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POLICY BRIEF

POVERTY REDUCTION AMONG RWANDAN SMALLHOLDER COFFEE PRODUCERS

A SYNTHESIS OF FINDINGS

Based on studies written by Alexandre Lyambabaje, Etienne Bihogo, Charles B. Moss, Jean Claude Kayisinga, Dave D. Weatherspoon, and James F. Oehmke

This brief synthesizes two studies that assess the impact of USAID-supported coffee interventions in Rwanda (Bihogo et al. 2011; Moss et al. 2011). The interventions were undertaken to support the Government of Rwanda's policy to transform all Rwandan coffee into high-quality, high-value products in an effort to increase the incomes of and reduce poverty among smallholders. The projects emphasized a value-chain approach to promote the development of premium coffee

markets. USAID/Rwanda supported this development through the Partnership for Enhancing Agriculture in Rwanda through Linkages (PEARL I, 2000–03, and PEARL II, 2003–05) and Sustaining Partnerships to Enhance Rural Enterprise and Agribusiness Development (SPREAD, 2006–11).

The studies' objectives were

- to determine if the USAID-supported interventions in the coffee value chain

have increased incomes and reduced poverty among smallholder coffee growers, and

- to ascertain whether it is possible to identify a "tipping point" in the coffee value chain beyond which sustainable improvements are led by the private sector and donors can begin to exit from the sector, and if so, to ascertain whether the Rwandan coffee sector has reached this tipping point.

JANUARY 2012

This publication was produced for review by the United States Agency for International Development. It was prepared with help from the Communications Division of the International Food Policy Research Institute.

A quantitative study focused on the first objective (Moss et al. 2011), and a qualitative study focused on the second (Bihogo et al. 2011). The studies were conducted during fall 2010 and spring 2011 by faculty of the National University of Rwanda with technical assistance from faculty at Michigan State University and the University of Florida.

THE PEARL AND SPREAD PROJECTS

PEARL I instituted a fully washed coffee (FWC) value chain based on farmer cooperatives that enabled smallholders to participate in premium-quality international markets. PEARL I provided assistance in cooperative formation, business plan development, credit negotiations, agronomy, the construction of coffee washing stations (CWSs), coffee processing, Fair Trade certification, cupping, and marketing. The Maraba cooperative pilot project successfully penetrated the high-value American premium coffee market, was picked up in the UK by Sainsbury for sale in over 350 supermarkets, and was able to return significantly higher revenues to farmers. PEARL II emphasized the establishment of producer cooperatives and CWSs by either farmer cooperatives or for-profit enterprises. CWSs increased from 2 in 2000 to 54 in 2005 to 187 in 2010; FWC exports grew from 32 metric tons in 2002 to 5,800 metric tons in 2010, representing 29 percent of Rwandan coffee exports.

SPREAD emphasized continued improvements in FWC quality and strengthened linkages with the international premium market. The project helped cooperatives establish the Rwanda Smallholder Specialty Coffee Company, which directly links smallholder cooperatives to international buyers. In 2008 SPREAD brought to Rwanda the first ever African Cup of Excellence competition, held again in 2010 and 2011. In 2010 the top 22 lots of the 154 entries were auctioned online, and 120 international coffee companies registered to bid in this auction. In 2011 producers entered 189 lots, and the top 36 were offered for sale in the 2011 online auction.

TABLE 1—2010 SUSTAINABILITY STATUS IN THE RWANDA FULLY WASHED COFFEE VALUE CHAIN

Value chain node	Sustainability tipping point	Current status/issues
Input Supply	Sustainable supply of fertilizers and pesticides	OCIR-café experimenting with supply schemes/lack of private-sector suppliers, credit, credit repayment
Smallholders	Investment in coffee trees	EU distribution program turned over to government/ small farm sizes limit growth potential
Washing stations	Private-sector and cooperative investment and construction	Good where transport and water infrastructure exists/greater quantities of cherries needed to improve utilization, efficiency
Farmer cooperatives (CWS owners)	Self-sustaining finance; ability to accept loans; ability to facilitate input distribution to farmers	The Rwanda Smallholders Coffee Cooperative Organization (RWASHOSCCO) emerging as a super-structure and support organization for cooperatives
Buyers/exporters	Sustained relationships with buyers; consistent and dependable supply of quality coffees in container-size lots; efficient transport	Emerging relationships, coffee quality improving—both need nurturing through institutions such as RWASHOSCCO; innovation needed to meet emerging organic, shade-grown, and other specialty market criteria; greater quantities needed; Rwanda's landlocked status requires regional approach to improved transport infrastructure
Production and Value Chain Research	Limited amount by SPREAD; public-private partnership needed	Inchoate private- and public-sector coffee and value chain research institutions, with the exception of cupping laboratories

Source: Synthesized from E. Bihogo, D. D. Weatherspoon, and J. F. Oehmke, *The Impact of PEARL and SPREAD Projects on the Development of the Rwandan Coffee Sector* (Kigali, Rwanda: USAID, 2011).

TABLE 2—COFFEE FARM SIZE AND SUBJECTIVE LIVELIHOOD STATUS OF FARM OWNER

Farm category	2010 estimated revenues per year (RWF)	Properties that coffee farmer may be able to acquire	Poverty status
≤ 100 coffee trees	≤ 49,000	He/she can buy a rabbit, chicken or goat and can afford health insurance. He/she cannot buy a cow, send a child to high school, or build a house.	Deprived
101–300 coffee trees	49,001–126,000	Coffee trees can be used as collateral. He/she can buy a bicycle and a cow under a bank loan and send one child to high school.	Poor
301–500 coffee trees	126,001–224,000	He/she can send two children to school.	Less poor
501–800 coffee trees	224,001–448,000	He/she can buy a cow without a loan, buy another piece of land, or build a decent house.	Less rich
1000+ Coffee trees (½ to ¾ ha)	>448,000 (> \$ 750)	He/she can buy a motorcycle or a car, send multiple children to school, or invest in other projects	Rich

Source: E. Bihogo, D. D. Weatherspoon, and J. F. Oehmke, *The Impact of PEARL and SPREAD Projects on the Development of the Rwandan Coffee Sector* (Kigali, Rwanda: USAID, 2011), based on 2010 Rwanda coffee prices.

Note: RWF = Rwandan franc.

METHODS

Nine CWSs and surrounding geographical areas comprising 17 statistical samples were selected for analysis. The selection was stratified by Rwanda's four rural regions and (four) private and (five) cooperative CWS ownerships. The quantitative analysis was conducted at the level of the smallholder. The qualitative analysis encompassed the entire FWC value chain, focusing on linkages from the nine CWSs.

The quantitative study used quasi-experimental methods, including case-comparison, difference-in-differences (DiD) analysis, and regression analysis. Data sources included the National Statistics Institute of Rwanda 2000 and 2005 national surveys and primary data collection to obtain comparable 2010 data in the nine study areas. The analysis quantified changes in income and poverty status over time among smallholders participating in the FWC value chain (the treatment group) compared to changes in income and poverty status among nonparticipating smallholders (the comparison group).

The qualitative study included a literature review and discussions with key informants. The study included 86 coffee growers, comprising 60 men and 26 women; 3 inputs suppliers; 5 private CWS owners; 4 managers and 18 cooperative directors; 2 representatives of US coffee importers; 4 coffee millers/exporters; 5 bank agents; 3 Rwanda Coffee Authority staff members; and 3 SPREAD project staff members. Data including wholesale and retail prices, quality ratings, and buyer information were collected from 11 international coffee buyers by phone and email.

RESULTS

Self-sustainability of the FWC value chain. Positive indications of sustainability include international recognition of Rwanda as a premium coffee exporter, farmer investment in coffee production, private sector investment in CWSs, and strong linkages between farmer cooperatives and the international value chain. Strong, quality-related price improvement is indicated by increases in the price premium for Rwanda coffee relative to international C-class coffee: in the 1990s the premium was negative, in 2009 Rwanda coffee exports received on average a 68 percent premium, indicating significant quality improvement. Areas needing additional improvement include weak input and credit supply, low yields, low capacity utilization of existing CWSs, lack of CWSs in remote areas, and poor regional transport infrastructure (Table 1). Chemical inputs are the key to increasing physical productivity of coffee smallholders and, most important, to continued improvement in the quality of smallholder coffee beans. The implication is that despite enormous progress to date, continued growth is needed before the FWC value chain becomes self-sustaining.

Qualitative results on smallholder income increases and poverty reduction. Key informants were able to delineate strong relationships among number of coffee trees, smallholder livelihood characteristics, and self-perceived poverty status (Table 2). The importance of increasing the number of coffee trees owned was seen in a case study of 11 coffee farmers who were asked for specific information about their coffee tree holdings in 2000 and

TABLE 3—NUMBER OF COFFEE TREES OWNED AND POVERTY STATUS, 2000 AND 2010, CASE STUDY OF 11 SMALLHOLDERS

2000		2010	
Number of trees	Subjective poverty status	Number of trees	Subjective poverty status
0	Deprived	101	Poor
400	Less poor	600	Less rich
0	Deprived	150	Poor
300	Poor	500	Less poor
300	Poor	600	Less rich
200	Poor	320	Less poor
250	Poor	350	Less poor
200	Poor	200	Poor
100	Deprived	400	Less poor
100	Deprived	200	Poor
200	Poor	300	Poor

Source: E. Bihogo, D. D. Weatherspoon, and J. F. Oehmke, *The Impact of PEARL and SPREAD Projects on the Development of the Rwandan Coffee Sector* (Kigali, Rwanda: USAID, 2011).

2010 (Table 3). Ten of the 11 smallholders increased the number of coffee trees they owned, and 9 of 11 reported sufficient accumulation of trees to improve their subjective poverty status per Table 2. Two of the 11 escaped poverty by moving significantly upward into the "less rich" category.

Smallholder income increases. The mean incomes of participants in the FWC value chain increased relative to the comparison group mean income (DiD calculations) in 16 of the 17 statistical samples (Table 4). Income increases ranged from -1.4 percent in Gasaka to 211.3 percent in Kageyo. That is, in Gasaka the incomes of participating smallholders (the treatment group) increased by 1.4 percent less than did the incomes of nonparticipating smallholders (the comparison group); in Kageyo the treatment group mean income increased more than three times as much as did the comparison group mean income. The negative change in Gasaka was explained by the introduction of a mining activity in the area, which greatly increased the opportunity for remunerative employment as unskilled laborers in the mine. For all areas, from 2000 to 2010 participating smallholder incomes grew 82 percent faster than comparison group incomes. A Wilcoxon signed-rank test ($Z = 3,702$; $P < 0.001$) statistically validated the more rapid income growth.

Smallholder poverty reduction. A simple comparison of 2010 poverty rates showed a rate of 65 percent among smallholders participating in the FWC value chain and a rate of 82 percent in the comparison group. Logistic regression analysis was applied

to the changes in smallholder poverty status from 2005 to 2010, controlling for household demographics and quantifying the effect of SPREAD on poverty reduction. SPREAD contributed to a 14.3 percentage point ($P < .001$) reduction in the poverty rate among participating smallholders.

Program efficiency. Program efficiency was measured by the cost per person climbing out of poverty. Rwanda has 394,000 smallholders, 29 percent of whom participate in the FWC value chain. At an average family size of five people, 14.3 percent of these smallholder families represent 81,695 individuals emerging from poverty attributable to PEARL/SPREAD. This represents a program cost of US\$12.24 per year per person emerging from poverty.

CONCLUSIONS AND LESSONS LEARNED

The evidence presented leads to the conclusion that the USAID programs have had a significant and cost-effective impact on smallholder poverty reduction through smallholder participation in the FWC value chain.

The value chain, and hence the poverty reduction, is not yet self-sustaining. Increased yields and production and continued quality improvement are critical next steps to achieving self-sustainability.

An important lesson learned is that increased asset productivity is not determined solely by the physical productivity of the asset. Introduction of a high-quality value chain, increased quality premiums, and rising international prices increased revenues per tree—they raised the economic value productivity of coffee trees that are the key asset in coffee production. This higher-value productivity led to broad-based increases in smallholder incomes and reduced poverty.

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TABLE 4—INCOME DIFFERENTIALS, FWC PARTICIPANTS VERSUS NONPARTICIPANTS, IN THE 17 STUDY AREAS, RWANDA

Statistical area	n	Income difference (RWF)	Income difference (%)
Coko	46	11,081	3.8%
Cyanika	50	129,940	41.9%
Gasaka	44	-57,854	-1.4%
Gashonga	45	468,251	61.8%
Kageyo	49	2,315,193	211.3%
Kamegeri	40	459,873	166.8%
Karama	18	716,924	100.1%
Kibumbwe	47	297,334	83.9%
Kilimbi	84	1,144,252	148.4%
Maraba	38	329,281	62.0%
Muhondo	42	170,772	36.4%
Muhura	51	5,664	1.4%
Nzahaha	48	284,748	68.9%
Remera	91	1,169,594	154.3%
Ruli	46	186,459	35.4%
Rushashi	53	194,529	38.4%
Simbi	16	337,946	67.7%

Source: C. B. Moss, J. F. Oehmke, and A. Lyambabaje, *An Economic Evaluation of SPREAD Impact on Rwanda's Rural Population* (Kigali, Rwanda: USAID, 2011).

Note: RWF = Rwandan franc; FWC = fully washed coffee value chain.

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