Opportunities for Organic Agricultural Products in East Africa, which was launched in 2005. The project implemented commission capacity-building studies prepared by international and national experts on key issues identified in the course of previous consultations and activities focused on OA in Uganda, Tanzania and Kenya. The studies are focused on providing relevant stakeholders in these countries with essential information and analysis in the promotion of OA production and trading opportunities including following areas of interest: (i) Overview of the current state of OA in East Africa and opportunities for regional harmonization. This initial study was done in Uganda and gives an overview about the OA sector; (ii) What the Governments in these countries can do to promote production and trade in organic agriculture; (iii) OA and food security in Africa. This study examines the relationship between OA and food security in Africa. It also focuses on agricultural productivity and yields of traditional, conventional, and OA in Africa; (iv) Export development of organic products from East Africa. It is aimed to examine the supply situation of East Africa organic products and export potential, as well as the demand for organic products from East Africa (UNCTAD/UNEP 2009).

CBTF is a vital player, which regularly facilitates OA in Uganda and favours its spread due to background studies and recommendations for national policies.

4.2.3.2. World Bank

As already stated in the very beginning (Chapter 1; page 1), World Bank (IBRD) recently is returning to the values of agriculture as a driver of rural development issues. In 2007 IBRD published its yearly *World development report 2008: Agriculture for Development* and considers agriculture as a "vital development tool" and "as the basis for economic growth in the agriculture-based countries" which "requires a productivity revolution in smallholder farming." (IRBD 2007:V/1). On IBRD´s homepage there is still the slogan "Working for a World free of Poverty" – and IBRD has been still working on it since 1944. Initially, maybe IBRD aimed to reach other objectives instead a world free of poverty. However, at the moment IBRD primarily aims to achieve macro-economic stability in all countries. In IBRD's opinion macro-economic stability leads towards economic development, in which the rich and especially the poor people can benefit.

To analyse IBRD's concept concerning agriculture as a contributory tool to economic development, *World development report 2008: Agriculture for Development* (WDR) was taken as a source. WDR concentrates on "calls for greater investment in agriculture in Africa and warns that the sector must be placed at the centre of the Region's development agenda if the goals of halving extreme poverty and hunger by 2015 are to be realized. (...) The report

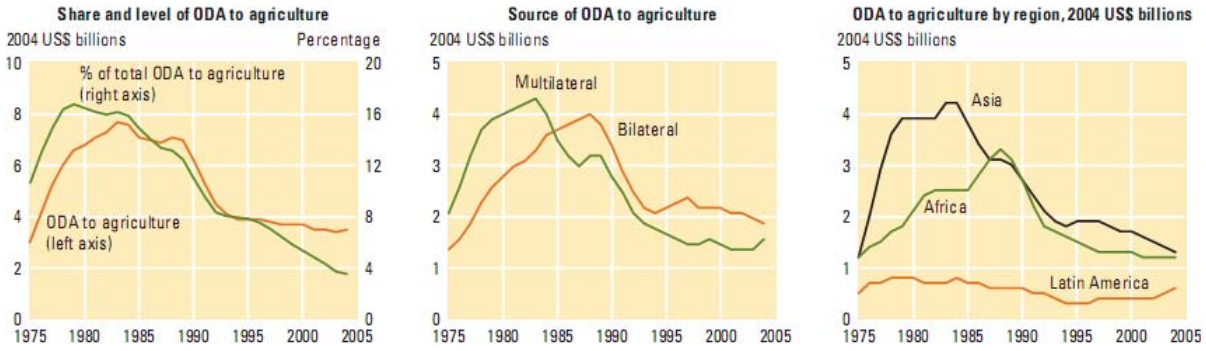
calls for an 'agriculture for development' agenda for Africa that will improve the investment climate as well as make optimal use of markets, technology, sustainable water and soil management, and institutional services. In addition, countries must deliver on issues such as a level playing field for trade, while farmer organizations and other local groups need more say in setting policies." (IBRD 2009d)

IBRD wants to achieve "productivity revolution in smallholder farming" due to "sustainable application" of Green Revolution[77] once again: "Given Sub-Saharan Africa's unique agriculture and institutions, that revolution will have to be different from the Asian green revolution. How to implement it after many years of limited success remains a difficult challenge. But conditions have changed, and there are many local successes and new opportunities on which to build." (IBRD 2007:3). Criticism on this strategy is done by Holt-Gimenez et al. 2006 in chapter 4.2.4.1 (page 92).

For IBRD it is necessary to start "with a favorable socio-political climate, adequate governance, and sound macroeconomic fundamentals" to enable effective agriculture, which then supports "sustainable growth and reducing poverty". (IBRD 2007:18) This has to be managed in an *agriculture-for-development agenda*, which addresses agricultural policies of agricultural based economies, like Uganda.

Official development assistance to agriculture declined continously during the last 30 years Figure 4.5; page 88). IBRD sees the causes in: "(i) falling international commodity prices that made agriculture less profitable in developing countries; (ii) increased competition within ODA especially from social sectors; (iii) emergency responses to numerous crises; (iv) opposition from farmers in some donor countries to supporting agriculture in their major export markets; and (v) opposition from environmental groups that saw agriculture as a contributor to natural resource destruction and environmental pollution." (IBRD 2007:43) As there are now higher international commodity prices for agriculture products; higher priority of agriculture to developing-country governments and new approaches to agricultural development projects based on decentralization, participation, and public-private partnerships with greater likelihood of success "agro-scepticism" of many donors is fading into the background.

Figure 4.5: Official development assistance to agriculture (1975 - 2004)



(Source: IBRD 2007:41)

„Structural adjustment in the 1980s dismantled the elaborate system of public agencies that provided farmers with access to land, credit, insurance, inputs, and cooperative organizations. The expectation was that removing the state would free the market for private actors to take over these functions—reducing their costs, improving their quality, and eliminating their regressive bias. Too often, that didn't happen." (IBRD 2007:138) So IBRD now aims to develop efficient input markets (like it is the particular aim of AGRA see chapter

[77] IBRD wants to achieve a *greening of the green revolution* (IBRD 2007: 188)

4.2.4.1; page 92) and promote the use of inorganic fertilizers and improved seeds, based on a private sector supply system (IBRD 2007).

Biotechnology has great promise for IBRD. IBRD states as well that transgenic technology remains, however, controversial, "because of perceived and potential environmental and health risks" even it has already reduced yield losses in transgenic Bt-cotton from insects and increased profits of about 9 Mio. smallholder farmers, who have adopted it mainly in China and India.[78] (IBRD 2007:163) IBRD sees in the adoption of transgenics a possible "capturing [of] the benefits of genetically modified organisms for the poor" (IBRD 2007:177) and a rise of transgenetics in most regions, but not in Africa and Europe. However, IBRD as well wants to favour sustainable agricultural technologies to "complement genetic improvement" (IBRD 2007:163) and to make "agricultural systems more environmentally sustainable." (IBRD 2007:180) So it seems a little that IBRD wants to get a *square peg into a round hole*.

Beside the agricultural intensification IBRD wants to diversify economic activities for rural population to increase non-farm employment (IBRD 2007).

OA for IBRD provokes a decommodification in special markets, which may lead towards a saturation for high-value exports on the markets(IBRD 2007).

However, it is not the aim of IBRD to favour OA in its contemporary return to agriculture as a means for development in general. Instead it wants to establish a surrounding that enables higher inputs into smallholder farming systems and in the longer run (maybe) IBRD favours GMOs, complemented by sustainable agricultural technologies that serve as a fig leaf. So IBRD may evaluated in a lightly negative way how it influences OA, at least in the discourse about it.

4.2.3.3. International Assessment of Agricultural Knowledge, Science and Technology for Development

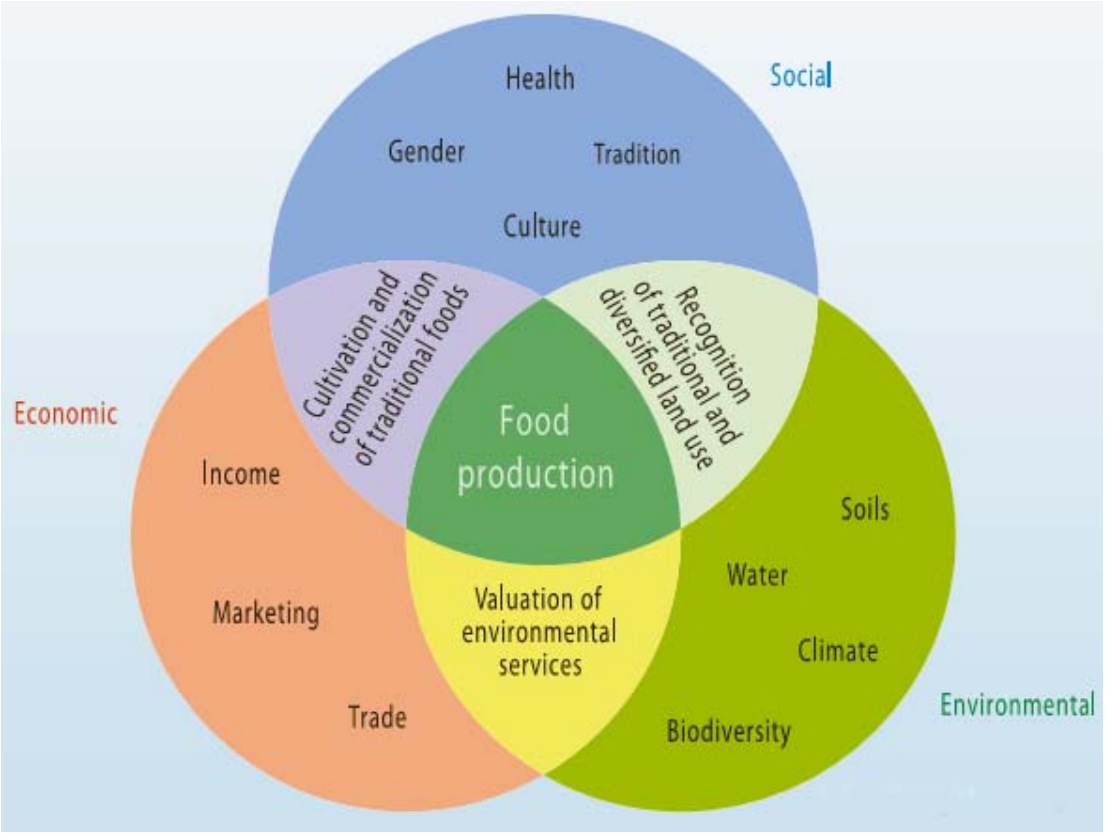
International Assessment of Agricultural Knowledge, Science and Technology for Development (IAAST) is an international organisation, which was launched in 2002 by FAO and IRBD founded as well by financial means of the Global Environment Facility, UNDP, UNEP, World Health Organisation (WHO) and United Nations Educational, Scientific and Cultural Organization (UNESCO). It aims to evaluate "the relevance, quality and effectiveness of agricultural knowledge, science, and technology (AKST); and effectiveness of public and private sector policies as well as institutional arrangements in relation to AKST. "How can we reduce hunger and poverty, improve rural livelihoods, and facilitate equitable, environmentally, socially and economically sustainable development through the generation, access to and use of agricultural knowledge, science and technology?" (IAAST 2009)

For IAAST "agriculture operates within complex systems and is multifunctional in its nature [Figure 4.6; page 90]. A multifunctional approach to implementing AKST will enhance its impact on hunger and poverty, improving human nutrition and livelihoods in an equitable,

[78] There is a controversy going on if the introduction of Bt-cotton in India led to an increase of suidices of cotton farmers. In an report by the International Food Policy Research Institute (IFPRI) it is stated that there is no clear evidence in a connection between the use of Bt-cotton and farmer´s suicides (IFPRI 2008). Whereas Shiva argues that there is an inherent connection between farmers suicides and the introduction of Bt-cotton and therefore blames the IFPRI-report "manipulative of the truth about farmer´s suicides and Bt-cotton at every level." (Shiva 2008:3) "An epidemic of farmers' suicides has spread across four states of India over the last decade. According to official data, more than 160,000 farmers have committed suicide in India since 1997." (Shiva 2008:1) "The technology of engineering Bt-genes into cotton was aimed primarily at controlling pests. However, new pests have emerged in Bt-cotton, leading to higher use of pesticides. In Vidharbha region of Maharashtra, which has the highest suicides, the area under Bt-cotton has increased from 0.200 million ha in 2004 to 2.880 million ha in 2007. Costs of pesticides for farmers have increased from Rs. 921 million to Rs. 13,264 billion in the same period, which is a 13-fold increase. A pest control technology that fails to control pests might be good for seed corporations, which are also agrochemical corporations. For farmers it translates into suicide." (Shiva 2008:3)

environmentally, socially and economically sustainable manner. Multifunctionality recognizes the inescapable interconnectedness of agriculture's different roles and functions, i.e., agriculture is a multi-output activity producing not only commodities, but also non-commodity outputs such as environmental services, landscape amenities and cultural heritages.

Figure 4.6: The inescapable interconnectedness of agriculture's different roles and functions



(Source: IAAST 2008)

Over the last 60 years, intensive production practices of high-yielding staple food crops were promoted, often on land cleared of much of its natural vegetation. To be productive for more than a few years, these crops require inputs of fertilizers, pesticides and often irrigation. In high-input agricultural systems, fertilizer and pesticide use is often excessive and environmentally damaging. In many parts of the world, small-scale farmers do not have sufficient access to state-of-the-art technologies, inputs, knowledge and innovations that enhance productivity while protecting health and the environment.

Thus, increased attention needs to be directed towards new and successful existing approaches to maintain and restore soil fertility and to maintain sustainable production through practices such as low-input resource-conserving technologies based on integrated management systems and an understanding of agro-ecology and soil science (e.g., agroforestry, conservation agriculture, organic agriculture and permaculture). These technologies minimize the need for high levels of inputs and are socially appropriate approaches to small-scale agriculture." (IAAST 2008)

Further IAAST argues that "farmers can enhance natural resources through sustainable soil management practices, promotion of agrobiodiversity and agroforestry." (IAAST 2008) Nevertheless there is a degradation of land, water and natural ecosystems occurring in many parts of the world (like in Uganda) due to unsustainable agricultural practices.

To enable the multifunctionality (social, environmental and economic functions) of agriculture IAAST states that it requires "policies and investments at multiple levels:

(i) Social functionality:

→ Empower marginalized stakeholders to sustain the diversity of agriculture and food systems, including their cultural dimensions.

→ Educate and train policymakers and public agency personnel in decentralized participatory planning and decision-making, and in understanding and working effectively with rural communities.

→ Invest in enriching training and education for farmers and other rural actors in order to facilitate their engagement in locally directed development processes.

→ Invest in modern information and communications technologies (ICTs) to open up potentially powerful opportunities for extending the reach and scope of educational and interactive learning.

→ Give women access, ownership and control of economic and natural resources through legal measures and appropriate credit schemes.

→ Support the development of women's income generating activities and reinforce women's organizations and networks.

(ii) Environmental functionality:

→ Provide safe water and encourage efficient water use practices.

→ Decrease greenhouse gas emissions.

→ Minimize the adverse impacts of climate change through integrating new and improved crop varieties and livestock breeds into diversified, resilient, risk-averse farming systems.

→ Maintain and enhance environmental and cultural services through support of agro-ecologically sound practices.

(iii) Economic functionality:

→ Promote market and trade policies that benefit small-scaled producers by levelling the playing field and increasing the opportunities for value addition. Reverse the export focus that has left small-scaled producers, the majority of the rural poor, more vulnerable to international market factors.

→ Increase the access to financial services and products, such as savings services and crop or rain insurance. These instruments are critical to building assets and reducing the risks associated with adopting new technologies, transitioning to sustainable agricultural practices, and innovating production and marketing methods

→ Use micro-finance to allow small scaled producers to expand production, buy fertilizers and other inputs and technologies, and to diminish seasonal fluctuation in incomes." (IAAST 2008)

So IAAST argues towards OA. Nearly all functions mentioned above OA may accomplish and therefore OA for IAAST is a "challenging, but attractive rural development pathway for policy makers wishing to support the production of global public goods. OA can help expand a growing alternative global market that extends economic opportunity to small-scale producers and improves agricultural performance through better access to food and relevant technologies, as well as environmental quality and social equity." (IAAST 2008)

4.2.4. Private Institutions/NGOs

In the broad field of private initiatives, there are chosen three to be presented and analysed in this report.

4.2.4.1. Alliance for a Green Revolution in Africa

AGRA is an African-led and Africa-based NGO, which was established in 2006 with initial support from the Bill and Melinda Gates Foundation and the Rockefeller Foundation with financial means more than 150 Mio. US$. In 2008 the United Kingdom's Department for International Development joined as a funding partner in 2008. AGRA´s aim is "to help millions of small-scale farmers and their families lift themselves out of poverty and hunger." (AGRA 2009) AGRA implements programs, which should ensure practicable solutions for smallholders to significantly "boost productivity and incomes while safeguarding the environment and promoting equity. (…) Unlike the Green Revolution in Latin America, which mostly benefited large-scale farmers because they had access to irrigation and were therefore in a position to use the improved varieties, AGRA is developing programs specifically geared to overcome the challenges facing smallholder farmers." (AGRA 2009). AGRA "focuses on a set of programs that constitute a comprehensive and integrated approach to the transformation of African agriculture for smallholder farmers: (i) Policy program (engages national governments and donors to establish an enabling environment for achieving a Green revolution in Africa); (ii) seed program (addresses capacity development, agro-ecology based crop breeding, the development of a vibrant, competitive African seed sector, and the widespread commercialization of appropriate and well adapted improved crop varieties through village-level agro-dealers); (iii) soil health program (focuses on a rapid dissemination of locally adapted and environmentally sound integrated soil fertility management technologies); (iv) market access program (promotes efficient and profitable output markets to assure higher returns to technology investments by farmers. This will be achieved by lowering transaction costs, reducing risks, improving market information systems, and enhancing value addition through processing." (AGRA 2009)

So AGRA is a international lobbying organisation founded by private means to increase agricultural productivity due to spread of Green Revolution technologies. AGRA believes in the success of Green Revolution technologies applied by small scaled farmers in Africa. Appearance of AGRA (at the homepage) slogans and phrases it uses are similar to them of OA only the meaning is different: "Improving income opportunities through better agricultural input and output markets." (AGRA 2009). However, Holt-Gimenez already in 2006 stated 10 reasons why Bill Gates will fail with AGRA (Holt-Gimenez et al. 2006): (i) Green Revolution technologies deepen the divide between rich and poor farmers; (ii) Application of Green Revolution technologies over longer periods degrade tropical agro-ecosystems and expose already vulnerable farmers to increased environmental risk; (iii) the Green Revolution leads to the loss of agro-biodiversity, the basis for smallholder livelihood security and regional environmental sustainability; (iv) Hunger is not primarily due to a lack of food, but rather because the hungry are too poor to buy the food that is available; (v) Without addressing structural inequities in the market and political systems, approaches relying on high input technologies fail; (vi) the private sector alone will not solve the problems of production, marketing and distribution; (vii) Introduction of genetic engineering (the driving force behind AGRA initiative) will make smallholder systems more environmentally vulnerable in Sub-Saharan Africa; (iix) the introduction of GMO crops into smallholder agriculture will likely lead to farmer indebtedness; (ix) AGRA's assertion that "There Is No Alternative" (TINA) ignores the many successful agroecological and non-corporate approaches to agricultural development that have grown in the wake of the Green Revolution's failures and (x) AGRA's "alliance" does not allow peasant farmers to be the principal actors in agricultural improvement (Holt-Gimenez et al. 2006).

Since 2008 AGRA has implemented projects in Uganda (of 2,5 Mio US$) with the purpose to spread the use of agro-chemicals and improved seed among smallholders in Uganda (AGRA 2009).

4.2.4.2. National Organic Agriculture Movement of Uganda

NOGAMU is, meanwhile, a powerful player advocating OA in Uganda. Its role is diverse and OA in Uganda was driven from the beginning mostly by NOGAMU and its activities (For more information refer to chapter 1.5.2; page 33). NOGAMU is a member of IFOAM.

4.2.4.3. Africa 2000 Network

Africa 2000 Network (A2N) is an NGO established in 1990 (in several African countries), which aims to promote the use of sustainable agricultural technologies and practices in harnessing the natural resources. A2N started to promote OA in Uganda in year 1994 and in 2001 A2N officially registered in Uganda as a NGO. A2N is implementing projects to build the capacities of smallholder farmers for ecologically sustainable development by encouraging active participation in development activities. It should lead to empowerment of the local communities and to the creation of new opportunities for livelihood by building local institutions for collective action in the areas of marketing, resource mobilization and advocacy. So A2N is a promoter of OA on local/regional level (A2N 2008).

4.2.4.4. International Federation of Organic Agriculture Movements

IFOAM started in 1972 as an initiative to bring Organic Agriculture Movements together to ensure a future for OA. From then it grew - to the end of 2007 when IFOAM had 661 members (OA Movements) and associates (IFOAM 2009g).

“IFOAM's mission is leading, uniting and assisting the organic movement in its full diversity. Our goal is the worldwide adoption of ecologically, socially and economically sound systems that are based on the principles of Organic Agriculture.” (IFOAM 2009g) In order to fulfil this mission, five goals were set by IFOAM for the medium term: “(i) IFOAM builds the global platform for the organic movement; (ii) IFOAM develops, communicates and defends the principles of organic agriculture; (iii) IFOAM advocates and facilitates the adoption of organic agriculture; (iv) IFOAM promotes the development of organic markets and (v) IFOAM ensures an effectively managed organization with sufficient and sustainable resources.” (IFOAM 2009g)

4.2.5. Initiatives of Foreign Governments

There are various efforts undertaken by foreign governments to contribute to an improvement of agricultural productivity. This paper presents the most important of them: the Export Promotion of Organic Products from Africa (EPOPA) by SIDA (Sweden). EPOPA was a programme to promote organic exports from Uganda (and other East African countries) introduced by the Swedish International Development Agency (SIDA) in 1995 (see also chapter 3.1.4; page 45). It aimed to overcome particular challenges for exporters (like marketing, certification, quality management, etc.). Activities of EPOPA were various and included among many others from management assistance and staff training over farmer mobilization, technical consultancy, agricultural improvements and the development and revision of Internal Control System techniques and inputs, until product development, market failure guarantee and risk assessment along the chain (EPOPA 2008). EPOPA boosted the organic sector in Uganda and aimed to enable institutional development and capacity building. So EPOPA helped to establish and promote NOGAMU and UgoCert.

4.2.6. Limitations and Challenges of Organic Agriculture in Uganda

OA is not the only answer to meet current challenges and issues of rural Uganda. Many commentators, institutions, organisations, lobbies and governmental bodies think about the best solution, or maybe only about the most feasibly. Lobbies have their own idea and impact in a certain way on OA. However there is existing a wide range of factors influencing the formation of OA in Uganda. Impacts come from different levels: international, regional or national. In Table 4.11 there are listened the most important factors and issues challenging and limiting OA in Uganda.

Table 4.11: Factors and issues challenging and limiting Organic Agriculture in Uganda

Limitations and challenges of Organic Agriculture	**Author**
Certified organic farmers serve a niche market	Walaga/Hauser 2005
Transition to certified OA is costly → Accreditation of UgoCert is a stride forward	Walaga/Hauser 2005
The organic sector and organic farmers benefit from world trade, but also depend on inequitable power relations among global market players	Walaga/Hauser 2005
Lack of interest of technical bureaucrats in the relevant ministries and government institutions concerning OA → no OA Policy by the GoU → a vacuum of government policy to support organic opportunities	Walaga/Hauser 2005
Certification of Organic Agriculture in tropical countries is based on standards that were developed for temperate industrialised agriculture conditions → Accreditation of UgoCert is a stride forward	Walaga/Hauser 2005
Lack of knowledge and skills, information source and technical support → NOGAMU is getting more power (more members)	Pretty/Hine 2006, Rundgren 2002
Invests of costs and time (to learn new systematic approach/during conversion) as OA is knowledge based	Pretty/Hine 2006, Rundgren 2002
Access to market (local, national or international), costs of certification systems (if the aim is certified organic farming); costs of freight	Pretty/Hine 2006
Powerful losers (corporations of agro-chemical produce and their lobbies) of increasing OA may hinder spread of OA	Pretty/Hine 2006
Farm specific limitations	Freyer 2009
Cultural and ethic limitations	Freyer 2009
Land tenure, land insecurity	Pretty/Hine 2006, Rundgren 2002
Lack of policies which promote OA, like it is the case in Uganda	Pretty/Hine 2006, Shiva 2002
Policies which indirectly put at a disadvantage on OA, such as subsidies for industrialised agriculture or governmental fertilizer promotion programs or PMA, which favours high energetic inputs	Rundgren 2002, Shiva 2002

> “Die Natur kennt keine Pause in Fortschritt und Entwicklung und legt ihren Fluch auf alle Untätigkeit.”

Johann Wolfgang von Goethe

5. Conclusions and Outlook

This last part of the paper attempts to highlight the conclusions achieved through the findings of the research process. As the results of the first and the second question of research lay down and make evident, OA appears to be a viable and sustainable option for smallholder farmers in Uganda to improve their livelihood and thus for Uganda’s development in general. Through the increased self-reliance of farmers, due to enhanced skills and knowledge and awareness of ecological processes, OA is likely to create an environment (in the meaning of natural and social environment), in which farmers can adapt and adopt the techniques of OA

to improve their fundamental productive powers respectively assets or/and increase outcomes. Additionally there is evidence indicating that agricultural productivity in OA is stable and grows over time. Along the production, marketing and consumption process OA ensures a multidimensional sustainability, while it is able to contribute to reduce poverty among small scaled-farmers and to increase food security in Uganda. So OA could play a prominent role and essentially contribute to solve the current and future challenges rural Uganda is facing, such as land degradation, deforestation and a decline of agricultural productivity. Therefore methods of OA in the long run surely will get more in scope of involved people and organizations as a contributory tool and thus may award OA a decisive role in future. However, to turn these beneficial effects of OA into common practice and to face these issues and topics in the shorter-run is a challenging task, which needs a lot more of research and further specific support to stabilize the benefits of OA in terms of food security and related improvements to natural, social and human capital. If this is the case OA could easily spread in Uganda and reach a much larger number of farmers and rural people in the coming decades and functioning as vital rural development tool.

Recently, research mostly is concentrated on certified OA in Uganda, while uncertified OA is somehow cold-shouldered by scientific community and involved organizations. Until now mainly certified OA experienced a lot of direct support from several organizations (such as SIDA, IFOAM, NOGAMU, etc.) in Uganda, which led to a focus of the potential benefits of OA on agricultural production for organic exports to overseas markets. The bulk of publications about OA in Uganda is about certified OA and highlights the positive impacts on the livelihood of involved people due to higher financial incomes, whereas uncertified OA is mentioned, but not in scope as a mean to improve livelihood apart from revenues achieved due to production for export markets. For sure it is the case, that it appears more difficult for scientists to deal with uncertified OA in Uganda, because of less available information, especially in peer-reviewed articles on this topic, but because of this fact one may not underestimate the value and importance of the methods of uncertified OA in subsistence agriculture. This value and importance were *re*-discovered last year by IAAST, which describes the significance of small-scaled multidimensional agricultural systems, such as uncertified subsistence OA in Uganda with a focus on food production and thus on agricultural productivity in general. Especially this kind of agriculture is suitable for countries with a majority of small-scaled farmers like it is the case in Uganda. So in future research, uncertified OA has to be more centred by scientists to appear as a viable and sustainable development option for rural regions. Further research on uncertified OA should emphasize the establishment and implementation of a stable and risks-minimizing agricultural production system, which primarily aims to achieve high yields of most important food crops to ensure a stable supply of staple foods and thus food security for all Ugandans, but mainly for those involved in subsistence systems. In the longer-run a stable supply of staple food may create improved opportunities for individuals and communities to become, firstly, more self-reliant and, secondly, to generate new abilities regarding education and economy (especially in non-farm activities). Meanwhile OA makes it possible to improve soil fertility (the productive base of all agricultural systems) while it maintains biodiversity as well as it mitigates climate change – so OA (certified or uncertified) possibly has the potential to reverse current environmental challenges in rural Uganda.

After the first recognition of the link between poverty reduction and OA in the 1990ies by SIDA and the launch of the EPOPA to force organic exports, now it might be the turn to strengthen uncertified OA with the focus to stabilize domestic food production. However, the PMA and other efforts of the GoU and international donors aim to commercialize agricultural production to reduce (rural) poverty in Uganda and hence it is achieved with OA as well. Uncertified OA may fit into these considerations and go along with PMA, or it may not, when it claims to produce staple food mainly for home consumption and/or the domestic demand, rather than for export markets. However, what clearly appears is the need for further research on theses topics on the one hand. On the other hand there is still missing a

integrated strategy of the GoU (or bodies of the GoU) to scale up the OA sub-sector (including production, marketing and trade) including a policy for OA in Uganda as an integral part.

The questions if OA is the unique solution for current challenges of rural Uganda and if OA is able to feed a growing population of Uganda cannot be answered totally certain in this paper. Having in mind the current and future challenges and issues of rural Uganda including poverty, food insecurity, land degradation and deforestation, one may state for sure that the prevalent (conventional and/or traditional) agricultural systems clearly do not have all the answers either. Described improvements and benefits of OA for small scaled farmers in Uganda are promising evidences for a possible future in which OA maybe appear like a sunrise for Uganda.

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