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## ZAMBIA'S STOP-AND-GO REVOLUTION: THE IMPACT OF POLICIES AND ORGANIZATIONS ON THE DEVELOPMENT AND SPREAD OF HYBRID MAIZE

By

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**BACKGROUND:** Beginning in the 1970s, the government of Zambia (GRZ) and donors invested heavily in creating an enabling environment for the expansion of smallholder maize production, including the development of improved maize varieties and the provision of seed, fertilizer, credit and marketing services. These policies had both production and political objectives. They aimed at (1) increasing domestic maize production in order to supply Lusaka and the mining belt with cheap maize meal; (2) reducing reliance on the European commercial farmers; and (3) improving rural equity and incomes by increasing the market involvement of farmers in more remote, less agriculturally advanced provinces, especially those who were key political supporters.

**OBJECTIVES:** This study examines the impact of investments by GRZ and international agencies that led to the development and adoption of ten improved maize varieties. Maize investment impact was assessed from three levels. First, results from an adoption survey of farmers in all major maize growing areas were used to calculate a rate of return (ROR). Because farmer adoption was influenced not only by research but also by non-research

complementary investments in seed, extension, and marketing, these costs were included in the ROR calculation. Second, numerical simulation was used to estimate the effect on the ROR and other indicators assuming that key marketing and price policies had not been in place. Third, the study examined the historical interplay of institutional and organizational factors that led to the initial choice of maize policies and affected their fiscal sustainability.

**RESULTS:** Adoption of the new improved Zambian maize varieties by small and medium-scale farmers was rapid and extensive following their introduction in 1984-88. By 1992, 60 percent of small/medium farm maize area was planted to Zambian improved varieties. In Eastern and Southern Africa, only Kenya and Zimbabwe have higher adoption rates.

The GRZ subsidized the establishment of input and maize marketing services to smallholders throughout the country, and implemented pan-territorial pricing policies that favored smallholders in remote areas over large commercial farmers and others close to the railway line. These investments had a striking impact on smallholder adopters. Of smallholders



who adopted improved maize, 88 percent had used fertilizer in at least one season, and application rates on maize were the second highest in Africa in the late 1980s. Over 60 percent of total maize production was marketed through official marketing channels until the early 1990s. Maize bought by official marketing organizations was resold to parastatal milling companies in urban areas, where it was processed into maize flour to be sold at subsidized prices to urban consumers.

**IMPACT OF POLICIES:** An investment is considered profitable if the ROR equals or exceeds the opportunity cost of capital (in Southern Africa, this is frequently assumed to be 10 percent). In spite of the widespread adoption of improved maize, the ROR to the package of maize investments was negative for the 1978-91 period. Marketing costs were pivotal: when these were excluded, the ROR exceeded 100 percent.

Numerical simulation was used to project what might have happened to production, technology adoption, distribution of benefits, and the ROR in the absence of maize price controls and marketing subsidies, for a representative year. The results showed that the main impact of the price controls and marketing subsidies was to redistribute, not increase, aggregate production. Maize production shifted from large to small farmers, and from areas adjacent to the line of rail to more remote and drier regions. In these areas, guaranteed prices and markets for maize accelerated production because farmers had few if any commercial crop alternatives. However, it was extremely expensive to subsidize transportation of inputs and maize between remote areas and major consumption centers.

GRZ expenditures in support of maize became unsustainable, consuming 17 percent of the total government budget by the late 1980s. Since then, the implementation of structural adjustment programs which liberalized marketing and financial services has contributed to a decline in

maize area and production, and a retraction of improved maize to areas closer to the railway line and major transportation arteries.

Efforts to increase the marketable surplus of remote smallholders suffered from three major flaws. First, the exclusive focus on maize, and the pan-territorial pricing structure for maize and maize inputs, facilitated a shift in the geographic pattern of maize production that was uneconomic. Second, the maize policies, and the absence of incentives for the agents implementing the policies (the marketing board, cooperatives, mills, lending institutions) to keep costs low, led to inefficiencies in the marketing system and did not facilitate an evolution toward a mixed public-private finance and marketing structure for a broader array of commodities. Third, as its base of support contracted, President Kaunda's party (UNIP) banned its main political rival, making Zambia a single-party state. With this move, UNIP isolated itself from groups representing key economic interests who might have steered the government toward an economically, as well as politically, sustainable path.

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This paper is a summary of a report entitled: "Zambia's Stop-and-Go Revolution: The Impact of Policies and Organizations on the Development and Spread of Maize Technology," International Development Working Paper No. 61. It can be obtained by writing to:

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This paper is also forthcoming as a SD Publication Series technical paper. It can be obtained through USAID's development information system (CDIE).