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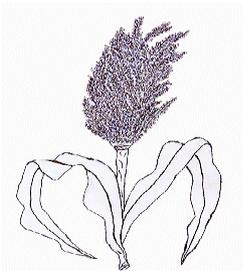
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# Agricultural Policy Synthesis

## Rwanda Food Security Research Project/ MINAGRI

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### Summary Comments on Forces Driving Change in Rwandan Smallholder Agriculture 1990-2001: Crops and Livestock\*

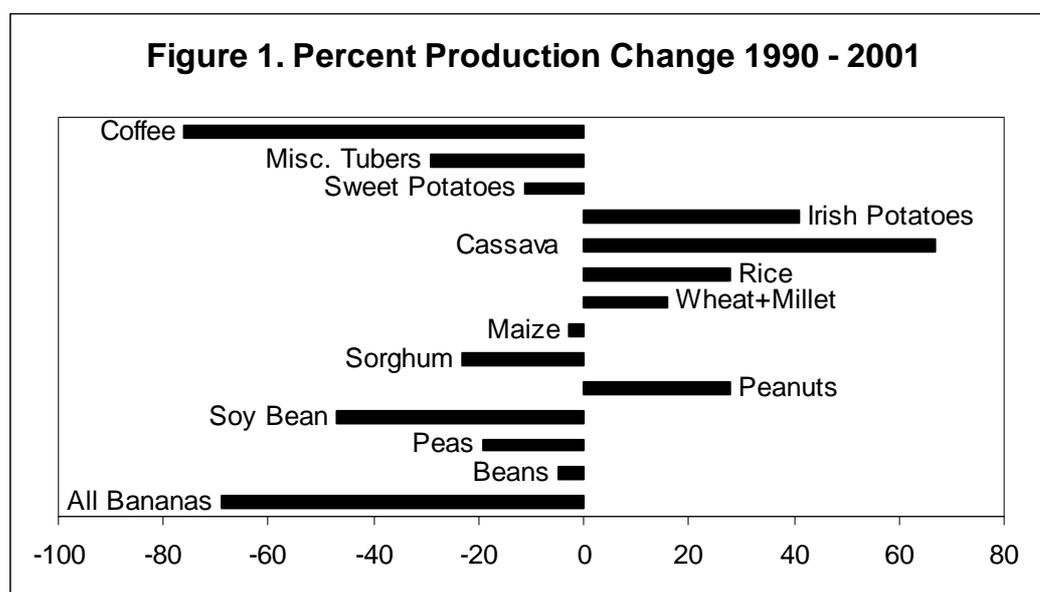
by

Cynthia Donovan, Edson Mpyisi, and Scott Loveridge

**INTRODUCTION:** Household surveys over the last decade reveal tremendous changes in Rwandan agricultural outputs. The traditional Rwandan farmer has apparently responded to changing circumstances by making radical shifts among crops. For some crops, the change in output may be the result of secular shifts in productivity driven by lack of resistance to disease. In other cases, land availability, prevailing prices, lack of labor, lack of land, or food security may be the primary drivers behind substantial crop shifts by smallholders. The purpose of this policy synthesis is to document major shifts in output and provide hypotheses about the reasons behind the changes. The paper also documents troubling trends in the traditional agriculture sector, underscoring the need for improved agricultural input and output systems.

We examine data collected by the Ministry of Agriculture's statistical unit. The 1990 data reflect the situation in the last pre-war year without political disruptions. The 2001 data set is the most current available. The information here reflects the situation among small farms, otherwise known as smallholders. The households are selected based on a statistically valid clustered random sample. Enumerators visit each household periodically for an entire crop year to collect information about quantities harvested.

**NATIONAL CHANGES:** Figure one presents changes in output of major smallholder crops between 1990 and 2001. In terms of percentage change, the greatest decreases were in coffee and bananas, while Irish potatoes and cassava surged. When we consider change in tonnage, the 1.9 million ton drop in banana



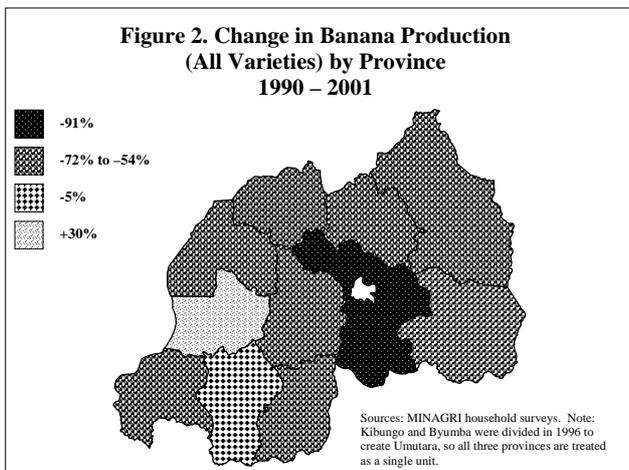
output dwarfs all other changes in the system, with a substantial shift away from sweet potatoes offset by the large increases in irish potatoes and cassava.

All categories of smallholder livestock inventories declined between 1990 and 2001, except for pigs, where there was a modest increase. The most dramatic reductions were in poultry and goats.

**SELECTED PROVINCIAL COMPARISONS:**

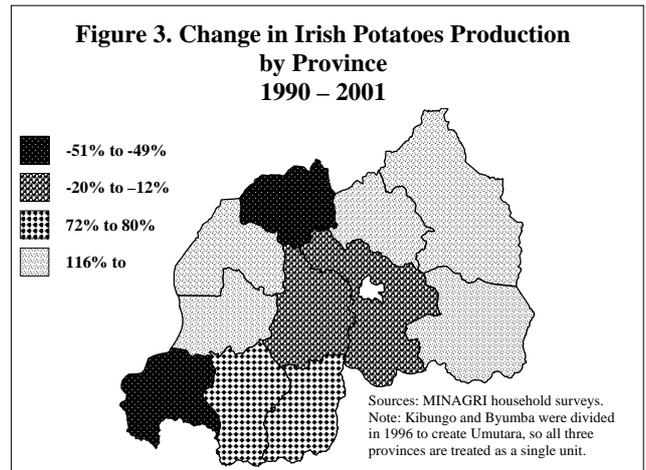
Section two documents major changes in five of Rwanda’s most important crops: bananas, cassava, irish potatoes, coffee and sweet potatoes. It is unusual to see such dramatic shifts in a relatively short period of eleven years. This section uses maps to explore patterns of the changes at the sub-national level<sup>1</sup> The tonnages and exact percentages by province are available in Donovan, Mpyisi, and Loveridge.

The **banana** map combines changes in brewing, cooking, and dessert bananas, and documents the distribution of the 1.9 million ton (69%) drop in output. Kibuye was the only part of the country with increased banana production. The reduction was most dramatic in the Kigali Rurale province, where output fell 91%. The areas surrounding Kigali Rurale also experienced substantial declines.

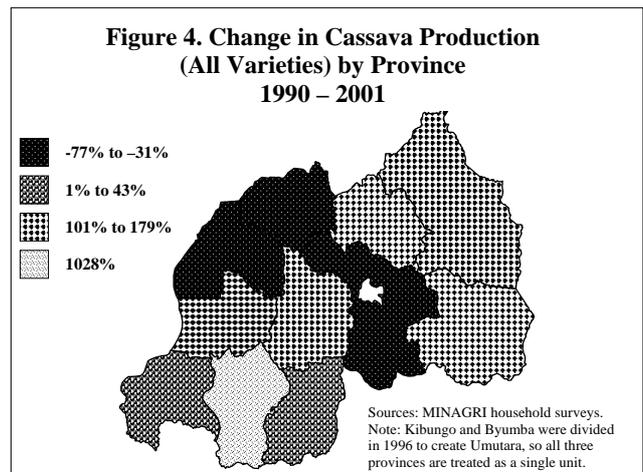


The **potato** map displays how the 121 thousand ton (44%) gain in production is distributed. Several regions experiencing gains of over 100% in irish potatoes; Butare and Gikongoro provinces also posted impressive gains. The traditional epicenter of Rwandan

irish potato production, Ruhengeri, lost about fifty percent of its production.



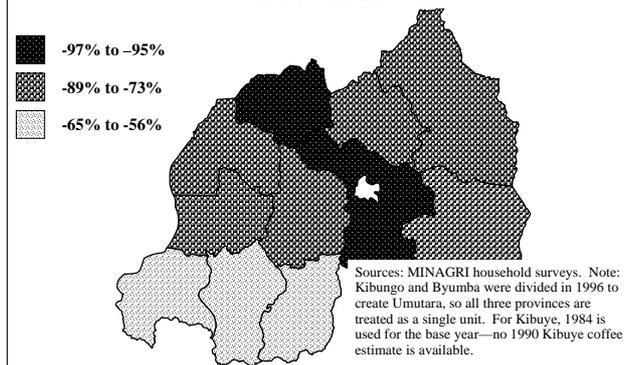
The **cassava** map reveals strong regional variation in the 71% (189 thousand ton) national increase in production. Gikongoro showed a **ten-fold gain** in its cassava production, while the eastern zone, Gitarama, and Kibuye more than doubled their output.



The **coffee** map allocates the 31 thousand ton (76%) national drop in production to regions. Both Ruhengeri and Kigali-Rural lost almost all their coffee production. Coffee harvests were substantially reduced in the other regions as well.

<sup>1</sup> The eastern zone groups Byumba, Kibungo and Umutara as one region because boundaries were redrawn in 1996.

**Figure 5. Change in Coffee Production by Province 1990 – 2001**



**DRIVERS OF CHANGE:** Potential reasons why agriculture in Rwanda changed so dramatically over the eleven-year interval are summarized in Table 1—see Donovan, Mpyisi, and Loveridge for complete discussion.

**Table 1. Summary of Reasons for Changes in Crop Output**

<b>INCREASES</b>	
<b>Irish Potatoes</b>	
<ul style="list-style-type: none"> <li>• increased technical support from NGOs</li> <li>• increased availability of inputs</li> <li>• increased high fertility acreage (ex-Gishwati Forest)</li> <li>• interest in potatoes by larger scale farmers</li> </ul>	
<b>Cassava</b>	
<ul style="list-style-type: none"> <li>• distribution of cuttings in drought years</li> <li>• drought resistance</li> <li>• flood resistance</li> <li>• increased demand and prices for cassava products</li> <li>• substituting cassava for sweet potatoes</li> </ul>	
<b>DECREASES</b>	
<b>Bananas</b>	
<ul style="list-style-type: none"> <li>• disease, drought and theft</li> <li>• political turmoil—lack of maintenance</li> <li>• reduced government investment in bananas</li> <li>• reduced use of manure as fertilizer</li> </ul>	
<b>Sweet Potatoes</b>	
<ul style="list-style-type: none"> <li>• poor rains in 1997, 1998, and 2000</li> <li>• lack of planting material</li> <li>• disease and caterpillars</li> <li>• fewer households producing</li> </ul>	
<b>Coffee</b>	
<ul style="list-style-type: none"> <li>• liberalization—farmers can remove trees</li> <li>• low international prices</li> <li>• low quality output &amp; poor processing</li> </ul>	

Our understanding of the changes we observe in Rwandan agriculture is enhanced by interactions with a wide array of people who work in agriculture on a regular basis, including MINAGRI personnel as well as National University of Rwanda agricultural faculty and staff of non-governmental organizations active in agriculture. Change can come from differences in yields, area planted per farm, or number of households planting the crop. Coffee, sweet potatoes, and bananas all experienced national declines in output as well as declines in the proportion of households harvesting the crop. The proportion of households producing cassava declined while total output rose by sixty-seven percent.

There was little change in the proportion of households producing irish potatoes, while total national output rose by forty-one percent.

**CONCLUSIONS AND POLICY IMPLICATIONS:**

Rwanda’s agriculture, while relatively stagnant in terms of technology and limited in terms of resources, is highly dynamic in one sense. It is capable of adapting quite quickly in response to new opportunities and constraints. Despite these positive aspects of Rwanda’s agriculture, our trend data overall reveal some troubling trends deserving attention from policy makers.

1. **Soil Fertility.** Decreased area in crops providing good soil protection such as bananas and mulched coffee could have rapid deleterious effects on Rwanda’s soil fertility, particularly if these crops are replaced with cassava. The problem is compounded by lack of fertilizer and the rapid decline in fallow fields. Loss of manure due to reduced livestock inventories is another indicator that soil fertility is increasingly at risk. More research to help identify ways to sustain or build soil fertility under the prevailing conditions is needed. Few households use purchased inputs. When research is available, Extension efforts should also include more attention to soil fertility.
2. **Other Yield Enhancement Measures.** More research is also needed on varietal improvements to increase resistance to disease and yields for selected crops. The feasibility of chemical or other treatments to reduce disease should also be explored.
3. **Potential of Reduced Access to the Cash Economy.** In 1990, bananas (including brewed bananas) and coffee were by far the two largest sources of cash income for Rwandan agricultural

households (Kangasniemi 1998). The reduced animal inventories we document above may exacerbate loss of cash resources. The declines in cash-generating activities may translate into reduced access to market goods. The limited access to cash may impact their ability to acquire improved inputs when opportunities arise.

4. **Effect of Crop Mix on Food Security.** Movement away from high protein crops (beans and soy), and reduced animal agriculture may imply a less healthy diet unless the gap is made up through imports of protein-rich foods. Chronic food insecurity may increase. With reduced access to cash, this strategy may not be feasible.
5. **Marketing Infrastructure.** Improved systems to process and deliver Rwandan agricultural outputs to the national and international market are needed. Markets cannot be reached without better secondary roads, market information systems, and agricultural processing facilities. Improved marketing infrastructure will also help farm families combat nutritional deficiencies through lower cost food imports. For example, imports appear to be dampening price increases for cooking bananas.
6. **Extension Services.** During the 80s and early 90s several regional projects (DRB, PDAG, etc.) supported extension services in those regions and the government had many more extension agents called “monagris”. The “monagris” system was abolished and the model of regional government projects is resulting in reduced farmer access to extension services.

In summary, Rwanda’s farmers are the major forces driving change in Rwandan agriculture. They are responding to pressures created by reduced availability of land per capita, reduced prices and yields of selected crops, and availability of improved inputs and varieties in other crops. If better systems to support agriculture are put into place, they will respond with greater productivity.

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