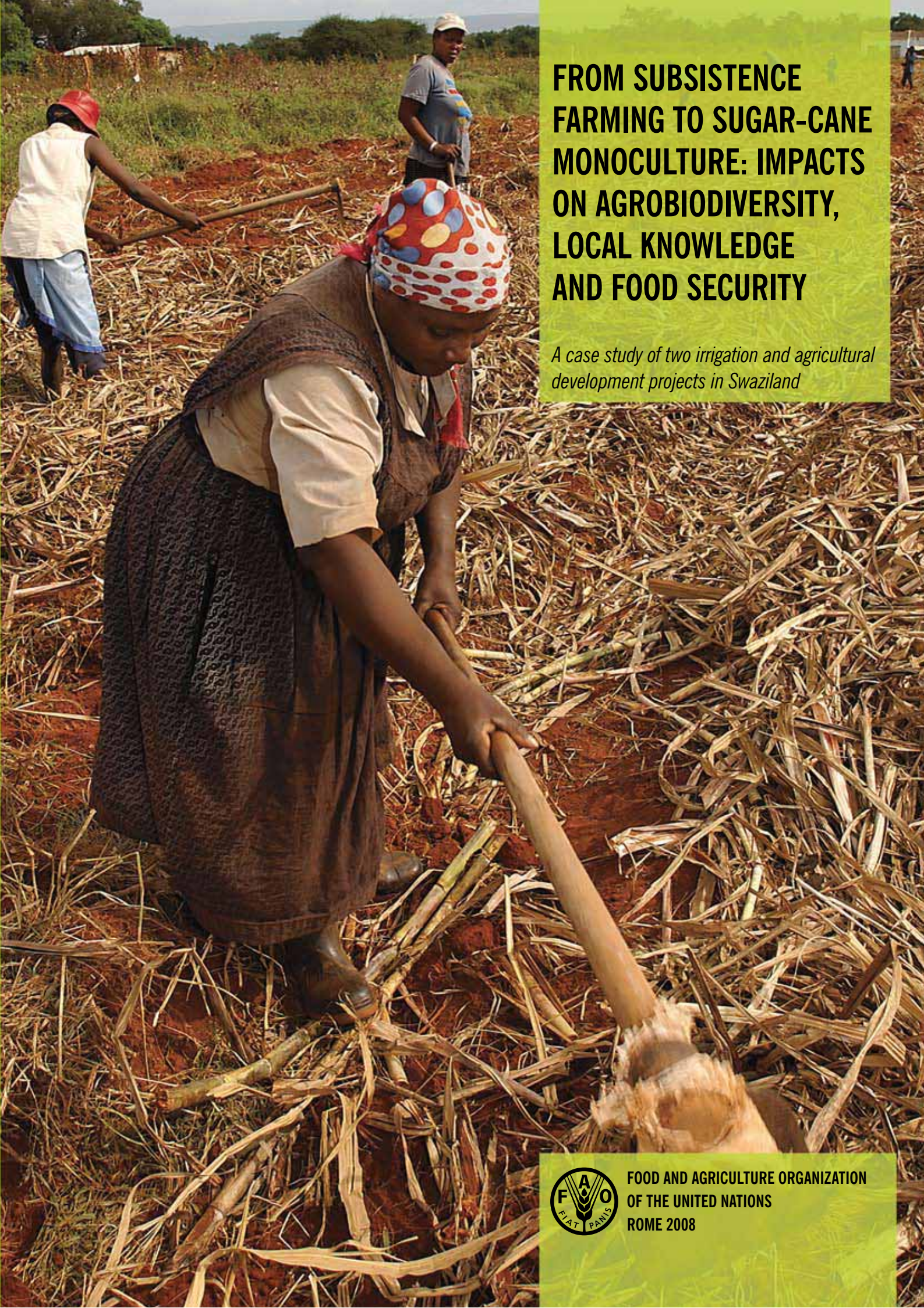

FROM SUBSISTENCE FARMING TO SUGAR-CANE MONOCULTURE: IMPACTS ON AGROBIODIVERSITY, LOCAL KNOWLEDGE AND FOOD SECURITY

A case study of two irrigation and agricultural development projects in Swaziland

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS
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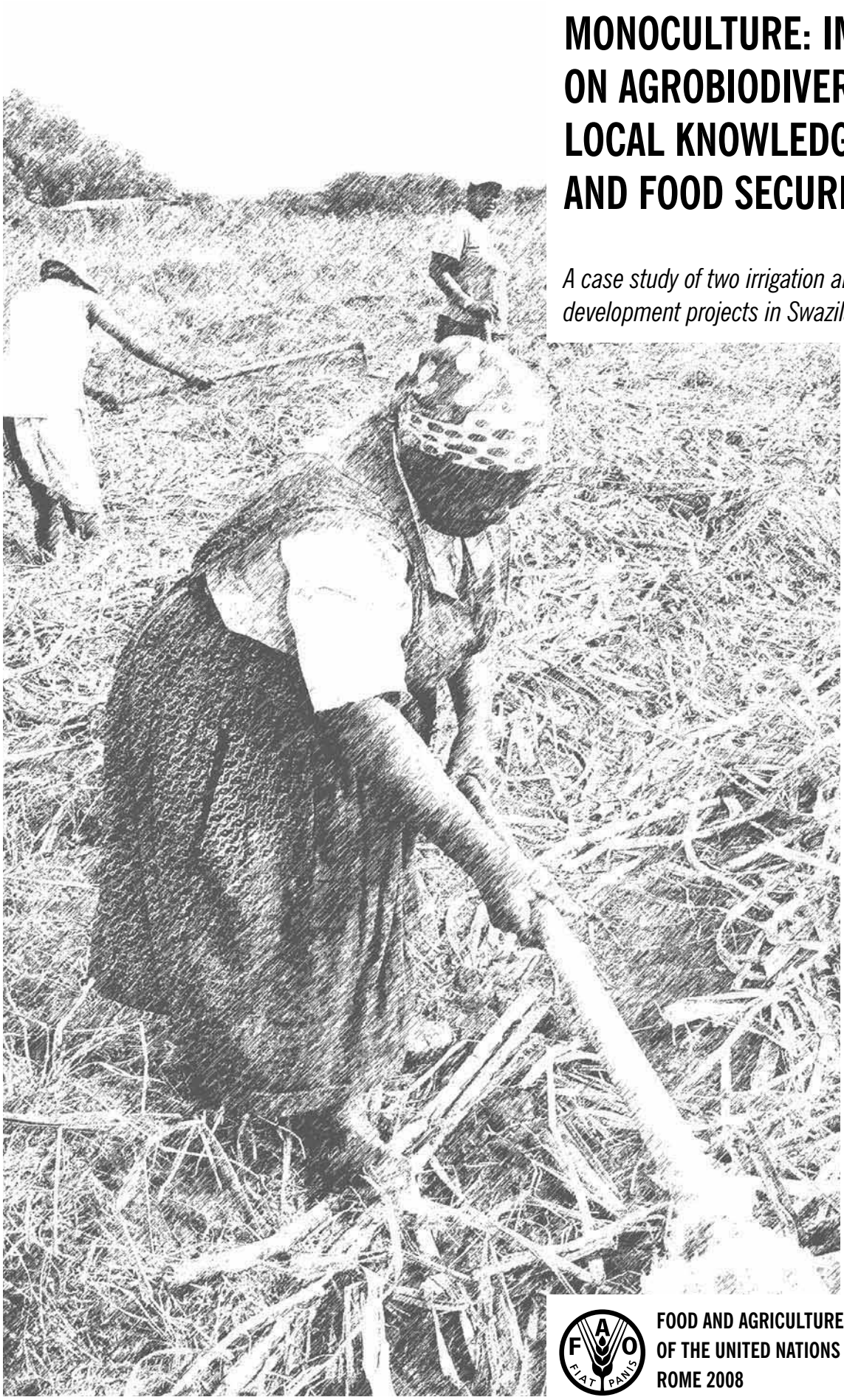

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LIST OF ACRONYMS

AIDA	Acquired immunodeficiency syndrome
BADEA	Arab Bank for Economic Development in Africa
DBSA	Development Bank of Southern Africa
EIB	European Investment Bank
EU	European Union
GDP	Gross domestic product
HIV	Human immunodeficiency virus
ICDF	International Cooperation and Development Fund
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
KDDP	Komati Downstream Development Project
KOBWA	Komati Basin Water Authority
LUSIP	Lower Usuthu Smallholder Irrigation Project
NDS	National development strategy
NGO	Non-governmental organization
NMC	National Milling Corporation
PRA	Participatory rural appraisal
SEAGA	Socio-Economic and Gender Analysis
SKPE	Swaziland Komati Project Enterprise
SNL	Swazi Nation Land
SWADE	Swaziland Water and Agricultural Development Enterprise
TDL	Title Deed Land
UNAIDS	United Nations Joint Programme on HIV/AIDS
UNDP	United Nations Development Programme
WFP	World Food Programme

CHAPTER 1
INTRODUCTION

In 1999, the Government of the Kingdom of Swaziland established a 25-year national development strategy (NDS) to guide the formulation of development plans designed to eradicate poverty, create employment, and achieve gender equity, social integration and environmental protection. Within the sectoral strategy "agriculture, land and rural development", the NDS identified a set of priorities, including the shift of smallholder farmers from rainfed subsistence farming to irrigation-based, commercial agricultural production.

Consistent with the priorities and strategies identified in the NDS, the Government of Swaziland has recently begun to implement two major water irrigation projects, the Komati Downstream Development Project (KDDP) and the Lower Usuthu Smallholder Irrigation Project (LUSIP), in one of the driest and poorest areas of the country (the Lowveld). The aim of these projects is to provide irrigation to 17 500 ha of land, helping local smallholder farmers to shift from a subsistence agricultural system to cash-crop production, mainly of sugar cane.

This study describes the changes prompted by the KDDP in local farming systems (e.g. their reduced diversity) and assesses their socio-economic impacts on rural livelihoods, with particular emphasis on food security and the loss of local knowledge. Chapter 2 provides an overview of the complex socio-economic situation of Swaziland, with a focus on the agriculture sector and rural livelihoods, and describes the recent macroeconomic trends in the country and their implications for food security. Chapter 3 focuses on the changes in farming systems and the reduction in agrobiodiversity (i.e. the variety and variability of animals, plants and micro-organisms – including crops, livestock, forestry and fisheries – that are used directly or indirectly for food, fodder, fibre, fuels and pharmaceuticals [FAO, 1999, 2004a]) that have occurred following implementation of the KDDP. It assesses the socio-economic and food security implications of such processes at the community, household and intra-household levels, based mainly on the results of a series of focus-group discussions with local female and male farmers that were carried out by a group of researchers. It also examines the consistency of these impacts with the development objectives and strategies identified by the Government of Swaziland. Based on the findings in Chapter 3, Chapter 4 provides recommendations on how to improve both the KDDP and the LUSIP (which is at an earlier stage of implementation) in order to maximize their socio-economic benefits for local communities.

CHAPTER 2
OVERVIEW

Socio-economic context

The Kingdom of Swaziland is located in southeast Africa, bordered by Republic of Mozambique to the east and the Republic of South Africa on all other sides, and has a total area of 17 360 km^2. Its population (2004) is estimated at slightly more than 1.1 million (52 percent female and 48 percent male), of which 76 percent live in rural areas (FAO/WFP, 2005).

Swaziland consists of three main agro-ecological zones, characterized by different elevations, landforms, geology, soils and vegetation: the Lowveld (6 416 km^2; average altitude 200 m); the Middleveld (4 597 km^2; average altitude 700 m); and the Highveld (5 029 km^2; average altitude 1.300 m). Another agro-ecological zone, which occupies less than one-tenth of the country, is the Lubombo Plateau. Climate conditions vary considerably among the agro-ecological zones, ranging from temperate and subhumid in the Highveld (700–1 550 mm/year of precipitation) to semi-arid in the Lowveld (400–550 mm/year of precipitation). Overall, Swaziland has a subtropical climate with summer rains; the national long-term average rainfall is 788 mm/year, and about 75 percent of the precipitation falls in the period October–March. Nine livelihood zones may be identified in Swaziland, defined by types of crops produced, susceptibility to various shocks, and economic activity (FAO/WFP, 2007; FAO, 2005).

The country has a dual land tenure system, the Swazi Nation Land (SNL) and the Title Deed Land (TDL). The former, which accounts for 54 percent of the nation's total land area, is communal land held in trust for the nation by the King through chiefs who allocate usufruct rights to individual Swazi families. It is dominated by rainfed subsistence agriculture. The TDL, which covers the remaining 46 percent of the country, is privately owned and is characterized by capital-intensive, irrigated cash-crop production. Generally, in Swaziland, land is owned and controlled by men. However, within the household, women may be allocated some land (usually near the house) for growing secondary crops (FAO, 2005; FAO/WFP, 2005).

Swaziland, with a per capita annual income of US$2 280 (2005), is classified as a middle-income country. The main economic sectors are industry (mainly agro-industry), which accounts for half of the gross domestic product (GDP), and services, accounting for 34 percent of the GDP. The total labour force is estimated at 410 000 (67 percent male and 33 percent female), with an extremely high unemployment rate (more than 40 percent if discouraged job seekers are considered). South Africa is the main trad-

ing partner, accounting for more than 80 percent of Swaziland's imports and receiving 74 percent of its exports (FAO/WFP, 2007; IMF, 2006).

Swaziland has one of the highest Gini coefficients in the world, at 60.9 percent (UNDP, 2005). Income distribution is very skewed (10 percent of the population receive about 43 percent of national income) and there is an ever-widening gap between rural and urban development. With such high poverty levels, much of the population is vulnerable to food insecurity. Overall, owing to these factors, in the 2006 Human Development Index compiled by the United Nations Development Programme (UNDP), Swaziland ranked 146th out of 177 countries (FAO/WFP, 2005, 2007; IMF, 2006).

Agriculture and livestock sectors

The contribution of agriculture to the country's GDP is estimated at about 11 percent. However, a large proportion of rural households practise subsistence agriculture, which is not included in this figure but is key to the food security of most Swazi families. Therefore, minimal shocks to agriculture have a profound impact on the ability of rural households to maintain their food security (FAO/WFP, 2007; FAO, 2005).

The agriculture sector employs about 32 percent of total economically active population (53 percent male and 47 percent female) in Swaziland. The country's cultivated area is estimated at 190 000 ha, of which 178 000 ha are arable land (11 percent of the total area) and 12 000 ha under permanent crops. Agriculture in Swaziland has a dualistic nature – SNL and TDL (above). Overall, the smallholder agriculture sector, based mainly on SNL, is the largest contributor to the livelihoods of the majority of the population and also represents the main raw material supplier for the agro-based industries (FAO, 2005).

Maize is the most important crop grown in Swaziland and virtually the sole staple for the majority of the population. The average maize planted area in the period 2001/02–2005/06 was 58 658 ha, of which the large majority was on SNL. In the last few years, the area planted with maize has declined. In the 2006/07 cropping season, the maize area was 20 percent below the five-year average at 47 409 ha, 98 percent of which was on SNL. The remaining SNL area is planted with relatively small amounts of cotton, groundnuts, pumpkins, various types of beans, sweet potatoes, and cassava. However, irrigated sugar-cane production accounts for about two-thirds of the contribution by the agriculture sector to GDP. In the last few years, the land and inputs allocated to sugar-cane production have shown a slow and steady increase as cane yields have remained high and the sucrose content has improved slightly (FAO/WFP, 2007). In 1992/93, the area under sugar cane was 37 384 ha, while in 2005/06 sugar cane was grown on about 52 200 ha, with 31 percent of TDL being cultivated with this crop (the rest of the TDL area, most of which is under irrigation, is used for commercial production of timber, grazing and the production of citrus, pineapples, vegetables, maize and fodder). The Government of Swaziland has encouraged sugar-cane production on irrigated TDL in order to improve its foreign-exchange earnings through exports of sugar-based products. At the same time, the increase in the area under sugar cane has coincided with the increase in the number of smallholder farmers on SNL growing sugar cane, which has been prompted by the implementation of major government-sponsored water irrigation and agricultural development projects such as the KDDP and LUSIP (FAO/WFP, 2005, 2007; FAO, 2005).

Livestock plays an important role in the production system and the livelihoods of Swazi smallholders. Cattle constitute the main type of livestock, but most households also own goats and other backyard stock such as chickens and ducks. The number of livestock has been declining constantly in the last few years, mainly because of a contraction in rangeland as a result of the increasing share of land being allocated to human settlements and sugar-cane plantations. For example, the cattle population fell from 588 288 in 2000 to 522 260 in 2002, a drop of 11 percent. The condition of pastures and livestock has also deteriorated owing to the adverse climate conditions (particularly the severe droughts) that Swaziland has experienced in recent years (FAO/WFP, 2005, 2007).

Macroeconomic trends and related impacts on food security

Swaziland's economic growth has weakened considerably in the past decade – with real GDP growth falling from 3.6 percent in the 1990s to slightly more than 2 percent since 2000 – mainly as a result of to declining foreign direct investment. Since 2002, economic activity has weakened further, owing to a combination of factors, including an appreciation of the national currency (lilangeni) in 2002–04 and high oil import prices, which have hurt Swaziland's main exports (sugar, wood pulp, and garments) and manufacturing activities (FAO/WFP, 2007; IMF, 2006). Another factor that has had a negative impact on the economy is the removal of textile quotas. Since January 2005, this has led to factory closures and significant job losses (estimated at 15 000 jobs) in the garment sector.

The economic stagnation experienced by Swaziland in the past decade is also the result of several consecutive years of adverse climate conditions. Drought is a regular and recurrent feature of the climate in sub-Saharan Africa. However, since 1970, there has been considerable interannual rainfall variability, and most of the countries in this region, including Swaziland, have experienced more intense and more widespread droughts, with negative impacts on agricultural output, particularly maize (the main staple crop) and cotton. Due also in part to the drought, maize production levels in SNL in 2004 were only about 60 percent of the 1900 levels (IMF, 2006). Droughts have been particularly severe in the last few years. A recent FAO/WFP mission to Swaziland found that "the 2006/07 agricultural season was characterized by erratic rainfall (started late with unusually heavy rains in November and December followed by a prolonged dry spell in the critical months of January to March) and below-average cumulative rainfall. Unusually high temperatures accompanied the dry spells, thus increasing moisture loss." Owing to such adverse climate conditions, total maize production in the 2006/07 cropping season was only 38 percent of the five-year average (2001/02–2005/06) at 26 170 tonnes (FAO/WFP, 2007).

The impacts of the adverse climate conditions experienced by Swaziland in the past decade on agricultural output have been particularly severe on SNL. As SNL is characterized by rainfed agriculture, it is vulnerable to droughts and other climate shocks (FAO/WFP, 2005, 2007; Rouault and Richard, 2003).

Other factors have also contributed to gradually weakening livelihoods and chronic food insecurity, with up to one-quarter of the country's population depending on food assistance in the last few years. In 2007, a total of about 407 000 food-insecure and vulnerable people will need assistance of about 40 000 tonnes of food in order to meet basic consumption needs and protect their livelihoods (FAO/WFP, 2005, 2007).

One of these factors is the highly skewed income distribution that characterizes Swaziland (above) – 66 percent of the population live on less than US$1 a day, and 40 percent average only US$230 a year. Food access remains precarious for many households, also because of an inefficient internal market for agricultural products. For example, the maize market is oligopolistic. The National Milling Corporation (NMC), a parastatal entity established in 1985, acts as a buyer of last resort for domestic production and is also, at the same time, the sole authorized importer of maize. This dual role gives the NMC an unfair advantage over its competitors, creating market imperfections that distort producer and consumer incentives. The NMC sells the imported maize to millers (two control more than 90 percent of the domestic maize flour market) at a price it determines, while the millers in turn determine the prices to charge consumers for maize meal. This oligopoly has contributed to keeping maize prices high (especially since 2002), with poor households having difficulty in accessing adequate supplies. Also as a consequence of such high prices, per capita consumption of maize in Swaziland has been declining since the beginning of the 1990s, and it is not evident that it has been substituted by other foods, particularly in the rural areas. Furthermore, the severe drought that Swaziland experienced in the 2006/07 agricultural season had a dramatic impact on the price of maize, which increased from E1 250 (US$169) per tonne in January 2007 to E2 300 (US$311) in April 2007, an almost 90percent increase, with devastating consequences on access to food. The price index for food, which accounts for 25 percent of the consumer basket on the basis of which inflation is calculated, had already increased from 9.1 percent in 2005 to 14.6 percent in 2006 (FAO/WFP, 2005, 2007).

In the last few years, another factor that has exacerbated food insecurity problems in Swaziland is the infection rate of human immunodeficiency virus / acquired immunodeficiency syndrome (HIV/AIDS). It is the highest in the world, with an estimated 42.6 percent of the population aged 15–49 years infected in 2004; in the 25–29 year age group, the infection rate was as high as 56 percent. As a consequence, overall mortality has doubled since the 1990s, and life expectancy dropped from 56.4 years in 1997 to 41.4 years in 2004. By 2010, life expectancy is expected to reach its lowest value, at 31.3 years, a level considerably lower than the average lower middle-income country and also one of the lowest in sub-Saharan Africa. Swaziland's extremely high HIV/AIDS infection rate has had a negative impact on the country's subsistence agriculture sector, contributing to increased levels of poverty and food insecurity among rural households. According to a recent study, as a consequence of HIV-related sickness and deaths, 38.5 percent of the households have suffered a reduction in the area under cultivation, 42 percent a change in cropping patterns, and 31 percent a diversion of labour to take care of the sick. Most importantly, 47 percent of the households have experienced a decline in crop yield, and 39 percent a loss of regular remittances (FAO/WFP, 2005, 2007).

HIV/AIDS has also contributed to the increased levels of poverty and food insecurity in Swaziland through its disproportionate impact on women, who have been found to have higher levels of morbidity and mortality at younger ages than men. According to one report (FAO/WFP, 2005): "Since women take the role of caretakers, breadwinners and providers of food, women's increasing morbidity and mortality rates adversely affect household's food security and particularly the nutritional status of young children" (IMF, 2006; Ministry of Agriculture and Cooperatives, the Federation of Swaziland Employers and UNAIDS, 2003).