

PROJECT PERFORMANCE ASSESSMENT REPORT

MALAWI

Irrigation, Rural Livelihoods and Agricultural Development Project, and Agricultural Development Program Support Project

Report No. 155283

JANUARY 6, 2021



IEG
INDEPENDENT
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PROJECT PERFORMANCE ASSESSMENT REPORT

Malawi

**Irrigation, Rural Livelihoods and Agricultural Development Project
(COFN-04560, IDA-48060, IDA-51410, IDA-H1900, IDA-H7930)**

and

**Agricultural Development Program Support Project
(IDA-50690, IDA-44760, TF-92100, TF-016364)**

January 6, 2021

Financial, Private Sector, and Sustainable Development

Independent Evaluation Group

Abbreviations

ADPSP	Agricultural Development Program Support Project
FISP	Farm Input Subsidy Program
ICR	Implementation Completion and Results Report
IDA	International Development Association
IEG	Independent Evaluation Group
IFA	Input for Asset
IRLADP	Irrigation, Rural Livelihoods and Agricultural Development Project
LSMS	Malawian Living Standards Measurement Study
MDTF	multidonor trust fund
MoAIWD	Ministry of Agriculture, Irrigation and Water Development
M&E	monitoring and evaluation
O&M	operation and maintenance
PDO	project development objective
PPAR	Project Performance Assessment Report
SHF	smallholder farmer
WUA	water user association
WUG	water user group

All dollar amounts are US dollars unless otherwise indicated.

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Project Data

This is a Project Performance Assessment Report by the Independent Evaluation Group (IEG) of the World Bank Group on the Irrigation, Rural Livelihoods and Agricultural Development Project (P084148) and the Agricultural Development Program Support Project (P105256) in Malawi. This instrument and the methodology for this assessment are discussed in appendix C. Following standard IEG procedure, copies of the draft report were shared with relevant government officials for their review; no comments were received.

Irrigation, Rural Livelihoods and Agricultural Development Project (P084148)

Basic Data

Country	Malawi	World Bank financing commitment	\$40.0 million (original IDA grant) and \$62.7 million (total AF)
Global Practice	Agriculture	Actual project cost	\$115.2 million
Project name	Irrigation, Rural Livelihoods and Agricultural Development Project	Expected project total cost	\$110.7 million
Project ID	P084148	Actual amount disbursed	\$115.2 million
Financing instrument	Specific Investment Loan	Environmental assessment category	B
Financing source	IDA original grant and AF		

Note: AF = additional financing; IDA = International Development Association.

Dates

Event	Original Date	Actual Date
Concept review	June 9, 2004	June 9, 2004
Negotiations	January 10, 2005	January 10, 2005
Board approval	November 29, 2005	November 29, 2005
Effectiveness	May 24, 2006	May 24, 2006
Closing date	June 30, 2012	June 30, 2015

Key Staff Responsible

Management	Appraisal	Completion
Project Team Leader	Tijan M. Sallah	Pieter Waalewijn
Practice Manager	Richard G. Scobey	Mark Cackler
Vice President	Makhtar Diop	Juergen Voegele
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Agricultural Development Program Support Project (P105256)

Basic Data

Country	Malawi	World Bank financing commitment	\$32.0 million (original IDA loan), \$30.0 million (AF1)
Global Practice	Agriculture and Food	Actual project cost	\$184.8 million
Project name	Agricultural Development Program Support Project	Expected project total cost	\$215.7 million
Project ID	P105256	Actual amount disbursed	\$154.98 million
Financing instrument	Specific Investment Loan	Environmental assessment category	B
Financing source	IDA (original, AF1), Global Environment Fund (original)		

Note: AF1 = first additional financing; IDA = International Development Association.

Dates

Event	Original	Actual
Concept review	November 8, 2007	November 8, 2007
Negotiations	February 13, 2008	February 13, 2008
Board approval	June 24, 2008	June 24, 2008
Effectiveness	July 30, 2009	December 14, 2009
Closing date	September 15, 2013	December 30, 2016

Key Staff Responsible

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Summary

Project Background and Description

Malawi is one of the poorest countries in Africa, and as the dominant economic activity in rural areas, agriculture plays a crucial role in poverty reduction. With high population growth rates, increasing land degradation, and high susceptibility to climate shocks, Malawi will need to increase its agricultural production substantially and sustainably to feed the growing population on a shrinking per capita farm size. Yields of major staple foods are low because of the limited adoption of modern inputs, dependence on rain-fed agriculture, declining soil fertility, and inadequate agricultural extension and research. Moreover, market opportunities are limited, and farmers are poorly connected to existing markets. Most farmers in Malawi depend on subsistence, maize-focused production systems.

The World Bank has been supporting the government of Malawi in its effort to promote sustainable growth in agricultural productivity. The Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) supported irrigation farming through the integrated provision of hardware, mainly irrigation infrastructure, and software, mainly local and institutional capacity building. The project introduced water user associations (WUAs) for the local management of water and financial resources in the irrigation schemes. The IRLADP also supported the Input for Asset (IFA) public works program to compensate poor rural households for their labor with inputs. The Agricultural Development Program Support Project (ADPSP) addressed the efficiency of decision-making at the institutional agricultural policy and farm input-productivity level. At the farm level, the project supported the reform of the Farm Input Subsidy Program (FISP) and provided training and agricultural extension to members of farmer organizations. Both projects thus supported farm productivity and the government's ability to create an enabling environment for agribusiness.

The objective of the Project Performance Assessment Report is to assess how the farm-level support of both projects contributed to sustainable increases in agricultural productivity among smallholder farmers (SHFs). Both projects fostered an integrated approach to increases in agricultural productivity by promoting the uptake of traditional measures to support supply (irrigation, modern inputs, and agronomic knowledge) together with complementary practices of improved land and water management. The Project Performance Assessment Report discusses two fundamental assumptions inherent in the two projects: (i) that their beneficiaries have sustained the high returns to rain-fed and irrigated farming; and (ii) that the integrated approach can be transferred to nonbeneficiaries and to areas outside the projects' intervention sites. For continuity and

scalability to occur, the government—with assistance from the private sector—was expected to take over the coordinating and implementing role of service provision to farmers, especially for public goods such as irrigation.

Results

The projects document the successful delivery of agricultural services and the improvement of project beneficiaries' productivity, but the evidence underpinning the productivity effects and the sustainability of those effects is weak. The IRLADP overachieved its targets for the delivery of irrigation infrastructure and capacity-building activities. The ADPSP achieved some but not all targets for service delivery. Both projects reported achievements for increases in the agricultural yields of their beneficiaries, with the IRLADP substantially overachieving its targets. However, the evidence presented in the projects' self-evaluations is inconclusive as to the sustainability of the projects' activities. This is especially problematic for the ADPSP because no counterfactual for project activities—that is, what would have happened to the intervention area if the project was not rolled out—was established.

The Independent Evaluation Group's assessment of the government's production estimates does not detect sustainable increases in agricultural productivity over time or across districts in Malawi. The productivity of maize and rice was low at the start of both projects, and the productivity of both crops increased at the beginning of the projects' implementation. Midway through the projects' implementation, productivity flattened. Productivity gains became more volatile at the end of the projects and afterward. Overall, there have been negligible systematic improvements in maize and rice yields over the past two decades. The main shortcomings in performance are linked to the limited uptake of project activities beyond beneficiaries, the limited capacity of the government of Malawi to implement service delivery, and the limited effort to shift the mind-set of SHFs from subsistence to market orientation.

Project beneficiaries are still using and receiving advice on technologies supported by the projects, but these technologies were not scaled to nonbeneficiaries or areas outside of project sites. Beneficiaries in supported irrigation schemes continued to receive agricultural extension and use improved technologies after the projects ended. Nationally representative data suggest that most farmers in Malawi have no access to irrigation and remain highly dependent on rain-fed farming. Moreover, despite the high coverage of extension services in Malawi, few households receive effective agricultural advice from the lead farmers supported by the projects to provide extension services. Thus, this mode is of questionable utility. Similarly, the effective use of the complementary land and water management practices that increase the profitability of modern technologies remains low.

Neither project beneficiaries nor nonbeneficiaries have been able to diversify away from subsistence-oriented maize production toward more rewarding income-generating farming. Diversification of farm systems is occurring in Malawi but arises from the necessity of food security instead of improved market opportunities. Population pressures force many SHFs to intercrop maize with legumes. Beneficiaries in irrigation sites showed a diverse production pattern of staples, legumes, and vegetables. The cash received from selling irrigated crops or legumes is typically reinvested into maize production to assure food security at home. Moreover, farmers show little progress in commercializing farming: only a limited share of the major food crops—even the higher-value ones—is sold. The marketed share does not change appreciably over time. Beneficiaries struggle to get their produce to the market when rural, unpaved feeder roads are not rehabilitated or are impassible during the rainy season. As a result, farmers commonly have no choice except to use on-the-spot transactions to sell their crops to middlemen and thus become price takers.

Design and Preparation

The design of both projects to provide productivity support through an integrated approach was innovative. Access to modern inputs, agronomic knowledge, and irrigation increases cropping intensities and productivity when yields are below agronomic potential. Complementary agricultural services maximize the profitability of agricultural inputs in maize production (ADPSP) and irrigated rice and maize production (IRLADP). The IRLADP introduced an innovative approach for capacity building and the institutionalization of irrigation management through WUAs, which continue to operate.

It is difficult to achieve sustainable growth in agricultural productivity when some project activities are primarily designed to address the food security of poor households. Through support for the FISP and IFA, the projects targeted poor farmers to improve their food security. However, sustainable growth in agricultural productivity requires more than meeting the basic food needs of poor households. Instead, it requires continued and substantial investments to intensify farming. The poorest SHFs are less able to make these investments, as they have historically been dependent on external support to improve their agricultural activities. Moreover, the size of their irrigated plots is typically too small to allow the economies of scale required to make irrigation profitable. Both projects thus supported a continuation of subsistence-oriented farming with limited possibilities for commercialization and failed to sufficiently scope the sustainable impact of the projects in the Malawian context.

A supply-side approach to stimulate agricultural productivity did not create the right agribusiness mind-set or incentives for farmers to invest in agricultural production or to

commercialize agricultural systems. The marketing aspect of both projects was weak and limited to support of farmer organizations and selective rehabilitation of rural roads. The projects did not create an agribusiness mind-set for farming nor did they develop farmers' nonphysical connection to markets. The projects' design thus did not pay attention to the demand side of the agricultural sector or to how farmers should create additional value after production to tap into growing urban markets. Without access to higher-value markets, farmers lacked incentives and motivation to keep investing in crop production to optimize revenue generation. Shifting the entrenched subsistence mind-set in Malawi requires an extensive and persistent cultural engagement, which was absent from the projects' designs.

The assumption that the government's system for service delivery was sufficiently resourced and staffed to provide the services was unrealistic. The projects used intensive approaches to local capacity building through demand-driven extension and bottom-up WUAs for irrigation management that require sustained follow-up. The projects' design implicitly assumed that after their completion, the government would have the capacity to continue and increase service delivery to farmers. This was not the case. For example, WUAs have not been sufficiently supported in the registration process nor in their efforts to repair irrigation infrastructure. The projects did little to break rural communities' historical dependence on donor or government support to sustain their agricultural production.

The focus on the intensive support of specific irrigation schemes came at the expense of a comprehensive catchment or landscape approach to irrigation development and contribution to higher-level resilience. The projects promoted land and water management activities suitable for small and well-managed irrigation or demonstration plots. Although such efforts have resulted in scattered pockets of success, appropriate land and water management practices have not been expanded from project sites. The projects did not provide incentives for catchment conservation in the upper-stream parts of the water source, which could compromise the steady and sustained availability of water for irrigation. The projects also did not pay enough attention to the risks of climate variability or build resilience to these risks.

Implementation and Supervision

Both projects contributed to the provision of modern inputs and agricultural extension to poor farmers and local capacity building. The ADPSP introduced reforms to the FISP and the IRLADP used IFA work schemes to improve the access of poor SHFs to modern inputs. Moreover, activities were implemented bottom-up and used a participatory approach that contributed to building local capacity and community ownership. The

IRLADP was further successful in providing irrigation infrastructure and in strengthening WUAs for the operation of irrigation schemes.

The government's limited capacity and resources to continue and sustain project activities resulted in limited effectiveness. The extension approach did not result in an effective sharing of agricultural information from lead farmers. The lack of government support for the repair of larger irrigation parts hampered the effectiveness of WUAs. Consequently, some of the supported irrigation sites suffer from water leakages, breakages, or the destruction of large pipes, which the WUAs cannot afford to repair themselves. Finally, the IFA stopped when the IRLADP ended. This suggests that the government of Malawi has limited interest in sustaining a safety-net approach to irrigation development or limited capacity to do so.

Although both projects made important contributions to improving decision-making about agricultural policy, the institutionalization of these changes remains limited. Both the IRLADP and ADPSP contributed to improvements in the capacity of the Ministry of Agriculture, Irrigation and Water Development for planning and managing the agricultural sector. The ADPSP improved coordination among the multiple ministries and their departments involved in the agricultural sector. The ADPSP also harmonized donor support through a recipient-executed trust fund that increased the dialogue between the government and the donor community. Nonetheless, the institutionalization of the government's capacity remains an issue. Government agencies do not provide adequate incentives to sustain the human and technical capacity built by projects. Thus, much of the well-intentioned support dissipated without new donor funding.

Independent Evaluation Group project ratings are described in appendix A. The evaluation methodology and evidence sources are described in appendix C.

Lessons

This assessment offers the following lessons:

- An integrated and participatory approach to agricultural development can initiate sustainable productivity growth among SHFs. In the context of a SHF-dominated agricultural sector and low productivity, traditional support measures of input supply are needed to close agronomic yield gaps. However, the adoption of such support measures will not be profitable for SHFs unless complementary training and extension support on proper input and land management are provided to reap the synergistic benefits.

- Agricultural projects with a supply-side focus on productivity growth that ignore market linkages are unlikely to provide the right agribusiness mind-set or incentives for farmers to sustainably invest in longer-term agricultural productivity. The projects' integrated approach initially boosted the productivity of staple crops. However, continuous increases in agricultural productivity require a change in mind-set from semisubsistence food production to farming as a business. Sustainable productivity increases require the right economic incentives by explicitly considering the demand side of agricultural production.
- A government's insufficient capacity and resources for agricultural sector development make it difficult to maintain an innovative but intensive demand-driven approach to service delivery in agriculture. In this case, the IRLADP introduced the WUAs for capacity building and institutionalization of irrigation management. Both projects provided extension services and organized activities in participation with local communities, but these advances need to be sustained to survive.
- Sustainable land and water management practices require a comprehensive approach that goes beyond irrigation or demonstration plots. The projects' activities resulted in pockets of success, but the full returns to the adoption of small-scale approaches depend on what happens in upstream or surrounding parts of the agricultural landscape. Hence, a comprehensive catchment or landscape approach, especially to irrigation development, is needed to achieve higher-level sustainability.
- For projects preparing an Agriculture Sector-Wide Approach, monitoring production outcomes without a counterfactual does not allow an understanding of what is driving the anticipated productivity increases. Even if the ADPSP had sustainably increased agricultural productivity, the results framework and monitoring and evaluation system as designed would not have allowed the identification of the mechanisms driving the sustainable increases or the revisiting of project activities along the way.

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1. Background, Context, and Design

Background and Context

1.1 Despite recent improvements in the macroeconomic stability and demographic factors in Malawi, the country remains one of the poorest in Africa. Extreme poverty levels stood at 70.3 percent in 2016 and had declined only 3.1 percentage points since 2004 (World Bank 2020b).¹ As a landlocked country in which more than 80 percent of the population resides in rural areas, Malawi relies on agriculture as the most important sector for household income and market linkages to other sectors (World Bank 2019). Agricultural income sustains the livelihood of nearly 90 percent of rural households. Expenditures for food account for a significant proportion of spending among poor urban households. Agriculture plays a crucial role in poverty reduction, so food security and price stabilization are central to Malawi's agricultural policies (Katjiuongua, Kray, and Fatch 2019).

1.2 With high population growth rates, increasing land degradation, and high susceptibility to climate shocks, Malawi will need to increase its agricultural production quickly and sustainably to feed the growing population on a shrinking per capita farm size. During the past decade, the median size of land cultivated by Malawian farmers went down by one-third because of increasing population density.² However, yield levels of major staple foods are low compared with other countries in the region because of limited adoption of modern inputs, dependence on rain-fed agriculture, declining soil fertility, weak market linkages, and inadequate agricultural extension and research (World Bank 2018b). Despite Malawi's relatively favorable agroecological environment, actual yields are significantly below the agronomic potential of smallholder farmers (SHFs), resulting in significant agronomic yield gaps (Benson and Edelman 2016).³ Moreover, thin markets, high input prices, and poor connectivity to markets are disincentives to crop diversification and commercialization (World Bank 2018b). All these factors force farmers into subsistence, maize-dominated production systems.

1.3 To break the cycle of low staple yield and self-sufficiency, the government of Malawi has increased its support to the agricultural sector in recent decades. In the agricultural season of 2005–06, for example, the Ministry of Agriculture, Irrigation and Water Development (MoAIWD) introduced the Farm Input Subsidy Program (FISP).⁴ The FISP aimed to accelerate sustainable intensification and productivity growth by increasing the distribution of modern inputs to SHFs.⁵ Moreover, at approximately the same time, the Malawi Social Action Fund of the government of Malawi launched the Input for Asset (IFA) public works program to reach the poorest rural households. IFA participants were compensated for their labor on public work schemes with vouchers

that could be redeemed for agricultural inputs. The MoAIWD further realized the need to build a resilient and diversified agricultural sector and has been promoting the integration of legumes into maize farming systems, the use of small-scale irrigation, and the use of sustainable agricultural practices.

Objective, Design, and Financing

1.4 The World Bank has been supporting the government of Malawi in its effort to transform the agricultural sector in a sustainable manner. The Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) was approved in November 2005. The objective was to sustainably improve the productivity of irrigation farming through the integrated provision of hardware, mainly irrigation infrastructure, and software, mainly local and institutional capacity building. The Agricultural Development Program Support Project (ADPSP) was approved in June 2008. The objective was to improve the efficiency of decision-making at the institutional agricultural policy and farm input-productivity level. Thus, both projects contributed to the promotion of sustainable growth in agricultural productivity by supporting farmers' yields and the government's ability to create an enabling agribusiness environment. As the two projects had the same long-term objectives and similar activities were undertaken to achieve them, the Project Performance Assessment Report (PPAR) provides a clustered evaluation of the two projects.

1.5 Financial information on the projects is taken from the Project Appraisal Document, Implementation Completion and Results Report (ICR), and Implementation Completion and Results Report Review.⁶ The International Development Association (IDA) and the International Fund for Agricultural Development cofinanced the original commitment of \$48 million for the IRLADP through a grant and a loan, respectively. Two rounds of additional financing through an IDA grant and two IDA credits provided an additional commitment of \$62.7 million. The total cost of the IRLADP amounted to \$115.2 million, which is \$4.5 million more than the cost estimated at appraisal. The total cost of the ADPSP is unclear because the information reported within the ICR is inconsistent.⁷ The project was financed by an IDA loan, a Global Environment Facility grant on a joint cofinancing basis, and a grant from the government of Norway. The project received the first additional financing in 2012 from an IDA credit, and the second additional financing in 2014 from a grant from the multidonor trust fund (MDTF) funded by Norway, Ireland, the United States, the United Kingdom, the government of Flanders, and the European Union. Although the exact numbers on the expected and actual project costs are unclear, there was a significant difference of \$60.7 million between the two costs, which the Implementation Completion and Results Report Review linked to a lower disbursement of the MDTF.

1.6 Table 1.1 presents the project development objective (PDO) and global environmental objective—if applicable—of the two projects as taken from the financing agreements (original) and additional financing (revised) documents. The IRLADP was restructured seven times, including one level-1 and six level-2 restructurings.⁸ At the time of the first additional financing in 2010, the PDO was simplified and aligned with the original financing agreement without substantially changing the objectives.⁹ A reference to the project’s 11 targeted districts was added. During the second additional financing in 2012, the PDO was revised in the financing agreement to remove the reference to net income and to reflect the scale-up of the project coverage from the original 11 districts to all 28 districts in Malawi. The ADPSP experienced three level-2 restructurings.¹⁰ During the second and major restructuring in 2012, the project title was changed to Agriculture Sector-Wide Approach Support Project. The PDO remained unchanged throughout the implementation period. Note that, although not explicitly mentioned in the PDO, the project activities covered all 28 districts in Malawi.

Table 1.1. IRLADP and ADPSP Project Development Objectives and Global Environmental Objectives

Project	IRLADP	ADPSP
PDO original	(i) To increase agricultural productivity and net incomes of approximately 196,550 poor rural households in the participating districts (ii) To strengthen institutional capacity for long-term irrigation development	To improve the effectiveness of investments aimed at food security and sustainable agricultural growth
PDO revised AF1	(i) To increase agricultural productivity and incomes of approximately 196,550 poor rural households in the 11 participating districts (ii) No change	Not revised
PDO revised AF2	(i) To increase agricultural productivity of poor rural households in all districts (ii) No change	Not revised
Global environmental objectives	—	To strengthen the natural resource base in agricultural lands through a doubling of the area under sustainable land management as a basis for securing ecosystem services and sustainable agricultural productivity

Source: Independent Evaluation Group.

Note: ADPSP = Agricultural Development Program Support Project; AF1 = first additional financing; AF2 = second additional financing; IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; PDO = project development objective. — = not available.

1.7 The projects provided support at the institutional and at the farm level. Figure D.1 in appendix D combines the generic theory of change of the two projects and identifies different mechanisms through which the projects’ activities contribute to the higher-level development objectives of food security and rural income growth. The

strengthening of the government's capacity to design, implement, and manage agricultural policies was expected to provide an enabling environment for growth in agricultural productivity. To reap the benefits of the enabling environment, the projects promoted inputs, technologies, and sustainable land-management practices to SHFs to sustainably increase their on-farm productivity. Table 1.2 provides an overview of the different components of each project and an estimation of the share of the total project budget allocated to each component.¹¹

1.8 The PPAR's objective is to assess whether and how the farm-level support of both projects contributed to sustainable increases in agricultural productivity among SHFs. As the theory of change is too complex and detailed to be fully covered, the focus of the PPAR is limited to the contribution of both World Bank projects to the sustainable, long-term growth in agricultural productivity of SHFs at a national scale. The focus on farm-level productivity is justified given that farm-level support activities accounted for the majority of project funds (table 1.2). Growth in productivity was also the core PDO or one of the PDO indicators for both projects. The focus on sustainability is warranted because many risks to the development outcomes have subsequently occurred. The national focus is appropriate as the geographical coverage of the PDO and its indicators was extended to all districts in Malawi.

1.9 Both projects fostered an integrated approach to increases in agricultural productivity by promoting the uptake of traditional measures of support together with complementary practices of improved land and water management. The productivity of SHFs was directly supported by the provision of agricultural inputs, such as irrigation, fertilizer, and improved seeds, to maximize the returns in the production of irrigated rice and maize (IRLADP) and rain-fed maize (ADPSP). Access to irrigation allowed the IRLADP's beneficiaries to cultivate during the dry season to improve production and productivity.¹² The integrated approach also promoted improved knowledge and practices of input management to increase the responsiveness of SHFs' crop production to agricultural inputs. In the early stages of agricultural transformation, when productivity is low, training and modern inputs are likely to contribute to closing the agronomic yield gap for SHFs. Finally, the land and water management practices sought to make the increases in agricultural productivity sustainable and resilient against climatic shocks. Specifically, the IRLADP promoted small-scale water conservation and management and the ADPSP promoted conservation agriculture.¹³

Table 1.2. Project Components and Their Estimated Share of IRLADP and ADPSP Budgets

Project or Component No.	Component Name	Estimated Share of Budget (%)
IRLADP		
1	Irrigation Rehabilitation and Development	26
2	Farmer Services and Livelihoods Fund	50
3	Institutional Development and Community Mobilization	18
4	Project Coordination Unit and Monitoring and Evaluation	6
5	Contingency Financing for Disaster Risk Response	n.a.
ADPSP		
1	Institutional Development and Capacity Building in Preparation of a Sector-Wide Approach in Agriculture	19
2	Sustainable Food Security	56
3	Project Coordination	0.3
4	Improvement and Maintenance of Unpaved Rural Roads	24.7

Sources: For the IRLADP, a project costs summary by components is reported in annex 1 of the Implementation Completion and Results Report (World Bank 2015). The Implementation Completion and Results Report of the ADPSP does not provide such an overview, and the information on project costs by components is from the Implementation Completion and Results Report Review (World Bank 2018a).

Note: ADPSP = Agricultural Development Program Support Project; IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; n.a. = not applicable.

1.10 Although the principal beneficiaries of the integrated approach were organized SHFs and their farmer organizations, substantial support was also provided to poor households. Appendix A provides a discussion of the beneficiaries (and expected benefits) of both projects. The IRLADP provided capacity building to irrigation users in water user associations (WUAs) or water user groups (WUGs)¹⁴ and to farmers who formed themselves into farmer business organizations. The ADPSP similarly supported capacity building by providing training and agricultural extension to farmer organization members. Farmers in groups are less likely to be the most vulnerable in local communities, but specific activities in both projects also reached out to poor households. Landless farmers and rain-fed farmers indirectly benefited from IRLADP activities through labor markets and conservation efforts. The IFA program directly targeted the rural poor who were willing and able to work (see below). Similarly, the ADPSP supported the FISP to target resource-poor but full-time SHFs. As both projects covered all districts (for the IRLADP, after the second additional financing), all farmers

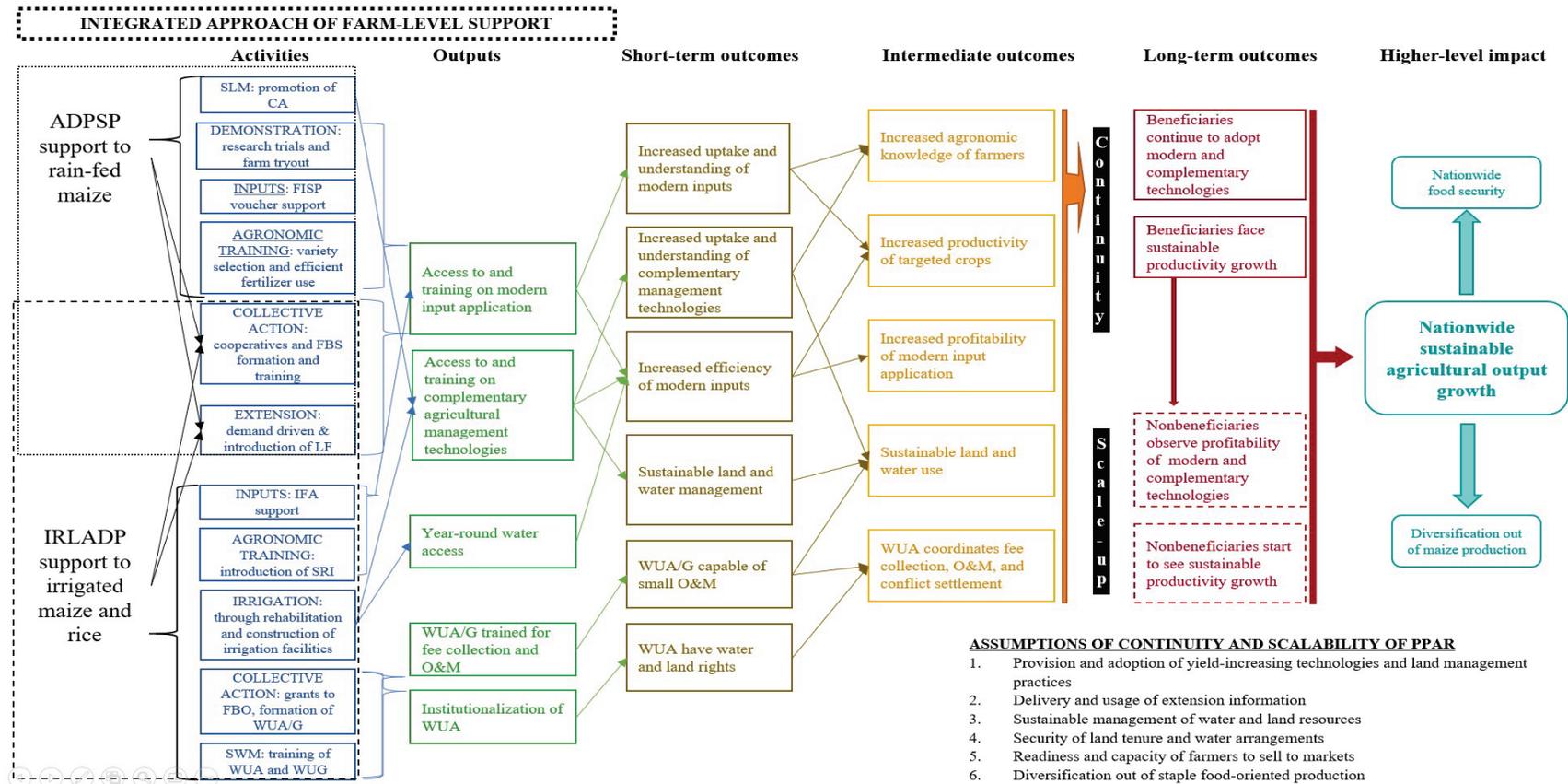
who were able to organize themselves in groups and poorer SHFs were eligible to receive some form of project support.

1.11 The PPAR discusses two fundamental assumptions inherent in the two projects to achieve sustainability of productivity increases: (i) the projects' beneficiaries have sustained the high returns to (irrigated) farming; and (ii) the integrated approach can be transferred to nonbeneficiaries and to areas outside the projects' intervention sites.

Figure 1.1 presents a simplified and shorter subset of the theory of change, which identifies six conditions required for continuity and scalability of the projects' activities: (i) the provision and adoption of yield-increasing technologies and land-management practices; (ii) the delivery and usage of extension information; (iii) sustainable management of water and land resources; (iv) security of land tenure and water user rights; (v) SHFs' readiness and capacity to sell at markets; and (vi) diversification away from production of food-oriented staples, primarily maize.

1.12 For continuity and scalability to occur, the government—with assistance from the private sector—was expected to assume the coordinating and implementing role of service provision to farmers, especially for public goods such as irrigation. The government of Malawi was implementing the ADPSP activities and was expected to take over IRLADP support.¹⁵ The government thus had an important coordinating role. The private sector was expected to deliver imported agrochemical products such as fertilizer or hybrid seeds, as well as agronomic advice. Farmers were expected to be connected to well-developed markets that would absorb the increased production and provide opportunities for value addition, such as processing or labeling. With services and proper price incentives available, and with the positive experience observed in the projects, farmers would be convinced to sustain productivity increases by investing in yield-increasing technologies and in land and water management to build long-term resilience. Chapter 2 addresses the validity and outcomes of this approach.

Figure 1.1. Simplified Theory of Change of the IRLADP and ADPSP



Source: Independent Evaluation Group, based on the Project Appraisal Document (World Bank 2005c) and Implementation Completion and Results Report (World Bank 2015) for the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) and the Project Appraisal Document (World Bank 2008) and Implementation Completion and Results Report (World Bank 2017b) for the Agricultural Development Program Support Project (ADPSP).

Note: In the Activities column, underlining refers to elements introduced by the additional financing. ADPSP = Agricultural Development Program Support Project; CA = conservation agriculture; FBO = farmer-based organization; FBS = farmer business school; FISP = Farm Input Subsidy Program; IFA = Input for Asset; IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; LF = lead farmer; O&M = operation and maintenance; SLM = sustainable land management; SRI = System of Rice Intensification; SWM = sustainable water management; WUA = water user association; WUG = water user group.

2. What Worked, What Didn't Work, and Why?

Results

2.1 The ICRs document the projects' largely successful delivery of agricultural services. The IRLADP exceeded the targets for the area developed or rehabilitated with irrigation and drainage services, the number of WUAs or WUGs supported, and the number of farmers benefiting from support for farmer business organizations and the IFA voucher program. The ADPSP was less successful in delivering all agricultural services to its beneficiaries. Although the project was successful in achieving targets for the delivery of legume seeds through the FISP and increasing the area covered by conservation farming, it did not achieve its targets for the number of farmers trained by lead farmers.¹ The project also had ambiguous achievements for the rehabilitation of rural roads. Despite being labeled as intermediate outcomes, the projects' achievements reflect the delivery of outputs and do not provide evidence on whether the projects affected the enabling conditions identified in figure 1.1 (such as application of technology or increased human capacity) needed to achieve sustainable productivity increases.

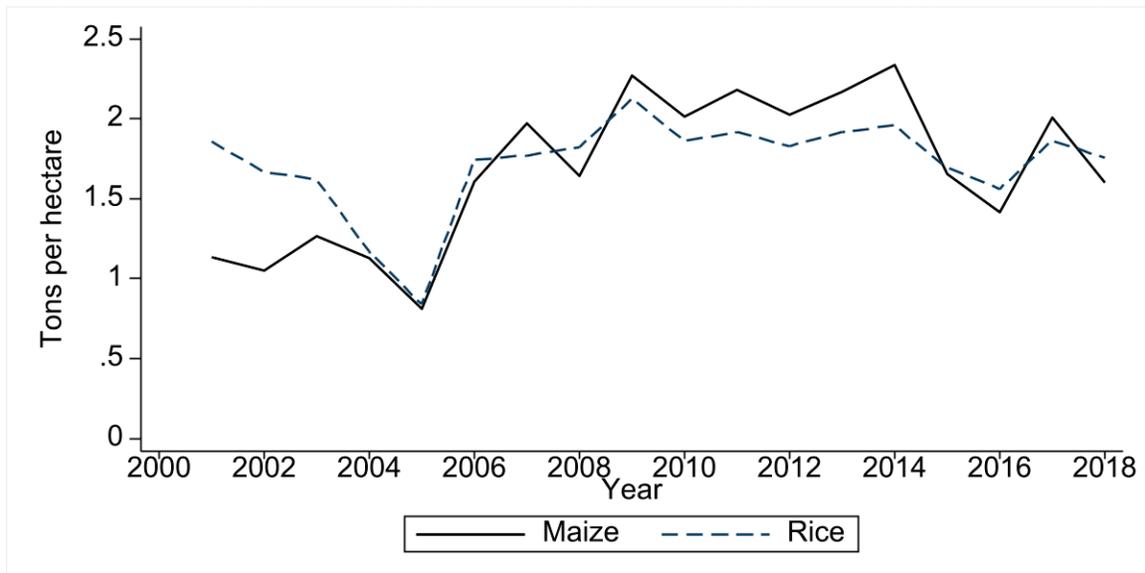
2.2 The projects further document the improvement in project beneficiaries' productivity, especially for the IRLADP. Unfortunately, the empirical evidence is incomplete and cannot be used to assess the sustainability of the outcomes at the farm level. The PDO-level indicators reflecting agricultural productivity were the yield of irrigated maize and rice (IRLADP) and the average national maize yield (ADPSP). The IRLADP collected farm-level data using different rounds of a beneficiary impact assessment. Using these beneficiary-level data, the IRLADP achieved yield increases of 112.5 percent of the target for irrigated maize and 230 percent of the target for irrigated rice.² Farm-level evidence is absent altogether for the ADPSP. Instead, the ADPSP used the official Agricultural Production Estimation Statistics. The estimation statistics showed that the ADPSP achieved 90 percent of the project's target to increase the national maize yield to 2.2 metric tons per hectare. The lower-than-expected maize yield is attributed to weather events (El Niño droughts and floods). There is, however, no counterfactual for project activities—that is, no evidence of what would have happened to the intervention area if the project was not rolled out.

2.3 IEG's assessment of the government's official production estimates does not show sustainable increases in agricultural productivity over time or across districts in Malawi. The time series of Agricultural Production Estimation Statistics data collected annually by the MoAIWD from 2001 onward allows IEG to assess trends in agricultural productivity (see appendix C). The upper graph in figure 2.1 shows negligible

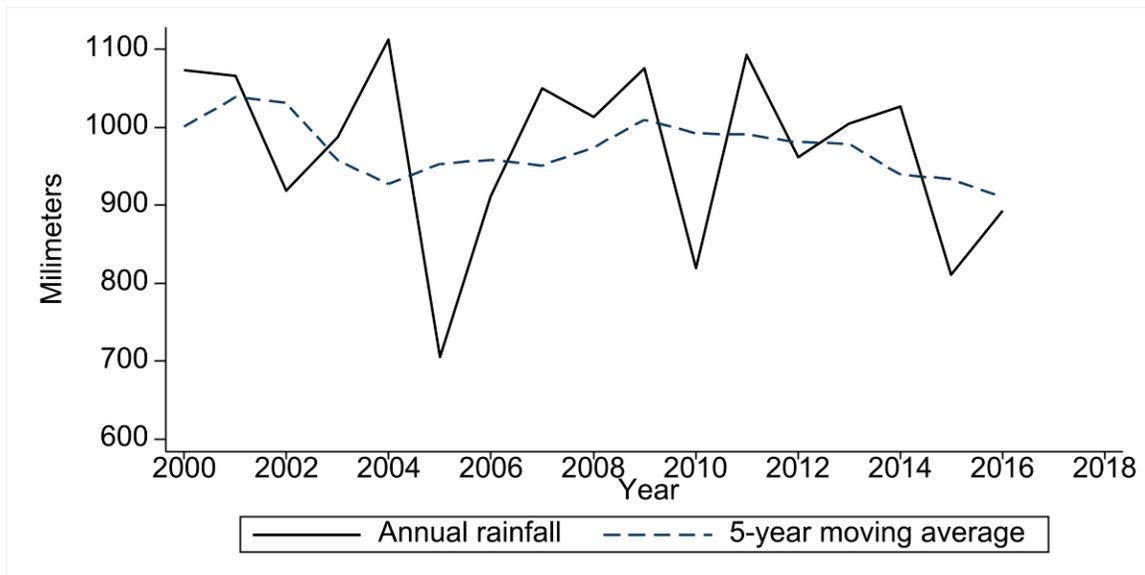
improvements in maize and rice yields over the past two decades. The productivity of both maize and rice was low at the start of both projects, and then improved at the beginning of the projects' implementation. Midway through the projects' implementation, the productivity increases flattened, and productivity gains became more volatile at the end of the projects and afterward. Crop yields follow the trend in cumulative rainfall in Malawi, shown in figure 2.1, panel b. Figure 2.1 thus indicates that agricultural productivity has not increased sustainably during or after the projects' timeline. Using farm-level data from different rounds of the Malawian Living Standards Measurement Study (LSMS), figure 2.2 shows the heterogeneity of changes in maize productivity across districts. Not all districts experienced positive increases in yields during or after the projects' timeline. Furthermore, when we link this interdistrict variability with project implementation data (results not shown for brevity), it is far from evident that targeted districts—where the projects were implemented earlier or where both projects were implemented simultaneously—fared better compared with districts that were supported during the scale-up phase.

Figure 2.1. Production Estimates of Maize and Rice Production in Malawi

a. APES crop yield estimation



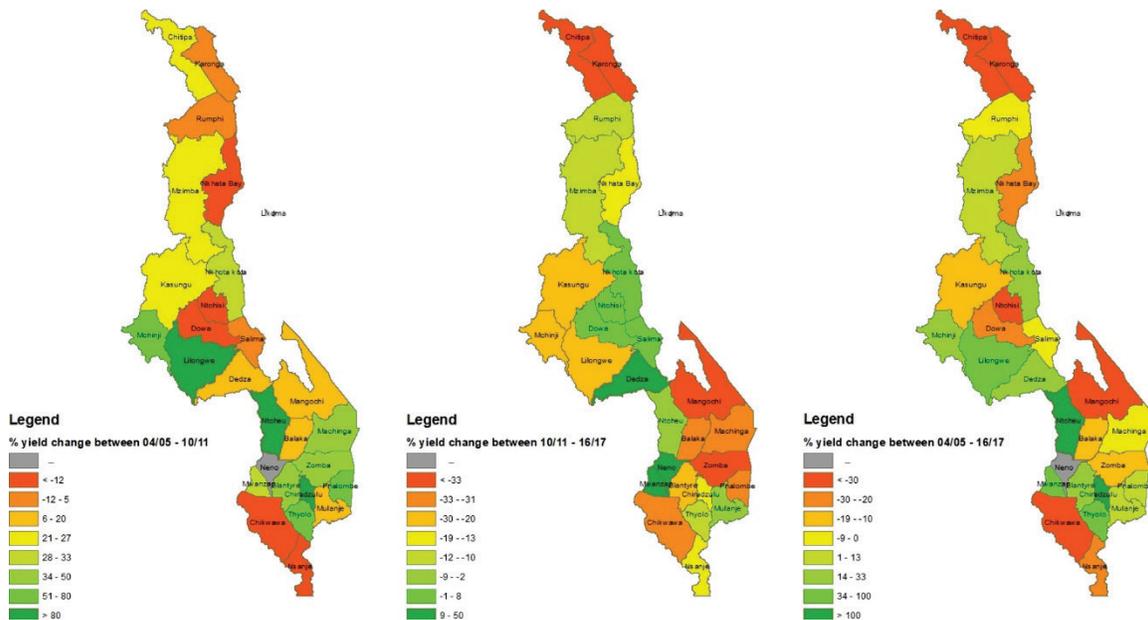
b. Cumulative rainfall during crop growing period



Sources: Yield estimates from APES. Rainfall data from the Climate Change Knowledge Portal (World Bank 2020a).
Note: See appendix C for an explanation of the data. The annual rainfall is the cumulative total of rainfall (in millimeters) measured during the growing period of maize and rice (October to April). APES = Agricultural Production Estimation Statistics.

2.4 To understand why the projects' activities did not routinely contribute to sustainable productivity increases, the different conditions in Figure 1.1 are discussed using the methodology defined in appendix C. No follow-up data were collected on project beneficiaries, so the assessment of continuity is based on qualitative responses from beneficiaries and nonbeneficiaries who were interviewed at purposively selected project (mainly IRLADP) sites. Beneficiaries are defined as members of WUAs in the IRLADP-supported irrigation sites. To verify the second assumption of scalability, we review the same conditions in figure 2.2 using nationally representative data (see appendix C) and evidence from academic literature.

Figure 2.2. District-Level Changes in Maize Yields between Rounds of the Living Standards Measurement Study



Source: Living Standards Measurement Study.

Note: See appendix C for an explanation of the data. — = not available.

2.5 Project beneficiaries are still using and receiving advice on technologies the projects supported, but farmers struggle to maintain or increase the intensification of farming over time. As the target audience of local extension offices, WUA members in supported irrigation schemes continued to receive agricultural extension after the projects ended. Many—but not all—are using the System of Rice Intensification promoted during the IRLADP.³ Irrigation provides cash for input purchases (see below), but interviewees mentioned that high prices and unreliable availability of inputs constrained the appropriate application of fertilizer in irrigated rice and maize production. Membership in WUAs is frequently the only way to gain access to a water source for irrigated farming in the dry season. However, even members face challenges in accessing irrigation water. Substantial leakage or pipe breakages were observed in large parts of the irrigation infrastructure, such as main canals (see appendix A). WUAs are typically not capable, equipped (with replacement parts and tools), or financially able to make major repairs to large irrigation infrastructure.

2.6 Nationally representative data suggest that technologies promoted in both projects were not scaled to nonbeneficiaries or areas outside of project sites once the projects ended. Table 2.1 summarizes data on the input and output behavior of SHFs in Malawi from the different LSMS rounds, but the discussion focuses on the most recent production year, 2016–17.⁴ The uptake of fertilizer and improved varieties in maize

production is above 50 percent, which is relatively high compared with similar African countries (Sheahan and Barrett 2014). Nonetheless, FISP beneficiaries have not been able to move beyond price subsidies for input acquisition (Ricker-Gilbert and Jayne 2017). The frequent sharing of subsidized inputs with other community members might result in ineffective use of the inputs (with respect to agronomic recommendations). As only a small portion of SHFs have access to irrigation facilities, less than 10 percent of SHFs in Malawi use an irrigated water source. Malawian farmers thus remain highly dependent on rain-fed farming. Even in communities that benefited from IRLADP's irrigation-related interventions, not all farmers have access to the irrigated water. Some are outside the boundaries of the scheme, and others cannot afford the fees associated with membership in a WUA or a WUG.

2.7 Despite the high coverage of extension services, few households in Malawi receive effective agricultural advice or information from the lead farmers who were supported by the projects to provide extension services. Table 2.1 reports that 91 percent of maize farmers received some extension, and 31 percent received extension from the government extension service.⁵ However, only 2 to 3 percent of farm households in Malawi received agricultural advice or information from lead farmers (Ragasa and Mazunda 2018). Farmers who received extension services tended to show increased awareness of management practices. Nonetheless, among trained farmers, the effective use of complementary technologies to increase the profitability of modern technologies remains low (Ragasa 2019). For example, the share of households using soil cover, minimum tillage, or pit planting, which are crucial elements of conservation agriculture, is well below 10 percent.

2.8 Diversification of farm systems is occurring but arises from a livelihoods-driven necessity instead of improved market opportunities. There is evidence that the FISP has contributed to crop diversification in Malawi (Kankwamba, Kadzamira, and Pauw 2018). Maize is increasingly intercropped with legumes. Table 2.1 shows that 61 percent of maize farmers intercropped maize with beans in production year 2016–17. Yet field interviews with beneficiaries and nonbeneficiaries indicated that maize intercropping is necessary for some farmers because increasing population-driven pressures do not allow the traditional and preferred stand-alone cultivation system. Many interviewed WUA members showed a diverse production pattern of staples, legumes, and vegetables. But even with access to irrigation, maize continues to be the dominant crop for food security. WUA members and farmers who practice intercropping receive cash from selling irrigated crops or legumes but typically reinvest this cash into maize production to assure home consumption. Thus, traditional staple crops, particularly maize, remain the dominant food crop.

Table 2.1. Farmers' Input and Output Behavior in Maize Production from Different Rounds of Household-Level Survey Data

LSMS Data Source	Summary Statistic			Change between LSMS Rounds		
	IHS 2	IHS 3	IHS 4	IHS 2–3	IHS 3–4	IHS 2–4
Round	2004/05	2010/11	2016/17	During project	After project	Long term
Production season or timeline of change						
Input usage: Share of households that ...						
Used inorganic fertilizer in maize (%)	61	77	68	Pos	Neg	Pos
Used hybrid maize seed in maize (%)	48	49	53	Pos	Pos	Pos
Used coupon for inputs (%)	—	55	23	—	Neg	—
Received agricultural advice (%)	13	46	91	Pos	Pos	Pos
Received agricultural advice from government (%)	—	22	31	—	Pos	—
Used agrochemicals in maize (%)	—	0	1	—	Pos	—
Cultivated in dry season (%)	37	17	9	Neg	Neg	Neg
Used irrigated water during any season (%)	29	11	7	Neg	Neg	Neg
Used irrigated water source if cultivated in dry season (%)	78	81	74	Pos	Neg	Neg
Output and sales: share of households that ...						
Intercropped maize with beans (%)	52	36	61	Neg	Pos	Pos
Sold any crop (%)	48	43	42	Neg	Neg	Neg
Sold maize (%)	15	15	15	0	0	0
Sold crop other than maize (%)	41	36	35	Neg	Neg	Neg
Crops other than maize (no.)	1	1	1	0	0	0
Share of output sold for households that sold crops (%)	30	25	31	Neg	Pos	Pos

Source: Living Standards Measurement Study.

Note: See appendix C for an explanation of the data. The units of observation are maize-growing households.

IHS = Integrated Household Survey; LSMS = Living Standards Measurement Study; Pos = a positive change between survey rounds; Neg = a negative change; and 0 = no change. — = not available.

2.9 Finally, farmers show little progress in commercializing farming and diversifying away from subsistence-oriented food production toward more rewarding income-generating farming. Despite the diverse irrigated crop-production patterns of WUA members, only a limited share of the major food crops—even the higher-value ones—is sold. This finding is in line with the LSMS data in table 2.1 for the production year 2016–17. Forty-two percent of households in Malawi sold any crop, and 15 percent sold maize. For those who sold crops in 2016–17, the share sold was 30 percent. When rural feeder roads were not rehabilitated or were impassible during the rainy season, and transport vehicles were absent or rudimentary, WUA members struggled to get their increased production to a market. As a result, the majority of interviewees used on-

the-spot transactions to sell the irrigated crops locally to intermediaries. Moreover, none of the marketing indicators in table 2.1 changed from 2004 to 2017, suggesting no appreciable improvement in marketing behavior over time. Hence, although crop diversification provides cash for beneficiaries to sustain production, it has contributed little to diversification away from semisubsistence food production to a market-based farming system. Shifting from semisubsistence to commercialized farming entails a trade-off between higher-value production and increased exposure to transport and marketing risks.

Design and Preparation

2.10 The integrated approach of productivity support in the designs of both projects was innovative. Traditional productivity-support measures are typically needed to initiate growth in agricultural productivity when yields are below agronomic potential. Irrigation provides year-round access to water that increases cropping intensities and allows year-round cultivation.⁶ As complementary agricultural services are needed to maximize the profitability of agricultural inputs in maize production (ADPSP) or irrigated rice and maize production (IRLADP), the projects promoted the integrated management of both land and water resources. In addition to the farm-level support, the two projects also addressed the institutional capacity of the ministries responsible for planning and managing Malawi's agricultural sector. Such a comprehensive approach in the designs of the projects is crucial for sustainable increases in agricultural productivity.

2.11 The IRLADP introduced an innovative approach to capacity building and institutionalization of irrigation management that is still in use. The project supported different irrigation infrastructures to provide a sustainable supply of water, ranging from the rehabilitation of large-scale irrigation schemes previously owned by the government to the construction of small-scale irrigation facilities and mini-scale irrigation earthen dams and canals. The project's physical infrastructure was complemented by an innovative approach to achieve the signing of a Land and Water Management Agreement between users and owners,⁷ depending on the type of infrastructure (Malawi, MoAIWD 2015). The IRLADP introduced the Irrigation Management Transfer, under which the land previously owned by the government was transferred to WUA members in large-scale irrigation schemes. WUAs were then able to manage water and financial resources, resolve conflicts, and improve irrigation performance. Initially these agreements were informal, but WUAs now have legal rights over water and land management. In small- and mini-scale irrigation facilities, the IRLADP introduced agreements to facilitate the transfer of customary land and water rights from landowners in irrigation schemes to WUA and WUG members during the dry season. Through the IRLADP, 91 WUAs were created (Malawi, MoAIWD 2020).

2.12 Achieving sustainable growth in agricultural productivity is difficult when project activities are primarily designed to address the food security of poor households. Both projects supported rain-fed maize production, directly in the ADPSP and indirectly in the IRLADP through alleviating cash constraints from irrigated crop sales. As indicated in paragraphs 1.20 and 1.21 of this chapter, this resulted in a continuation of mainly subsistence-oriented farming for food security with limited diversification. Through support for the FISP and IFA, the projects directly targeted resource-poor SHFs to improve their food security.⁸ Sustainable growth in agricultural productivity is unlikely to come from targeting only the poorest households. Historically, farmers have depended on external support to improve their agricultural activities. In contrast, sustainable productivity increases require a different approach that focuses in particular on more commercial SHFs with the capability of making profitable investments in farming (Mellor 2017). Similarly, although irrigation has been shown to be important in Malawi to achieve household food security, the small size of most irrigated plots does not allow the economies of scale required to make irrigation profitable (Schuenemann et al. 2018). The MoAIWD (2015) stated that a minimum size of 0.5 hectares of irrigated land per household is needed for profitable irrigated agriculture.⁹ The plots in the small- and mini-scale irrigation schemes are often only 0.1 to 0.2 hectares, and these sizes are insufficient to allow commercially oriented agriculture. Hence, it seems difficult to achieve the joint goals of food security and growth in productivity using the same project approach.

2.13 By focusing entirely on a supply-side approach to stimulate agricultural productivity, an agribusiness mind-set and incentives were not created for farmers to invest in agricultural production or to commercialize agricultural systems. The marketing aspects of both projects were weak. Farmer organizations were created under the IRLADP, but the use of grants rather than soft loans resulted in leadership problems, lack of ownership, and even misuse of funds (Posthumus et al. 2014). The market access aspects of both projects focused only on providing physical access through rural road rehabilitation.¹⁰ The projects did not create an agribusiness mind-set for farming or develop farmers' nonphysical connection to markets. As farmers' exposure to logistical and marketing risks was not addressed, the limited diversification and commercialization of beneficiaries might not come as a surprise. The projects' designs did not pay attention to the demand side of the agricultural sector or how farmers should create additional value after production to tap into growing urban markets. Without access to higher-value markets, farmers lacked incentives and motivation, once the two projects ended, to keep investing in crop production to optimize revenue generation.¹¹

2.14 The projects' designs implicitly assumed that after their completion, the government would have the capacity to continue and increase service delivery to farmers. This assumption was unrealistic. The projects used intensive approaches to local capacity building through demand-driven extension systems and bottom-up WUAs for irrigation management that require sustained follow-up. To ensure the continuation and scale-up of similar activities, the government system for service delivery was expected to be sufficiently resourced and staffed to take over these activities. The field visits indicated that the MoAIWD lacked the resources and staff to repair large components of the project-supported irrigation infrastructure. The MoAIWD also struggled to assist informal WUAs in the process of becoming formally registered. Only 13 of 91 IRLADP WUAs were formally registered at the time of the fieldwork (see appendix A). This finding suggests that the MoAIWD is not able to maintain the IRLADP's approach to irrigation development or extend a similar approach to other irrigation schemes. The project did little to break rural communities' historical dependence on donor or government support to sustain their agricultural production.

2.15 Some promoted land-management technologies might not be appropriate given the farm realities, which may explain the limited scale-up from small demonstration plots to farms. The ADPSP promoted sustainable land-management practices, with most focusing on conservation agriculture. The IRLADP focused on sustainable water management, including small-scale irrigation and hotspot water conservation, combined with the System of Rice Intensification for irrigated rice plots.¹² Conservation agriculture is a labor- and knowledge-intensive technology and requires farmers to leave crop residues on their plots. However, not only does labor availability pose a major constraint to adoption, but the benefits of conservation agriculture might be realized only in the long term, which is often beyond the decision-making perspective of SHFs. Furthermore, the incorporation of crop residues in the soil conflicts with farmers' need for residues to feed livestock. Given the small plot sizes, both the livelihood and conservation approaches seem, to some extent, incompatible. Similarly, the labor intensity of manual seeding and the unpredictability of rainfall constrain the uptake of the System of Rice Intensification.

2.16 The focus on intensive support for specific irrigation schemes came at the expense of a more comprehensive catchment or landscape approach to irrigation development and contribution to higher-level resilience. Initial project activities on rainwater harvesting and catchment conservation failed, and efforts shifted toward the prioritization of hotspots of highly degraded land (Posthumus et al. 2014). Similarly, the projects promoted activities for land and water management suitable for small and well-managed irrigation or demonstration plots. Although such efforts resulted in scattered

pockets of success, appropriate land and water management practices were not expanded from project sites. Hotspot prioritization, furthermore, did not incentivize catchment conservation in upstream parts of the water source and thus compromised a steady and sustained availability of water. An integrated approach to on-site productivity support will not build sufficient sustainability if the underlying risks caused by climate events are not addressed. The risk-mitigating component of both projects was limited to soil and water conservation. The focus was on emergency responses rather than risk-reducing and resilience-building strategies, such as weather-based insurance.

Implementation and Supervision

2.17 Both projects implemented activities bottom-up and used participatory approaches that aimed to build local capacity and community ownership. Both projects delivered farmer extension and training using a demand-driven approach, which marks a clear shift from a top-down system toward a more pluralistic and demand-driven extension system (Posthumus et al. 2014). The organization of farmers into farmer associations, the identification of extension topics, and other support services were community-driven. Both projects followed the national extension policy and were implemented by the District Agricultural Development Offices in each of the 28 districts.

2.18 Using lead farmers to disseminate technologies and information to untrained farmers did not result in an effective sharing of agricultural information. The projects' designs anticipated that the staff-intensive approaches to extension could not be sustained given the limited human and financial resources available at the district level of the MoAIWD. Therefore, both projects used lead farmers as an approach to extension. Although the selection of lead farmers was driven by demand and steered by the community, tensions occurred among lead farmers, communities, and extension officers.¹³ Without sufficient incentives, lead farmers had little motivation to share information with farmers in the most need of information. Moreover, some districts implemented a different incentive structure or farm-support mechanism. This suggests that a uniform lead farmer approach was not institutionalized, which complicated expansion.

2.19 The IRLADP's success in providing infrastructure and the legal framework for irrigation development was substantial, especially the contribution to strengthening WUAs for the successful and sustainable operation of irrigation schemes. As explained in paragraph 1.23 of this chapter and appendix A, in the absence of a land law or other legally binding instrument, the Land and Water Management Agreements filled the void (Malawi, MoAIWD 2015).¹⁴ The IRLADP also laid the foundation for the registration of WUAs to the Trustees Incorporation Act and the legal framework to

manage water resources and to penalize nonmembers in case of violation.¹⁵ The IRLADP further contributed to the institutionalization of WUAs by drafting a WUA constitution, assisting the Department of Irrigation to prepare a monitoring and evaluation (M&E) framework, and preparing a WUA training manual (Malawi, MoAIWD 2015). The IRLADP led to the creation of 91 WUAs, but only 15 percent of them are formally registered as independent legal entities because of the complex and tedious registration process (see appendix A), undermining their legal and institutional effectiveness.

2.20 WUAs require close support and guidance from district irrigation and extension officers for effective operation and maintenance (O&M). Unfortunately, weak O&M capacity hampers the effectiveness of WUAs and WUGs and they remain dependent on external support for the repair of larger irrigation parts. The O&M and collection of water fees are the responsibility of the WUA or WUG. Members are trained to maintain small irrigation structures (earthen canals or dams). However, as mentioned in paragraph 1.17 of this chapter, they are not trained or financially able to repair major problems with leakages (appendix A). In larger irrigation schemes visited during the fieldwork that were still operating effectively, other donors or World Bank projects (for example, the Malawi Floods Emergency Recovery Project) had rehabilitated or extended the infrastructure. As a consequence, WUA and WUG members remain highly dependent on external support for the repair of larger parts of their irrigation infrastructure.

2.21 The IFA approach to the supply of modern inputs supported by the IRLADP did not provide a clear alternative to the often-criticized FISP. The ADPSP promoted input uptake and crop diversification through reforms of the price subsidies for fertilizer and hybrid seeds in the FISP. The IRLADP promoted input uptake through labor arrangements in the IFA work schemes. The FISP, and more generally any fertilizer subsidy program in Sub-Saharan Africa, received considerable criticism for its limited on-farm effectiveness (Jayne et al. 2018). The ADPSP contributed to FISP reform by supporting the promotion of legume seeds and improving logistics, beneficiary targeting, and the private sector's involvement in input delivery. Nonetheless, stakeholders highlighted that the FISP remains a popular program that addresses food security, and there is little willingness within the MoAIWD to reform it. The reforms implemented were minor, and recipients' sharing of inputs with other households can undermine the effectiveness of the inputs that the FISP provided (see appendix A).

2.22 Despite being the vehicle through which the IRLADP successfully reached the rural poor, the IFA stopped when the IRLADP ended. This suggests limited interest or limited government capacity to continue a safety-net approach to irrigation development. The IFA had a safety-net focus, as its work schemes were open to everyone, including WUA members and nonmembers. Vulnerable households were

targeted. The ICR of the IRLADP considered the IFA a more flexible and cost-effective alternative to the FISP for providing production-increasing technologies because no cash was involved. The IFA is widely considered successful because it simultaneously provided community assets and inputs for income generation (Ng'ong'ola et al. 2015; Posthumus et al. 2014). During the IRLADP's second additional financing, substantial resources were made available to increase IFA support as a cushioning response to Malawi's unstable macroeconomic situation. Hence, the IFA was increasingly used as a safety net to show that irrigation development and food security can go hand in hand (see paragraph 1.24 of this chapter). However, safety nets with a productive inclusion element have rarely been capable of generating sustained income to lift the rural poor out of poverty (World Bank 2016a). Moreover, the IFA required intensive supervision, coordination, and commitment at the district level. As a consequence, the quality of IFA projects dropped, as observed by a knowledgeable and experienced respondent.

2.23 Both projects made important contributions to building the capacity of the MoAIWD to plan and manage the agricultural sector. Nonetheless, the institutionalization of changes in agricultural policy remains limited in the absence of adequate incentives within government agencies to retain the human and technical capacity to which the projects contributed. The projects aimed to improve the effectiveness of investments that promote the sustainable growth of agricultural productivity (ADPSP) and irrigation (IRLADP). The ADPSP is considered the first serious attempt to harmonize the MoAIWD's departments and to coordinate the multiple ministries involved in the agricultural sector (Malawi, Ministry of Agriculture and Food Security 2014). These include the ministries of Agriculture, Trade, Lands, and Transport. Similarly, as mentioned in paragraph 1.23 of this chapter, the IRLADP made an important contribution in building the institutional capacity to manage land and water in irrigation schemes. Although many aspects of the institutional support of both projects have been continued or used in other projects (see paragraph 1.31 of this chapter and appendix A), the institutionalization of the government's capacity remains an issue because of high staff turnover, a weak incentive structure, the apparent absence of career paths, and the decentralization of staff.

2.24 One of the ADPSP's major achievements was the recipient-executed MDTF, which increased the dialogue between the government and the donor community. Harmonizing donor support through a trust fund helped establish a coordinated and improved system of procurement and reporting. For example, donors coordinated their efforts to cap the budget contributions to the FISP and proposed reforms. As the trust fund's coordinator, the World Bank found itself in a difficult position between the government, which was mainly interested in direct budget support, and donors pursuing their own interests. Since a major corruption scandal in 2013, several donors'

trust in the government had declined.¹⁶ Although the MDTF was recipient-executed, some government officials indicated a lack of full control and ownership. These officials pointed to the strong preferences of individual donors regarding which activities their support would be used for,¹⁷ and the bureaucratic and time-consuming protocols, such as the World Bank's "no-objection" rules. In contrast, donor efforts were not always well coordinated. Not all donors participated in the MDTF, and some donors provided additional support outside the MDTF.

2.25 Supervision using a project coordination unit or the existing government structures requires a trade-off between short-term gains in efficiency and longer-term capacity gains in project coordination within the government. The ADPSP was implemented within the MoAIWD, which increased technical coordination among departments and ministries (see appendix A). Nonetheless, centralized financial management, slow internal procurement procedures, and red tape complicated procurement and financial management. Late disbursements of funds to other ministries and to District Agricultural Development Offices delayed project implementation, which was detrimental because of the time specificity of many agricultural activities, like sowing. In contrast, the IRLADP had a dedicated project coordination unit that facilitated the smooth implementation of project activities and enhanced financial management and M&E systems. Although both approaches have their advantages and disadvantages, both capacity-building approaches were compromised because of the high staff turnover and the weak incentive structure.

3. Lessons

3.1 An integrated and participatory approach to agricultural development can initiate sustainable growth in productivity among SHFs. In the context of a SHF-dominated agricultural sector and low productivity, traditional support measures of input supply are needed to close agronomic yield gaps. However, the adoption of such support measures will not be profitable for SHFs unless complementary training and agricultural extension on proper input and land management are provided. The projects, therefore, promoted the synergistic benefits of the simultaneous adoption of hardware (mainly agricultural inputs and irrigation) with software (mainly agronomic knowledge and capacity building). Many irrigation management and extension activities were demand-driven and bottom-up. This approach, therefore, contributed to local capacity, ownership, and community involvement.

3.2 Agricultural projects with a supply-side focus on productivity growth that ignore market linkages are unlikely to provide the right agribusiness mind-set or incentives for farmers to sustainably invest in longer-term agricultural productivity. The

projects' integrated approach boosted staple-crop productivity, but continuous increases in agricultural productivity require a change in mind-set toward farming as a business. Without being introduced to or trained to acquire an agribusiness mind-set, it can be difficult for SHFs to think beyond the semisubsistence of food production. To achieve sustainable productivity increases, the right economic incentives must be put in place by explicitly considering the demand side of agricultural production. Higher-value markets offer higher prices (even in rural areas), but if beneficiaries are not integrated into these markets beyond establishing physical access, SHFs have few economic incentives to intensify agricultural production once the projects have ended. Without access to higher-value markets, many of the productivity gains achieved by supply-side efforts will not generate the returns on investments necessary to sustain the profitable intensification of agricultural production.

3.3 Intensive and demand-driven approaches to service delivery in agriculture are innovative but are unlikely to be maintained or expanded when support systems for agricultural sector development lack the capacity and resources to continue providing them. In this case, the IRLADP introduced WUAs to support the capacity building and institutionalization of irrigation management. Both projects provided extension services and organized activities in participation with local communities. Because demand-driven support is intensive and requires continuous follow-up, it is likely to fail when a government's service providers lack the capacity and resources to provide agricultural services to SHFs.

3.4 Introducing sustainable land and water management practices requires a more comprehensive focus beyond irrigation or demonstration plots. As discussed in chapter 2, paragraph 1.28, hotspot prioritization, selective site rehabilitation, and conservation agriculture can result in pockets of success, but a full return to the adoption of small-scale approaches depends on what happens in upstream or surrounding parts of the agricultural landscape. Hence, a more comprehensive catchment or landscape approach to irrigation development is needed to achieve higher-level sustainability. The projects could have considered institutional solutions related to how to transfer uninsured risks in agriculture out of the sector, such as through weather-based insurance mechanisms. As long as agricultural production is highly susceptible to climate shocks and the underlying causes of risks and vulnerability are not addressed, supply-side productivity increases are not likely to be sustained over time.

3.5 There is evidence that the World Bank has learned from these experiences. Two current agricultural projects in Malawi (the Malawi Agricultural Commercialization Project and the Lower Shire Valley Landscape Project) promote agricultural commercialization and adopt a landscape approach in the development of large-scale irrigation schemes.

A project preparing an Agriculture Sector-Wide Approach that will assess its effectiveness based only on production outcomes lacks the granularity to understand which project activities are driving observed changes. Moreover, the use of production estimates at the national level without a proper counterfactual does not allow for the attribution of changes to the project. By design, projects that prepare the implementation of an Agriculture Sector-Wide Approach implement a variety of activities at different levels of support. The ADPSP, however, tracked only national production estimates and some service delivery outputs. Even if the ADPSP had been successful in achieving sustainable increases in productivity, the results framework and M&E system would not allow an explanation of the increases. As a consequence, the project missed the opportunity to learn from design issues and revisit the effectiveness of various project activities.

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Notes

¹ Extreme poverty is defined as the share of the population that lives below the international poverty line of \$1.90 per day.

² The median farm size in the Malawian Living Standards Measurement Study was 1.5 acres in production year 2004–05 and 1 acre in production year 2016–17.

³ The agronomic yield gap is the difference between the obtained yield and the yield potential under optimal agronomic management given the agroecological conditions.

⁴ Throughout the project, the Ministries of Agriculture and Irrigation changed structure and names several times, from Ministry of Agriculture to Ministry of Agriculture and Food Security and subsequently Ministry of Agriculture, Irrigation and Water Development (MoAIWD). Throughout most of the projects' timelines and during the PPAR mission, the two ministries were joined under the MoAIWD. For consistency, the PPAR refers to the MoAIWD throughout the text. In April 2020, however, the Ministry of Agriculture reverted to its former name of Ministry of Agriculture and Food Security.

⁵ Malawi has rolled out a nationwide input subsidy program since 2005–06 to provide smallholder farmers access to improved agricultural farm inputs. The Farm Input Subsidy Program (program and targeting) has been restructured several times, and the program in production year 2018–19 focused on providing maize fertilizer and cereal (maize, rice, sorghum) and legume (beans, groundnuts, and so on) seed to resource-poor but full-time smallholder farmers. Eligible beneficiaries who are selected by the Farm Input Subsidy Program receive a voucher with a fixed value of each fertilizer or seed coupon, and beneficiaries are expected to pay the difference between the coupon value and market price (Chirwa and Dorward 2013; Goyal and Nash 2017).

⁶ The financial agreement, Implementation Completion and Results Report (ICR), and Implementation Completion and Results Report Review (ICRR) for the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) are documented in World Bank (2005b), World Bank (2015), and World Bank (2016b), respectively. The financial agreements (International Development Association and Global Environment Facility), ICR, and ICRR for the Agricultural Development Program Support Project (ADPSP) are documented in World Bank (2009a, 2009b), World Bank (2017b), and World Bank (2018a), respectively.

⁷ The ICR reports that the disbursed amount was \$131.1 million in the basic information sheet, whereas annex 1 reports the program allocation and amount disbursed to the client as \$184.4 million and \$154.98 million, respectively.

⁸ Two types of project restructurings of World Bank projects exist. A level-1 restructuring involves a change in the project development objective(s), a change in the safeguards category from a lesser category, or the triggering of a new safeguard policy. A level-2 restructuring applies to all other project modifications, such as changes in outcome indicators or targets, change in design, and so on (World Bank 2013b).

⁹ The IRLADP was restructured twice, and both restructurings came through the provision of additional financing. The government of Malawi requested the second additional financing under the rapid economic response package to expand the project to cushion the impacts of

difficult economic reforms that it implemented in 2012, which affected the rural poor in all 28 districts of the country. This expansion necessitated changes in the project's design (Ng'ong'ola et al. 2015).

¹⁰ The first restructuring of the ADPSP reflected changes to the project's design, including additional subcomponents and components, and revisions to the results framework, implementation arrangements, fiduciary arrangements, safeguards, and loan covenants. The second additional financing, financed by the multidonor trust fund, supported the scale-up of project activities and the extension of the project (World Bank 2017b).

¹¹ Table 1.2 does not report absolute numbers because of inconsistent (or absent) reporting among the Project Appraisal Document, ICR, ICRR, and the World Bank's operations portal. A more detailed discussion of the different components is provided in appendix A.

¹² Irrigation allows crop cultivation during the dry season (May to August) and therefore improves the year-round production potential from multiple cropping. Year-round production is also likely to improve productivity because access to sustainable and year-round sources of water reduces the water-stress constraints to higher crop yields.

¹³ Conservation agriculture encompasses different agronomic technologies to simultaneously (i) increase water and nutrient use efficiency and (ii) conserve biodiversity and the environment. The main technologies include permanent soil cover, minimum soil disturbance (zero tillage), and reduced plant (seeding) density (Thierfelder et al. 2013).

¹⁴ Water user associations (WUAs) are formal organizations that bring water users together to manage and pool financial, technical, and human resources for the operation and maintenance of a shared irrigation system (Malawi, MoAIWD 2015). Water user groups (WUGs) are informal variations on WUAs for the management of small-scale irrigation facilities.

¹⁵ The postcompletion operation assumptions of the IRLADP state that "the Government is better placed to follow-up ... with WUAs on performance." (World Bank 2015, 17).

¹ Lead farmers, also referred to as contact or model farmers, are farmers elected by the community to voluntarily assist in the delivery of agricultural practices and technologies on which they are first trained by extension agents (Ragasa 2019).

² Appendix A discusses the methodological issues of the data on farm-level productivity in the beneficiary impact assessment and the levels of targets used.

³ The System of Rice Intensification is an agronomic practice aimed at increasing the yield of irrigated rice by improving the management of plants, soil, water, and nutrients. The main feature is the manual transplanting of young seedlings in single-spaced rows and the minimal use of water. The technology is labor-intensive.

⁴ See appendix C for a discussion and timeline of the data.

⁵ The main sources of extension advice are the government agricultural extension service (33 percent), neighbors or relatives (30 percent), and electronic media (24 percent).

⁶ Note that in small-scale and mini-scale irrigation schemes, this does not refer to year-round water access on the same plot, as the lands within the schemes were given back to the landowners during the rainy season.

⁷ In the absence of a Land Act to facilitate the government's acquisition of customary land for public purposes, the IRLADP proposed a land- and water-management agreement as a tool specifying the land and water use arrangements between owners and users of the irrigated land over a specified time period. Although the agreement is not legally binding, it documents agreement to the intended use and benefits from the land to support the WUA and landowner to benefit equally from it. Each agreement is signed by the WUA chairperson and the landowner, and the traditional authority acts as an arbitrator in the case of disputes (Malawi, MoAIWD 2015).

⁸ For example, the ICR of the IRLADP draws the lesson that "In Malawi's context food security and irrigation development can go hand in hand through simple 'IFA [Input for Asset] schemes,' that are catalytic for organic growth in the irrigated area at very low cost and with immediate benefits to farmers" (World Bank 2015).

⁹ The MoAIWD (2015) states that "a minimum of at least 0.5 ha of irrigable land must be allocated to each household [to] generate sufficient cash flow to pay for all necessary inputs." Actual irrigated plot sizes observed during the fieldwork, from 0.04 hectares to 0.16 hectares per plot, seem to be too small to achieve economies of scale.

¹⁰ The designs of both projects also addressed postharvest losses, but the activities were limited to the demonstration of postharvest handling technologies (IRLADP) and studies on postharvest losses (ADPSP).

¹¹ The design flaw that the projects were too focused on stimulating the supply side of agricultural production growth does not detract from the need for supply-side interventions. At the early stages of agricultural transformation, production levels need to be boosted for any productivity growth to occur. Nonetheless, at the time of the projects' design, it was well understood that the supply and demand side of agricultural productivity need to be developed together. For example, the World Bank report *Agricultural Growth for the Poor* (World Bank 2005a) set out a development agenda for agricultural growth and stressed the need for simultaneously investing in public goods and stimulating market development.

¹² Conservation efforts initially planned to apply a catchment approach to reduce erosion and siltation of water resources. As the catchments were too large to manage, it was decided to focus on the most degraded and vulnerable parts of the catchment, so-called hotspots. Tackling hotspots of severe erosion has the purpose of protecting water sources. Efforts included vetiver planting, riverbank protection, and agroforestry around and upstream of the water intake (Posthumus et al. 2014).

¹³ Some of the tensions involved lead farmers prioritizing their own fields before assisting others, extension workers spending more time assisting lead farmers than the entire community, and lead farmers failing to meet other farmers because work was on a voluntary basis (Posthumus et al. 2014).

¹⁴ Nonetheless, some of the WUAs and WUGs initially faced security issues about land tenure (see appendix A). For example, Posthumus et al. (2014) note reports of conflicts about land tenure or landowners demanding some form of payment (use or lease fee) because the signed agreements between land users and owners were not legally binding.

¹⁵ The Water Resources Board oversees the enforcement of the Water Resources Act. The act provides regulations for water rights such as diversion, storage, abstraction, and use of public water, and the board is authorized to punish water users who violate these regulations (Malawi, MoAIWD 2015).

¹⁶ The “cashgate” scandal is considered to be the biggest financial scandal. Public funds were misused through fraudulent transactions carried out in the government’s Integrated Financial Management Information System (World Bank 2018b).

¹⁷ In theory, donors’ conditionalities are not possible in recipient-executed trust funds. Nonetheless, as donors had other projects with the MoAIWD, it might have been the case that donors tried to influence the MoAIWD outside the multidonor trust fund.

Appendix A. Project Ratings

Irrigation, Rural Livelihoods and Agricultural Development Project (P084148)

Table A.1. Irrigation, Rural Livelihoods and Agricultural Development Project

Indicator	ICR	ICR Review	PPAR
Outcome	Satisfactory	Satisfactory	Moderately satisfactory
Overall efficacy	Substantial	Substantial	Substantial
Bank performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Quality of monitoring and evaluation	—	Modest	Substantial

Sources: World Bank 2015, 2016.

Note: The ICR is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. Bolded ratings are different than the original rating in the ICR. ICR = Implementation Completion and Results Report; PPAR = Project Performance Assessment Report. — = not available.

1. Relevance of the Objectives

Objectives

Components—Original

Component 1: Irrigation rehabilitation and development supported the rehabilitation and gradual management transfer of four government-owned large-scale irrigation (LSI) schemes, the development of new gravity small-scale irrigation (SSI) and mini-scale irrigation (MSI) schemes, the rehabilitation of 11 small reservoirs, and the construction of group civil works for water harvesting and catchment conservation on a demand-driven basis.

Component 2: The Farmer Services and Livelihoods Fund supported beneficiary communities to obtain complementary services (extension, technology training, inputs, and marketing) and postharvest assets, on a demand-driven basis, to optimize returns to irrigated farming and access markets for their produce.

Component 3: Institutional development and community mobilization restructured, strengthened, or formed smallholder farmer (SHF) organizations and water user associations (WUAs) for irrigation transfer, management, and related activities, and additionally, in the case of WUAs, for the operation and maintenance (O&M) of water harvesting structures and soil conservation. This component supported policy and institutional capacity building for national irrigation institutions (Ministry of

Agriculture, Ministry of Irrigation and Water Development), including public training institutions, field staff, and farmer beneficiaries.

Component 4: Project coordination unit and monitoring and evaluation established a project coordination unit (PCU) at the Ministry of Agriculture and assisted in building ministry capacity through integration with ministry structures.

Components—Revised During the Second Additional Financing in 2012

Two major changes were made to component 1: (i) the rehabilitation of existing small storage reservoirs was dropped at Mid-Term Review (MTR) because of high costs, and (ii) two new activities were added: preparation for future investments and support for increased water use in existing irrigation schemes.

The support for extension under component 2 continued and was revised to include community mobilization and sensitization, which was initially covered under component 3. The support for marketing and postharvest assets also continued and was revised to include support to the Marketing Development Unit (this support also moved from component 3).

With the transfer of community mobilization activity to component 2, component 3 continued under a new title, “Institutional Development and Capacity Enhancement.” Four changes were made: (i) irrigation water management continued with specific subactivities on capacity enhancement to public irrigation service delivery, WUAs, and Irrigation Management Transfer (IMT); (ii) capacity building for farmers and the merger of community mobilization and sensitization activity with activities under component 2; (iii) support to the Marketing Development Unit was merged with activities under component 2; and (iv) support to Bunda College, Natural Resources College, and other training was merged with activities under irrigation water management.

A new **component 5, contingency financing for disaster risk response**, was added to support preparedness and rapid response to disasters as needed, and to allow rapid reallocation of proceeds from other components under streamlined procurement and disbursement procedures. Triggering this component required the head of state to declare a national disaster.

Relevance of the Objectives

The original and revised objectives of the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) were aligned with the objectives of (i) the medium-term development strategy for Malawi, that is, the Malawi Growth and Development Strategy (I and II), and (ii) Malawi’s compact to the Comprehensive Africa Agriculture Development Programme (mainly the sustainable land management and increased food

supply pillars).¹ Regarding the latter, the IRLADP complemented the Agriculture Sector-Wide Approach (ASWAp) by supporting the development of policies on irrigation, water management, and demand-driven extension. The IRLADP objectives remain relevant today because the development challenges of low productivity and profitability of smallholder agriculture and their root causes (low irrigation development, poor farming practices, and so on) addressed in the project are still central to Malawi's current development struggle. The most recent Systematic Country Diagnostic for Malawi in 2018 considers "improved irrigation and water management" to be important components of the "increasing agricultural productivity" pathways to sustainably reducing extreme poverty and boosting shared prosperity (World Bank 2018b).

Given the need for the government of Malawi to develop the country's irrigation potential to promote sustainable agricultural growth, the relevance of the objectives is rated **high**.

2. Efficacy

Agricultural Productivity and Its Drivers

Given the focus of the Project Performance Assessment Report (PPAR) and original project development objective (PDO) of the IRLADP on productivity growth, we discuss the two PDO indicators on national yield levels of irrigated rice and maize in detail. The beneficiary impact assessment (BIA) of Ng'ong'ola et al. (2015) documents the productivity levels of rice and maize as *combined* yields (including output from upland, irrigation schemes, and *dambo* and *dimba* areas) and *irrigated* yields. The BIA reports that the *combined* maize and rice yields of beneficiaries substantially increased by 114 and 356 percent, respectively, between the baseline in 2006 and the endline in 2014. These numbers are reported in the Implementation Completion and Results Report (ICR) as achievements for the *irrigated* yield. The difference is important. The *combined* maize yield in 2014 (3.4 metric tons per hectare) was larger than the *irrigated* maize yield (2.3 metric tons per hectare). The same applies for irrigated rice yields. Moreover, the BIA provides only a before-and-after comparison, but the analysis also could have provided a with-and-without project comparison using the panel data on beneficiaries and nonbeneficiaries.

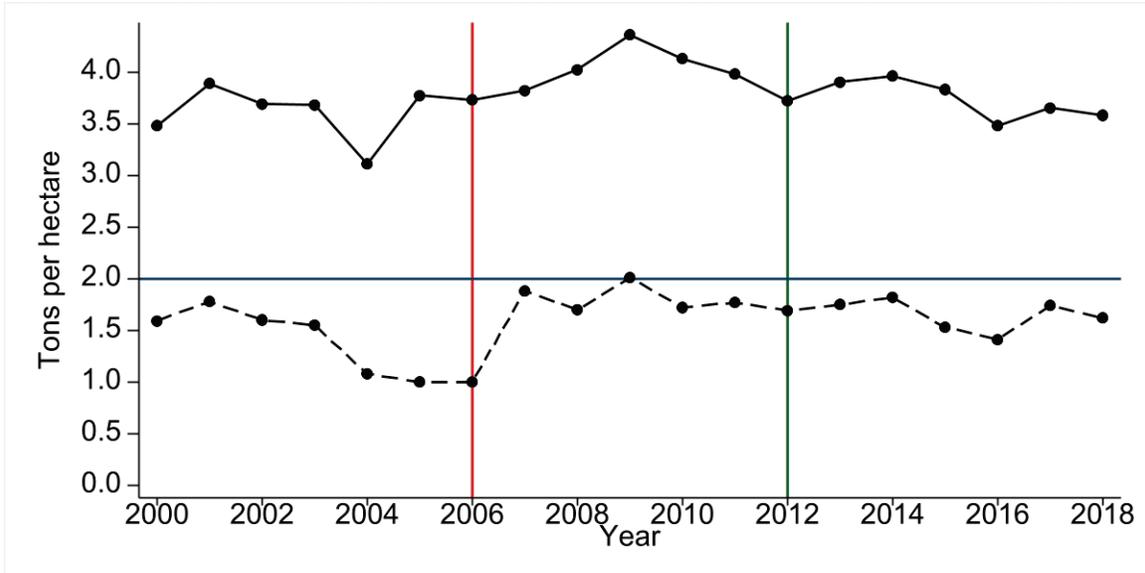
To see what happened before and after the project's timeline, figure A.1 shows the evolution of irrigated and rain-fed rice and maize yields from 2000 until 2018. The data are from the Agricultural Production Estimation Statistics (APES) produced by the Ministry of Agriculture, Irrigation and Water Development (MoAIWD) (Malawi, MoAIWD 2000–18). The time series includes production years before, during, and after

the project's timeline. As noted in appendix C, the APES data are most helpful for assessing trends in production rather than assessing the value of crop productivity in a particular year. A first observation is the volatile trend in irrigated yields for both crops. Irrigated yields of rice and maize were low before the project. Irrigated yields of both crops increased during the years after the project's start in 2006 (red vertical lines in figure A.1). Since 2009, however, neither crop has seen any meaningful and positive increase in yields. Moreover, the project was implemented with delays (see the Bank Performance section of this appendix), and the ICR assumed that benefits from irrigation activities would be realized from the third year of the project's implementation. In other words, at the time beneficiaries could start reaping the benefits from the project, the APES did not show significant yield increases.

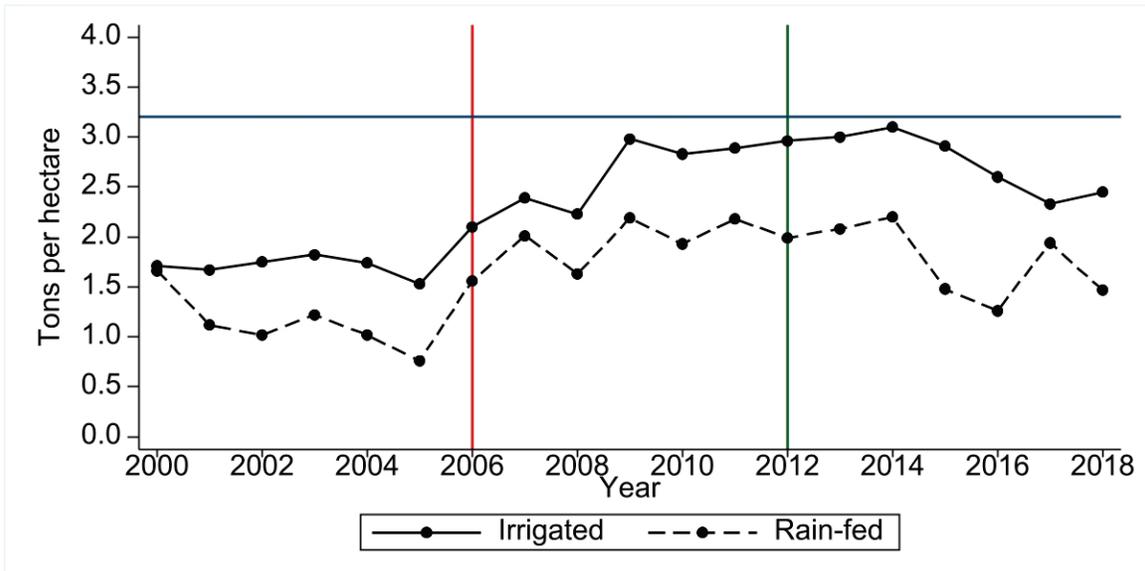
A second observation is the unclear definition of the revised target values of the PDO indicators. The ICR mentions that the data from the baseline survey formulated the original targets for rice and maize yield, 1 and 1.6 metric tons per hectare, respectively. The baseline values appear to be identical to the APES values. The second additional financing (AF) in 2012 revised the yield targets for irrigated rice and maize to 2 and 3.2 metric tons per hectare, respectively. The ICR does not mention what information was used to update the targets or why the change was made. Panel a of figure A.1 shows that the estimated yield of irrigated rice was 3.7 metric tons per hectare in the APES data in 2012. Hence, the revised target of the IRLADP was 75 percent below the official yield estimate. On the contrary, the revised yield target of irrigated maize closely resembles the APES yield data in panel b of figure A.1.

Figure A.1. Evolution of Rice and Maize Yields (Irrigated and Rain-Fed)

Rice yield estimates



Maize yield estimates



Source: Agricultural Production Estimation Statistics (Malawi, Ministry of Agriculture, Irrigation and Water Development 2000–18).

Note: See appendix C for an explanation of the data. The red vertical lines represent the year the Irrigation, Rural Livelihoods and Agricultural Development Project became effective, and the green vertical lines represent the year of the second additional financing. The blue horizontal lines represent the revised target values for irrigated rice and maize yields.

In summary, the APES data show that sustainable increases in agricultural productivity did not occur for the two primary crops. The national statistics do not reflect the yield

benefits accruing to IRLADP beneficiaries documented in the BIA, suggesting that benefits have not been expanded beyond the beneficiaries.

The introduction of the WUAs is a main achievement of the project (see chapter 2, paragraphs 1.31 and 1.32). The IRLADP facilitated the transfer of the responsibility for land and water management in irrigation schemes from landowners to land users in the absence of a Land Act (Malawi, MoAIWD 2015a). The IRLADP transferred irrigation management from the government of Malawi to communities through the IMT and the joint management period in LSI schemes.² The IRLADP also promoted WUAs for O&M, although the concept is not new in Malawi (Posthumus et al. 2014). In SSI and MSI schemes, the IRLADP introduced WUAs or WUGs and Land and Water Management Agreements between landowners and land users. Land in the irrigation schemes owned by individuals under customary land arrangements would be rented out to WUAs in the dry season, providing WUA members with access to water for irrigation.

The IRLADP-initiated land agreements were informal, so some WUAs (and WUGs) initially faced insecurity of land tenure. This issue had been identified as a major risk to the project's outcomes because of potential conflicts among owners, irrigation users, and other users of the customary land in the irrigation schemes. The group of other users includes, for example, farmers who use pastureland for livestock herding. Thus, land-security issues were expected to arise, particularly in SSI and MSI schemes and when a few individuals owned the land in the irrigation schemes. The 2018 Land Act formalized the certification of land, which facilitated the transfer of land between users and owners. This policy change should minimize conflicts over land in the future. As the government previously owned the land in LSI schemes and then transferred it to the WUAs under the IMT, such conflicts were absent in the LSI schemes. Nonetheless, some nonmembers—previously using the idle government land—sought compensation for land expropriation when the government claimed the land after independence.

The WUAs' successful approach to the management of land and water is now being used as a model for other agricultural projects in Malawi. The Shire Valley Transformation Program provides an example. The institutional framework of WUAs reports that members pay an annual subscription fee of 2,000–2,500 Malawian kwacha (MK) to the WUA at the beginning of the irrigation season for the right to cultivate 0.1 hectares of irrigated land (Malawi, MoAIWD 2015a).³ The fees cover the cost of the land lease and water abstraction certificate (MK 1,000) and finance the O&M of the irrigation scheme (MK 1,500). The water abstraction certificates allow WUAs to settle disputes about water rights with nonmembers in the case of illegal water diversion by households without water abstraction certificates.

Water availability becomes an issue when extreme weather events cause damage to the irrigation infrastructure. Water availability is usually not a major issue when communities have access to a sustainable source of water such as a lake or a river. As mentioned in chapter 2, paragraph 1.32, however, the fieldwork indicated some hardware issues that reduced the efficiency of bringing water to the irrigated fields. Many of the irrigation sites visited were affected by floods caused by El Niño weather events in 2015 (and by floods that Cyclone Idai caused in 2019). Support for the rehabilitation of existing irrigation schemes by the Malawi Drought Recovery and Resilience Project of the World Bank and other donor projects targeted the LSIs. As a consequence, most of the SSIs and MSIs were not included in those rehabilitation programs. Irrespective of damage caused by extreme climatic events, all schemes need proper repairs every two to three years. Although WUA and WUG members have the capacity to maintain small and earthen irrigation canals, they lack the knowledge and skills to maintain or repair larger parts of the irrigation infrastructure (water inlets, weirs, and so on). As a consequence, the recently rehabilitated LSI facilities visited during the fieldwork were visibly in good condition, whereas severe quality issues were observed in some larger components in other irrigation schemes (photo A.1).

Photo A.1. Quality of Major Irrigation Infrastructure



Source: Independent Evaluation Group.

Note: Pictures from the fieldwork (from left to right): Windu scheme in Dedza, Likangala scheme in Zomba, and Chingale scheme in Zomba. Red circles show problems with the infrastructure (missing pipes and joints, water leakage).

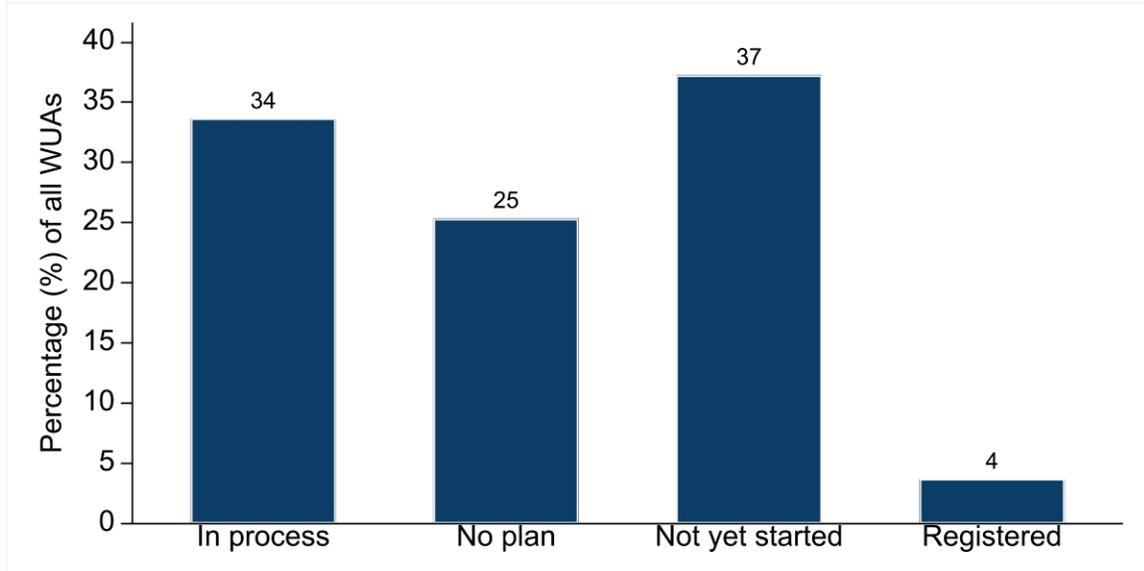
Moreover, water availability has become more problematic in recent years because of the unsustainable water and land management of nonmembers in the upper-stream parts of the catchment areas. Catchment committees lacked incentives to reforest the riverbanks to maintain the water-retention capacity of the soil, and upstream farmers illegally tapped river water (Posthumus et al. 2014). At the end of the project, seedlings for fruit

trees were distributed to protect riverbanks, but many farmers planted them on plots outside the scheme. Efforts to promote rainwater harvesting and catchment conservation failed, and limited resources forced the project to prioritize hotspots of highly degraded land (Posthumus et al. 2014).

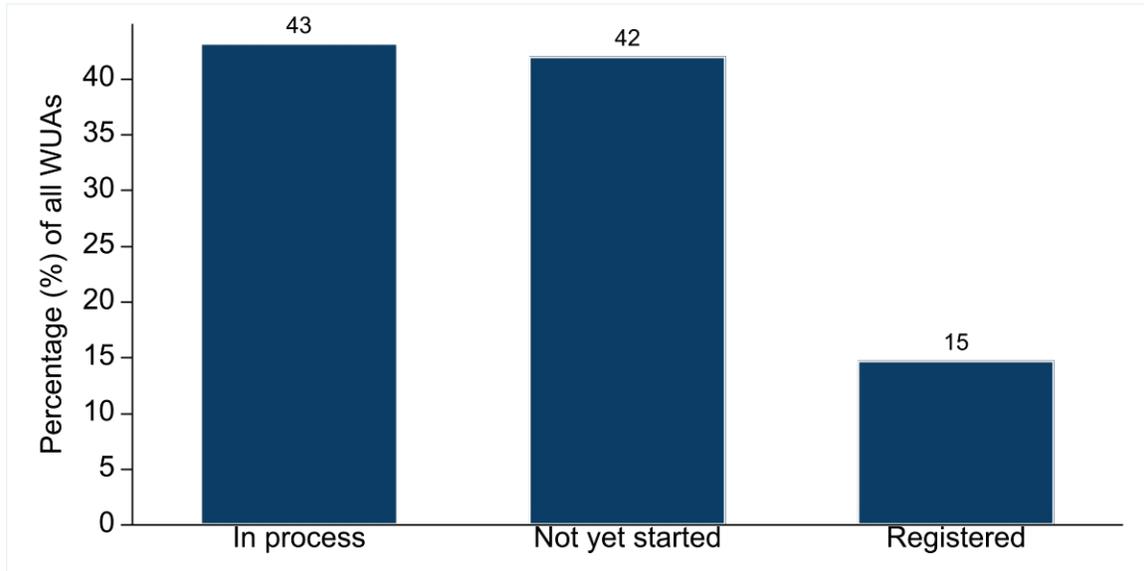
The IRLADP supported WUAs' registration under the Trustees Incorporation Act, but progress stalled after the project ended. The official database of irrigation schemes in Malawi included 3,389 irrigation facilities as of early 2020. Just over 1,400 of them were indicated as having the status of WUA.⁴ Figure A.2 shows the status of these WUAs in terms of their legal registration. As of early 2020, only 4 percent (that is, 52 facilities) of the WUA schemes were registered. The database indicates that the IRLADP supported 132 irrigation facilities, which led to the formation of 91 WUAs. As of early 2020, only 13 of these groups were formally registered as WUA cooperatives.⁵ Although this is only 15 percent of the total number of WUAs, it is 11 percentage points higher than the national average. The low number of registered WUAs is related to the time-consuming and tedious paperwork process for the registration of the cooperatives under the Trustees Incorporation Act.

Figure A.2. Status of Water User Association Registration Process

Status of registration process for all water user associations in Malawi (n = 1,403)



Status of registration process for water user associations supported by IRLADP (n = 91)



Source: Malawi, Ministry of Irrigation and Water Development 2020.

Note: See appendix C for an explanation of the data. IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; WUA = water users association.

The System of Rice Intensification (SRI) technology is claimed to have boosted irrigated rice yields, but uptake is limited. During the second AF in 2012, the SRI technology was introduced to increase the yields of irrigated rice. Lead farmers demonstrated that correctly implementing the three main principles of SRI—planting young seedlings, using planting spaces of 20 centimeters by 20 centimeters, and planting one seedling per

hole—in combination with the application of manure and the use of a cono weeder, can substantially improve irrigated rice yields. In the subsequent year, farmers interested in SRI could participate in demonstration plots, and the project provided seed and trained artisans to manufacture cono weeders. The BIA claimed that “there were 1,949 SRI practicing farmers across the country by mid-February 2015, who doubled or tripled their rice yields... depending on variety” (Ng’ong’ola et al. 2015, 62). The MoAIWD’s Department of Agricultural Research Services estimates that about half of the farmers who tried SRI were still using it in early 2020. The decline in adoption rates is related to the labor-intensiveness of hand seeding and the unreliability of rainfall, which complicates the alternated wetting and drying practice. Another constraint is linked with the extension message. Farmers understand that SRI applies only to a small part of their plots, and usually only one person in the household has been properly trained in SRI techniques. The impact of the labor opportunity cost of SRI on other elements of the farm system is unclear.

Other Project Benefits

In addition to the achievements of the IRLADP with respect to agricultural yields, the project also achieved the other PDO indicators of on-farm sales, the adoption of a harmonized investment framework, and the coverage of project beneficiaries. For intermediate outcomes, the project achieved all targets related to the area developed and rehabilitated with irrigation and drainage services, support to the WUAs and WUGs that operated the irrigation facilities, and support to individual farmers through the Input for Asset (IFA) program and farm business organizations. The project also achieved its targets for the training of technical staff and project-related activities (for example, the monitoring and evaluation [M&E] system).

The direct beneficiaries of the IRLADP identified in the Project Appraisal Document (PAD) are (i) the irrigation water users and farmers in upper catchments for the supply and management of irrigated water under component 1, and (ii) farmers who formed groups and developed a proposal for either creating productive assets or receiving extension services (World Bank 2005). Farmers’ access to irrigation plots and organization in groups often reflected observed and unobserved characteristics (such as location in the village or entrepreneurship). Thus, both categories of beneficiary farmers are less likely to be among the most vulnerable and poorest in the local communities than the typical farmer in the village. The PAD also stated that landless farmers and rain-fed farmers located around irrigation schemes could potentially benefit from indirect effects from wage work and soil conservation and rainwater harvesting measures, respectively. The interviews during the fieldwork did not indicate that members of the WUAs systematically made use of hired labor, potentially related to the small plot sizes. Poor farmers—or better, the rural poor willing and able to work—were,

however, directly targeted when the IFA public works activities were increased under the second AF. The latter group accounts for 71 percent of the total beneficiaries reached at the end of the IRLADP.

The IRLADP, directly and indirectly, addressed gender issues within beneficiary households. The IRLADP introduced the “household approach” to address gender (and HIV/AIDS) issues within the household. Moreover, the ICR documents that the project’s indicators with a disaggregated target for gender were all achieved, especially those on the representation of women at WUAs, farmer business organizations, and IFA committees. For example, the MoAIWD’s irrigation database shows that the share of female beneficiaries participating in IRLADP-supported sites was 57 percent (total beneficiaries = 13,105; Malawi, MoAIWD 2020). This share was 50 percent for the irrigation facilities not supported by the IRLADP (total beneficiaries = 161,518). It is important to note that women represent a relatively higher share of irrigated rice farmers, as women are often responsible for the labor-intensive farming of staple crops.

Institutional Capacity Building

A thorough assessment of the increased effectiveness of Malawi’s irrigation investment policy (under the second part of the PDO to “strengthen institutional capacity for long-term irrigation development”) is beyond the scope of the PPAR. Nonetheless, several elements are important. The IRLADP successfully contributed to the change in irrigation legislation and policies (see above and chapter 2, paragraph 1.31). The IRLADP introduced an innovative approach to capacity building and the institutionalization of irrigation management through the IMT in LSI schemes, Land and Water Management Agreements, the O&M responsibility of the WUAs, and the establishment of district irrigation advisory services. The latter were created to strengthen irrigation advisory services at the district level. The institutional and legislative capacity for irrigation development has improved through the WUAs and agreements. Despite this improvement, the district irrigation advisory services do not seem to have the capacity to respond quickly to irrigation problems that WUAs cannot handle or provide technical assistance for repairs.

Efficacy Rating

The IRLADP achieved the project targets for irrigation development outcomes. Most important, the ICR documents substantial overachievement in the increase in beneficiary yields. At the intermediate outcome level, the project made an important contribution to the delivery of agricultural services. More specifically, the project achieved the targets for the rehabilitation and construction of irrigation infrastructure, the institutionalization of WUAs, and the (technical) capacity building of the WUAs and farmers on the management and O&M of small irrigation infrastructures.

There are, however, concerns about the sustainability of project activities. The Independent Evaluation Group (IEG) assessment of the time series of official production estimates does not show significant productivity increases over time. Hence, the IRLADP did not fully contribute to the PDO indicator “to increase agricultural productivity of poor rural households in all districts.”

IEG’s field assessment confirmed that beneficiaries still have access to agricultural services. The most useful service is membership in a WUA, and members continue to use the promoted technologies and receive extension. But WUAs suffer from dependence on external support for their continuation. WUAs remain dependent on government or donor support for site rehabilitation after a climate shock or for the maintenance of larger parts of the irrigation scheme. IEG’s field assessment further identified concerns about the maintenance of larger parts of the irrigation infrastructure, the limited institutionalization of the WUAs, and the low uptake of technologies to increase productivity. Finally, the scale-up of the irrigation coverage, technology, and extension beyond the supported schemes is limited. The IFA approach for input provision has been abandoned, and the scalability of the SRI technology is limited.

Despite a number of shortcomings in the project’s assessment of efficacy identified above, the project achieved the targets for all the PDO indicators and most intermediate outcomes. Hence, the IRLADP’s efficacy is rated **substantial**.

3. Efficiency

Economic and Financial Analysis

The Economic and Financial Analysis (EFA) in the PAD and ICR shows favorable returns to investments and increasing returns in the ICR’s updated EFA, even though the latter accounted for the delays in the project’s implementation. The increased returns are attributed in the ICR to the “increment in the number of beneficiaries, total hectareage under irrigation and crop productivity as a result of the rehabilitation and development of the schemes coupled with related activities” (World Bank 2015, 22).

Despite this finding, caution is essential in accepting this result. The EFA suffers from substantial methodological issues that make the estimated returns on investments questionable. It is unclear how the EFA (i) defined crucial elements (for example, labor income); (ii) extrapolated benefits from individual plots; (iii) accounted for the increased use of family labor; and (iv) critically assessed the quality of the data used to calculate net incomes. In the following paragraphs, we illustrate the shortcomings.

The average plot sizes—using data from the BIA (tables 3.2, 3.3, and 3.4 in ICR annex 3)—realized for LSI, SSI, and MSI schemes are 0.32, 0.27, and 0.48 hectares,

respectively. In contrast, the ratios of the actual total irrigated area of the schemes over the total number of direct beneficiary households are 0.18, 0.13, and 0.10 hectares per household, respectively. First, it is unclear why the average plot sizes in the BIA are much higher than the sizes of irrigated land in the schemes that are available for each beneficiary household (calculated as the above ratio). Second, the realized plot sizes reported in the ICR are 50 percent (LSI) and 100 percent (MSI) larger than the typical size of 0.1 to 0.2 hectares for an irrigated plot within the WUA (Malawi, MoAIWD 2015a).

These numbers raise questions about how the benefits per direct beneficiary were calculated. Were benefits calculated per reported plot size and extrapolated to the total number of beneficiaries? Or were benefits calculated for the total size of irrigated land and then divided by the total number of beneficiaries? This is not explained in the ICR and a relative measure of returns to farming per hectare would be more informative. The size of irrigated plots is fundamental for the EFA of irrigated farming.

The EFA in the ICR shows that the cropping intensity of beneficiaries in LSI, SSI, and MSI schemes has increased between 2006 and 2014 by 89, 119, and 144 percent, respectively. Although this is a favorable trend toward smoothing agricultural labor calendars over the production year, increased cropping intensities can be environmentally sustainable only when fertilizer compensates for the increased extraction of soil nutrients. Neither evidence nor increased costs are provided on compensating measures.

Compared with the baseline, the EFA reports that the demand for family labor in LSI, SSI, and MSI schemes increased by 296, 183, and 483 percent, respectively. At the same time, however, the returns to labor in LSI, SSI, and MSI schemes increased by 643, 2,269, and 2,675 percent, respectively.⁶ This implies that income gained per person-day of labor was more than 25 times higher at the end of the project than at the baseline. It is unclear how labor income is defined, and it appears that the opportunity cost of the increased labor demand was not considered.

The ICRR mentioned the lack of explanation on how incomes were defined and calculated in the ICR. The IRLADP team responded to the critique that the methodology and data from the BIA were used. Ng'ong'ola et al. (2015, 47) argue that "net income is defined in this study as the difference between total cash income and total cash expenditure." Table A.2 reports the monthly level of nominal gross income from agriculture and other sources, nominal expenditure, and real net income of beneficiary households for 2006, 2008, 2012, and 2014 from the BIA. The BIA reported that the monthly agricultural and total income increased from 2006 to 2014 by 83 and 227 percent, respectively. During the same period, however, the total monthly

expenditure of households dropped by 92 percent, to MK 6,421 from MK 78,703. Also, of concern is that no time reference for the income or expenditure data is provided. This omission raises concerns about the validity of the data. Moreover, the original table reported in the BIA contained errors and therefore an overestimation of the incremental real net income.⁷

Table A.2. IRLADP Beneficiary Households' Gross Income, Expenditures, and Net Income

Income or Expenditure	2006	2008	2012	2014
Total income (MK)	49,837	68,489	62,380	91,224
Agricultural income (MK)	16,586	32,108	37,440	54,364
Other income (MK)	33,251	36,381	24,940	36,860
Total expenditure (MK)	78,703	49,387	6,404	6,421
Nominal net income ^a (MK)	-28,866	19,102	55,976	84,802
Composite rural CPI	214.6	246.1	356.8	406.4
Real net income ^b (MK)	-13,451	7,762	15,688	20,867
Incremental real net income ^c (MK)	n.a.	21,213	29,139	34,318

Source: Ng'ong'ola et al. 2015.

Note: All amounts are expressed in MK, except for the CPI, which is unitless. Bolded numbers are corrected data instead of the original data. CPI = consumer price index; IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; MK = Malawian kwacha; n.a. = not applicable.

a. Net income is calculated using the CPI, where 2,000 = 100.

b. Real net income is nominal net income divided by the CPI.

c. Incremental real net income in a given year is the difference between the real net income in that year and the real net income in 2006.

Table A.3 compares the household levels of nominal consumption expenditures calculated from the different rounds of the Living Standards Measurement Study (LSMS) data with the values reported in the BIA. Note that the LSMS data were not collected for the same years as the BIA, and that expenditures are calculated on an annual base. For simplicity, to obtain the per-month expenditures, the annual value was divided by 12. Table A.3 shows that the nominal value of household expenditures reported for different years in the BIA tends to be out of line with the values calculated based on the LSMS. First, the nominal value of the monthly household consumption expenditure reported in the BIA for 2006 (MK 78,703) is 14 times more than the monthly expenditure value calculated from the second round of the LSMS data for 2005–06. In other words, it is likely that the *per-month* expenditure for 2006 in the BIA corresponds to the *annual* household expenditure in the LSMS data.

Second, the value of the nominal household consumption expenditure for 2014 (MK 6,421) in the BIA seems to reflect the *per capita* monthly expenditure rather than *per-household* expenditure. Another table of the BIA reports summary statistics on both per

capita and per-household expenditure of MK 25,618 and MK 6,137 (for beneficiaries), respectively. In comparison, the monthly household expenditure value of MK 25,618 in the BIA is more than double the monthly household expenditure (MK 11,751) calculated from the third round of the LSMS. A similar observation occurs for the level of expenditures in 2014. Hence, the expenditure data in the BIA for 2006 appear to be an overestimation, whereas the expenditure data for 2012 and 2014 are likely to be underestimated.⁸ This complicates the correct interpretation of the net income gains claimed in table A.2.

Table A.3. Total Nominal Monthly Consumption Expenditure per Household (MK)

Year	2005	2006	2008	2011	2012	2014	2016
LSMS	5,576	—	—	11,751	—	31,914	44,157
BIA	—	78,703	49,387	—	6,404	6,421	—

Sources: Ng'ong'ola et al. 2015 and Living Standards Measurement Study.

Note: Data are presented for years in which they were available. The LSMS data provide a calculation of total nominal annual consumption per household, which was divided by 12 to convert it into a monthly value. The LSMS data for 2005, 2011, and 2016 are from the second, third, and fourth rounds of the LSMS, respectively. The value for 2014 is (linearly) interpolated based on the three rounds. BIA = beneficiary impact assessment; LSMS = Living Standards Measurement Study; MK = Malawian kwacha; — = not available.

Administrative and Institutional Efficiency

The project was in effect as of May 2006, but it took three years for the first activity to be implemented. This caused severe delays in the rehabilitation and construction of irrigation schemes and capacity building for WUAs. The delayed construction was linked with several issues.

First, the technical design of the project did not properly consider the role and recruitment of irrigation engineers at an early stage of project implementation. Second, the feasibility studies to identify and assess the state of irrigation schemes underestimated the time and resources needed. Third, delays in processing payments of the invoices for construction materials resulted in procurement being finalized at the end of the dry season. Because of such delays, the project risked not meeting the expectations of the intended beneficiaries. As some irrigation facilities were completed only at the project's end, the effects of these efforts are visible only because the second AF provided an extension of the project (Posthumus et al. 2014).

The construction of irrigation schemes was more expensive than budgeted because of the financial crisis of 2008 and the devaluation of the national currency (and lack of foreign exchange).⁹ Further issues in the construction of irrigation schemes were (i) delayed rehabilitation of some LSI schemes because of poor contractor performance and damage by floods; (ii) improper site identification, delayed introduction of WUAs,

and delayed beneficiary mobilization for SSI schemes; and (iii) delayed completion of MSI schemes because of late design finalization, central procurement of materials, and delayed recruitment of local artisans (Posthumus et al. 2014). For MSI schemes, the IRLADP adapted the project approach by bringing MSI under the IFA component and simplifying construction design by using sketches rather than full designs.

A final weakness of the project design was the use of grants rather than soft loans to farmer organizations (Ng'ong'ola et al. 2015; Posthumus et al. 2014). Grants discouraged ownership, responsibility, and commitment among their recipients, leading to misuse of funds, leadership problems, and a collapse of the venture in some cases.

Efficiency Rating

Using a PCU resulted in fewer administrative and institutional inefficiencies compared with the Agricultural Development Program Support Project (ADPSP) approach of using existing government structures for project coordination. Nonetheless, administrative and institutional inefficiencies delayed the implementation of project activities by three years. There were significant delays in the rehabilitation and construction of irrigation schemes.

The project is economically and financially viable, but there are concerns about the EFA's methods and analysis presented in the ICR that raise doubts about the evidence on beneficiary incomes. But the project at least attempted to do an empirical analysis using survey-based data.

For the above reasons, the efficiency of the IRLADP is rated **modest**.

4. Outcome

The rating for the overall outcome is based on the individual ratings for relevance, efficacy, and efficiency. In accordance with IEG's guidelines, a rating of **high** for relevance, **substantial** for efficacy, and **modest** for efficiency results in a rating of **moderately satisfactory** for the project's overall outcome. This revised rating is based on the additional evidence from IEG's assessment of the official government statistics, the LSMS data, and qualitative information from the fieldwork.

5. Risk to Development Outcome

Four risks to development outcomes were identified: (i) land tenure insecurity; (ii) O&M of irrigation infrastructure; (iii) demand-driven advisory services support; and (iv) complementary input support. All these risks are discussed in detail in the main text. The risk to development outcome is rated **substantial**.

6. Bank Performance

Quality-at-Entry

As mentioned before, the IRLADP introduced an innovative approach to water management by empowering local communities in land and water management and introducing institutional changes. This was an ambitious project and among the first in Africa to put irrigation back on the agricultural investment agenda using an innovative approach to combine “hard and software” (Posthumus et al. 2014). As acknowledged by the project’s BIA, however, the project’s scope was too broad. The scope entailed many interventions involving diversified stakeholders, which complicated the implementation process (Ng’ong’ola et al. 2015). The ICR acknowledged that the results framework was open-ended and the analysis conducted in the EFA was basic (World Bank 2015, 28).

The quality-at-entry is rated **moderately satisfactory**.

Quality of Supervision

The ICR documents several examples of the PCU’s active involvement that positively affected project implementation. Examples include the review meetings and joint field trips with implementing departments and the ongoing restructuring to respond to the government of Malawi’s requests. The government requested the first AF in 2010 to account for cost overruns and to finalize the rehabilitation and capacity-building activities. The second AF was requested in 2012 as a cushioning measure against the impact of the macroeconomic stabilization program on vulnerable households, by increasing the IFA component.

Appendix B highlights the problems with financial management and delays in the implementation of activities caused by the low procurement and financial management capacity of the ministries responsible for project implementation. That appendix also documents the World Bank’s efforts to address some of these issues, such as by applying the lessons learned during the MTR.

The quality of supervision is rated **satisfactory**.

The overall Bank performance is rated **moderately satisfactory**.

7. Borrower Performance

Government Performance

The government of Malawi’s sustained commitment to addressing low agricultural productivity had a positive effect on the performance of the IRLADP’s implementation.

The two rounds of AF illustrate dedication to the IRLADP. However, initial institutional capacity constraints resulted in significant implementation delays (see the discussion in section 3 of this appendix and in appendix B).

The government performance is rated **moderately satisfactory**.

Implementing Agency Performance

Various government agencies, notably the MoAIWD and the Malawi Social Action Fund (MASAF), were responsible for supervising and implementing the project. The MoAIWD had the overall responsibility for the implementation of component 1 and directly implemented the rehabilitation and construction of LSI and SSI schemes, respectively. MASAF implemented the MSI schemes under component 1 and was responsible for the implementation of all demand-driven investments of component 2. The overall responsibility for the implementation of project activities was under the local assembly at the district level (through the District Agricultural Development Offices). External constructors implemented the construction works with contributions from local communities and supervision by engineers.

A capacity assessment of the MoAIWD and MASAF found limited capacity of, and weak coordination between, the ministries; a lack of qualified human resources at the district level; and an absence of comprehensive accounting systems (World Bank 2015). Therefore, a PCU was established in the MoAIWD to oversee project implementation, coordinate financial management, and monitor project progress. To further address capacity constraints, justification assistants were recruited at the district level, regional project outreach offices were established, and advisory services were strengthened at the district level.¹⁰ Using a dedicated PCU rather than implementing the project using the existing government structures improved the project performance regarding implementation, M&E, and financial management.

The implementing agency performance is rated **satisfactory**.

The overall borrower performance is rated **moderately satisfactory**.

8. Quality of Monitoring and Evaluation

Design

The PCU was responsible for M&E and designed the M&E system based on rapid results and a participatory approach. The PDO and intermediate outcome indicators originally documented in the PAD were revised during the two rounds of AF to improve alignment with the PDO, to reflect the expansion of project coverage under the AF, and to improve measurement of the outcomes. The three main PDO indicators realigned in

the results framework of the second AF were the crop yields for irrigated maize and rice and farm sales. As discussed in the ICRR, the latter indicator lacked a clear definition and was difficult to measure and attribute to the project.

Eighteen intermediate outcome indicators existed, but most of them referred to service-delivery outputs (for example, farmers getting advice and training) rather than outcomes. The M&E, therefore, offers limited evidence about how the project's outputs contributed to outcomes.

Implementation

The monitoring of project implementation and assessment of project impact were a joint effort between the PCU and district experts. The regional M&E specialists coordinated the collection of agricultural data, which were then processed by a highly skilled M&E specialist in the PCU. A baseline survey was conducted in 2006, and BIAs were conducted in 2009, 2012, and 2016. In the final BIA, Ng'ong'ola et al. (2015) analyzed the panel data from the baseline and endline.

Use

The M&E system was highly informative for decision-making and provided the basis for an impressive learning exercise. The baseline data benchmarked the targets for the indicators in the results framework, but the revision of the targets in the second AF is questioned in the discussion on efficiency. At the end of the project, two comprehensive reports—a “lessons learned” report by Posthumus et al. (2014) and an “Independent Endline Survey and Impact Evaluation” by Ng'ong'ola et al. (2015)—disseminated the project's impact on beneficiaries and lessons from implementation.

Because of the impressive learning exercise conducted, which was not available at the time of the ICR, the PPAR rates the M&E as **substantial** (despite having outputs as intermediate outcomes in the results framework).

Notes

¹ The Comprehensive Africa Agriculture Development Programme is the pan-African policy framework for agricultural transformation. It pushes for reforms in the agricultural sector aligned with two targets: (i) 6 percent annual growth in agricultural gross domestic product, and (ii) the allocation of at least 10 percent of public expenditures to the agricultural sector.

² The Irrigation Management Transfer was encouraged under the National Irrigation Act of 2001.

³ At the time of the Project Performance Assessment Report mission, the exchange rate was 1 Malawian kwacha to \$0.00136.

⁴ The existence of a water user association (WUA) was identified when an irrigation facility in the database (n = 3,389) had a non-missing value of the indicator on status in the WUA registration process WUA (n = 1,403).

⁵ Note that 38 WUAs are in the process of being registered.

⁶ The percentage changes in labor demand and returns to labor are from table 6.12 of Ng'ong'ola et al. (2015).

⁷ In the original table reported in Ng'ong'ola et al. (2015), the real net income for 2006 was incorrectly calculated as the product of the nominal net income *multiplied* (instead of divided) by the consumer price index. As a consequence, the incremental real incomes for each year were incorrect. The correct (incremental) real income is provided in table A.2.

⁸ A similar comparison for the income sources is not possible.

⁹ The Irrigation, Rural Livelihoods and Agricultural Development Project put in place several measures to avoid critical structures being compromised by engaging farmers in a participatory prioritization of activities.

¹⁰ Justification assistants manage the project's accounting and information systems at the district level (World Bank 2015).

Agricultural Development Program Support Project (P105256)

Table A.4. Agricultural Development Program Support Project

Indicator	ICR	ICR Review	PPAR
Outcome	Satisfactory	Satisfactory	Moderately unsatisfactory
Overall efficacy	Substantial	Substantial	Modest
Bank performance	Moderately satisfactory	Moderately satisfactory	Moderately satisfactory
Quality of monitoring and evaluation	—	Modest	Modest

Source: World Bank 2017, 2018a.

Note: The ICR is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. Bolded ratings are different than the original rating in the ICR. ICR = Implementation Completion and Results Report; PPAR = Project Performance Assessment Report; — = not available.

1. Relevance of Objectives

Objectives

Components—Original

Component 1: Institutional development and capacity building in preparation of a sectorwide approach in agriculture strengthened and harmonized the investment strategy underlying the sectorwide approach. It included four subcomponents: (i) management and coordination support to strengthen the MoAIWD; (ii) planning, monitoring, and evaluation support of the Department of Planning, Agricultural Development Divisions, and district agricultural offices; (iii) development of technical systems and skills for the MoAIWD; and (iv) development of administrative systems for the MoAIWD.

Component 2: Sustainable food security supported the implementation of three priority agendas outlined in the project's investment framework relating to the enhancement of food security. The priority agendas included growth in maize production, sustainable land management, and the development of national capacity for market-based risk management. Component 2 included two subcomponents: (i) the Sustainable Productivity Growth Initiative to promote the use of improved technology options for sustainable SHF maize-based cropping systems through a combination of improved practices for sustainable yield growth and enhanced adaptation to rainfall variability and soil degradation; and (ii) strengthening market-based agricultural risk management strategies and capacity building for integrated commodity risk management as a key component of national risk management systems.

Component 3: Project coordination managed and used resources for the project's objectives and procedures.

Components—Revised During the First and Second AF

A new subcomponent was added to **component 1** to strengthen the decision-making processes and capacity for land administration. This subcomponent provided up-to-date information and analysis on land management and land-use planning. This allowed the monitoring of the evolution of land use under estate management.

The title of **component 2** was reformulated to **Sustainable Food Security, Agricultural Growth, and Diversification** to include additional activities to diversify maize-based farming systems and strengthen support to the FISP. Three subcomponents were added: (i) support to the FISP and seed monitoring/certification; (ii) legume crop production and marketing; and (iii) improving the agribusiness environment and promoting agribusiness partnerships.

The first AF in 2012 added a new **component 4, improvement and maintenance of unpaved rural roads**, to finance improvement works on unpaved rural roads and support improved market access of inputs and outputs of agricultural produce. The estimated cost of this component at appraisal was \$49.2 million, but the actual cost was not reported in the ICR.

Relevance of the Objectives

The ADPSP supported the ASWAp and the first AF relabeled the project as ASWAp-SP1. Thus, the sustainability of the relevance and outcomes of the ADPSP can be assessed against the outcomes of the ASWAp.

Malawi pursues the Comprehensive Africa Agriculture Development Programme (CAADP) agenda for Africa. By signing the CAADP compact in 2010, the government of Malawi showed its commitment to the twin CAADP targets, that is, the allocation of 10 percent of the annual national budget to agriculture and achieving at least 6 percent agricultural growth annually. To achieve these targets, the CAADP promotes the creation of a national agricultural policy to guide longer-term investment, provides clear and comprehensive policy guidance, and implements priorities in the agricultural sector. Such a national agricultural policy had been lacking until 2016, and the ASWAp—implemented from 2011–12 to 2015–16—filled this gap. The ASWAp provided an agricultural investment framework to guide investments and actions for the development of the agricultural sector.¹

The ASWAp was also in line with key and strategic national policy documents, including the Malawi Growth and Development Strategy, the Malawi Development

Assistance Strategy, and the Vision 2020; additionally, it was in line with the Millennium Development Goals at the international level.

The ADPSP's support of the development of an ASWAp, and later the National Agricultural Investment Plan (NAIP), is highly relevant. Hence, the relevance of the ADPSP's objectives is rated **high**.

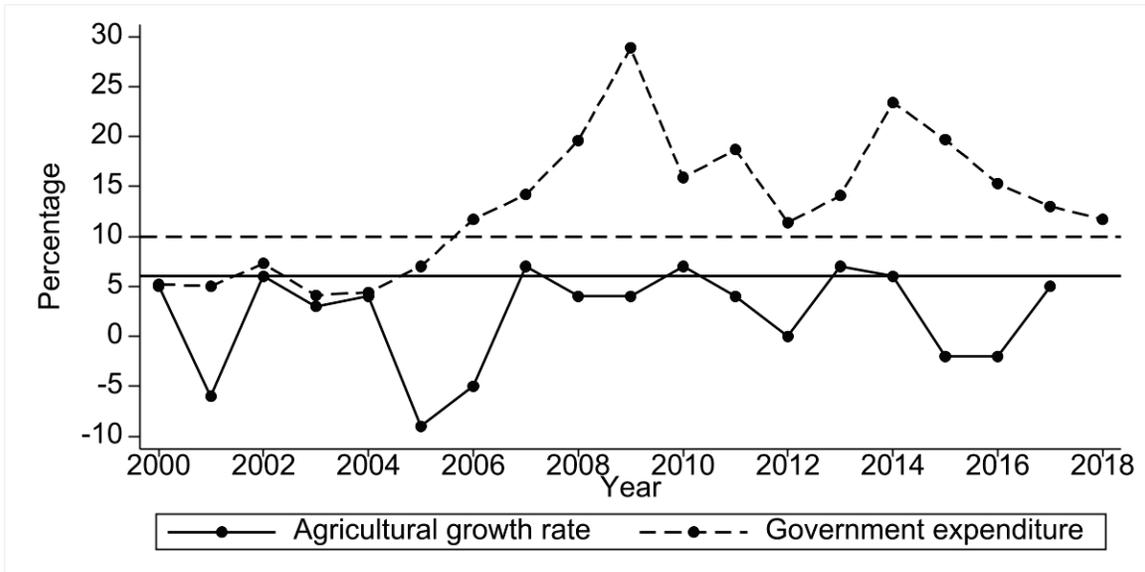
2. Efficacy

Agricultural Productivity and its Drivers

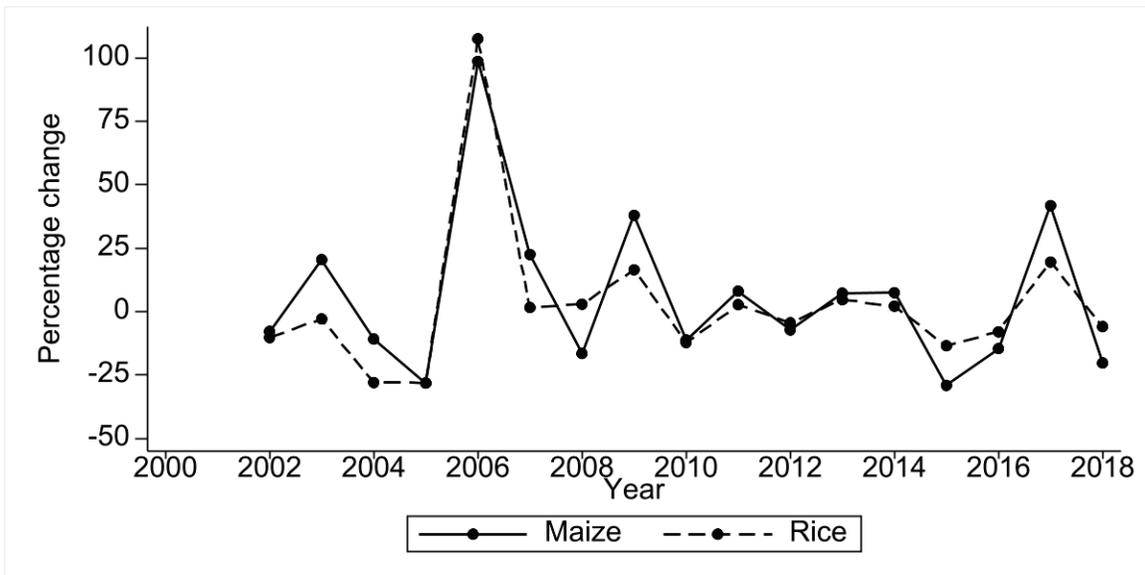
Figure A.3, panel a, shows the evolution of the two CAADP indicators for Malawi since 2000. Malawi has consistently met its financial commitments to CAADP. Public expenditures for agriculture (the variable dotted line) have been above 10 percent (dotted horizontal line) since 2006, but these public investments have not achieved the agricultural growth target. As is evident from the solid variable line in figure A.3, panel a, agricultural growth (measured by the growth rate in agricultural value-added) has been consistently below the 6 percent target (solid horizontal line). This is related to the volatile growth rates in the productivity levels of maize and rice in figure A.3, panel b. Thus, the most important staple crops supported through the ADPSP have seen little structural improvement in their agricultural productivity levels.

Figure A.3. Evolution of CAADP Targets Over Time in Malawi

CAADP commitment indicators



Agricultural productivity growth rates



Source: Regional Strategic Analysis and Knowledge Support System 2020.

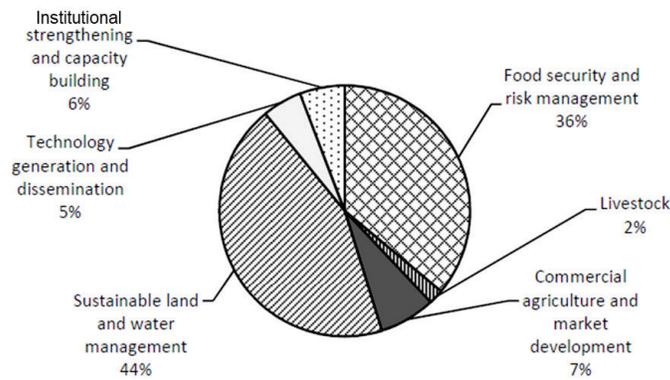
Note: See appendix C for an explanation of the data. The horizontal lines in panel a represent the CAADP targets. CAADP = Comprehensive Africa Agriculture Development Programme.

The inability to convert public investments into sectoral growth has been linked to the low quality of the public expenditure in agriculture and the misalignment between ASWAp intentions and agricultural expenditures (Malawi, Ministry of Agriculture and

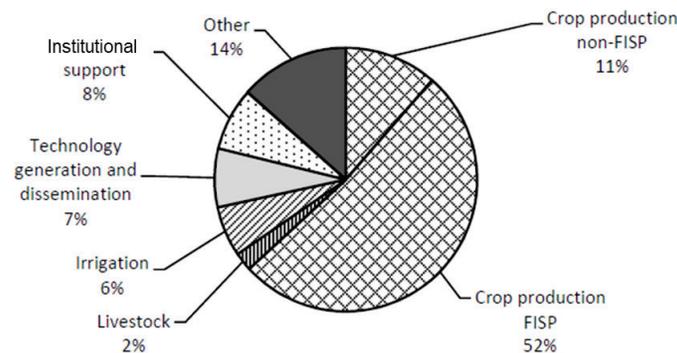
Food Security 2014; World Bank 2013a). A review of public expenditure for agriculture in Malawi (World Bank 2013a) showed that crop production dominates the ASWAp’s budget expenditures, and in particular the FISP, which accounts for half of the ASWAp’s resources (figure A.4). Such a heavy involvement in the provision of farm inputs crowds out the private sector’s involvement. It also comes at the expense of investments in other crucial priority areas, such as sustainable land and water management, value chain development, or commercialization of agriculture. The gap between this recurrent spending on farm inputs and capital spending (for example, on research and development) has widened over time in favor of the former. Policy analysts believe that this gap explains why agricultural productivity in Malawi has not significantly changed over time (World Bank 2013a).

Figure A.4. Expenditure Allocation in ASWAp and Agricultural Budget

a. Respective shares of focus areas in ASWAp budget, 2011–12 to 2014–15



b. Functional classification of total actual agricultural expenditures, 2007–08 to 2011–12



Source: Adapted from World Bank 2013a.

Note: ASWAp = Agriculture Sector-Wide Approach; FISP = Farm Input Subsidy Program.

The ICR states that “given the generally low production levels, and the increasingly open and responsive market for maize and complementary crop products, agricultural

smallholder production improved substantially despite the climatic shocks experienced during the period of project implementation” (World Bank 2017, 52). This conclusion conflicts with the volatile trend in productivity shown in the APES data. The growth in rain-fed maize yield is on average –1.3 percent between 2009 and 2016 in figure A.3, panel b. The rapid BIA of the ADPSP documented that maize yields increased from 1,400 kg per hectare in 2007–08 to 1,454 kg per hectare in 2015–16 (Malawi, MoAIWD 2017). This is an increase of 3.9 percent. Hence, neither the government’s official statistics nor the data the project collected support the ICR’s conclusion that the agricultural production of SHFs improved significantly.

Next to sustainable productivity growth, achieving food security was the ADPSP’s second PDO-level indicator and the higher-level objective of the ASWAp. The revised target was that 95 percent of rural households in Malawi would be food secure. Table A.5 reports the absolute and relative number of people who are food secure or insecure. The data are from the Annual Assessment and Analysis reports of the Malawi Vulnerability Assessment Committee (2017–19), which are based on the APES annual estimates. The share of food-secure rural households was above 95 percent between 2007–08 and 2011–12 but started to decline afterward. The low point occurred in 2016–17, which reflects the consequences of the El Niño events (dry spells in the central and southern regions and floods in the northern region) for the 2015–16 agricultural season, when crop production was severely impacted.

The Malawi Vulnerability Assessment Committee data thus show that at the end of the ADPSP in 2016, 80 percent of rural households were food secure, which was 15 percentage points below the target. This outcome resonates with the evidence on the food security of ADPSP beneficiaries reported in the rapid BIA conducted during the 2015–16 production season. Seventy-one percent of the respondents surveyed for the BIA indicated a food shortage for households in the 12 months preceding the interview. Hence, the food security of beneficiaries had not been achieved when the project ended. Moreover, since 2016, the share of food-secure rural households in Malawi has never reached the 95 percent target.

The ADPSP promoted the uptake of fertilizer and improved seeds through its support for the FISP. As discussed below, a large amount of literature exists on the FISP’s targeting and effectiveness in Malawi and elsewhere. Although subsidized prices increase the uptake of modern inputs, the impact on crop productivity is limited and evidence is inconclusive for Malawi (Jayne et al. 2018; Ragasa and Mazunda 2018).² The FISP introduced legumes to beneficiaries, which resulted in increased crop diversification. Yet, as explained in chapter 2, paragraph 1.20, this diversification arose out of land-pressure necessity rather than through opportunity. Nonetheless, in the absence of the ADPSP-induced reforms, beneficiaries would not have had access to

improved legume seeds, and therefore production and diversification would likely have been lower.

Table A.5. Number and Share of Food-Insecure People

Consumption Period	Absolute Number of Food-Insecure People (millions)	Rural Population (millions)	Relative Number of Food-Insecure People (%)	Relative Number of Food-Secure People (%)
2007/08	0.06	11.31	0.6	99.4
2008/09	0.61	11.62	5.3	94.7
2009/10	0.28	11.95	2.3	97.7
2010/11	0.51	12.28	4.1	95.9
2011/12	0.27	12.62	2.2	97.8
2012/13	1.97	12.96	15.2	84.8
2013/14	1.86	13.31	13.9	86.1
2014/15	1.31	13.66	9.6	90.4
2015/16	2.80	14.01	20.0	80.0
2016/17	6.70	14.37	46.6	53.4
2017/18	1.04	14.72	7.1	92.9
2018/19	3.30	15.07	21.9	78.1
2019/20	1.10	—	7	93.0
Source	MVAC	WDI	IEG	IEG

Sources: Malawi Vulnerability Assessment Committee 2017–19 and World Bank 2020.

Note: Food-insecure people are individuals who will not be able to meet their annual minimum food requirements (using the survival threshold). The consumption periods highlighted in bold are the years that the ADPSP was effective. MVAC = Malawi Vulnerability Assessment Committee; WDI = World Development Indicators; — = not available.

To complement modern inputs, the ADPSP promoted conservation agriculture on small plots to demonstrate to farmers the benefits of joint adoption of modern inputs and land-management practices. Agronomic evidence exists that conservation agriculture can substantially increase maize production (Thierfelder et al. 2013). Despite the potential benefits, farmers’ uptake of conservation agriculture is limited in Malawi (Hermans et al. 2020; Holden 2019).

Several constraints to adoption were discussed during interviews with the MoAIWD’s research staff, field officers, and farmers. There is a trade-off between the incorporation of residuals to increase soil fertility with the use of residuals as livestock feed. Farmers complained that if residuals were to be left in the field, they would need to be sprayed with chemicals against termites. Residuals are also often burnt to catch rodents. Conservation agriculture is labor-intensive and requires the right equipment for minimal soil disturbance, seeding, and fertilizer application. Such equipment is often locally unavailable. Finally, field officers mentioned that conservation agriculture has

been widely but incorrectly blamed for infestations of fall army worms in Malawi. As a result, many farmers have lost interest in the technology.

Other Project Benefits

The ADPSP did not achieve the targets for national maize yield and the number of food-secure households, but the project achieved the targets for other PDO indicators, namely the percentage change in motorized traffic volume on targeted rural roads and the number of project beneficiaries.

The project did not achieve the targets for all intermediate outcomes related to service delivery. Although the project achieved the distribution of high-quality legume seeds through the FISP and increased the area under conservation agriculture, the project did not achieve the target for the number of farmers getting advice and training from lead farmers. Moreover, even though the PDO indicator on motorized traffic was achieved, the intermediate outcomes on the kilometers of rural roads rehabilitated and the percentage of the road network in good and fair condition were not achieved.

The beneficiaries of the ADPSP are SHFs in Malawi. According to the ICR, these SHFs received benefits from (i) investments in yield-increasing agricultural inputs; (ii) the capacity building of farmer organizations; and (iii) more intensive and efficient agricultural extension and training. The latter two benefits, as was the case for the IRLADP, are likely to be captured by SHFs able to organize themselves in groups to receive capacity building or extension. The first benefit manifested through the project's support to the FISP, which targeted full-time SHFs but gave priority to resource-poor households. The latter could, for example, have elderly, HIV-positive, or female household heads (Kilic, Whitney, and Winters 2015). Allocation of coupons occurred first at the district level (based on farm population) and then at the level of extension planning areas. Within each village, beneficiaries were selected through community-based targeting in open forums.

Some academic literature has questioned the FISP's success in reaching poor households. Based on robust empirical analysis of the panel structure of the Malawi LSMS data, Kilic, Whitney, and Winters (2015) concluded that "the FISP is not poverty targeted and that the... relatively well-off, rather than the poor or the wealthiest, and the locally well-connected have a higher likelihood of program participation and, on average, receive a greater number of input coupons." The FISP has therefore been considered regressive and inefficient because the cost of the subsidy program outweighs the value for inappropriately targeted beneficiaries (Goyal and Nash 2017). In contrast, empirical evidence on the FISP suggests that male- and female-headed households were equally likely to participate in the FISP and to receive similar amounts of inputs (Jayne

et al. 2018). Hence, the academic evidence suggests that the FISP is not pro-poor but does not discriminate against women.

Institutional Capacity Building

The ASWAp was well aligned with the CAADP framework. This alignment improved the participation, ownership, use of evidence, and policy alignment in the policy-making process (Malawi, Ministry of Agriculture and Food Security 2014). Malawi ranks sixth out of the 55 African countries committed to CAADP in terms of the development and implementation status of an NAIP (Regional Strategic Analysis and Knowledge Support System 2020).

The ADPSP made important contributions toward capacity building in the agricultural sector by preparing the ASWAp. The ADPSP introduced multisectoral collaboration, mutual accountability, and open discussions among the stakeholders involved in agricultural policy making in Malawi. The establishment of Technical Working Groups (TWGs) and joint sector reviews improved the policy dialogue and facilitated the coordination with current agricultural development projects (for example, the Malawi Agricultural Commercialization Project). The ADPSP is considered the first serious attempt to coordinate the ministries of Agriculture, Trade, Lands, and Transport and the different departments within the MoAIWD (Malawi, Ministry of Agriculture and Food Security 2014).³ Through the joint collaboration and capacity-building activities for different ministries, the ADPSP supported (but did not implement) several policy reforms that contributed to the development of the NAIP.

The ADPSP also contributed to a substantial improvement in the harmonization of donors and their alignment with agricultural policies. Chapter 2 mentioned progress in donor engagement with the government and policy review. In the multidonor trust fund (MDTF), donors mutually agreed to agricultural policies and reforms proposed to the government to avoid fragmented policy implementation. The MDTF and the Donor Committee for Agriculture and Food Security continue to contribute to the coordination of donor activities and investments and the move toward budgetary support instead of financing projects. Despite this change, donors indicated that their discussions with the government of Malawi remain focused on food security and emergency responses requested by the government rather than on longer-term solutions through agricultural commercialization and crop diversification.

Finally, one of the ADPSP's most important policy reforms was the FISP. The efficiency of the FISP's implementation was increased through (i) better matching of the supply of inputs, demand for these inputs, and beneficiaries; (ii) improved private sector participation and logistical support; and (iii) stronger voucher security. Although certain elements of the reform have been sustained—most notably the outsourcing of input

procurement, the delivery to the private sector and the introduction of e-vouchers – these reforms were considered minor. The effective use of fertilizer and seeds by FISP beneficiaries remains an issue. For example, FISP beneficiaries tend to share the inputs received with other households. Input sharing was mentioned by nonmembers of the WUAs in the visited irrigation schemes that had received FISP vouchers in the past five years. Input sharing is also well-documented in the literature (Chirwa and Dorward 2013). Moreover, donor interest in the FISP’s reform has cooled down, potentially related to the increase of the FISP in the production season (2018–19) preceding the presidential elections in 2019 (Holden 2019).

A point often raised during the interviews was that despite good intentions from the World Bank, the MoAIWD never assumed full oversight and ownership of the ASWAp. As a consequence, limited change and innovations were introduced in the MoAIWD. A lack of alignment between the policy framework outlined in the ASWAp and the overall government budget planning resulted in inefficient budgeting and ineffective implementation of activities. Coordination between line ministries and departments was limited, resulting in departments implementing similar projects funded by different donors (Malawi, Ministry of Agriculture and Food Security 2014). The policy landscape remained fragmented, and many policies remained under review or were only partly implemented (Malawi, Ministry of Agriculture and Food Security 2014).⁴ A recurrent issue throughout the ADPSP was the MoAIWD’s struggle to deploy an adequate number of qualified staff for the implementation and oversight of ASWAp activities.

A related issue is the continuity of support to institutional reforms after the project finished. Through the ADPSP, trust between donors and the government was reestablished, and the MDTF created leverage to introduce change in the agricultural sector. After the ADPSP ended, a second phase of the ASWAp was rolled out to sustain the changes introduced and commitments made in the ADPSP. The World Bank supported this second phase through the follow-up support project ASWAp-SP2. Although the first phase of the ASWAp created the foundations and momentum for fundamental policy change, the second phase lost traction. The ASWAp was decreased in terms of activities and geographical coverage in the second phase as donors became dissatisfied with the government. Benson et al. (2018) found an overall decline in the quality of agriculture and food security policy and partly link this decline to the transition of the ASWAp project into the NAIP.⁵

Efficacy Rating

The project has contributed to coordinating agricultural policy making and harmonizing donor support in Malawi. The ADPSP introduced new coordination initiatives between ministries and departments (for example, TWGs), built the capacity of the MoAIWD and

other ministries, proposed policy reforms, and harmonized donor efforts through the MDTF. Through these elements, the ADPSP has directly prepared or contributed to the ASWAp and the NAIP and hence the development of agricultural policy in Malawi.

Unfortunately, several years after the assessments provided in the ICR and its review, IEG found that the effective implementation and institutionalization of policy changes remain limited. Moreover, there are indications that the quality of agricultural policy has decreased (Benson et al. 2018).

The on-farm effects of the project, growth in agricultural productivity and in the percentage of food-secure people, were not achieved. Moreover, some targets for important intermediary outcomes, and most notably the delivery of extension, were not achieved.

The analysis of longer-term data on production estimates and food security in Malawi shows volatile trends during the past decade. Although attribution to the project is difficult, given the lack of a counterfactual, this finding suggests that the ADPSP did not introduce sustainable changes in productivity. This new evidence and the review of the recent literature discussing the outcomes of the ASWAp in Malawi highlight several concerns about the sustainability of the activities promoted by the ADPSP.

Because the PPAR presents novel evidence that questions the sustainability of the project activities in terms of effective agricultural policy change and productivity improvements, the rating for efficacy is **modest**.

3. Efficiency

Economic and Financial Analysis

The EFAs conducted for the PAD and ICR indicated favorable returns on investments. The analyses assumed that the ADPSP's beneficiaries would benefit from production increases resulting from increased cropping intensity and sustainable productivity increases. The ICR found more favorable financial returns compared with the PAD. The difference was attributed to the increase in the number of beneficiaries, the total area under improved technologies, and the crop productivity resulting from the adoption of new varieties and improved agronomic practices (World Bank 2017, 53). The ICR reported a lower economic rate of return than did the EFA in the PAD. This is believed to be due to poor data availability and quality and increased average spending on project activities (World Bank 2017, 54).

The methodology and assumptions in the EFA for the ADPSP were solid but basic. The ICR used official data (crop estimates, agricultural market information system, and

related gross margins) from the MoAIWD. Several crop production models were estimated using different assumptions regarding the use of fertilizer, improved maize varieties, improved fertilizer management, and conservation agriculture. The ICR did not discuss the assumptions in detail, so it is unclear how each of the assumed technology choices were expected to affect the returns of maize farming. For example, what agronomic benefit did the EFA assume from the improved management of fertilizers? The EFA in the ICR did not collect information on project beneficiaries but stated that benefits were derived from “on-farm trials and a large-scale farmer tryout network” (World Bank 2017, 52). It is unclear how these trials were conducted and how data were collected from a “tryout network.” The ICR did not report the actual returns on agricultural production per unit of land or labor, and as such, a detailed verification of the assumptions in the EFA (as was done for the EFA of the IRLADP) is not possible.

A few points are important to mention. The EFA in the ICR assumed an average farm size of 1 hectare, of which 0.5 hectares were allocated to maize. The BIA conducted after the project ended in 2017 used an average farm size of 0.45 hectares but did not report how much of the land was occupied by maize. The 12 percent discount rate used in the financial analysis was lower than the discount rate used in the EFA of the IRLADP. The latter used a discount rate of 20 percent, and the ICR stated that “bank interest rates hovered between 13 percent and 25 percent during the entire project implementation period” (World Bank 2015, 21). As discussed in section 2 of this appendix, the ICR claimed substantial productivity increases for the ADPSP’s beneficiaries. These increases were supposedly used in the EFA, but they are not supported by the APES data or the data collected during the BIA. Also, the ICR is inconsistent in explaining the higher and lower economic and financial returns calculated in the ICR compared with the PAD. The higher financial return is related to “improved smallholder production despite the climatic shocks experienced during the period” (World Bank 2017, 51). Conversely, “lowered net benefits resulting from the project activities were largely a result of the weather shocks” (World Bank 2017, 51).

Administrative and Institutional Efficiency

The ADPSP’s implementation began 18 months after effectiveness because the need for parliamentary approval delayed the first disbursement of funding. To accelerate implementation, TWGs and an executive management committee were established. The committee served as the ASWAp secretariat responsible for the project’s day-to-day management. In addition, high vacancy rates, a hiring freeze, high staff turnover, procurement delays, late submission of financial reports, and a weak M&E system constrained effective implementation (World Bank 2017, 19).

Despite all these issues, using the existing MoAIWD systems and structures implied a trade-off between building capacity and local ownership within the government versus the likely smooth and timely implementation of activities through a PCU. In the context of limited capacity and a large government bureaucracy, it is to be expected that the short-term costs of building local capacity might initially be high. As mentioned before, however, the joint sector reviews and TWGs have improved the policy dialogue and coordination. The secretariat created to coordinate the ASWAp continues to operate and now coordinates the NAIP's implementation.

However, several stakeholders interviewed indicated that the government approached the ASWAp as another project rather than a sectorwide approach focusing on higher-level and broader aspects of agricultural development. As a consequence, several ASWAp initiatives were never institutionalized or there was no follow-up. The policy satisfaction survey (Benson et al. 2018) points out that once the ASWAp funds enabling the regular meetings of these different groups ended, the coordination process became less effective. The ASWAp secretariat was never institutionalized as a structure for project coordination: capable staff were seconded from other departments or districts and faced low motivation, limited commitment to a centralized administrative job, and divided loyalties to previous projects.

Efficacy Rating

The ADPSP is economically and financially viable. The explanation of the EFA's methodology was less extensive than what was done for the IRLADP project, and some crucial assumptions in the analysis were not discussed.

The administrative and institutional efficiency was considered appropriate despite some issues with financial management. The preparation of the ASWAp required the buildup of capacity and ownership in the different ministries from the bottom-up, and this entailed some initial short-term inefficiencies. However, by the end of the project, the joint sector reviews and the project-supported TWGs improved the policy dialogue and coordination. The ADPSP's efficiency is therefore rated **substantial**.

4. Outcome

The rating for the overall outcome is based on the individual ratings for relevance, efficacy, and efficiency. In accordance with IEG's guidelines, a rating of **high** for relevance, **modest** for efficacy, and **substantial** for efficiency results in a rating of **moderately unsatisfactory** for the project's overall outcome. This revised rating is based on the additional evidence from IEG's assessment of the official government statistics, the LSMS data, and qualitative information from the fieldwork.

5. Risk to Development Outcome

The ICR notes that the risks to operations, policy, and implementation identified in the PAD materialized during implementation. The risks are discussed in the main text and this appendix. The risk to the development outcome is rated **substantial**.

6. Bank Performance

Quality-at-Entry

As the ADPSP prepared the ASWAp, the project's implementation was done within the MoAIWD. In theory this should have contributed to capacity building within the MoAIWD. The PDO was designed to mirror the high-level impacts and outcomes of the ASWAp, and as such the project was complex and ambitious. The ADPSP was using and supporting the existing government structures, but a core function analysis was conducted only at closure, highlighting issues with "supporting documentation for payments, duplicate payments, failure to follow procurement procedures, improper payment of allowances, delays in the liquidation of advances, failure to properly account for fuel expenses, and failure to prepare back-to-office reports" (World Bank 2017, 30). Such an analysis would have been critical at the start of the project to identify and prioritize capacity gaps.

Although technical coordination among departments and ministries increased (see above), financial coordination was more difficult. Financial management was centralized at the MoAIWD, which suffered from red tape, weak financial management, and slow internal procurement procedures. This, in combination with the MDTF guidelines (for example, the "no-objection" rules of the World Bank), resulted in significant delays in the distribution of funds between ministries and to districts and therefore caused delays in implementation. Despite these challenges, it seems that it would be difficult to harmonize departments and ministries without working in the existing government structure to improve them from within.

The quality-at-entry is rated **moderately unsatisfactory**.

Quality of Supervision

The World Bank provided guidance and oversight of the implementation process, financial management, auditing, and M&E. The World Bank noted some ineligible expenses for operations, but they were all repaid to the World Bank (see appendix B). The ICR noted issues with the quality of infrastructure due to contractors' lack of capacity and insufficient supervision by district agricultural offices. Through the MTR, the World Bank made an important contribution to improving project implementation,

financial management, and procurement. For example, the MTR introduced the MDTF that provided the second AF and recommended the strengthening of the government's M&E structure.

The quality of supervision is rated **satisfactory**.

The overall Bank performance is rated **moderately satisfactory**.

7. Borrower Performance

Government Performance

The government of Malawi demonstrated commitment and ownership to the ADPSP, which was implemented using the systems, structures, staff, and offices of the government. The executive management committee under the MoAIWD met biannually to provide strategic oversight of the project work plans and budgets. However, ownership, leadership, and traction by implementing departments were problems in the first years of implementation. Moreover, as discussed in the previous section, the lack of a core function analysis affected project implementation.

The government performance is rated **moderately satisfactory**.

Implementing Agency Performance

The project was implemented by the MoAIWD and the executive management committee acted as the project's steering committee. The implementation of the ADPSP in the first years was delayed because of unclear leadership and division of responsibilities. Other issues affecting the effective implementation mentioned in the previous section and in appendix B were high staff turnover, procurement delays, issues with financial management, and incomplete project activities at the end of the project.

The implementing agency performance is rated **moderately unsatisfactory**.

The overall borrower performance is rated **moderately satisfactory**.

8. Quality of Monitoring and Evaluation

Design

All interviewed stakeholders considered the design of the M&E for the ADPSP to be weak. This was mainly because the M&E was embedded in the government's existing but weak M&E structure. The PDO indicators reflected the higher-level ASWAp outcomes. But as the ADPSP was not designed to be as comprehensive as the ASWAp, attribution of any higher-level effect to the ADPSP would be tedious, as acknowledged

in the ICR. The indicators were therefore reformulated during the project's restructuring.

Indicators for intermediate outcomes to track and monitor the performance of the ADPSP in the M&E framework came from the results framework in the PAD. These indicators measured the delivery of the MoAIWD's activities rather than intermediate outcomes, such as uptake. Such delivery indicators measured at a national level are of limited relevance for evidence of on-the-ground effects. Even though attribution would be difficult, the lack of empirical data on beneficiaries complicates (i) the measurement of on-farm input and output changes and (ii) the analysis of how project activities contributed to the observed changes in the indicators.

Implementation

The capacity of the Department of Agricultural Planning Services to collect data and coordinate the M&E process was weak. The M&E systems lacked a proper flow of information from the decentralized collection to the central system. Inadequate staff and the absence of knowledge- and information-sharing mechanisms in the sector weakened the M&E system. In contrast, progress was made on the collection of intermediate and outcome indicators after the project introduced some changes. The project invested in capacity building of M&E officers at all levels, simplified the M&E tool kits, and developed an M&E master plan for the ASWAp. Nonetheless, given the adoption of ASWAp indicators and the lack of a baseline, national-level data were used for the M&E data collection.

Use

The initial weak design of the M&E system and lack of empirical data compromised the analysis of the project's data to inform decision-making. The ICR noted that once the quality of data and reporting improved, the M&E framework was appropriately used to inform decision-making and resource allocation during planning and implementation (World Bank 2017, 21).

Clearly, the weak capacity of the responsible ministry initially compromised the design, implementation, and use of a qualitative and informative M&E system. This is, however, the consequence of using existing government structures and attempting to improve their capacity by training and creating ownership. As the project actively tried to improve the M&E capacity, the overall rating of the M&E framework is considered **modest**.

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Notes

¹ As the Agriculture Sector-Wide Approach (ASWAp) provided only an agricultural investment framework to operationalize the commitments made by the government of Malawi and development partners, it was not designed as a comprehensive policy document.

² The evidence is from empirical analysis using a regression framework, holding other explanatory variables constant.

³ The increased visibility was especially important for the Ministry of Trade and rural roads authority, as previously they were often considered as working in parallel with the Ministry of Agriculture, Irrigation and Water Development. The ministry got involved in the additional financing of the Agricultural Development Program Support Project (when it became ASWAp-SP1) and contributed to reforming the regulations related to the commodity exchange framework, warehouse receipt systems, and commercial court division, and to facilitating the immigration e-payment system. The Agricultural Development Program Support Project also provided substantial capacity building to the Ministry of Land (for example, the demarcation of traditional authorities, land rental modules, and so on) to prepare a new land law.

⁴ The current agricultural policy landscape is fragmented because the majority of existing policies relate to the activities of various departments and units of the Ministry of Agriculture, Irrigation and Water Development rather than actual policies. The majority of activities are currently either under review, partially or wholly unimplemented, or as yet undeveloped (for example, the National Fisheries and Aquaculture Policy, National Livestock Policy) (Malawi, Ministry of Agriculture and Food Security 2014).

⁵ As Benson et al. (2018, 11) wrote: "Moreover, at a practical level, the ASWAp, which was at the center of many of the institutional reforms, is now being replaced by the NAIP [National Agricultural Investment Plan]. Under the ASWAp both government and development partner resources were provided to the policy processes and the institutions involved to facilitate broad discussions and mutual accountability among the broad set of stakeholders involved in agriculture and food security issues in Malawi. With the winding up of the ASWAp, several respondents to the endline survey reported that the funding that enabled the regular holding of Agricultural Sector Working Group and Technical Working Group meetings is no longer in place, rendering these policy processes less effective."

Appendix B. Fiduciary, Environmental, and Social Aspects

Irrigation, Rural Livelihoods and Agricultural Development Project (P084148)

Financial Management

The project followed standard World Bank funding, accounting, and disbursement procedures. The project coordination unit (PCU) competitively tendered preidentified project investments and, once awarded, the investments were implemented by experienced civil contractors from the private sector.¹ Funds were disbursed from a PCU account directly to local assembly accounts for the implementation of project activities. By the end of the project, the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP) had adequately disbursed and reported on all expenditures. In contrast, the flow of funds from the centralized PCU account in Lilongwe to district offices struggled at the beginning of the project because of weak financial management and reporting delays in districts. To address these issues, district staff were trained, a financial management system was introduced, and justification assistants were recruited in districts with low accounting and procurement capacity.

Procurement

The Implementation Completion and Results Report (ICR) documents procurement as one of the successes of the project. A clear procurement system was in place and a full-time procurement specialist was hired. This facilitated scheduling and processing of contracts, compliance with procurement procedures, and timely payments, and ensured there was no misprocurement, fraud, corruption, or bribery. Nonetheless, Posthumus et al. (2014) documented some delays in procurement.

Initially, the PCU selected and procured farm inputs centrally. Through the Input for Asset component, the IRLADP would strengthen the capacity of agrodealers to distribute farm inputs. However, the weak capacity of local agrodealers forced the IRLADP to organize the supply and delivery of farm inputs. The procurement and selection of suppliers of construction materials for irrigation facilities were decentralized to the district level. The decentralization facilitated the planning of project activities and timely distribution of materials and allowed for beneficiary involvement in the entire process, increasing local ownership. The IRLADP provided training and assistance on capacity building and modified the protocol for procurement, tendering, and contractor selection. This ensured a smooth process and improved the value for money, but the

weak accounting, procurement, and capacity for selecting contractors within districts caused delays in procuring material.² These problems affected the completion, quality, and sustainability of the irrigation facilities. Despite these issues, Posthumus et al. (2014) noted the importance of not withdrawing procurement and accounting responsibilities from the district level, and the IRLADP instead developed capacity and ownership within districts.

Environmental and Social Safeguards

The IRLADP was classified as category B under Environmental Assessment (Operational Policy/Bank Procedure [OP/BP] 4.01) and triggered the following policies: Pest Management (OP/BP 4.09), Involuntary Resettlement (OP/BP 4.12), and Projects on International Waterways (OP/BP 7.50). The IRLADP ICR reports that compliance with the environmental and social safeguards was not appropriate up to the Mid-Term Review. An action plan was developed during the Mid-Term Review, and project staff, extension workers, and beneficiaries were trained on safeguard management and implementation with local communities. The IRLADP ICR does not report issues with the pesticide management plan or involuntary resettlement. The ICR of the second Agriculture Sector-Wide Approach reports that the design of social and environmental safeguards and their mitigation measures benefited from the household approach adopted by the IRLADP to promote the inclusion of women and joint decision-making regarding gender and HIV/AIDS issues. The review of the ICR mentions that the project team confirmed that the project complied with World Bank safeguard policies.

Agricultural Development Program Support Project (P105256)

Financial Management

As the Agricultural Development Program Support Project (ADPSP) was mainstreamed in the Ministry of Agriculture, Irrigation and Water Development (MoAIWD), financial management was centralized with funds transferred to other ministries, which provided periodic liquidation reports. For the reasons mentioned before, the centralized financial management through the commingled bank accounts of the MoAIWD was challenging for the timely and efficient allocation of resources to the districts. Moreover, having all the ADPSP funds in one account and lacking the skills to properly apply the accounting software offered the leeway to spend funds before districts implemented ADPSP activities. The project experienced delayed audit reports and lacked adherence to controls and procedures at different levels. Therefore, the external audit reports were qualified with potential ineligible expenditures amounting to over \$65,000. The government repaid all the ineligible expenses.

Weak financial management in combination with the multidonor trust fund's requirements resulted in delays in the distribution of funds to ministries and districts, which in turn resulted in delays in the project's implementation. During the additional financing, the multidonor trust fund addressed these issues by channeling resources through an exclusive World Bank account (in local currency and US dollars) by installing accounting officers in each cluster of districts. The ADPSP also recruited a financial management specialist trained in the World Bank's procedures to coordinate and oversee financial management at the central level, and justification officers were hired at the Agricultural Development Division. The ICR documents that such efforts increased the financial management and documentation at the national and district levels. However, these changes were not entirely sufficient. Interviews with World Bank staff indicated that proper documentation and reporting of expenses remained an issue, and funds under the second Agriculture Sector-Wide Approach are often disbursed only twice a year rather than quarterly. This continues to delay the implementation of activities.

Procurement

The flow of funds from the MoAIWD to implementing departments and districts was delayed because of the centralized financial management system, the bureaucratic system, and the late submission of financial reports and liquidation. The late availability of funds delayed the implementation of project activities, which was detrimental to project outcomes. Agricultural activities are time-specific. For example, because of late disbursements of hybrid maize seeds in December, well after the prime planting season had passed, farmers were forced to grow local and less desirable varieties. After the Mid-Term Review, two procurement specialists were hired to support the procurement unit. Toward the end of the project, a documentation officer was recruited to improve record keeping. The decentralization of financial management also contributed to some improvements in procurement, but as indicated before, tardy disbursements of funds remain an issue for timely procurement and implementation of project activities.

Environmental and Social Safeguards

The original project was classified as category B and triggered two policies: Environmental Assessment (OP/BP 4.01) and Pest Management (OP/BP 4.09). At restructuring, an additional policy on Involuntary Resettlement (OP/BP 4.12) was triggered when a new component on rural roads was added. The project prepared and implemented all the required safeguards documents: the Environmental and Social Impact Assessment, the Environmental and Social Management Framework, the Pest Management Plan, and the Resettlement Policy Framework. The Land Resources and Conservation Department of the MoAIWD coordinated the mitigation measures, which

included safeguards sensitization and capacity building of front-line officers and farmers. The review of the ICR states that all safeguard issues were complied with.

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Notes

¹ Initially, the Malawi Social Action Fund implemented the demand-driven investments under Component 2 in coordination with the project coordination unit (PCU). Malawi Social Action Fund funding, accounting, and disbursement procedures were applied and ensured that all reporting of such activities was shared with the PCU. After the second additional financing, the government of Malawi decided that the PCU would fund these activities.

² Posthumus et al. (2014) also note late submission of invoices, late identification of projects, and delayed tendering of contracts to the lowest bidders.

Appendix C. Methods and Evidence

This report is a Project Performance Assessment Report (PPAR). This instrument and its methodology are described at <https://ieg.worldbankgroup.org/methodology/PPAR>.

Overview of Data and Evidence Used

Table C.1 provides an overview of the data used in the PPAR, which distinguishes project-related assessments of performance and data external to the projects. The latter is further distinguished by official data collected by the government of Malawi and nationally representative data collected by the international development community.

Table C.1. Overview of Data and Evidence Used in the PPAR

Type of Data	Project-Related Assessments				
	Source	Year	District sampling	Respondent sampling	Attribution due to
BIA for the IRLADP	Ng'ong'ola et al. (2015)	2015	Purposive	Random	Matching
Lessons learned document for the IRLADP	Posthumus et al. (2014)	2014	Purposive	Purposive	—
Technology adoption study for the ADPSP	Malawi, MoAIWD (2015b)	2015	Purposive	Random	—
Rapid BIA for the ADPSP	Malawi, MoAIWD (2017)	2017	Purposive	Random	Matching
External data					
<i>Government data</i>					
Agricultural Production Estimation Statistics	MoAIWD	Annually since 2000	Country-level indicator	Crop cut-based estimation	Figure 2.1 and figure A.1
National Food and Nutrition Security Forecasts	MVAC	2017–19	Country-level indicator	Model-based estimation	Table A.5
Master Database of Irrigation Schemes	Malawi, MoAIWD (2015a)	Annually since 1970	Irrigation inventory	—	Figure A.3
<i>Development community data</i>					
Household-level agricultural data	LSMS	Production seasons 2004–05, 2010–11, and 2016–2017	Nationally representative	Random	Figure 2.2, table 2.1, table A.3

Type of Data	Project-Related Assessments				
	Source	Year	District sampling	Respondent sampling	Attribution due to
Pluralistic Extension System	IFPRI	2016, 2018	Nationally representative	Random	Paragraph 2.7 in chapter 2
CAADP target indicators	ReSAKSS	Annually since 2000	Country-level indicator	—	Figure A.4

Source: Independent Evaluation Group.

Note: ADPSP = Agricultural Development Program Support Project; BIA = beneficiary impact assessment; CAADP = Comprehensive Africa Agriculture Development Programme; DoI = Department of Irrigation; IFPRI = International Food Policy Research Institute; LSMS = Living Standards Measurement Study; MoAIWD = Ministry of Agriculture, Irrigation and Water Development; MVAC = Malawi Vulnerability Assessment Committee; PPAR = Project Performance Assessment Report; ReSAKSS = Regional Strategic Analysis and Knowledge Support System; — = not available.

Official Data from the Government of Malawi

The PPAR uses the government of Malawi’s official data. The most important data are the Agricultural Production Estimation Statistics (APES) collected by the Department of Agricultural Planning Services. The APES are published annually, providing data on cropped area and crop production for major crops under different farming structures. The crop production data are based on crop cuts collected on sample farmer plots and then aggregated at the section level (Babu et al. 2018). For the aggregation exercise, agricultural extension development officers provide qualitative assessments on crop growth performance, but the quality of these data is often criticized (World Bank 2018). Extension workers who collect the APES have limited expertise and time for data collection. The objectiveness of the agriculture production can also be questioned when extension workers feel that their performance is being assessed through the data (Benson and Edelman 2016). Although the annual estimates of crop production might not be entirely representative of actual crop production in a given year, the trend between years tends to be more accurate (assuming a consistent methodology).

The PPAR also uses the data that are reported in the Department of Irrigation’s irrigation master database (Malawi, Ministry of Agriculture, Irrigation and Water Development 2020). The master database contains information on all irrigation schemes in Malawi. Finally, the PPAR uses food security data from the Annual Assessment and Analysis reports published by the Malawi Vulnerability Assessment Committee (2017–19). The Malawi Vulnerability Assessment Committee uses the APES to estimate the number of food-insecure households in the population each year.

The PPAR relies on this national and district- or irrigation facility–level information for the assessment of the PDO indicators linked to the projects’ on-farm effects. Given that both projects covered all districts in Malawi (by the end of the projects), these data are representative at the national and district level.

Development Community Data

Data from the international community are from different sources. The Regional Strategic Analysis and Knowledge Support System provided data on the Comprehensive Africa Agriculture Development Programme indicators. The Climate Change Knowledge Portal of the World Bank (2020) provided data on rainfall. The crop-growing period is based on the rain-fed crop calendar for maize and rice and includes October to April. Data from the International Food Policy Research Institute's Pluralistic Extension System panel (2016 and 2018) data set are not used directly, but the PPAR draws heavily on the findings and insights of Ragasa (2019).

The Living Standards Measurement Study (LSMS) data in Malawi have been collected during several survey rounds of the Integrated Household Survey (IHS). The implementation was conducted by the National Statistics Office of Malawi. Each round of the IHS uses a nationally representative sampling frame, but the interviewed households in the different rounds are not necessarily the same. Hence, it is not a panel data set, although for a subset of households, panel responses are collected in the Integrated Household Panel Survey. The second (IHS2), third (IHS3), and fourth (IHS4) survey rounds were conducted in production season 2004–05, 2010–11, and 2016–17, respectively. Hence, by comparing the values of key indicators between different survey rounds, we can measure changes that occurred during the projects' implementation period (IHS 2–3), after the projects' implementation period (IHS 3–4), and long-term trends (IHS 2–4)—that is, a before-and-after comparison.

Data in the IHS are collected at the household, individual, parcel, plot, crop, and input levels. To construct agricultural indicators, data at the crop and plot levels are aggregated at the household level. For example, to construct an indicator for agricultural land productivity, crop yields were calculated at the plot level as crop output over plot size. Then, the plot-level data for each crop were aggregated to the household level by taking the median yield for multiple plots of the same crop cultivated by the household.¹ For simplicity, the PPAR restricted the yield calculation to maize (combining local, hybrid, and composite maize). Yield could be estimated only when the household reported harvest output in conventional units. This implies that the sample contains households that produced at least one plot with maize during the rainy season and used conventional output units.

The household-level data were then summarized at district levels and weighted by the sampling probabilities reported in each survey round.² As the LSMS data are representative at the district level, and both projects covered all districts, these summary statistics are used as point observations for districts.

Fieldwork

Between February 24 and March 6, 2020, fieldwork collected qualitative information on agricultural decision-making and outcomes by projects' beneficiaries and nonbeneficiaries, first in Lilongwe and then at irrigation sites in five districts. The following paragraphs explain the selection of regions, districts, and interviewees.

Selection of regions. Initially, the plan called for all three regions of Malawi to provide a comprehensive geographical overview of project sites. Because of the poor condition of many rural roads in the rainy season and to increase the number of visited irrigation sites with similar agroecology (to minimize external factors), the fieldwork focused on Malawi's central and southern regions.

Selection of districts. The PPAR applied two ex ante selection criteria to identify districts for the fieldwork. First, the district had to have an irrigation facility supported by the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLADP). Second, at this irrigation facility, the activities of the Agricultural Development Program Support Project (ADPSP) should have been implemented. This could, for example, include the establishment of a farmer organization or the delivery of extension services. Applying these selection criteria retained districts with a previously government-owned large-scale irrigation scheme and districts with several small-scale irrigation schemes. From this pool of preselected districts, the PPAR further refined the selection process based on the districts' trends in agricultural productivity (from the LSMS surveys); their agroecology, using the classification developed by Benson, Mabiso, and Nankhuni (2016); and their geographical proximity. Figure C.1 gives an overview of the agroecological classification (Benson, Mabiso, and Nankhuni 2016), as well as the targeting of districts by both projects (that is, whether the district was an initial target district of the project or was covered later in the scale-up phase of the projects during the additional financing).

experienced a substantial increase in maize yields during the project and over the long run.

Selection of interviewees. Interviewees included district development officers, field officers, local extension agents, project beneficiaries, and nonbeneficiaries. The district development officer and field officers facilitated the selection of villages in and around the irrigation schemes. In each irrigation scheme, the PPAR aimed to visit one village within the irrigation scheme and one village located farther away from the water source. The field officers and local extension agents helped with the selection of both beneficiaries and nonbeneficiaries within villages. Beneficiaries of the IRLADP were identified based on their membership in the water user association (WUA). In each village, the fieldwork aimed to interview two WUA members, two nonmembers within the same village, and two nonmembers in the village farther away. This sampling scheme was implemented randomly to the extent possible.

On arrival at an irrigation scheme, the evaluation team met with the WUA board, visited the irrigation scheme—often with a large number of curious villagers—and selected individuals to be interviewed in consultation with the local extension agent and the WUA board. The evaluation team interviewed individuals using a structured questionnaire. A local extension agent facilitated translation. Although using local extension agents as translators was not ideal, it allowed for efficient implementation of the interviews (and sampling), and it established trust and proper understanding with the interviewee. Given that interviewees sometimes expressed critical responses about the functioning of the local extension system, we do not consider respondent confirmation bias to affect the qualitative results too much.

Table C.2 provides an overview of the sites visited, and the number and types of farmers interviewed. Given that the initial sampling approach could not be implemented in each site, the total number of farmers interviewed is 47, with on average an equal selection of male and female respondents.

Table C.2. Selection of Districts, Irrigation Schemes, and Farmers in the Fieldwork

Date	District	EPA	Irrigation Scheme	Site name	Type	WUA Members in Surrounding Village		Nonmembers in Surrounding Village		Farmers in Outside Village		Interview Sample Total
						F	M	F	M	F	M	
28 Feb 2019	Salima	Tembwe	Lifuwu	LSI	1	1	1	1	2	—	6	
29 Feb 2019	Dedza	Kanyama	Windu	LSI	2	2	2	2	—	—	8	

Date	District	EPA	Irrigation Scheme	Site name	Type	WUA Members in Surrounding Village		Nonmembers in Surrounding Village		Farmers in Outside Village		Interview Sample	Total
						F	M	F	M	F	M		
1 Mar 2019	—	—	—	—	—	—	—	—	—	—	—	—	—
2 Mar 2019	Zomba	Likangala	Likangala	LSI		1	1	1	1	1	1	6	
2 Mar 2019	Blantyre	Ntonda	Chimwari, Kanyola	SSI		1	2	—	—	—	—	3	
3 Mar 2019	Zomba	Chingale	Chingale	SSI		2	2	2	2	1	1	10	
3 Mar 2019	Blantyre	Lunzu	Ndemanje	SSI		1	1	1	1	—	—	4	
4 Mar 2019	Phalombe	Nkhulamb e	Lilchatcha, Malema	SSI		1	1	—	2	2	—	6	
4 Mar 2019	Blantyre	Chipande	Midule	SSI		2	1	—	1	—	—	4	
					Total	11	11	9	8	6	2	47	

Source: Independent Evaluation Group.

Note: F = female; M = male. EPA = extension planning area; LSI = large-scale irrigation; SSI = small-scale irrigation; WUA = water user association. — = not available.

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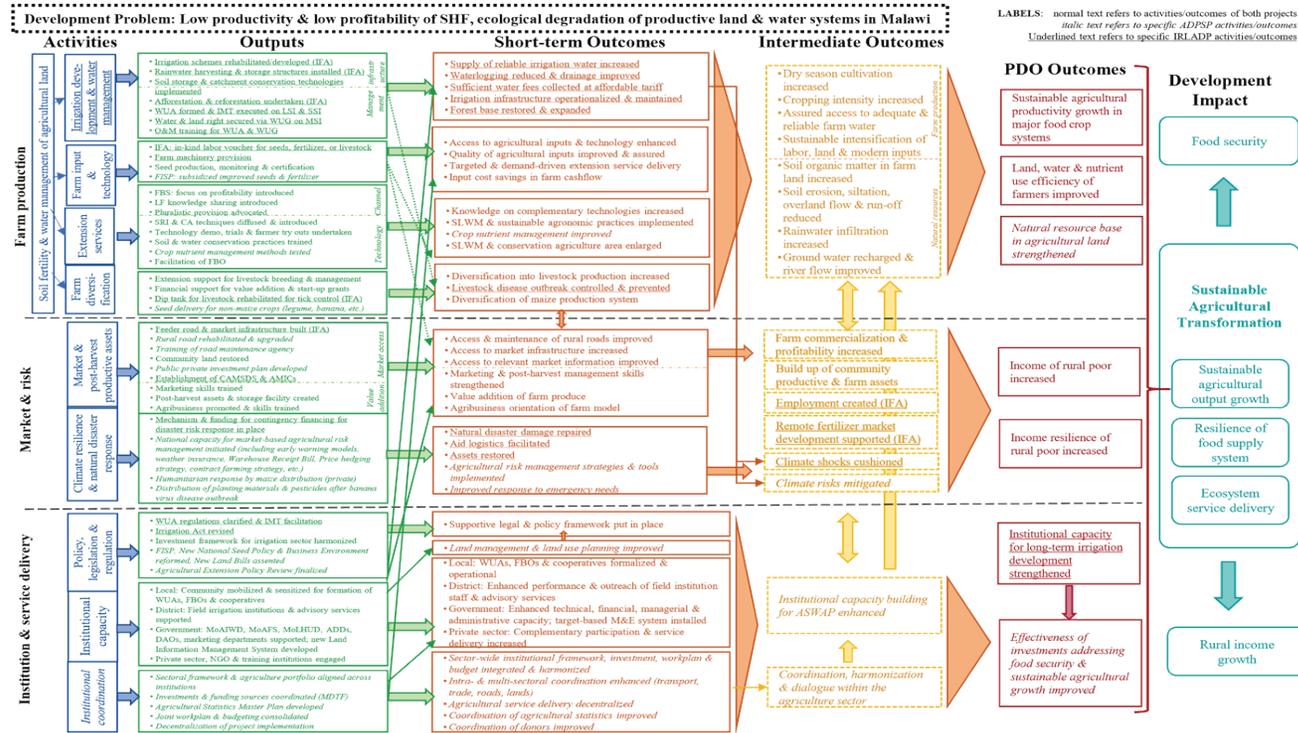
Notes

¹ This strategy was not possible for the second Integrated Household Survey because the structure of the questionnaire was different. In this case, the ratio of crop output (aggregated at the household level) over crop plot size (aggregated at the household level) was used as an indicator of households’ crop yields.

² This implies that descriptive statistics are weighted by the total number of households represented by each district in the latest survey round available.

Appendix D. Additional Data

Figure D.1. Generic Theory of Change of the IRLADP and ADPSP



Source: Independent Evaluation Group.

Note: ADD = Agricultural Development Division; ADPSP = Agricultural Development Program Support Project; AMIC = Agricultural Market Information Centres; ASWAp = Agriculture Sector-Wide Approach; CA = conservation agriculture; CAMSDS = Comprehensive Agricultural Market Systems Development Strategy; DAO = district agricultural office; FBO = farmer-based organization; FBS = farmer business school; FISP = Farm Input Subsidy Program; IFA = Input for Asset; IMT = Irrigation Management Transfer; IRLADP = Irrigation, Rural Livelihoods and Agricultural Development Project; LF = lead farmer; LSI = large-scale irrigation; M&E = monitoring and evaluation; MDTF = multidonor trust fund; MoAFS = Ministry of Agriculture and Food Security; MoAIWD = Ministry of Agriculture, Irrigation and Water Development; MoLHUD = Ministry of Lands, Housing and Urban Development; MSI = mini-scale irrigation; NGO = nongovernmental organization; O&M = operation and maintenance; SHF = smallholder farmer; SLWM = sustainable land and water management; SRI = System of Rice Intensification; SSI = small-scale irrigation; WUA = water user association; WUG = water user group.

Appendix E. List of Persons Met

Name	Position	Institution
WASHINGTON DC		
Catherine Ragasa	Senior Research Fellow	IFPRI
Cnudde Veerle	Foreign Policy Officer	Flemish Government
Maes Eva	Foreign Policy Officer	Flemish Government
Olivier Durand	Senior Agriculture Economist	World Bank
Pieter Waalewijn	Sr Water Resources Mgmt. Spec.	World Bank
Todd Benson	Senior Research Fellow	IFPRI
LILONGWE		
<i>World Bank staff, consultants, others</i>		
Blessings Botha	Senior Agricultural Economist	World Bank Country Office
Derrick Kapolo	Monitoring and Evaluation Specialist	Farmers Union of Malawi
Eluphy Nyirenda	Policy and Partnership Development Specialist	USAID
Francisco Javier Obrique Arqueros	Senior Agricultural Economist	World Bank Country Office
Greg Toulmin	Country Manager	World Bank Country Office
Jacob Nyirongo	Director of Programme Development and Learning	Farmers Union of Malawi
Nikolas Bosscher	Deputy General Representative	Flemish Government
Paul Jere	Economist	Independent Consultant (responsible for organizing interview logistics)
Time Fetch	Senior Agricultural Economist	World Bank Country Office
Trust Chimaliro	Financial Management Specialist	World Bank Country Office
<i>Government officials</i>		
Benamin Banda	Senior Irrigation Engineer	DoI, MoAWID
Benon Bibbu Yassin	Deputy Director of Environmental Affairs	Ministry of Natural Resources, Energy and Mining
Dalitso Chikapa	Principal Human Resources Development Officer	MoAIWD
Davie Chilonga	Team leader Land Reform Implementation Unit	Ministry of Lands, Housing and Urban Development
Geoffrey Mamba	Director of Irrigation Services	DoI, MoAWID
Geoffrey Mwepa	Deputy Director of Irrigation Services	DoI, MoAWID
George Kanthiti	Chief Investment Promotion Officer	Ministry of Industry and Trade
Gertrude Kambauwa	Agricultural Director	Land Resources & Conservation, MoAIWD
Godfrey Ching'oma	Director	Crop Development, MoAIWD

Name	Position	Institution
Hendrex W. Kazembe Phiri	Deputy Director	Agricultural Research Services, MoAIWD
Henry Msatilomo	ASWAP SP II Project Coordinator	NAIP secretariat, MoAIWD
Lusungu Sinda	Principal Irrigation Officer	DoI, MoAWID
Masankho Bulirani	Controller of Agriculture Services	MoAIWD
Nelson Matava	Head NAIP Coordinator	NAIP secretariat, MoAIWD
Readwell Musopole	Deputy Director	Agricultural Planning Services
Robins Lukasi	Chief Physical Planning Officer	Ministry of Land Housing and Urban Development
Tenyson R. Mzengeza	Senior Deputy Director	Agricultural Research Services, MoAIWD
Yanira Mtupanyama	Chief Director	Management, MoAIWD

DISTRICTS

Austin Kaunda	Extension Methodologies Officer	Salima district
Christina Masoatenganji	Agriculture Extension Development Coordinator	Salima district
Dominic Cheyo	DADO director	Salima district
George Gondwe	Agriculture Extension Development Officer	Salima district
Blessings Chicuah	Irrigation Officer	Dedza District
Franklin Giovanni	Agriculture Extension Development Officer	Dedza District
Idrice Kansenola	Crops Officer	Dedza District
Mavuto Mdulamizu	DADO director	Dedza District
Osmund Chapotoka	Agriculture Extension Development Officer	Dedza District
Rhoxannah Melambi	Field staff	Dedza District
Sellina Kotansganji	Crops Officer	Dedza District
Catherine Botomani	Irrigation Officer	Blantyre District
Linda Mphande	DADO director	Blantyre District
Linda Mphande	District Agriculture Development Officer	Blantyre District
Martha Mbawe	Crops Officer	Blantyre District
Thokozani Mwapa	Agriculture Extension Development Coordinator	Blantyre District
Dupa McKenley	Crops Officer	Zomba District
Isaac Alli	DADO director	Zomba District
James Chingwalu	Field staff	Zomba District
Leonard Manylingwa	Agriculture Extension Development Officer	Zomba District
Leonette Binali	Field staff	Zomba District
David Galli	DADO director	Phalombe District
Emmanuel Lambala	Field staff	Phalombe District
Henry Ubgemoyo	Agriculture Extension Development Officer	Phalombe District