Land Use Policy 26 (2009) 763–771

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Agricultural land-use change during economic reforms in Ghana

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ARTICLE INFO

Article history:
Received 22 September 2007
Received in revised form 4 August 2008
Accepted 13 October 2008

Keywords:
Land-use change
Cropland
Structural adjustment
Economic reforms
Ghana

ABSTRACT

Land-use change is driven by many interrelated factors including national policies formulated in response to the forces of globalization. This study integrates remote sensing data with social surveys to identify the role of demographic, technology and market-related variables in cropland expansion during economic reforms in Ghana. Macroeconomic changes increased the commercial orientation of farming as the sources of food supply changed from import to domestic production. However interest rates liberalization increased the use of labor at the expense of fertilizer and other complementary inputs. Demographic variables were more important in explaining cropland change after structural adjustment. Public agricultural support services are required for sustainable market-induced agricultural change in Ghana.

Introduction

National governments exert enormous influence on land-use change in a directly causative or mediating fashion (Geist and Lambin, 2001). The indirect role of government and institutions in land change is usually accomplished through formal policies such as devaluation, trade liberalization, credit subsidies, infrastructure development, and land tenure and distribution. Some of the policies (e.g. perverse subsidies) operate as slow evolutionary processes, whereas others (e.g. currency devaluation) apply as fast processes, perturbing the human–environment systems suddenly (Lambin et al., 2003). The trajectories of land change in these situations principally depend on the interaction between these exogenous forces and the socioeconomic conditions of land managers (Mertens et al., 2000). Assessment of land change in the context of specific policies could therefore lead to an improved understanding of human–environment interactions (Klepeis and Turner, 2001).

Ghana's structural adjustment program formulated in response to its incessant economic decline in the 1970s and the 1980s is one of the most publicized efforts at macroeconomic adjustment in Africa. Like other adjustment programs of the International Monetary Fund and the World Bank, Ghana's program was designed to open up the country to globalization by making the economy more liberalized and export-oriented. The adjustment process entailed market-oriented reforms in policies and institutions geared at restoring sustainable balance of payment, reducing inflation, and creating conditions for sustainable growth. The main instruments of adjustments included changes in taxes, subsidies, public expenditure, trade reforms and private sector deregulation to promote a competitive economy with fewer regulations (Reardon et al., 1999).

Most studies on structural adjustment in Ghana have focused on macroeconomic performance and social costs of structural adjustment, with only little studies done to examine agricultural land change in the stabilization and post-adjustment phases. The few studies on the link between structural adjustment and the environment (e.g. Benhin and Barbier, 2004; Lopez, 1997) are conducted outside the largely agrarian Northern Ghana whose population depends on agriculture the most for their livelihood.

The current study is designed to understand how fiscal and commercial policies affect farming decisions in Northern Ghana. It integrates satellite-derived information and social data sets to highlight the influence of demographic, technology and market variables on agricultural land change during macroeconomic reforms. The degree to which economic reforms affect the commercial orientation of farmers is examined, as well as the opportunities and constraints faced by farmers whilst responding to structural changes. The analyses provide insight for policymakers on the imperatives of agricultural support programs for smallholders when sudden macroeconomic changes occur.

The study area

The study area lies between latitude 8°50′ and 10°N and stretches between longitudes 0°30′ to 1°30′W in the Guinea Savannah ecological zone of the northern region of Ghana (Fig. 1). It has a mean temperature above 27 °C, and receives an annual rainfall of

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doi:10.1016/j.landusepol.2008.10.006

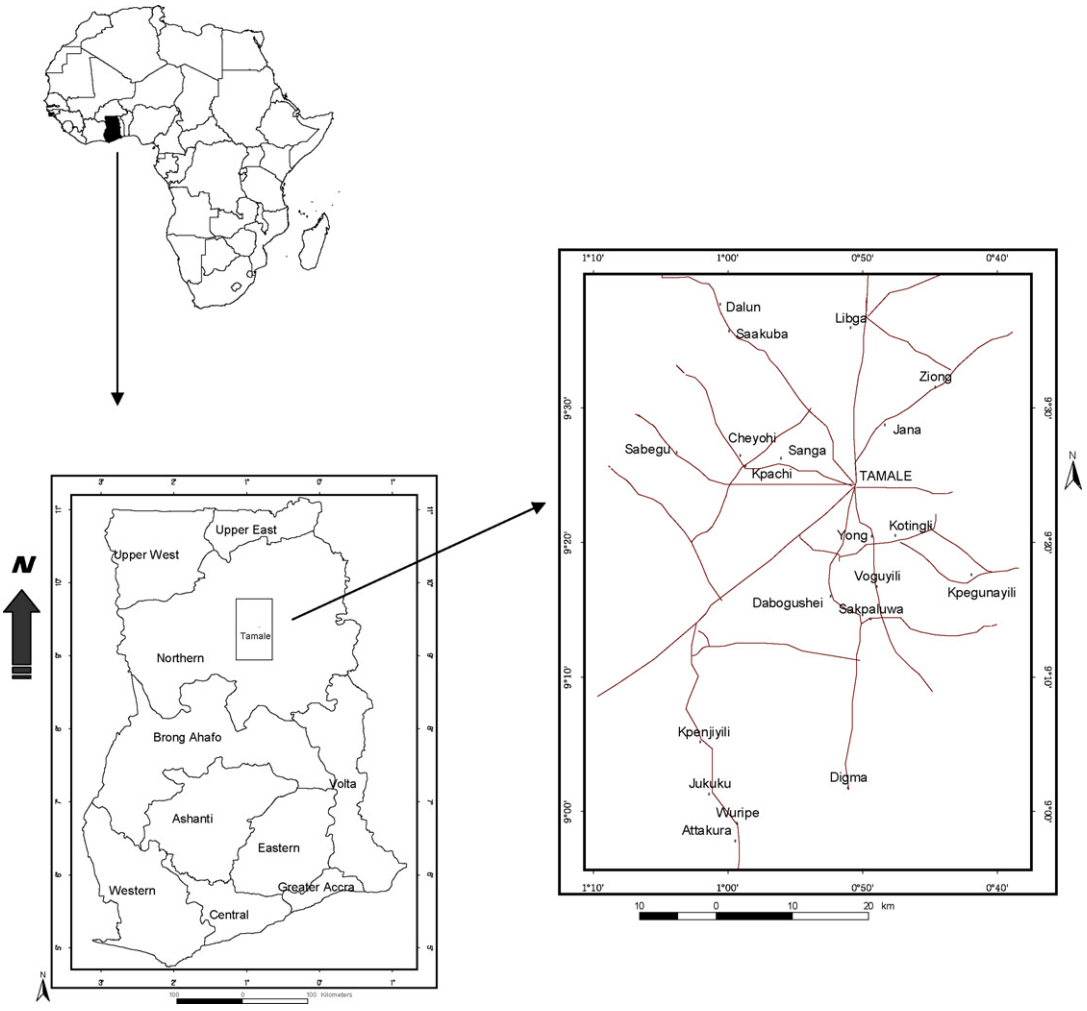

Fig. 1. The study area. The locations of the 20 sampled villages are also shown.

about 1100 mm. The terrain has a mean elevation of 150 m and a mean slope gradient of 7%. The entire northern region of Ghana has a population of about 1.8 million and an average population density of about 26 persons km^{-2}. The population density however varies markedly from 10 to more than 150 persons km^{-2} (Ghana Statistical Services, 2002). About 80% of the population of the economically active population is agricultural. The estimated poverty incidence of 69% (International Fund for Agricultural Development, 2003) makes it one of the poorest regions in Ghana.

The northern region produces about 25% of Ghana's national supply of rice, millet and sorghum, and more than 80% of the country's peanut. The region's importance of other food crops especially maize diminished in the last decade due to soil fertility problems (Braimoh and Vlek, 2006). The soils of the area have developed from sandstone parent materials and have low nutrient holding capacity. In spite of this, the farming system depends mainly on natural soil fertility and very little on inorganic fertilizers.

Land ownership and tenure in Northern Ghana are entrenched in the traditional common property system with land administration vested in the village chief. Land lease to households is done according to needs of indigenous households. The right of usage of land is heritable patrilinealy. Tenure is generally secure so long as the land is actually cropped. Migrants such as the Fulanis cannot acquire freehold rights to land, but are only given usage rights after the necessary customary rites have been fulfilled. Competition between farmers and herdsmen for land is common in Northern Ghana. Alluvial plains are a source of dry season pasture for herders, and are also required by farmers for dry season cultivation of rice and vegetables for subsistence and commercial purposes.

Macroeconomic transformations and land-use change

Macroeconomic policies induce changes in market conditions and prices which in turn influence farmers' choice of agricultural technologies and factor proportions (Reardon and Vosti, 1992). Reardon et al. (1999) itemizes the channels through which macroeconomic policies affect farmers' land-use decision-making and the environment (Fig. 2). At the top are forces exogenous to the land-use system – macroeconomic policies and structural changes – that are formulated at the national level in response to globalization or other economic forces. The second level consists of incentives offered to farmers as a result of macroeconomic policies and farmers' capacities to act on these incentives. Incentives and capacities in turn lead to resource allocation at the farm level as well as to other non-farm activities. Various types of resource allocations lead to different types of environmental effects.

Four macroeconomic epochs can be identified in Ghana since independence. The first period is the pre-reform era from 1957 to 1982, in which the government of Ghana consistently intervened in both input and output markets of the agricultural sector. Cocoa was the country's major cash crop. Even though the economy relied on agriculture, there was no conscious effort at increasing