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How Institutions Mediate the Impact of Cash Cropping on Food Crop Intensification: An Application to Cotton in Sub-Saharan Africa

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Summary. — It is widely agreed that smallholder-led agricultural growth would contribute most to improved food security and reduced poverty. Yet, how to achieve broader and more sustainable access by smallholder farmers to productivity-enhancing inputs for food crop production remains a largely unsolved riddle. In light of the great institutional diversity across cotton sectors in Sub-Saharan Africa, this study investigates whether cotton can be used to spur the intensification of smallholder food production. First, a conceptual framework linking cotton institutional structures to food crop intensification is developed. Then, predictions from the conceptual framework are compared with empirical evidence from different countries.

Key words — cotton, food crops, intensification, institutions, Sub-Saharan Africa

1. INTRODUCTION

The worldwide food price crises of 2007–08 and 2011, and continuing high prices for most agricultural commodities to this day, have led to a renewed focus among governments and donor agencies on agricultural growth, especially growth in staple food production in Sub-Saharan Africa (SSA). There is widespread agreement that growth in smallholder agriculture, if it can be achieved, will result in the broadest-based growth that contributes most to improved food security and reduced poverty (Christiansen, Demery, & Kuhl, 2011).[1] It is also widely agreed that achieving such growth requires much broader access by smallholders to improved input packages, such as improved seed and fertilizer and to the technical advice needed to use them properly. Yet, how to achieve broader and more sustainable access by smallholder farmers to productivity-enhancing inputs for food crop production remains a largely unsolved riddle.

From the 1960s through the mid-1980s, the main approach to spurring such access relied on state-controlled enterprises distributing fertilizer, and to varying degrees, other inputs such as improved seeds at subsidized prices. Although this model led to an increase in fertilizer use in SSA (FAOSTAT, 2013), its financial sustainability became a growing concern. In the mid-1980s, input market reforms started to be implemented with the aim of reducing state control over the price and distribution of inputs and encouraging private input market development (World Bank, 1981). After a period of sharply reduced subsidies, policy reforms, and other attempts to develop private input distribution systems, many governments have been unsatisfied with the level and rate of progress. As a result, the past ten years have seen a dramatic renewal in the use of input subsidies focused on staple grain production. Most of the current programs claim the smart subsidy label, implying an attempt to avoid the failures of the earlier state-implemented programs by featuring collaboration with the private sector.[2]

There is evidence that some of these programs have succeeded in increasing production and yields of selected staple grains among smallholder farmers for some periods of time (Druilhe & Barreiro-Hurle, 2012). Still, major questions have been raised about the financial sustainability of the programs and about their impact on the development of private sector input distribution systems that could provide a robust, long-run solution to the problem. In fact, today's programs, many based on input vouchers, suffer from some of the same problems of the earlier unsustainable centralized subsidy programs, including late delivery of fertilizer, displacement of private sector input dealers, and very high total costs (Minot & Benson, 2009; Ricker-Gilbert & Jayne, 2008).

These findings about new subsidy programs along with continued underdevelopment of private input systems and low use of inputs on the continent, raise the question of whether cash cropping structures in SSA can be used to spur the intensification of smallholder food production more efficiently, and with greater positive impact than has generally been the case even with the new smart subsidies.

There is a longstanding debate in economic development concerning the impact of cash crops on food crop intensification. On the one hand, critics claim that reforms promoting market liberalization and exports have undermined local food production by diverting scarce resources from food crops to cash crops. A common claim is that cash crops are usually grown on the most fertile land, displacing food crops to more marginal land (e.g., Mittal, 2009). On the other hand, advocates of cash cropping argue that they play a key role in fostering agricultural development and in inducing economic growth. Cash crops strategically produced on the basis of comparative advantage are said to significantly increase household incomes and foreign exchange earnings (Timmer, 1997).

This study focuses on cotton, which is the most widely produced cash crop by African smallholder farmers and which has been at the core of the food versus cash crop debate in SSA. In some studies cotton has been depicted as "the mother of poverty" (Isaacman, 1980). In contrast, other studies have

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described cotton as being "the white gold" (Dione, 1989; Tefft, 2010), since it is a major source of export earnings for governments and of income for smallholder farmers. There are several instances where governments and private–public collaborations have explicitly used cotton – and the institutional structure that surrounds it – to promote broader agricultural productivity.[3]

In light of the great institutional diversity across cotton sectors on the continent, this study examines how the particular institutional structure of a cotton sector might affect its ability to spur such growth in food crop intensification. The conceptual framework developed in the paper may have relevance beyond cotton, as it depends not only on the characteristics of the crop itself but also on the institutional structure in which it is grown and marketed and which are known to exist also for other cash crops.[4]

The study makes two important contributions to the literature. First, it explicitly examines the institutional details that might allow cash crop production to make a financially sustainable contribution to food crop intensification. To our knowledge, no other study has unpacked the institutional story in such comparative fashion.[5] Second, it extends the food crop question to the cotton sector typology first developed by Poulton *et al.* (2004) and further developed by Tschirley *et al.* (2010), Tschirley, Poulton, and Labaste (2009). No study has yet elaborated on the implications of these structures for food crop intensification.

The paper proceeds as follows. The first section draws on previous research to highlight the range of institutional structures governing cotton production in SSA and to show how these structures drive cotton sector performance. Then, a conceptual framework for linking cotton institutional structures to the challenge of promoting food crop intensification is developed. The framework consists of (a) a typology of pathways through which cotton may spur food crop intensification, and (b) predictions as to the impact of varying cotton sector institutional structures on the likelihood that a given pathway will exist and be sustainable. Drawing on the literature, experience from 13 countries across the continent is reviewed and expectations that emerge from the conceptual framework are assessed against available evidence. The final section concludes with a brief assessment of the framework's performance against evidence, and initial suggestions regarding policy implications.

2. INSTITUTIONAL STRUCTURES GOVERNING COTTON PRODUCTION IN SUB-SAHARAN AFRICA

Tschirley *et al.* (2009, 2010), building on Poulton *et al.* (2004), identified five types of cotton sectors on the African continent, based on the structure of the market for the purchase of seed cotton and the regulatory framework in which firms operate. Figure 1 lays out the typology in a decision-tree framework. The typology is first based on a distinction between market-based and regulated sectors, with the latter referring to sectors in which free competition for seed cotton purchase is not allowed. The second distinction is based on the number of buyers of seed cotton: many or few in the case of market-based systems, and one or more than one in regulated systems. These two distinctions generate four sector types: (1) national monopolies, (2) local monopolies, (3) concentrated market-based systems, and (4) competitively structured systems. A fifth category, hybrid market structures, captures the sectors that cannot be classified into one of the four main types.

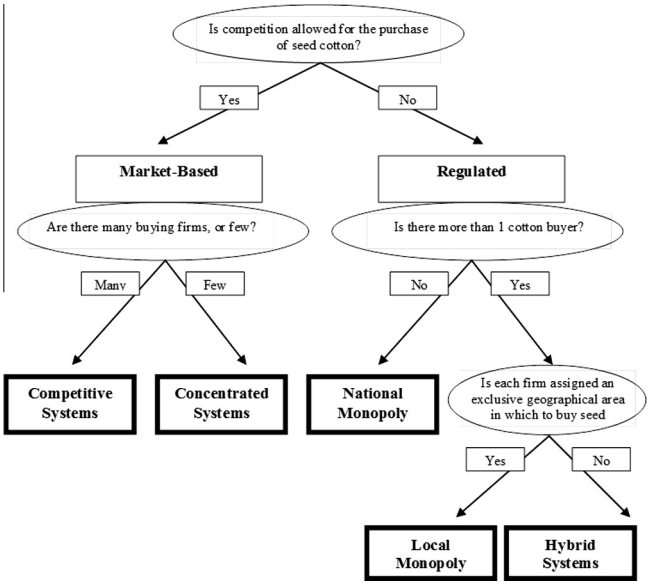

Figure 1. *Cotton sector typology in decision tree framework from Tschirley et al. (2009).*

In Cameroon, Chad, Mali, and Togo, cotton sectors remain managed by a national monopoly responsible for purchasing all cotton from farmers at fixed pan-regional prices. Cotton sectors in Burkina Faso, Ivory Coast,[6] and Mozambique are organized into local monopolies, where exclusive purchasing rights are given to one ginning firm within a delimited geographical zone. Concentrated market structures define cotton sectors, such as in Zambia and Zimbabwe until at least the early 2000s, in which a very small number of firms (two in these particular examples) dominate market share but face free competition from other firms and, potentially, from each other. Unlike local monopolies, concentrated sectors have no geographical zoning that delimits firms' scope of operations. In competitively structured sectors, such as in Tanzania since 1994, Uganda during the first years of liberalization, and Ghana during the 1990s, a large number of buyers compete without restriction to purchase seed cotton from farmers, with no single set of firms dominating. Finally, hybrid structures encompass cotton sectors that are either attempting to liberalize (e.g., Benin) or to solve unintended consequences from the liberalization process (e.g., Uganda since shortly after liberalization).

With the exception of competitive market structures, cotton is produced under some type of contract farming scheme. Previous studies showed that participation in contract farming schemes can overcome some of the constraints related to input intensification, directly through better access to input packages and indirectly through increased income (e.g., Bellemare, 2012; Strasberg, 1998). By reducing the liquidity-constraint faced by farmers in using inputs, this type of contractual arrangement can increase such use, thereby increasing production and productivity. Yet, firms participating in contract farming face challenges of asset specificity, free-riding, moral hazard, adverse selection, and non-excludability, as further explained below.

The primary motivation for ginning companies to provide inputs on credit is to increase the flow of seed cotton through their gin. Seed cotton is an asset with little or no value outside of cotton processing since it cannot be used for other purposes (a condition referred to as "asset specificity" in the economics