INTRODUCTION

Of the global land area, about 38% is agricultural land of which some 30% is arable land (faostat.fao.org). The relations between agriculture and the natural environment are complex. Agriculture is of vital importance to many societies and is the sector with the most intensive interaction between man and environment. Agriculture has, by its very nature, a strong impact on the natural environment and the natural environment sets limits to agricultural production systems. Simply put, changes in agriculture affect the natural environment and vice versa (De Wit et al. 1987). In this chapter, we will examine some of the important interactions and challenges for low income countries.

Agriculture utilizes natural processes to produce the goods (food and non-food) that we need to support the demand of an ever-growing population. Agriculture also contributes to economic development in terms of income generation and employment. Paradoxically, however, economic growth and poverty reduction lead to declining relative importance of the agricultural sector (Dorward et al. 2004; Kuiper et al. 2007).

Which goods are needed and hence what agriculture should produce is largely determined by society. Changes in consumption patterns and preferences are reflected in agricultural land use. These societal and political changes are also visible in the
manner in which development is framed. After World War II, the concept of ‘catch-up development’, in which underdeveloped economies were expected to catch-up to achieving economic growth in a similar manner as developed economies, provided the framework in which development projects and policies were framed (Van Keulen 2007). This changed as soon as the environmental impacts of this biased focus on economic development became clear. After a period in which economy and environment were perceived as conflicting objectives, societies and policymakers moved to a multi-dimensional approach of development. Sustainable development embraces the concept of an economically viable, socially just and ecologically sound development not only for the present, but also for the future (Agenda 21, UN 1992). In this approach, the three pillars are set on equal footing for present and future generations (see also Roetter et al. 2007c). Following this concept, the responsibility lies with present societies to manage natural, human and economic resources in such a way that future generations are not constrained in their development.

Agricultural land use has the potential to damage or destroy the natural resource base, thus undermining future development potentials. It often is the focus on short-term economic gain and disregard of long-term impacts and needs that lead to environmental degradation. Clearly, part of the solution lies in a change in demands from society, e.g., via changes in diet and lifestyle, but also the agricultural sector has a responsibility to find ways to reduce the negative environmental impacts. Agriculture, rooted in the natural resource base and serving as a major contributor to development, is at the forefront of shaping the concept of sustainable development (WSSD 2002).

AGRICULTURE-ENVIRONMENT INTERACTIONS

Agriculture is the major user of land and water resources and competes with other users for these limited resources. The sustainable development challenges for agriculture are strongly related to this competition and the role of agriculture in rural development. Agenda 21:

*Major adjustments are needed in agricultural, environmental and macro-economic policy, at both national and international levels, in developed as well as developing countries, to create the conditions for sustainable agriculture and rural development. The major objective of sustainable agriculture and rural development is to increase food production in a sustainable way and enhance food security. This will involve education initiatives, utilization of economic incentives and the development of appropriate and new technologies, thus ensuring stable supplies of nutritionally adequate food, access to those supplies by vulnerable groups, and production for markets; employment and income generation to alleviate poverty; and natural resource management and environmental protection.*

Ten years after Rio at the WSSD conference in Johannesburg the importance of Agenda 21 was reaffirmed and a strong commitment to implementation of Agenda