



Woman waters single plant, Ethiopia. Photo by Ray Witlin, courtesy of World Bank Photo Library.

Appendixes

The evaluation used four main instruments: a review of the Bank's lending and nonlending activities; country-level agriculture sector reviews; a review of relevant Bank and non-Bank literature; and a survey of Bank staff. In addition, IEG conducted 13 assessments of agricultural projects in various African countries during fiscal 2007.

This appendix describes these instruments. Also included is a section on how IEG identified the Bank's strategic approach in Africa's agriculture sector.

Portfolio Review

The portfolio review was a desk study of projects in the Sub-Saharan Africa agriculture portfolio. The study team first identified all Africa agriculture projects, and then selected a sample for a detailed review of appraisal and completion documents.

Identifying the agriculture portfolio

The review covers the 15-year period from fiscal 1991 to 2006 and is restricted to projects funded by the IBRD and IDA. Using World Bank data, the study team identified the Africa agriculture portfolio using standard Operations Policy and Country Services (OPCS) sector codes, consistent with the methodology used by the Agriculture and Rural Development (ARD) Department to report on lending trends in the sector. The agriculture codes are grouped under two sectors: *Agriculture, Fishing, and Forestry* and *Industry and Trade*. The subsectors under the former are agriculture, extension, and research (AB); animal production (AJ); crops (AH); forestry (AT); irrigation and drainage (AI); and general agriculture, fishing, and forestry (AZ). Relevant subsectors under the industry and trade

sector are agriculture marketing and trade (YA) and agro-industry (YB).

As noted by ARD, problems with the Bank's sector coding system may cause underreporting of lending to the agriculture sector. Investments for agriculture agency reform, land administration, and rural finance in particular may not be fully captured by sector codes.

In the Bank's database, sector codes are mutually exclusive, but thematic codes are not. Therefore, thematic codes have been used to identify projects for more detailed examination, but not for purposes of reporting on lending amounts.

Selection of sample for portfolio review

The database identified 262 agriculture projects approved for Africa during fiscal 1991–2006. However, the database does not recognize a supplemental project as an additional project—only the loan/credit amount is included. The logic is that since the parent project is already in the system, there is no need to count the supplemental separately. The IEG review therefore included supplemental projects when their parent project was approved before fiscal 1991 as a separate project. If the parent was approved during the study period (fiscal 1991–2006), the supplemental was not counted as a separate project, because this would have led to double counting. Hence, 10 additional supplemental projects were added to the identified universe, for a total of 272 projects.

A stratified random sample of 71 projects was selected from the universe of 272 projects for further review. The stratification used two criteria: the number of subsectors and country

type. The sample comprises 54 investment projects and 17 adjustment projects. During the review of the sample, we discovered that two projects had been miscoded as agriculture. One, Benin Urban Rehabilitation and Management (fiscal 1992, P000097), was coded as AI, but the component related to cleaning of storm gutters was not agriculture-related irrigation and drainage. The other, Kenya El Niño Emergency Project (fiscal 1999, P056595) was coded as AI, but project components related to reconstruction of rural water supply (wells, culverts) were not for water for agriculture. These projects were replaced with the next two consecutive projects in the random number list: Uganda Agriculture Sector Management (fiscal 2002, P073604) and Eritrea Emergency Demobilization and Reintegration (fiscal 1996, P037582).

Other components of the portfolio review

IEG Implementation Completion Report (ICR)

Reviews: Extensive analysis of project performance was done for the 144 completed Africa agriculture projects using IEG ICR reviews. The analysis focused on lessons learned from agriculture projects, reasons for less than satisfactory Bank and borrower performance, and sustainability issues.

Monitoring and Evaluation (M&E) Analysis: In January 1996, clarifications from OPCS provided guidance to staff on preparing indicators. Accordingly, the 54 investment projects in the sample of 71 were examined for the extent to which the OPCS guidance had been internalized in project design and implementation and how the trend shifted after 1996. The indicators were categorized into three groups:

1. **Output indicators**—mainly quantitative targets such as number of markets established, number of extension workers, number of smallholders, number of associations established, number of farmers/beneficiaries reached, number of loans, number of village banks established, reduction in fertilizer subsidies, and the like
2. **Outcome indicators**—for instance, improved capacity of relevant ministry, improved research capacity, improved adoption of fertilizers, improved credit access, increased access to extension services, sale of parastatals, increased seedling production, and so on
3. **Impact indicators**—such as increased productivity, increased land fertility, increased cultivated area, increased food security, improved trade balance, increased farmer income, and the like.

The review focused only on agriculture-related indicators. The actual share of agriculture varies considerably across projects, so we did not quantify the number of indicators included in the project documents, and the inclusion of even a single indicator is recorded in the analysis.

Human Resources data: Data for staff mapped to ARD in the Africa Region were obtained from the Human Resources (HR) Department. Staff was categorized as either economists and generalists or technical, based on their title.

Review of Quality Assurance Group (QAG) data: QAG Quality at Entry Assessment (QEA) and Quality of Supervision Assessment (QSA) reports were reviewed for all Africa agriculture projects in the portfolio that have been assessed by QAG. Thirty-seven projects were reviewed for QEA and 43 for QSA.

Country-Level Reviews

CAS/PRSP review

CAS review: To assess the evolution of the focus on agriculture and agriculture-related issues in the Bank's country strategies, two CASs (Country Assistance Strategies) were reviewed from each of the countries. The selection was made based on the availability of a CAS for a country from two periods, one from the 1990s and one from the 2000s. Because Sierra Leone only has a CAS during the latter period, the comparison could not be made for that country. Thirty CASs were reviewed for the remaining 15 countries, for a total of 31 CASs.

PRSP review: Sixteen African countries had completed Poverty Reduction Strategy Papers (PRSPs) as of July 2006. The selected documents

were used to assess the borrowers' focus on agriculture and agriculture-related issues.

In-depth program review

The Bank's total lending program was reviewed in four countries where there has been significant Bank lending for agriculture. This was done to gain an in-depth understanding of the Bank's contribution to development of agriculture in those countries over time. For this analysis, two countries were selected in East Africa (Kenya and Malawi) and two in West Africa (Cameroon and Nigeria).

Project reviews

The review drew upon the findings of 13 project assessments (PPARs) carried out in fiscal 2007:

- Ethiopia: National Fertilizer Sector (ICR in fiscal 2003)
- Ethiopia: Seed System Development (ICR in fiscal 2003)
- Madagascar: Agricultural Extension Program Support (ICR in fiscal 2001)
- Madagascar: Irrigation Rehabilitation (PCR in fiscal 1995)
- Madagascar: Second Irrigation Rehabilitation Project (ICR in fiscal 2001)
- Malawi: Emergency Drought Recovery Project (ICR in fiscal 2005)
- Mali: Agricultural Trading and Processing Promotion Pilot (ICR in fiscal 2003)
- Mali: National Agricultural Research (ICR in fiscal 2002)
- Mali: Pilot Private Irrigation Promotion (ICR in fiscal 2004)
- Tanzania: Agricultural Research Project 2 (ICR in fiscal 2005)
- Tanzania: Agricultural Sector Management (ICR in fiscal 2002)
- Tanzania: National Extension Project 2 (ICR in fiscal 2004)
- Zambia: Emergency Drought Recovery Project (ICR in fiscal 2006).

These assessments provided the review with lessons of experience from the field as well as the perspectives of government officials and other stakeholders on the Bank's agriculture support in the countries involved.

Literature Review

A review of the relevant Bank and non-Bank literature was undertaken to provide a theoretical basis for understanding African agriculture and the Bank's role in its development. The literature review also provided a means for "testing" the findings emerging from the portfolio analysis and the country-level reviews.

A significant amount of research on issues relevant for agriculture and its development in Africa has been undertaken worldwide, including work by the World Bank. Given the diversity of conditions in Africa along with the varying potential for the growth of agriculture in the 47 countries in the Region, such triangulation of evidence is essential to answer the evaluation questions.

The review also built on relevant IEG evaluations, sector and thematic studies, and CASs, all of which are listed in the references at the end of this report.

Staff Survey

This instrument sought the views of relevant Bank staff on internal factors and incentives related to the Bank's assistance for agriculture in Africa. The staff survey was preceded by structured interviews of key staff in the Region and in ARD, which helped inform the design of the questionnaire. A total of 258 headquarters and country office staff and consultants were identified for the survey using the following criteria:

- ARD anchor staff and ARD-mapped staff in agriculture
- Water anchor staff and water-mapped staff in agriculture (excluding water and sanitation engineers, specialists, and financial analysts)
- Staff who are not primarily agriculture experts but have in some way contributed to agricultural development in Africa, as part of a team working on agriculture projects or on relevant transport, trade, or other sector investments; structural adjustment credits; sector work; or research.

The survey was e-mailed to the staff. The results of the survey were shared with management in

the Region and in ARD. The response rate and survey results are reported in appendix F.

How the Bank's Strategic Approach in the Agriculture Sector Was Identified

The broad strategic goals the Bank has pursued in African agriculture over the period fiscal 1991–2006 were extracted from five rural

strategy documents. The documents cover a wide range of issues and their treatment differs across documents. Table A.1, based on IEG's comparative analysis of the strategy documents, shows the set of critical constraints that defined the Bank's strategic approach to agricultural development in Africa during the period.

Table A.1: Identification of Key Constraints/ Priority Areas for Agricultural Development

Constraint/priority	A Strategy to Develop Agriculture in Africa, 1993	Vision to Action, 1997	Action to Impact: Africa Region Rural Strategy, 2002	Reaching the Rural Poor, 2003	Africa Action Plan, 2005
Need for price and market reform	X	X	X	X	
Research	X	X	X	X	X
Extension	X	X	X	X	
Natural resource management					
Soil degradation/conservation soil fertility	X	X	X	X	X
Water management systems/ conservation	X	X	X	X	
Irrigation	X	X	X	X	X
Drought is covered but risk and vulnerability are seen as a broader issue	X	X	X	X	
Food security	X	X		X	
Agro-ecological diversity	X	X	X	X	
Transportation infrastructure	X	X	X	X	X
Credit	X	X	X	X	
Land policy/reform	X	X	X	X	

APPENDIX B: CATEGORIZATION OF COUNTRIES BY FACTOR ENDOWMENTS
AND AGRICULTURE'S SHARE OF GDP

Table B.1: Cross-Country Typology for Sub-Saharan Africa

	Agriculture's share above average (34% GDP)		Agriculture's share below average (34% GDP)		Middle-income countries (> US\$1,000 per capita)
	Falling GDP per capita (1991–2001)	Rising GDP per capita (1991–2001)	Falling GDP per capita (1991–2001)	Rising GDP per capita (1991–2001)	
More favorable agricultural conditions (top two-thirds of FAO country-level farming system assessment)					
Coastal country	The Gambia Togo	Benin Ghana Guinea-Bissau Tanzania	Côte d'Ivoire	Kenya Mozambique Senegal	Mauritius South Africa
Landlocked country		Burkina Faso Ethiopia Malawi Uganda		Lesotho Zimbabwe	Swaziland
Mineral-rich country	Cameroon Central African Rep. Congo, Dem. Rep. of Sierra Leone	Sudan	Angola Congo, Rep. of Zambia	Guinea Nigeria	Equatorial Guinea
Less-favorable agricultural conditions (lowest third of FAO country-level farming system assessment)					
	Comoros Burundi Niger	Mali Rwanda Chad	Madagascar	Mauritania	Cape Verde Botswana Gabon Namibia

Source: Diao and others 2006.

Note: Of the 47 African countries, the table does not include the following: Eritrea, Liberia, São Tomé and Príncipe, Seychelles, and Somalia.

Table B.2: Share of Agriculture and Agricultural GDP Growth Rates

Country	Agriculture's share of GDP (percent)		Average annual growth (percent)	
	1990	2004	1990–2000	2000–04
Better performers (average annual growth rate for 2000–04 greater than 5%)				
Angola ^a	17.9	8.5	–1.4	13.7
Mozambique ^b	34.1	21.2	4.8	8.9
Niger	35.3	0.0	3.0	6.4
Cameroon	24.0	40.0	5.5	6.0
Benin	36.1	32.1	5.8	5.7
Congo, Republic of	12.9	6.0	1.0	5.5
Nigeria	32.4	16.3	3.4	5.3
Burkina Faso	27.8	30.8	4.2	5.1
Gabon	7.3	8.1	–1.4	5.1
Mali	44.1	33.4	2.6	5.1
Ghana	44.8	35.3	3.4	5.0
Medium performers (average annual growth rate for 2000–04 greater than 2% and less than 5%)				
Tanzania	42.0	42.3	3.2	4.9
Rwanda	32.5	41.2	2.6	4.7
Guinea	23.4	24.3	4.6	4.5
Uganda	53.3	29.5	3.7	3.9
Guinea-Bissau	56.9	63.4	3.9	3.3
Central African Republic	43.8	57.0	3.8	3.0
Mauritius	11.0	5.4	–0.5	2.8
Togo	33.8	41.2	4.0	2.7
Poor performers (average annual growth rate for 2000–04 less than 2%)				
Burundi	51.1	36.1	–1.6	1.9
Kenya	25.3	23.9	1.9	1.9
Malawi	38.5	33.7	8.6	1.8
Botswana	4.5	2.3	–1.2	1.5
Madagascar	26.1	26.2	1.8	1.3
Zambia	18.2	18.8	4.2	1.3
Namibia	10.6	9.0	3.8	1.2
Ethiopia	50.7	42.2	1.9	0.9
Côte d'Ivoire	32.5	22.1	3.3	0.5
Senegal	19.9	17.0	2.9	0.0
Gambia, The	24.3	30.0	3.3	–0.2
Mauritania	26.6	17.0	4.4	–0.3
Swaziland	10.8	6.5	1.2	–0.3
South Africa	4.2	2.7	1.0	–0.4
Eritrea		12.6	1.5	–0.5

Country	Agriculture's share of GDP (percent)		Average annual growth (percent)	
	1990	2004	1990–2000	2000–04
Lesotho	19.6	15.5	2.0	–1.8
Zimbabwe	14.8	14.2	4.3	–9.0
Average annual growth rate not available				
Cape Verde	14.4	6.8	—	—
Chad	27.9	23.5	4.4	—
Comoros	39.4	36.2	—	—
Congo, Democratic Republic of	30.1	47.4	1.2	—
Equatorial Guinea	58.9	—	—	—
Liberia	54.4	54.9	—	—
São Tomé and Príncipe	27.6	18.5	—	—
Seychelles	4.8	2.6	—	—
Sierra Leone	44.0	43.2	–13.0	—
Somalia	62.7	—	—	—
Sudan	—	33.2	9.2	—

Source: 2006 World Development Indicators.

Note: For some countries high growth in agriculture is due to returns from activities in the forestry sector such as logging and growth in export crops.

a. The high growth rate is due to the process of rehabilitation and reactivations after conflict (World Bank 2005).

b. Agricultural growth has mainly been driven by the post-conflict resettlement of refugees in the rural areas and the resulting expansion in labor and land (World Bank 2006g).

**Table B.3: Agricultural GDP Growth Rates
(countries with average annual growth rate over 3%)**

Country	Average annual growth (percent)	
	1990–2000	2000–04
Benin	5.8	5.7
Burkina Faso	4.2	5.1
Cameroon	5.5	6
Central African Republic	3.8	3
Ghana	3.4	5
Guinea	4.6	4.5
Guinea-Bissau	3.9	3.3
Mozambique ^a	4.8	8.9
Niger	3	6.4
Nigeria	3.4	5.3
Tanzania	3.2	4.9
Uganda	3.7	3.9

Source: 2006 World Development Indicators.

Note: For some countries high growth in agriculture is due to returns from activities in the forestry sector such as logging and growth in export crops.

a. Agricultural growth has mainly been driven by the post-conflict resettlement of refugees in the rural areas and resulting expansion in labor and land (World Bank 2006g).

Table B.4: Selected Agricultural Indicators for Africa, Asia, and Latin America

Indicator	Sub-Saharan Africa ^a	South Asia	Latin America
Irrigated area (% of cropland)			
1989–91	3.6	33	11.1
2001–03	3.6	39	11.4
Fertilizer consumption (100 gms per hectare of arable land)			
1989–91	142	745	602
2000–02	123	1,066	895
Agricultural machinery (tractors per 100 sq. km of arable land)			
1989–91	20	62	121
2001–03	13	130	123
Cereal yield (kilograms per hectare)^b			
1993–95	1,034	2,128	2,493
2003–05	1,087	2,505	3,159
Food production index (1999–2001 = 100)			
1992–94	81.7	80.3	79.1
2002–04	105.9	103.5	110.4
Agricultural productivity^c			
Agriculture value added per worker (2000\$)			
1992–94	294	364	2,234
2002–04	341	401	2,812

Source: 2006 World Development Indicators.

a. Includes South Africa.

b. Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.

c. Calculations include cash crops and forest and fisheries.

APPENDIX C: AGRO-ECOLOGICAL DIVERSITY, PRODUCTION SYSTEMS, AND
GROWTH RATES OF FOOD AND CASH CROPS

Table C.1: Extent of Major Climatic Zones and Agricultural Land Use in Africa

Climate zone or region	Total area, million hectares (percent)	Annual rainfall (mm)	Land use, farming systems, and main agricultural constraints
Desert	822.0 (29.1)	<100	Nomadic pastoralists and hunter/gatherers, camel, sheep, goats. Too dry and hot for agriculture.
Arid North Africa and areas in southern Africa	844.0 (17.1)	100–400	Nomadic pastoralists, sheep, goats, camel, and some cattle. Main crops are rice, wheat, barley, and sorghum. Production-based irrigation. High animal population, overgrazing, deforestation causing soil degradation. Frequent drought.
Semi-arid Southern Africa Sudano-Sahelian	233.0 (8.1)	400–600	Nomadic pastoralists. Millet/sorghum, cowpea, groundnut, cotton, some maize. Low potential for rain-fed agriculture and variable annual rains. Production mainly based peri-urban systems. Pervasive soil nutrient mining.
Dry subhumid Subhumid west Subhumid south	314.0 (11.0)	600–1,200	Zone of arable crop production – maize, sorghum, groundnut, cassava, sweet potato, cowpea, rice, tobacco, cotton, tea, soybeans, cocoa. Some animals – cattle, sheep, and goats. Declining yield, severe land degradation and soil nutrient mining. High degree of deforestation and use of marginal lands.
Moist subhumid Mountain east	584.0 (20.4)	1,200–1,500	Transition zone with cereals (maize) and root crops (cassava, yams), banana, pineapple, and sugar cane. Wheat, coffee in east African highlands. Livestock. High erosion potential and soil fertility limitations.
Humid Humid west Humid central Wetlands	409.0 (14.3)	>1,500	Tree crop zone – oil palm, rubber, cocoa, food crops, yams, cassava, banana, rice, pineapple, and forest resources. Severe disease infestations, which limited exploitation of crops and livestock. Low fertility of soils.

Source: Henao and Baanante 2006.

Table C.2: Production and Farming Systems of Sub-Saharan Africa

Farming system	Land area (% of Region)	Agricultural population (% of Region)	Principal livelihoods
Maize mixed	10	15	Maize, tobacco, cotton, cattle, goats, poultry, off-farm work
Cereal/root crop mixed	13	15	Maize, sorghum, millet, cassava, yams, legumes, cattle
Root crop	11	11	Yams, cassava, legumes, off-farm income
Agro-pastoral millet/sorghum	8	9	Sorghum, pearl millet, pulses, sesame, cattle, sheep, goats, poultry, off-farm work
Highland perennial	1	8	Banana, plantain, enset, coffee, cassava, sweet potato, beans, cereals, livestock, poultry, off-farm work
Forest based	11	7	Cassava, maize, beans, cocoyams
Highland temperate mixed	2	7	Wheat barley, teff, peas, lentils, broadbeans, rape, potatoes, sheep, goats, cattle, poultry, off-farm work
Pastoral	14	7	Cattle, camels, sheep, goats, remittances
Tree crop	3	6	Cocoa, coffee, oil palm, rubber, yams, maize, off-farm work
Commercial – largeholder and smallholder	5	4	Maize, pulses, sunflower, cattle, sheep, goats, remittances
Coastal artisanal fishing	2	3	Marine fish, coconuts, cashew, banana, yams, fruit, goats, poultry, off-farm work
Irrigated	1	2	Rice, cotton, vegetables, rain-fed crops, cattle, poultry
Rice/tree crop	1	2	Rice, banana, coffee, maize, cassava, legumes, livestock, off-farm work
Sparse agriculture (arid)	18	1	Irrigated maize, vegetables, date palms, cattle, off-farm work
Urban based	<1	3	Fruit, vegetables, dairy, cattle, goats, poultry, off-farm work

Source: Dixon and others 2001 in InterAcademy Council 2004.

Table C.3: Production of Food Crops in Agricultural Areas of Africa

Region/crop	Growth per year 1995–2004		Area and yield 2002–04		
	Area (%)	Yield (%)	Area (hectare)	Area (%)	Yield (ton/hectare)
Humid central					
Cassava	−0.6	−0.2	2,394,600	38.6	7.78
Maize	0.6	1.2	1,886,000	30.4	1.09
Pulses	1.3	1.3	605,900	9.8	0.81
Sorghum	−0.7	2.6	593,000	9.5	1.09
Humid and subhumid west					
Cassava	2.5	−0.6	5,433,700	12.4	9.51
Maize	−0.5	−0.8	7,404,000	17.0	1.13
Millet	1.6	−0.7	6,577,500	15.1	0.99
Pulses	3.2	−0.9	5,819,900	13.3	0.44
Rice	6.4	−2.7	6,513,000	14.9	1.14
Sorghum	1.4	0.1	7,927,000	18.2	1.03
Subhumid and mountain east					
Cassava	1.5	3.5	1,035,609	7.2	9.65
Maize	1.0	0.1	4,206,095	29.2	1.60
Pulses	2.1	0.0	3,729,910	25.9	0.70
Rice	0.9	0.7	1,351,290	9.4	2.29
Sorghum	2.7	−0.9	2,006,000	13.9	1.10
Wheat	1.3	0.1	1,178,200	8.2	1.41
Sudano-Sahelian					
Maize	6.7	2.4	1,191,483	3.7	1.41
Millet	0.5	3.1	12,192,458	37.9	0.53
Pulses	1.0	5.0	4,639,587	14.4	0.33
Rice	2.5	1.1	698,389	2.2	1.92
Sorghum	2.4	2.5	13,144,363	40.8	0.67
Subhumid and semi-arid southern					
Cassava	1.5	3.2	2,700,625	13.3	8.27
Maize	0.7	2.4	11,107,000	54.7	1.5
Millet	−1.0	0.8	1,055,021	5.2	0.54
Pulses	1.1	0.4	2,214,640	10.9	0.53
Sorghum	−0.8	1.0	1,619,342	8.0	0.96
Wheat	−3.7	4.4	1,033,550	5.1	2.29

Source: Henao and Baanante 2006.

Table C.4: Production of Cash Crops in Agricultural Areas of Africa

Region/crop	Growth per year 1995–2004		Area and yield 2002–04		
	Area (%)	Yield (%)	Area (hectare)	Area (%)	Yield (ton/hectare)
Humid central					
Coffee	–3.6	–0.6	360,000	15.4	0.32
Groundnuts	–1.7	3.0	841,000	36.1	0.88
Oil palm	0.5	0.6	329,000	14.1	7.83
Humid and subhumid west					
Groundnuts	4.5	0.8	3,900,500	35.0	0.96
Oil palm	1.0	–0.2	3,944,200	35.4	3.22
Seed cotton	4.3	–0.3	1,570,500	14.1	0.89
Subhumid and mountain east					
Bananas	1.2	–0.2	571,395	14.9	4.92
Barley	–4.5	2.9	767,000	20.0	1.19
Coffee	0.2	–0.8	955,670	25.0	0.61
Sudano-Sahelian					
Groundnuts	2.6	–0.5	3,943,550	68.8	0.73
Seed cotton	5.6	–0.4	1,610,461	28.1	1.06
Subhumid and semi-arid southern					
Groundnuts	3.4	0.6	1,193,137	31.1	0.54
Seed cotton	1.9	1.9	1,040,600	27.7	0.81
Sugar cane	1.2	0.3	474,000	12.3	70.78

Source: Henao and Baanante 2006.

APPENDIX D: THE BANK PORTFOLIO AND ITS PERFORMANCE

The Portfolio

Table D.1: Details of Agriculture Lending to Africa, Fiscal 1991 to 2006

Total lending (all sectors) (US\$ millions)	50,498
Investment lending (all sectors) (US\$ millions)	34,337
Lending to projects with agriculture components (US\$ millions)	14,305
Lending to projects with agriculture components (as a percentage of total lending to Africa)	28
Lending for agriculture (US\$ millions)	4,535
Lending for agriculture (as a percentage of total lending to projects with agriculture components)	32
Investment lending in agriculture (US\$ millions) (Includes emergency recovery lending of US\$ 247.22 million)	2,814
Investment lending in agriculture (including emergency) (as a percentage of total lending to Africa)	5.5
Investment lending in agriculture (as percentage of total investment lending to Africa)	8
Investment lending in agriculture (US\$ millions) (Excludes emergency recovery lending of US\$ 247.22 million)	2,567
Adjustment or development policy lending for agriculture (US\$ millions)	1,721

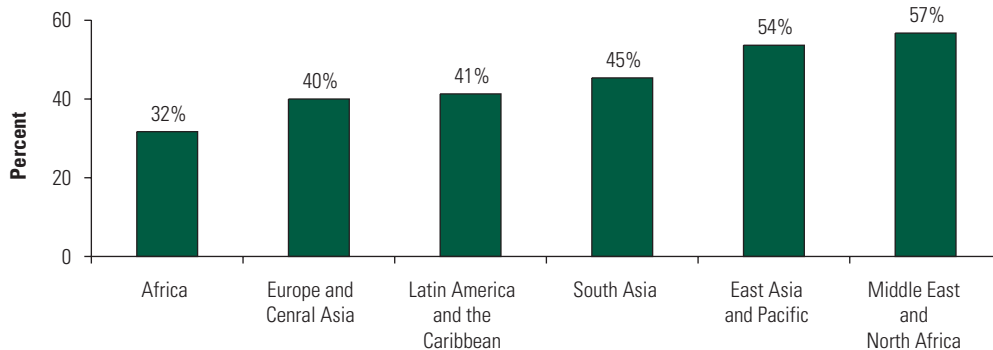
Source: World Bank data.

Table D.2: Breakdown of Agriculture Lending by Region, Fiscal 1991 to 2006 (US\$ millions)

Region	Total lending (all sectors)	Lending to projects with agriculture components	Lending for agriculture	Lending for agriculture as a percent of lending to projects with agriculture components
Sub-Saharan Africa	50,498	14,305	4,535	32
East Asia and Pacific	74,909	14,339	7,691	54
South Asia	50,764	12,818	5,808	45
Europe and Central Asia	63,380	11,120	4,446	40
Middle East and North Africa	19,713	4,815	2,731	57
Latin America and the Caribbean	86,138	11,156	4,601	41
Total	345,403	68,554	29,812	43

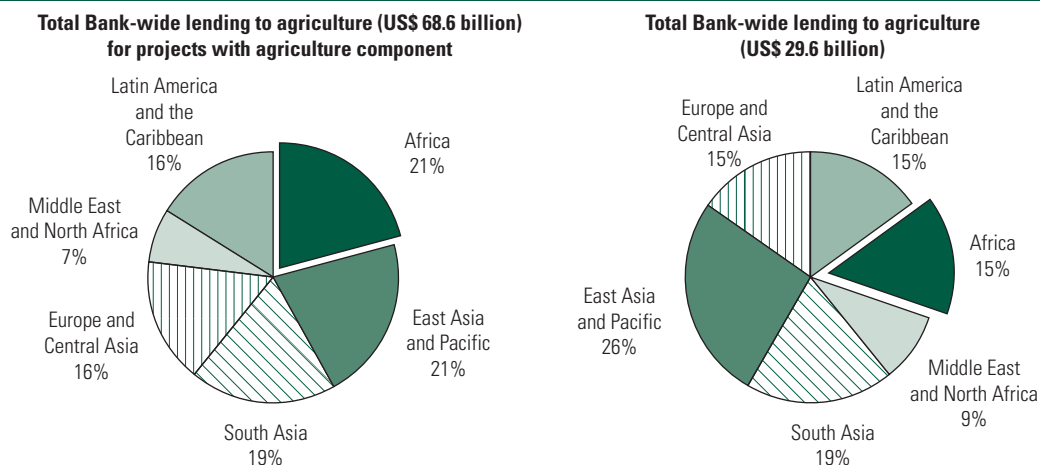
Source: World Bank data.

Figure D.1: Lending for Agriculture as Percentage of Total Lending to Projects with Agriculture Components, by Region



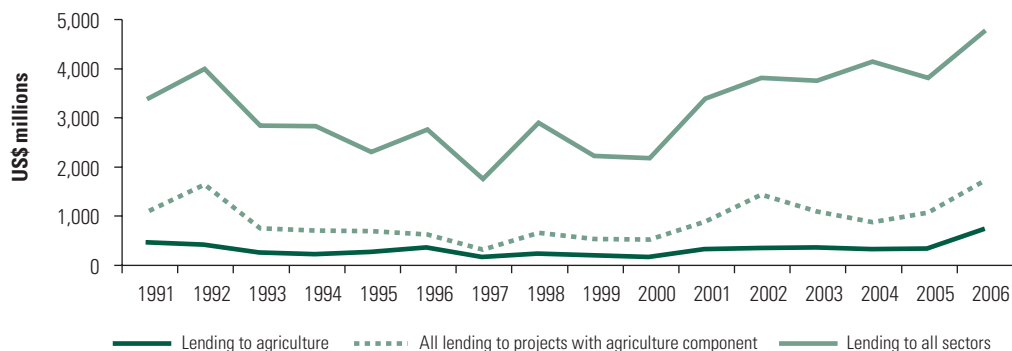
Source: World Bank data.

Figure D.2: Distribution of Bank-wide Agriculture Lending to Regions



Source: World Bank data.

Figure D.3: Trends in IBRD/IDA Lending in Africa

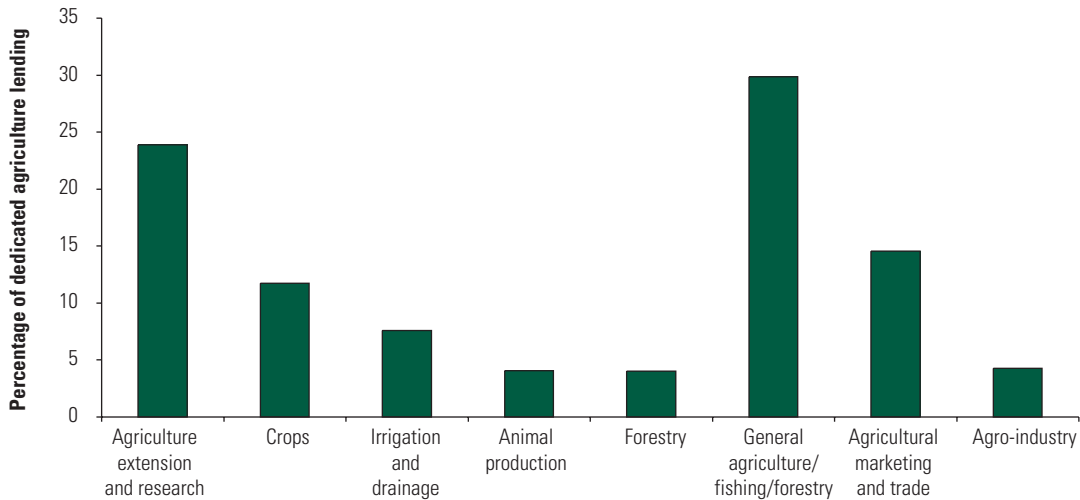


Source: World Bank data.

Table D.3: IBRD/IDA Lending to Africa, 1991 to 2006 (US\$ millions)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Lending to agriculture	419	374	221	178	234	323	127	196	160	123	286	308	318	287	295	685
All lending to projects with agriculture component	1,088	1,625	730	683	675	609	301	634	512	502	862	1,415	1,068	855	1,054	1,695
Lending to all sectors	3,379	3,971	2,815	2,808	2,284	2,740	1,730	2,871	2,205	2,159	3,370	3,793	3,737	4,116	3,792	4,727

Source: World Bank data.

Figure D.4: Lending to Agriculture by Subsector

Source: World Bank data.

Table D.4 illustrates the point made in chapter 3 regarding the limitation of the World Bank's existing data systems. Information on Bank support at the country level is limited to the eight categories presented in the table. As noted in box

3.1, the current coding system is inadequate for tracking support to some critical activities that constrain agricultural development, such as seeds, credit, and land tenure.

Table D.4: Lending to Agriculture Subsectors, 1991–2006 (top 10 countries)

Fiscal year	Agriculture extension and research	Crops	Irrigation and drainage	Animal production	Forestry	General agriculture/fishing/forestry	Agri-cultural marketing and trade	Agro-industry	Overall result
Tanzania									
1991	1.0					1.6	5.0	6.0	13.5
1992	4.5					5.1	7.5	4.2	21.3
1993						0.2	0.2		0.5
1994	8.8								8.8
1997	5.6		14.5	2.5					22.6
1998	6.1								6.1
2000						13.3			13.3
2001						0.1			0.1
2002				1.3	5.3	4.1			10.7
2003	2.8	39.6				26.4	2.8		71.7
2005	0.3				0.3	32.1	30.0		62.7
2006	24.3		18.9			154.4	8.1		205.7
Total	53.5	39.6	33.4	3.8	5.6	237.4	53.6	10.1	436.9
Côte d'Ivoire									
1992						6.0			6.0
1994	12.2					3.0			15.2
1995							32.8		32.8
1996		39.4				43.1	109.1	10.5	202.0
1997						6.6			6.6
1999	42.5								42.5
2002		40.0					60.0		100.0
Total	54.7	79.4				58.6	201.8	10.5	405.1
Uganda									
1991	5.0	30.2		18.3			45.4		98.8
1992	3.6	0.2					0.3		4.0
1993	31.3								31.3
1994	4.6	16.0				15.7	6.4	0.6	43.2
1995		0.1				0.1	0.0		0.3
1996	1.3					14.0			15.2
1997	5.3			0.5		1.7			7.5
1999	10.4								10.4
2001	31.5						3.2		34.7
2002						3.9			3.9
2003	2.0			0.2		24.1			26.3
2004						22.5			22.5
2005						30.0		7.0	37.0
2006						16.2			16.2
Total	95.0	46.5		18.9		128.2	55.2	7.6	351.4

Fiscal year	Agriculture extension and research	Crops	Irrigation and drainage	Animal production	Forestry	General agriculture/fishing/forestry	Agricultural marketing and trade	Agro-industry	Overall result
Ethiopia									
1993		17.5							17.5
1994		0.0							0.0
1995	13.5	0.0					6.4		19.9
1996			12.0						12.0
1998	22.2								22.2
2001	1.8						40.9		42.7
2002						32.3	0.9		33.2
2003			2.8		6.6	45.0	12.0		66.5
2004						30.0			30.0
2006	62.5			0.5					63.1
Total	100.0	17.5	14.8	0.5	6.6	107.3	60.2		307.0
Ghana									
1991	37.5	0.3					0.2		38.0
1992	20.4	20.0				15.2	12.8	16.0	84.4
1993				16.2					16.2
1994						0.3	10.6		10.9
1995		1.3		3.0		1.0	0.8	1.0	7.0
1997						4.5			4.5
1998					4.3				4.3
1999						28.8			28.8
2000						0.2		1.6	1.8
2001	42.2					7.8			50.1
2002		11.0							11.0
2004						3.7			3.7
2005			12.0					12.0	24.0
Total	100.1	32.6	12.0	19.2	4.3	61.4	24.4	30.6	284.6
Mali									
1991	14.6	2.8		3.9	2.2				23.5
1992		4.1			4.1				8.2
1994	20.0								20.0
1995							5.6		5.6
1997			2.0						2.0
2000			52.9						52.9
2002	23.9	24.7		2.2					50.8
2004						3.0			3.0
2005			1.0					3.0	4.0
2006		11.1	2.5			29.4	26.0	2.5	71.5
Total	58.6	42.7	58.5	6.1	6.3	32.4	31.6	5.5	241.6

(Continues on the following page.)

Table D.4: Lending to Agriculture Subsectors, 1991–2006 (top 10 countries)
(continued)

Fiscal year	Agriculture extension and research	Crops	Irrigation and drainage	Animal production	Forestry	General agriculture/fishing/forestry	Agricultural marketing and trade	Agro-industry	Overall result
Kenya									
1991	15.4	3.0		12.5	11.9	16.5	18.8		78.1
1993		9.5				6.0			15.5
1996						1.5	3.1		4.6
1997	29.5			0.5		2.0			32.0
1999			2.0						2.0
2001		23.0							23.0
2002		0.2							0.2
2003				18.0		24.0			42.0
2004	40.0								40.0
Total	84.9	35.7	2.0	31.0	11.9	50.1	21.8		237.4
Malawi									
1991	1.1			3.8					5.0
1992		1.4				1.0			2.4
1993	29.8		4.6						34.4
1996		17.0				24.5			41.5
1997		0.5				0.8			1.3
2001		6.7				0.4			7.0
2003						31.0			31.0
2004		12.5				24.0	12.5		49.0
2006	8.0	7.5	12.0			14.0	7.5		49.0
Total	38.9	45.6	16.6	3.8		95.7	20.0		220.6
Madagascar									
1991				13.5			0.1		13.5
1992							0.1		0.1
1993							0.1		0.1
1994						1.6			1.6
1995	25.2		15.1						40.3
1997			4.2			30.0			34.2
1998	0.3								0.3
2001	11.6		18.7			16.5		18.7	65.5
2003						15.0			15.0
2004	0.1					18.0			18.1
2005						16.3			16.3
Total	37.2		38.0	13.5		97.3	0.2	18.7	204.8
Burkina Faso									
1991					5.3	5.6		5.6	16.5
1992		4.8				2.2	8.1	7.0	22.1
1998	34.3		2.1	2.1					38.4

Fiscal year	Agriculture extension and research	Crops	Irrigation and drainage	Animal production	Forestry	General agriculture/fishing/forestry	Agri-cultural marketing and trade	Agro-industry	Overall result
1999		0.8	3.4						4.1
2001						10.0			10.0
2003						7.0			7.0
2004						6.5			6.5
2005						9.0		9.0	18.0
2006	22.4		21.8			9.0	9.9	5.9	69.1
Total	56.7	5.5	27.2	2.1	5.3	49.3	18.0	27.5	191.7
Nigeria									
1991	40.6								40.6
1992	37.0								37.0
2002	0.9							24.2	25.1
2004	10.0	12.0	30.0	4.2		14.0			70.2
2006	12.0			6.5					18.5
Total	100.4	12.0	30.0	10.7		14.0		24.2	191.3

Source: World Bank data.

Performance of the Portfolio

IEG Ratings

Table D.5: Agriculture versus Non-Agriculture Projects in Africa: Outcome and Sustainability Ratings

Lending type	Number of projects with outcome ratings	Outcome, percent satisfactory	Number of projects with sustainability rating	Sustainability, percent likely
Africa investment lending (50% or more to agriculture)	52	60	47	40
Africa investment lending (non-agriculture)	378	65	343	53

Source: World Bank data.

Table D.6: Agriculture in Africa versus Agriculture Projects in Other Bank Regions

Region(s)	Number of projects with outcome ratings	Outcome, percent satisfactory	Number of projects with sustainability rating	Sustainability, percent likely
Africa investment lending (50% or more to agriculture)	52	60	47	40
Other Regions, investment lending (50% or more to agriculture)	150	73	138	63

Source: World Bank data.

Table D.7: Non-Agriculture in Africa versus Non-Agriculture in Rest of the Bank

Region(s)	Number of projects with outcome ratings	Outcome, percent satisfactory	Number of projects with sustainability rating	Sustainability, percent likely
Africa investment lending (non-agriculture)	378	65	434	53
Other Regions, investment lending (non-agriculture)	1,103	79	1,028	77

Source: World Bank data.

Table D.8: Change in Performance of Agriculture over Time

	Number of closed projects	Number of projects with outcome ratings	Outcome, percent satisfactory	Number of projects with sustainability rating	Sustainability, percent likely
Africa investment lending (50% or more to agriculture)	60	52	60	47	40
1991–99	54	48	58	43	37
2000–06	6	4	75	4	75

Source: World Bank data.

APPENDIX E: LENDING TO AGRICULTURE FROM BILATERAL
AND MULTILATERAL DONORS

Table E.1: Aid to Agriculture by DAC Countries and Multilaterals, 1981–2001

Donor	Aid to agriculture (global) (% of donor total)			Aid to African agriculture (US\$ million, 2001)			Aid to African agriculture (as a % of donor's total aid to Africa)		
	1981	1991	2001	1981	1991	2001	1981	1991	2001
DAC countries	11	8	5	833	1,047	557	15	12	6
Multilaterals	33	22	8	1,089	640	440	32	14	7
Donors total	18	12	6	1,921	1,687	997	22	13	6

Source: OECD CRS database, as noted in Kane and Eicher 2004.

Table E.2: Aid to African Agriculture as a Percentage of Aid from all Donors to African Agriculture

	1990	2000	2005
Bilateral donors	61	58	52
Japan	11	11	6
United States	5	9	8
Multilateral donors	39	42	48
IDA	29	10	20
All donors	100	100	100

Source: OECD Creditor Reporting System.

Note: Excludes South Africa.

APPENDIX F: BANK STAFF SURVEY RESULTS

A survey was conducted to gather staff perceptions of institutional factors and incentives within the institution, as well as some general aspects of Bank support to agricultural development in Africa.

A total of 258 headquarter and country office staff and consultants were identified using the following criteria:

- Staff who are not primarily agriculture experts but have in some way contributed to agricultural development in Africa, as task managers or as part of teams working on agriculture projects or relevant transport, trade, or other sector investments, structural adjustment credits, sector work, or research
- ARD anchor staff and ARD-mapped staff in agriculture
- Water anchor staff and water-mapped staff in agriculture (excluding water and sanitation engineers, specialists, and financial analysts).

The survey was e-mailed to the staff and 56 responded (a response rate of 22 percent). Since it is in the nature of opinion surveys to have a response bias, it is difficult to ascertain whether those who responded are representative of the 258 staff to whom the survey was sent. Because of the limited number of responses and the likely response bias, the report has used the survey results only to substantiate findings from other information sources.

The survey response data are presented in table F.1. A brief analysis of the responses to the most pertinent questions follows the table. The survey also sought the views of Bank staff on some aspects of agricultural development through open-ended questions. The responses to these questions are presented after the analysis.

Table F.1: Bank Staff Survey: Response Rate

	Agree or strongly agree	Disagree or strongly disagree	Do not know
Strategic Approach to Agriculture in the Country Program			
1. The Ministry of Finance, which is the main counterpart for the Bank in the countries, recognizes the need for investment in agriculture development as a priority area for growth and poverty alleviation.	46.43	50.00	3.57
2. The current Country Assistance Strategies for countries in Africa generally reflect a strong focus on agriculture development.	26.79	69.64	3.57
3. The current Country Assistance Strategies are generally prepared in active consultation with agriculture staff in the Bank.	46.43	46.43	7.14
4. The Bank's policy dialogue bearing on rural development in the Africa Region adequately addresses technical issues in agriculture productivity (soil fertility, land management, land tenure, irrigation, improved seeds, etc.).	26.79	66.07	7.14
5. Sufficient and rigorous analytical work/sector work generally informs the design and implementation of agriculture projects in the Africa Region.	37.50	55.36	7.14
6. The strategic approach by the Bank towards focusing on rural development more broadly has diluted attention to technical issues in agriculture lending in the Africa Region.	64.28	25.01	10.71
7. The Bank's shift toward programmatic lending will sustain sufficient focus on technical issues in agriculture in the Africa Region.	19.65	69.64	10.71
Bank Support for Interventions in the Agriculture Sector			
1. It is much more difficult to show satisfactory results for agriculture sector projects in comparison to other sector interventions in the Africa Region.	57.14	35.72	7.14
2. Agriculture sector interventions are more complex and require longer-term support from donors than interventions in other sectors in the Africa Region.	78.57	17.86	3.57
3. The political economy in the countries in Africa is conducive for long-term support for development of agriculture.	44.64	53.57	1.79
4. Supervision and project preparation costs to the Bank for agriculture projects are significantly higher than projects in other sectors in the Africa Region.	62.50	19.64	17.86
5. Bank agriculture projects in Africa are able to respond adequately to the agro-ecological diversity and the needs of diverse production systems.	33.93	51.78	14.29

Bank's Strategic Approach to Agriculture

Only 26 percent of the respondents agreed that the current Country Assistance Strategies (CASs) for countries in Africa generally reflect a strong focus on agricultural development. There was no clear consensus among the respondents regarding whether the current CASs are generally prepared in active consultation with agriculture staff in the Bank.

More than 58 percent of the respondents disagreed that in the past decade the Bank has focused on priority issues for development of agriculture in Africa. Sixty-six percent of the respondents also disagreed that the Bank's policy dialogue bearing on rural development in the Africa Region adequately addresses technical issues in agricultural productivity (soil fertility, land management, land tenure, irrigation, improved seeds, and the like).

	Agree or strongly agree	Disagree or strongly disagree	Do not know
6. In the past decade the Bank has focused on priority issues for development of agriculture in Africa.	28.57	58.93	12.50
7. A focus on sustainability has been a significant element in project design for agriculture projects in Africa.	41.07	50.00	8.93
8. Community-driven development (CDD) approaches are effective in addressing critical sectoral issues in agriculture development in Africa.	42.85	46.43	10.72
9. The Bank's support for institution building in the agriculture sector in Africa, whether through T&V or CDD, has been carefully designed taking into account the reality on the ground and lessons of experience.	26.79	55.36	17.85
10. The Bank has a comparative advantage in the policy and institutional aspects to achieve satisfactory development outcomes for agriculture projects.	85.72	10.71	3.57
Bank Management Commitment to Agriculture Development			
1. The country directors in countries in the Africa Region sufficiently take into account the complex and multisectoral nature of agriculture activities in taking decisions on IDA allocations among sectors.	12.50	82.14	5.36
2. The current Bank matrix-management organizational structure adequately supports the needs of agriculture projects.	17.86	75.00	7.14
3. There is sufficient allocation of scarce IDA resources at the country level in the Africa Region for agriculture sector issues for optimal national development.	10.71	73.21	16.08
4. The Bank provides adequate resources overall (for lending and sector work) to support development of agriculture in Africa.	17.86	75.00	7.14
5. There is good coordination between donors working in the agriculture sector in countries in the Africa Region.	32.14	60.72	7.14
6. There is good coordination between staff working on agriculture and other sectors within the Bank in the Africa Region.	17.86	80.35	1.79
7. The Africa Region has an adequate level of technical staff skills (irrigation specialists, soil specialists etc.) to support implementation of agriculture projects.	17.86	67.86	14.28

Source: Staff survey.

Note: Based on 56 responses.

However, 85 percent of the respondents agreed that the Bank has a comparative advantage in the policy and institutional aspects to achieve satisfactory development outcomes for agriculture projects.

Complexity of the Sector

Seventy-nine percent of the respondents agreed that the agriculture sector interventions are more complex and require longer-term support from donors than interventions in other sectors

in the Africa Region. Moreover, 57 percent of the respondents agreed that it is much more difficult to show satisfactory results for agriculture sector projects in comparison with other sector interventions in the Africa Region. More than 80 percent of the respondents disagreed that the country directors in the Africa Region sufficiently take into account the complex and multisectoral nature of agriculture activities in making decisions on IDA allocations among sectors.

High Cost of Agriculture Projects

Sixty-two percent of the respondents agreed that the supervision and project preparation costs to the Bank for agriculture projects are significantly higher than projects in other sectors in the Africa Region. Seventy-five percent of the respondents disagreed that the Bank provides adequate resources overall (for lending and sector work) to support development of agriculture in Africa.

Bank's Internal Organization and Agricultural Development in Africa

Seventy-five percent of the respondents did not agree that the current Bank matrix management organizational structure adequately supports the needs of agriculture projects. More than 80 percent of the respondents disagreed with the statement that there is good coordination between staff working in agriculture and those working in other sectors in Africa.

Sixty-eight percent of the respondents disagreed that the Africa Region has an adequate level of technical staff skills (irrigation specialists, soil specialists, and so on) to support implementation of agriculture projects.

Responses to Open-Ended Questions

Q1. What do you consider to be the major constraint to agricultural development in Africa? In what areas has the Bank contributed to addressing these constraints?

The responses were categorized into the following groups:

Enabling Factors (those that “enable” agricultural development, such as roads that allow access to markets and credit that enables the farmer to buy seeds):

Lack of rural infrastructure (rural roads and irrigation) was identified by many respondents as a critical constraint for the development of agriculture in Africa. Lack of rural credit was next, followed by the lack of access to markets—both domestic and export. Other issues listed were inadequate extension or research and lack of private sector investment in agriculture.

In the view of one respondent, rural infrastructure issues are often ignored by agricultural staff in the Bank, who assume that they are being covered by colleagues in other sectors. Another respondent's view was that the Bank's portfolio does not address poor access to markets because it is not coordinated across sectors, and project locations rarely overlap, so synergies are not developed. Other reasons cited for neglect of attention to these issues within the Bank were:

- The Bank's emphasis on development policy lending and dialogue has been at the expense of action in critical productive sectors such as agriculture and infrastructure.
- Most country directors focus too much on PRSPs and PRSCs at the expense of investment projects.
- Most of the sectoral interventions outside the agriculture units (such as financial sector reforms, public sector reforms, energy, and transport) continue to have an urban bias, with insufficient attention to the development of agriculture.

Some respondents believed that infusion of funds through community-driven development operations is one option for development of small link roads, culverts, irrigation schemes, and watershed development.

Many respondents noted that the Bank has largely failed in addressing the credit needs of smallholders. In term credit and financial services, the Bank has consistently remained timid and very conservative. The financial sector family has been of little assistance in coming up with realistic and practical solutions to the problem of lack of or limited access to financial services to support real agriculture sector growth.

Incentive Factors (those that determine a farmer's incentive to produce):

Many respondents identified constraints such as a lack of incentives, a noncompetitive export sector, developed-country subsidies, an unfavorable business climate, and market distortions. Some respondents felt that the Bank's failure to

address pricing issues at local, national, and international levels has adversely affected agricultural development in Africa. Insecurity of land tenure was also mentioned. According to some respondents, the Bank does not have any significant operations in Africa working on land tenure because of the political sensitivities surrounding the issue.

Physical Factors (availability of quality farmland, labor, and inputs, among others):

Among the physical constraints respondents identified were low agricultural productivity at the farm level, weak producer organizations, and human resource deterioration (such as HIV/AIDS, brain drain, low agriculture education and training investments, and so on).

A few respondents mentioned that the Bank portfolio is still too focused on the elements that made the Green Revolution work in Asia. They noted that this will work only in certain agro-ecological zones and political/institutional environments.

Natural Factors (weather and disease related):

Post-harvest losses, plant and animal diseases, and weather shocks were the three natural factors listed by some of the respondents who believe that the Bank needs to develop better strategies to help farmers cope with weather shocks.

Institutional Factors (government capacity):

A majority of the respondents noted institutional constraints: poor governance and weak institutional capacity, especially in the Ministry of Agriculture. Other constraints were weak agricultural policy frameworks and lack of sustained strategic priorities.

Respondents said that the Bank has not adequately addressed some of the major institutional constraints. They attribute this to: inadequate or insufficient analytical work, lack of assessment of past priorities, and unwillingness

on the part of Africa's senior management to address deep-seated issues of political economy. Some respondents acknowledge that institutional reforms take far more than three to four years, and the Bank's project period is too short to actually see reforms through to completion.

Q.2. What aspect of the Bank's assistance—policy advice, lending, analytical work—has contributed the most to the development of agriculture in Africa?

Bank lending was most often indicated (62 percent of responses) as an important contributor to the development of agriculture in Africa, followed by analytical work (50 percent) and policy advice (43 percent). The respondents did not indicate the order of importance.

Respondents offered some interesting views on analytical work:

- Past analytical work has been focused too much on the “standard” situations in which, as always, it has been providing excellent analysis.
- The Bank lacks the courage to draw far-reaching conclusions: a departure from the Green Revolution model as it has worked for the South Asia Region.
- The Bank does not do enough in analytical work. For years none has been done, yet the Bank provides advice freely and develops lending operations based on “borrowed” knowledge.
- Analytical work has helped, but the Bank is in a situation where much of the analytical work done is not used because there are severe limits on funds available for lending.

Q3. What are the Bank priorities for agricultural trade reform in the countries that you know have worked, and has that been clearly communicated to Bank staff working in the Region?

Most respondents noted that there is no clear Bank-wide priority for agricultural trade reform. They believe that the priorities have never been stated explicitly. Also, no clear vision for agricultural trade has been communicated to staff.

At the same time, some respondents believed that:

- The Bank's priorities for agricultural trade reform seem to be mainly to reduce trade barriers and encourage trade in all areas (not just agriculture). There is also emphasis on trade liberalization and elimination of subsidies that is fairly well communicated, but not always accepted by clients.
- Agricultural trade reform has focused on "traditional export commodities" to the exclusion of internal trade in agricultural goods and related inputs, processing, and storage. Unfortunately, since the spate of criticism by international NGOs, the Bank has soft-pedaled support to growth in agricultural exports from low-income countries. At the same time, efforts to liberalize agricultural trade with OECD countries is not likely to get very far.
- The issue is now one of non-tariff barriers, but the Bank is not working on this in a significant way, and there is no teamwork with Poverty Reduction and Economic Management or Development Economics in this area.

Q4. There was a multiple choice question that asked staff to select what should be the top priority for agricultural trade in Africa.

The four options that they were asked to choose from were:

- Promoting measures to increase regional trade
- Promoting reduction in trade barriers and distortions in OECD countries
- Promoting increased production of export crops from African countries
- Promoting measures to achieve food self-sufficiency in African countries.

Thirty-eight percent of the respondents identified promoting measures to increase regional trade among African countries as the top priority for agricultural trade in Africa. This was followed by promoting reduction in trade barriers and distortions in OECD countries (29 percent). Only 13 percent of the respondents identified promoting increased production of export crops from African countries, and 11 percent selected promoting measures to achieve food self-sufficiency in African countries.

Q5. Any other issues not adequately covered in this questionnaire.

The respondents repeated several issues already covered in the questionnaire, but also raised some others.

Issues already covered:

- Adequacy of staff skills in Africa.
- Inadequate analytical work.
- The country dialogue needs to include input from agriculture.
- Agricultural growth is key to reducing poverty.
- Lack of coordination across sectors in the Bank.
- High cost of preparation of agriculture projects.
- Inadequate supervision resources.
- The Country Assistance Strategies are not adequately making the case for agricultural development.
- Inadequate resources for development of agriculture from the Bank and other donors.
- Focus on potential of communities.
- Research and extension.

Additional issues raised by individual respondents:

- Lack of quality control in design and implementation of Bank projects.
- Not enough work is done to verify the feasibility of using a sectorwide approach. Agriculture is multisector; each subsector (for example, credit) is almost a sector. Therefore, a sectorwide approach is unsuitable because it is attempting the impossible.
- There is little understanding in the Bank of traditional farming systems.
- Agriculture is subject to higher standards of evaluation than other sectors.
- The challenge is less to convince people to support agriculture, and more on how to support agriculture.
- Unsuitability of programmatic lending to support agriculture.
- Lack of consistent, sustained project implementation assistance.
- Need to stress the interconnection between agricultural production and industrialization.
- Impacts of droughts and the like in wiping out productivity gains from agricultural growth.

- Organic farming is rising in importance in the industrial countries but is being killed in Africa by the active promotion of chemical-driven farming.
- Transboundary transport infrastructure between countries is key to promoting regional agricultural trade.
- Increasing land titling could improve security of tenure for agribusiness investors.
- Irrigation development should be top priority because of significant rainfall variability and weather risk.
- Difficulty in assessing the impacts of Bank-funded agricultural development activities.

The performance indicators that often end up being used (for example, crop yields, value of production, value of agricultural exports) tend to be determined not only by Bank-funded interventions, but also by many other factors outside the control of the Bank.

- The Bank is no longer the dominant force in most of Africa that it once was. Other donors are becoming more important.
- Relationship of the work of the Bank with other global and regional organizations.
- Importance of promoting soil health.
- The issue of food security and its links to rural, human, and general development.

APPENDIX G: SECTOR STAFFING ANALYSIS

Table G.1: Staff Mapped to the Agriculture and Rural Development Department in the Africa Region

Category	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Generalists (number)	42	37	32	35	38	37	44	45	43	43
Technical (number)	40	36	35	36	29	28	25	22	20	17
Total of generalists + technical staff	82	73	67	71	67	65	69	67	63	60
Technical staff as percentage of total	48.7	43.9	42.6	43.9	35.3	34.1	30.4	26.8	24.3	20.7
Generalist staff as percentage of total	51.2	50.6	47.7	49.3	56.7	56.9	63.7	67.1	68.2	71.6

Source: Human Resources (HR) Unit of the Bank.

Note: Technical staff included, among other groups, soil scientists and forestry, extension, livestock, agribusiness, and irrigation specialists. Generalist staff included operations officers, economists, and rural development specialists, among other categories.

APPENDIX H: SELECTED EXTENSION APPROACHES

Table H.1: Extension Services

Type of extension service	Origin or characteristics
General national extension services	The standard approach to public sector extension with field advisory services provided free to farmers throughout the country.
General agricultural extension	The traditional form of extension that has been dominant for the past 80 years.
Training and visit extension (T&V)	Debuted in the late 1960s as a reform of ineffective general extension services.
Strategic Extension Campaign (SEC)	Methodology developed by FAO to systematically incorporate peoples' participation into a national extension program.
Extension by educational institutions	Especially for agricultural universities, can be the dominant approach to national extension.
Publicly contracted extension	Services are provided by private firms or NGOs on contract to government.
Targeted extension services	Some extension approaches attempt to avoid the high recurrent costs by narrowing their focus in subject matter, clients, region, or time.
Specialized extension services	Focus efforts on improving production of a specific commodity or aspect of farming (such as irrigation, fertilizer use, forest management, and the like).
Project-based extension	Focus increased extension resources on a defined area for a specific period of time.
Client-group-targeted extension	Focuses on specific types of farmers, usually on disadvantaged groups, such as small farmers, women, minorities, or disadvantaged ethnic groups.
Producer-led extension services	These approaches involve farmers in the work of extension—drawing on producers' knowledge and resources.
Animation Rurale (AR)	Introduced in francophone Africa as a strategy to break the top-down pattern found in most development programs.
Participatory extension	Harnesses farmers' own capacities to organize group meetings, identify needs and priorities, plan extension activities, and use indigenous knowledge to improve production systems.
Farming systems development extension	Requires a partnership between extension, researchers, and local farmers or farmer organizations.
Producer-organized extension services	Completely planned and administered by producers.
Commercialized extension services	These approaches rely on commercialized extension.
Cost-sharing extension	May be incorporated into any of the other extension approaches by requiring farmers to share costs of services.
Commercial extension advisory services	Are becoming more common, as the rationale for free public extension services is questioned and farmers find they need more dependable or specialized services than are available from a public extension agency.

(Continues on the following page.)

Table H.1: Extension Services (continued)

Type of extension service	Origin or characteristics
Agribusiness extension	Supports commercial interests of input suppliers and produce buyers who require or benefit from provision of sound extension services to support farm production and management.
Mass media extension	These approaches support other extension efforts or provide information services to a general audience.
Mass media extension	Provides pure information services directed to a wide audience.
Facilitated mass media	Links mass media information services with field extension agents or farmer-extensions to facilitate discussion and understanding of issues.
Communications technologies	Allow people in rural areas to interact with specialists or specialized sources of information through rural telephone or internet services possibly institutionalized in “telecottages” for community access.

Source: World Bank 2002b.

APPENDIX I: COTTON SECTOR REFORMS: AN UNFINISHED STORY

Cotton is critical to the economic development of several countries in West Africa (Benin, Burkina Faso, Chad, Mali) and East Africa (Mozambique, Tanzania, Zambia, Zimbabwe). It is often considered a success story because between 1980 and 2000, while Africa's share of world agricultural trade fell by half, its share of world cotton trade rose by 30 percent, and cotton production was able to contribute significantly to poverty reduction in some countries, such as Burkina Faso. This was mainly because cotton is predominantly a smallholder crop. Over 2 million poor rural households in Africa depend on it as their main source of cash income (Tschirley and others 2006a). Cotton cultivation has also made possible growth in infrastructure and greater satisfaction of basic needs such as health and education in some countries. However, dependence on a single export crop has also made smallholders in many countries vulnerable to world prices.

Before the adjustment era, the marketing and trade of cotton in most African countries was handled by parastatals, which in several cases also met the input and credit needs of the farmers. The Bank has provided considerable support for cotton sector reform in the Region for the past 10 years. Though the specific reforms undertaken have varied according to country circumstances, the broad goals of the reforms have been similar: to improve the efficiency and competitiveness of the sector.

In several countries the Bank has provided support for privatization of the parastatals, linking producer prices to world markets, ginnery rehabilitation, improving grading practices, research in and adoption of new

varieties of cotton, and strengthening the capacity of producer organizations to play an increasing role in management of the cotton sector, among other reforms.

The cotton reform story is unusually complex, because neither the Bank nor its clients in Africa are in a position to influence cotton-production subsidies in the United States and other developed countries. The subsidies in the developed countries have increased production and consequently depressed world market prices. Whether the removal of subsidies would actually lead to higher world prices for cotton is debatable (since U.S. exports would likely be replaced by those of higher-cost producers), but research points to considerable revenue forgone by African countries because of these subsidies (World Bank 2006e). In addition, pest management techniques and technology improvements that contributed to increased yields have reduced production costs in major world producers such as the Brazil, China, and the United States, making it difficult for African countries to compete.

It is difficult to draw conclusions about the outcome of Bank interventions, partly because it is difficult to trace causality. Also, reforms have been implemented at differing paces and to different degrees across countries. For example, in Zambia the government completely liberalized the cotton sector, whereas in Mali the privatization of the main parastatal has not yet taken place. Though there have been organizational differences in structure and pricing policies in the cotton industry among the various countries, there have been common technical challenges in maintaining quantity and quality of production in the face of declining and highly volatile world

prices. While in some countries, such as Burkina Faso, organizations of producers have taken on major responsibility for a growing number of functions in the sector, this has not happened across countries. Some gains that have followed the reform period include a higher percentage of market prices for farmers, more timely payments, and reduced pressures on state budgets. However, with the privatization of the parastatals, the private sector has not stepped in to fill the gap left in the supply of inputs and credits.

The cotton sector faces the same constraints as other crops do because of the reform process: lack of access to inputs (fertilizers, pesticides, seeds), extension, and credit. The Bank's approach to cotton sector reform in Africa does not show adequate recognition of how the sector had been insulated from some of these problems because of the special role played by parastatals in input supply and credit access. Data show that

cotton yields have stagnated in most countries—including Benin, Burkina Faso, Chad, and Tanzania. Lack of inputs and declining soil fertility (particularly because in several countries expanded output under cotton production resulted from increasingly marginal areas being brought under cultivation for the crop) remain major concerns. Tschirley and others (2006a) also note nine technical challenges the sector faces (box I.1). The Bank is now at a crossroads. Given its long-term involvement in the sector, other donors and clients are looking to the Bank for advice in how to move forward.

Despite its long involvement in the sector, the Bank has not—until very recently (and ongoing)—attempted to undertake rigorous analytical work that identifies the multiple constraints to development in the cotton sector and lessons of experience across the Region to inform its policy dialogue with the clients.

Box I.1: Technical Challenges in the Cotton Sector

- **Support strong varietal research and dissemination.** Seed quality has major impacts on yields, ginning ratios, and fiber characteristics. It thus establishes the outer limits of productivity and quality throughout the system.
- **Maintain the purity of varieties once they are released.** This typically requires varietal zoning agreements, which demand some level of horizontal coordination among players.
- **Assure sufficient and timely provision of treated seed to farmers.** Treated seed reduces disease in a very cost-effective manner.
- **Ensure sufficient and timely provision of appropriate pesticides to farmers.** Most cotton varieties currently in use in Africa are highly susceptible to attack by pests, so that in many areas three to five pesticide applications are considered necessary for economical yields.
- **Manage pesticide use to reduce cost and avoid insect resistance.** The “pesticide treadmill”—inappropriate use of chemicals that increases insect resistance, leading to more use—increases financial costs and both environmental and human health externalities.
- **Manage pesticide use to reduce damage to human health and the environment.** This issue has received very little attention to date, and is becoming increasingly important within several francophone systems. Maumbe and Swinton (2003) note the significant health costs incurred by pesticide-using cotton farmers in Zimbabwe.
- **Ensure appropriate use of fertilizers.** High cost of fertilizers and varieties that do not respond well to fertilizer means that this input is often not profitable for cotton in Africa. Wider use, which may be a prerequisite for cotton to make major and sustainable contributions to poverty reduction, requires reducing its cost and combining it with improved varieties that are more responsive to fertilizer.
- **Control quality from the farm gate through the export of fiber.** Quality relates to fiber characteristics and to the uniformity of these characteristics in any given export lot. Countries with a reputation for high and uniform quality will have a ready market and better prices for their output, even during the periodic gluts that afflict the world cotton market.
- **Pay farmers sufficiently remunerative prices to ensure their continued and increasing participation in the sector.**

Source: Tschirley and others 2006a.

APPENDIX J: MARKETING REFORM

Table J.1: Some Examples of Policy and Market Reform from the Portfolio Review

Table J.1: Some Examples of Policy and Market Reform from the Portfolio Review

Approval fiscal year	Country	Project name	Project ID	Lending instrument type	Planned reform
1991	Zambia	Recovery Credit	P003235	Adjustment	Decontrol of maize and fertilizer marketing and pricing; privatization of all parastatals except public utilities and natural monopolies; trade liberalization, involving tariff reform, the removal of export restraints.
1992	Tanzania	Agricultural Adjustment	P002818 (P002776 Parent Project)	Adjustment	Reform the pricing and marketing systems of food crops and three major export crops—coffee, cotton, and cashew nuts. Restructuring of crop processing facilities.
1992	São Tomé and Príncipe	Agriculture Sector	P002535	Investment	Privatize the publicly owned agricultural estate: <ul style="list-style-type: none"> • Distribute and lease a major part of the Public Agricultural Enterprises (Empresas Estatal Agricola, EEAs) to smallholders and medium-size farm and agro-processing enterprises. • Reduce the number of estate laborers and increase labor productivity on the remaining (private) estates. • Lease the financially viable EEA and nucleus-processing facilities to the private sector. • Reduce export taxes on cocoa.
1992	Mozambique	Economic Recovery Credit (ERC)	P001775	Adjustment	Foreign exchange system reform. Agriculture price reform: <ul style="list-style-type: none"> • Adjust the floor prices of cotton and cashew in line with the evolution of border prices. • Remove policy constraints preventing traders from operating in rural areas. • Review the role of AGRICOM (the state marketing agency). • Privatize Caju de Mozambique (the largest state-owned processing enterprise in the cashew sector).
1993	Zimbabwe	SAC II	P003322	Adjustment	Agriculture market reform.
1993	Malawi	Agriculture Services	P001660	Investment	Increase the availability of improved seeds and fertilizers to smallholders by supporting the formulation and implementation of seed and fertilizer policy reforms and financing incremental fertilizer.

Result

All price controls have been abolished. Producer prices for all crops are set by supply and demand (although there is still a producer floor price for maize). All prices were decontrolled in 1989, except maize meal and fertilizer prices. Private traders can buy and sell all agricultural products with no public monopolies. The NAMBOARD (National Ag Marketing Board) structures have been disbanded. Fertilizer importation and marketing are fully liberalized.

Grain marketing and pricing policy. The expected private sector investment in grain marketing business, including construction of warehouses, did not take place. All food crops are now freely marketable. While the government no longer determines producer prices, it does establish the SGR floor price for the purchase of grain for food security reserves. In contrast to the grains subsector, where reforms were well under way, the reforms related to the export crops subsector had only recently commenced. The project was successful in starting the withdrawal of parastatals from agricultural production; introducing competition in the supply of seeds and fertilizer; rationalizing and substantially reducing the number of agricultural projects; and providing continuing support for agricultural policy analysis and project management. The Tanzanian Seed Corporation, TANSEED, was reorganized, and seed companies were established by early 1991. With respect to fertilizer, reforms were initiated slowly, because the government failed to raise fertilizer prices to the agreed level by September 1990. But by June 1991 the prices had been raised to the agreed targets. In addition, the subsidy was made explicit.

Two private NMCs, SODEAP and SAC Sur, were created in order to increase competition with the already established private enterprises managing or leasing the rehabilitated estates for the purchase of cocoa and the provision of inputs and credit. The NMCs are still operating in the northern and southern part of the country but are only partially fulfilling their mandate. They have been purchasing and processing smaller and smaller amounts of cocoa over the past two years and stopped providing seasonal credit some years ago because of reduced access to working capital and farmers' very poor repayment rates. In addition, four of six private enterprises operating at the beginning of the project cancelled their leases because of labor problems and poor results (yield forecasts for the cocoa replantations in Uba Budo and Sta. Marguerida were 1,500 kilograms of dried cocoa per hectare, but in reality only about 700 kilograms were obtained on the best plots, with a general average of only 350 kilograms). The reason for the poor results was the introduction of inadequate planting hybrid materials during CRP. Following their departure, the government asked the project to distribute the land of these estates. But as a consequence, the quality of the marketing, input supply, and credit services provided to farmers has been declining dramatically.

Floating exchange rate policy was adopted. The official exchange rate was set on the basis of the parallel market exchange rate. The objectives of the ERC were met, but after some delays. Private sector participation in the domestic marketing of agricultural products increased sharply with the relaxation of the licensing requirements on retailers and wholesalers. Prices of agricultural commodities rose above the minimum prices, which rendered obsolete the envisaged review of minimum prices and AGRICOM, the state marketing board, whose share in the procurement of maize declined drastically. The main domestic effects of the policy measures were to increase agricultural marketing, particularly for maize, and to reverse the worsening of the terms of trade between agriculture and industry in regions where small private traders were active. Externally, the policy measures led to increased exports.

Liberalization of trade and exchange rate by progressively moving to a unified, market-based foreign exchange system and an import regime based on modest, tariff-based protection.

Removal of price controls in beef, dairy, cotton, yellow and white maize, oilseeds, and wheat and elimination of marketing board monopolies. Slaughter quotas imposed by the Department of Veterinary Services were eliminated so that the private sector could participate more actively in meat processing.

The turnaround of the Grain Marketing Board was one of the most important public sector financial management improvements under SAC II. Deregulation was not complete, however.

The reform with the most far-reaching implications was the amendment to the Special Crops Act, which allowed smallholders to begin growing burley tobacco. This, together with support targeted at burley groups by SFSP, resulted in a major expansion in the number of smallholders growing burley from 18,000 to 50,000, and substantially enhanced incomes for these farmers. The deregulation of fertilizer imports has been partly achieved, and at one stage nine local and international companies were active. Subsidies, which started to be reduced from 1991/92, were completely removed in 1993/94. Toward the end of the project, however, only two private fertilizer companies were operating, and the government has again been playing a major role in fertilizer importation, reversing the liberalization trend of the fertilizer policy. There has been no success in reducing the cost of fertilizer imports to farmers for a number of technical and policy reasons.

(Continues on the following page.)

Table J.1: Some Examples of Policy and Market Reform from the Portfolio Review (continued)

Approval fiscal year	Country	Project name	Project ID	Lending instrument type	Planned reform
1993	Malawi (continued)				
1993	Kenya	Parastatal Reform Technical Assistance	P001348	Investment	Restructuring, preparation for privatization, and commercialization of specific parastatals (Kenya Tea Development Authority, National Cereals and Produce Board [NCPB]).
1994	Chad	Economic Recovery	P035594	Adjustment	Increase producer price of cotton by 50 percent.
1995	Ethiopia	National Fertilizer Sector Project	P000753	Investment	Decontrol retail and wholesale fertilizer prices. Eliminate fertilizer subsidies. Develop institutional mechanisms to ensure that both public and private sector importers would have equal access to IDA and government funds for importing fertilizers. Level playing field between fertilizer distributors by eliminating special access to government-owned warehouses by the state-owned Agricultural Inputs Supply Corporation (AISCO).
1995	Benin	SAC III	P000111	Adjustment	Divestiture of public agro-processing companies. Cotton sector reforms: <ul style="list-style-type: none"> • Transfer of SONAPRA, the cotton company, into a mixed capital company. • Adopt market-based pricing mechanism procedures for seed cotton sales to private gins and revise the price stabilization mechanism.
1998	Cameroon	Cameroon - SAC III	P054443	Adjustment	Privatization of agro-industries (palm oil, cotton, sugar, and fruits).
1998	Lesotho	Agriculture Policy and Capacity Building	P001402	Investment	Introducing changes in management through institutional restructuring, privatization, and divestiture of activities and market liberalization.

Result

The objective of liberalizing production and marketing of hybrid seed was achieved, and all subsidies on improved seed were removed. Two commercial companies are currently producing or importing almost all hybrid maize seed used. Overall, while the agreed policy reforms have been largely implemented, this component has not fully achieved its objectives because the overall impact on the availability of inputs to small farmers, and competitiveness in supply, has been very modest. The policy reforms, in particular the liberalization of the markets for hybrid seed and burley tobacco, have encouraged greater involvement of private seed and fertilizer companies, but at the time of project closure there were clear signs that the government is becoming increasingly involved in fertilizer distribution again.

Twenty-nine tea factories were sold to tea farmers.
National Cereals and Produce Board (NCPB).

A contract with Agriconsult of Australia was reached as part of an agreement under an agricultural adjustment credit that the government would commercialize the entity and get out of the business of managing a strategic reserve. The government's contract with Agriconsult allowed the advisors to sell off the silos and to undertake a retrenchment program that has improved the environment for grain production in the country.

The project had a positive impact on some small enterprises that were privatized and became more efficient in their operations. However, many of the small firms—for example, the ginneries—were sold by what were considered nontransparent processes to parties that have ceased to operate them because of insufficient investment funds. The result has been that the cotton ginneries have become a major bottleneck and a major reason for the dramatic decline of the cotton sector in Kenya.

Increase in producer prices of cotton by 50 percent for the 1994-95 crop season and reinstate the previous cotton-sharing system. The liberalization of most prices and the increase in the producer price for first-grade cotton have enhanced producer incentives (as reflected in increased cotton plantings), while reduced inflation has fostered the emergence of a sounder economic environment; more effective customs operations have been established, and the program has brought down the government's accumulation of payments arrears and absorption of available credit, allowing it to improve the liquidity of the private sector.

All agreed policy reforms were fully carried out, but the objective of the reforms—creation of a functioning and competitive industry—was not accomplished. Fertilizer pricing was totally liberalized, and fertilizer subsidies abolished. A fertilizer trade and manufacturing proclamation was issued in 1998, which set fertilizer standards and enabled the government to start enforcement of fertilizer quality standards from port to retail. Further, in order not to have an unfair advantage over its competitors, the government parastatal AISCO withdrew from marketing centers supported by Ministry of Agriculture staff, and ceased to have preferential access to the ministry's warehouses. Finally, foreign exchange for fertilizer importation was allocated among importers in a fair and transparent manner throughout the life of the project. However, government-introduced programs (already discussed under Component 2 above), although well-meaning in their intentions, had a design that was deleterious to competitive market development. Furthermore, more could have been done to address the persistent allegations of privileged market access by some regional trading houses.

Cotton production more than doubled in the 1990s. But quality of inputs distributed to farmers by some private suppliers was less than adequate. As a result, production was expected to decline in the 1998/99 crop year. The farm gate price was increased from 80 CFAF/kg prior to the devaluation to 200 CFAF/kg in the two crop seasons 1996–98, but the producers' share in SONAPRA's after-tax profits has not been adjusted, and represents only a small portion of their income (less than 2 percent). Their share in cotton exports (a proxy for the industry's revenues) actually declined during the decade, from 63 percent in 1991–93 to 55 percent in 1996–98. The allocation of seed cotton among private ginning companies remains an administrative decision.

Privatization of agro-industries partially met the targeted objectives. The outcomes envisaged under this subcomponent were met for sugar, palm oil, and tea, but not for the other crops.

Agreed policy statement on subsidies for farm inputs based on subsidy evaluation review. Cabinet has issued a policy directive on the use of input subsidies.

Deregulation of remaining controls on agricultural commodities implemented according to schedule. Deregulation schedule has been submitted to Cabinet for approval.

Privatization, deregulation, and liquidation have not progressed as envisaged at appraisal. Of the 16 enterprises identified to be privatized at appraisal, 1 has been privatized (leased); 4 liquidated; with a further 2 being partially liquidated.

Project activities related to marketing facilitation/reform have not yet led to deregulation. However, the project succeeded in carrying out studies, including an analysis of the 13 commodities that are under government control, with the view to understanding the impact of liberalization/deregulation on producers, consumers, and trade in general. The results of these studies were discussed with stakeholders in workshops carried out in all 10 districts, the recommendations of which were discussed in a national workshop in March 2003.

(Continues on the following page.)

Table J.1: Some Examples of Policy and Market Reform from the Portfolio Review (continued)

Approval fiscal year	Country	Project name	Project ID	Lending instrument type	Planned reform
1999	Rwanda	Economic Recovery Credit	P057294	Adjustment	Increase in tea prices and the removal of the coffee tax. Adoption of a comprehensive strategy to revive the coffee sector; privatize tea factories and estates; and establish stakeholder-based regulatory frameworks for the tea and the coffee subsectors. Privatization of tea factories and participation of tea farmers in ownership of factory. Adoption of market-oriented policy framework for distribution and marketing of agricultural inputs.
2005	Tanzania	Tz-PRSC2	P074073	Adjustment	Review the role of crop boards to limit their functions to regulatory activities.

Note: Because of the problems with reporting and attribution (as discussed in the section on M&E), it is not always possible to determine the outcome of Bank interventions. The above list includes cases where it was possible to determine achievements based on the information provided in project completion reports.

Result

In 1999, the government eliminated the 30 percent tax on coffee exports and increased the producer price of tea by 37 percent. Another important development has been the emergence of producers' associations that have become active in selling coffee directly to exporters and in distributing inputs such as fertilizers and pesticides to members. Legislation was passed in 2000 to change the legal mandates of OCIR-Cafe and OCIR-The, the two parastatals involved in production, marketing, and regulatory functions in the coffee and tea sectors, limiting their role to regulation, monitoring, and promotion. The privatization of the tea factories has not yet taken place. Most of the coffee-processing plants have been privatized and the privatization of the nine state-owned tea estates is expected to take place. In line with its policy of liberalization of markets, the government has reaffirmed the policy of market-based pricing and distribution of these inputs, thus abandoning the pre-genocide practice of state control of the market for these inputs.

The review work is being done in phases. Initial work on the review process began in September 2003 with an institutional mapping exercise of coffee, cotton, cashew, and tea, followed by funding, institutional, and impact evaluation of the four Crop Boards.

APPENDIX K: IRRIGATION DATA

Table K.1: Current and Potential Irrigated Area in Africa and Selected Countries

Country	Cultivated area (‘000 ha)	Irrigated area (‘000 ha)	Potentially irrigable land (‘000 ha)	Current irrigated area as percent of cultivated area (%)	Current irrigated area as percent of potential (%)
Ethiopia	10.671	290	2.700	3	11.0
Somalia	1.071	200	240	18.7	83.3
Madagascar	3.550	1.086	1.517	30.6	71.6
Sudan	16.653	1.863	2.784	11.2	66.9
Zimbabwe	3.350	174	366	5.2	47.5
Mali	4.700	236	566	5.0	41.7
Malawi	2.440	56	162	2.3	34.8
Zambia	5.289	156	523	2.9	29.8
Nigeria	33.000	293	2.331	0.9	12.6
Mozambique	4.435	118	3.072	2.7	3.8
Ghana	6.331	31	1.900	0.5	1.6
Kenya	5.162	103	353	2	29.0
Tanzania	5.100	184	2132	3.6	9.0
Congo, Democratic Republic of	7.800	11	7.000	0.1	0.2
Total, Sub-Saharan Africa	182.682	7.105	39.413	3.9	18.0
Total, Sub-Saharan Africa excluding the three largest irrigation countries	146.767	2.658	33.613	1.8	7.9

Source: Peacock, Ward, and Gambarelli 2007.

From Conference Paper No. 8 “New Challenges in the Cassava Transformation in Nigeria and Ghana”

By Felix Nweke

Nature of the Success

Why is it considered a success?

- Production triples within a decade, from 1984 to 1992
- Nigeria surpasses Brazil as world’s leading cassava producer
- Sixty percent of Nigerian villages plant improved varieties
- Resulting price fall benefits consumers, making cassava a powerful poverty fighter.

Motors of change

- Improved varieties (tropical Manioc Selection (TMS)): high yielding, early bulking, and disease resistant
- Biological control of mealybug epidemic
- Processing technology development: gari (dried prepared cassava porridge), mechanical grater to release processing labor
- Change from inhibiting to favorable trade policies.

What constrains further expansion?

- Harvesting labor bottlenecks
- Market competition from subsidized imported starches.

Aggregate Impact

Scale and productivity gains

- Five million farmers produce cassava

- Cassava accounts for 12 percent of farmers’ cash income.

Equity

- Broad access to improved varieties across farm sizes
- Cash production concentrated, 50 percent among top 10 percent of households, but less concentrated than maize (70 percent cash sales among top 10 percent of farm households)
- Poor consumers are major beneficiaries of a 30-year productivity-induced fall in real cassava and gari prices.

Sustainability

- Financial: highly profitable for smallholders, returns to HYV plus mechanical grating 20 times greater than traditional varieties with hand grating
- Ecological: long-term yields sustainable without fertilizer.

Lessons for Building Future Successes

Resume long-term funding for cassava research

Processing technology necessary for rapid market development

Table L.1: Dynamics and Drivers for Change

Timing	Phase 1 Cassava becomes a staple food, 1910–60	Phase 2 Laying the foundation, 1960–77	Phase 3 Mealybug invasion, 1978–83	Phase 4 The surge, 1984–92	Phase 5 New challenges, 1993 on
Key actors	Immigrants Farmers	Rural artisans IITA Shell Oil	IITA	Government National Root Crop Research Institute Private oil companies	
Motors of change	Severe rural labor shortages (the result of wars and influenza epidemic of 1918) induce a move out of labor-demanding cocoyam and into cassava. Emancipated slaves from Sierra Leone introduce gari processing technology. Immigrants bring in new, bitter varieties.	Mechanical graters imported from Benin and refined by local artisans. Graters spread, releasing processing bottlenecks. TMS varieties developed (1971–77) but fail to spread rapidly.	Mealybug invasion attacks cassava crop.	Biological control of mealybug (1981 on) takes effect. Policy changes stifle food imports —drop food import subsidies —ban on cereal imports —devaluation of the naira raises food import prices. Government includes cassava in extension programs. Oil companies help finance cassava promotion.	Rising wage rates lead to labor constraints in harvesting and processing. Imported corn starch becomes cheaper than cassava starch.
Beneficiaries	Small farmers Urban gari consumers	Small farmers Urban consumers		Cassava farmers Urban consumers	
Production gains	Production doubles from 1948 to 1958	Grater induces 50% increase in production. Annual growth 2.5% per year.	Production falls 20% –3.7% per year.	Production increases 150%. Annual growth rate of 12% per year.	Production up 15% Annual growth rate slows to 1.5% per year.
Impact	Cassava becomes established as a rural food staple. Growing urban markets attract gari trade.		Massive mobilization for biological control of mealybug across Africa.	Real gari prices fall. Gari/yam price ratio falls by 50%. Gari/rice price ratio falls by 25%.	Consumer gari prices trend upward. Industrial demand for cassava starch stalls.

APPENDIX M: PREPARATION COSTS AND RISK RATINGS
FOR AGRICULTURE PROJECTS

**Table M.1: Africa Region Projects: Average Preparation Costs over Time
(non-agriculture versus agriculture)**

Approval fiscal year	Non-agriculture projects (US\$)	Agriculture projects (US\$)
1991	325	711
1992	219	2,049
1993	242	1,069
1994	260	1,148
1995	288	1,551
1996	370	3,459
1997	313	929
1998	308	6,734
1999	254	1,841
2000	234	
2001	252	3,149
2002	230	5,762
2003	261	2,872
2004	289	2,861
2005	391	2,628
2006	360	3,145
Overall results	288	1,969

Source: World Bank data.

**Table M.2: Africa Region: Projects at Risk over Time
(percent, all projects versus agriculture projects)**

Fiscal year	At risk (%)	
	All projects	Agriculture projects
1991	54.9	65.3
1992	49.4	57.8
1993	47.2	55.4
1994	48.1	52.3
1995	44.4	48.1
1996	34.8	24.5
1997	39.5	33.0
1998	30.8	24.4
1999	27.3	17.5
2000	13.9	18.4
2001	14.8	14.5
2002	26.2	32.9
2003	19.0	17.6
2004	22.8	22.0
2005	29.0	39.1
2006	21.9	23.0

Source: World Bank data.