



1. Project Data

Project ID
P144497

Project Name
TZ-Expanding Rice Production

Country
Tanzania

Practice Area(Lead)
Agriculture and Food

L/C/TF Number(s)
TF-18462

Closing Date (Original)
30-Apr-2020

Total Project Cost (USD)
22,224,814.76

Bank Approval Date
12-Mar-2015

Closing Date (Actual)
31-Jan-2021

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	22,900,000.00	22,900,000.00
Revised Commitment	22,900,000.00	22,224,814.76
Actual	22,897,585.39	22,224,814.76

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2. Project Objectives and Components

a. Objectives

The objectives of the project were: **“to increase the productivity and production of rice among smallholders in targeted areas of Morogoro and Zanzibar”**. (Grant Agreement, page 6). The PDOs in the PAD were the same as those in the Loan Agreement.

b. Were the project objectives/key associated outcome targets revised during implementation?



Yes

Did the Board approve the revised objectives/key associated outcome targets?

No

c. Will a split evaluation be undertaken?

No

d. Components

The project had four components:

1. Sustainable Seed Systems (Appraisal Estimate: US\$3.38 million, Actual: US\$1.64 million). The component aimed to enhance the adoption and sustained use of improved rice varieties that have been released by the research system. This aimed to support on-farm demonstrations to introduce the new varieties to farmers, the multiplication and distribution of preferred varieties by smallholder farmers, and improvements in quality assurance for rice seed. Tanzania had thirteen improved rice varieties released for multiplication however, these were grown on less than 15 percent of the total area cropped to rice. The project aimed to: (i) strengthen the capacity of the Kilombero Agricultural Research and Training Institute (KATRIN) and the Zanzibar Agricultural Research Institute (ZARI) to produce the requisite quality and quantity of pre-basic seed; (ii) support the Agricultural Seed Agency (ASA) and the Seed Unit in the Ministry of Agriculture and Natural Resources (MANR) in Zanzibar to produce adequate quantities of basic seed; and (iii) encourage private seed companies to engage in production of certified seed. On quality control, support would be provided for the rehabilitation and operation of seed laboratory infrastructure at the ASA on the Mainland and Kizimbani in Zanzibar, and for the purification of contaminated varieties by national crop breeders (where contamination occurs). Support would also be provided to the Tanzania Official Seed Certification Institute (TOSCI) to strengthen the inspection and testing of pre-basic and basic seed, and the certification of rice seed that is multiplied by ASA, MANR and private seed companies

2. Improving Crop Productivity through Better Irrigation and Crop Management (Appraisal Estimate: US\$18.48 million, Actual: US\$11.79 million). The component sought to support expansion and/or rehabilitation of five smallholder irrigation schemes on the Mainland (250 ha of irrigated area), and eight smallholder irrigation schemes in Zanzibar (44 ha). The project supported the design of the irrigation infrastructure, the construction of the infrastructure, and the strengthening of Irrigator Organizations (IO) to assure sustainable operation and maintenance of the irrigation works. In addition, the project aimed to speed the adoption of improved technologies needed to raise rice productivity and production by smallholder farmers distributed across 40 irrigation schemes on the Mainland (including the five where irrigation infrastructure was to be rehabilitated or expanded) and 24 irrigation schemes in Zanzibar (including the 8 to be rehabilitated or expanded) by supporting: (i) farmer-led, on-farm demonstrations of two methods of the SRI - one with manual weeding, and one with chemical weed control, (ii) training of extension staff, irrigation technicians and lead farmers, and (iii) a temporary, market-friendly subsidy scheme promoting the uptake of technologies.

3. Innovative Marketing Strategies (Appraisal Estimate: US\$2.37 million, Actual: US\$2.61 million). The component aimed to increase the quantity of rice marketed by strengthening access to markets and improving price incentives at the farm-gate. Activities under this component were targeted at only the Morogoro Region of Tanzania Mainland, due to the absence of marketable surpluses. The project aimed to improve market efficiency through two major activities: (i) provision of marketing infrastructure (feeder roads and warehouses) and (ii) strengthening of market linkages (fund studies to help farmers better



understand rice markets; support the testing of multiple marketing strategies such as contract delivery with nearby processors, the auctioning of grain to groups of traders, warehouse receipts, and the strengthening of market information systems).

4. Project Management and Coordination (Appraisal Estimate: US\$3.11 million, Actual: US\$ 4.36 million). The aim of this component was to facilitate efficient implementation of project activities and tracking of results. Project implementation used the existing structures in Ministry of Agriculture Food Security and Cooperatives (MAFC) for Tanzania Mainland and MANR in Zanzibar. Each of these Ministries would assign a dedicated implementation team of key staff to ensure that there is adequate capacity to coordinate, implement and monitor the project effectively. Under this component, support would be provided for operational costs, project monitoring and evaluation and impact assessments.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Cost: Project cost planned at appraisal was US\$27.34 million, and actual cost at closing was US\$ 20.4 million (75 percent of the planned amount). The project team stated that: *"Additional expenditures were incurred before Project closing but documented subsequently during the grace period, so that the final total disbursed amount is approximately \$22.2 million"*. This would make final cost 81 percent of planned amount. The reason for the decrease in costs is not clear from the ICR; the project team consequently reported that this is due to not being able to report on beneficiary contribution.

Financing: The project was financed by a Global Agriculture and Food Security Program grant that planned to provide US\$22.9 million and US\$4.4 million by beneficiary contribution at appraisal. At closing, US\$20.4 million was provided by the Global Agriculture and Food Security Program (final provision was US\$22.2 million as mentioned above) and beneficiary contribution was not reported by the ICR. The Bank project team subsequently explained that the beneficiary contribution of US\$4.4 million was Tanzania's contribution to the subsidy program which amounted to 50% of the estimated cost of seed and fertilizer incurred by smallholders. . When the subsidy program was reduced by the government to a total of just \$0.6 million the "beneficiary contribution" was reduced . However, the Bank team also clarified that project beneficiaries (farmers) also provided in-kind contributions in terms of labor and land (e.g. land for the warehouses), which was difficult to estimate. Nevertheless, the total contribution by beneficiaries was larger than reported in the ICR.

Borrower Contribution: There was no borrower contribution.

Dates: The project was approved by the Board on 12 March 2015 and became effective about two months later on 18 May 2015. Original closing date of 30 April 2020 was extended for nine months to 31 January 2021, to complete the unfinished works.

Restructuring: The project went through two restructurings. While the PDO did not change the original outcome, targets changed. First restructuring occurred in November 2019 and it increased the end target of the PDO indicator on "average yields of targeted farmers growing paddy in the Mainland" from 3.5 to 5.0 tons/ha, which aligned to the actual baseline yields achieved at that time. The restructuring also removed US\$3,797,342 from disbursement category 2 (subsidies) to component 1 (goods, works, non-consulting, training and operational costs), in order to align to the Government's directive to move away from traditional input subsidies. The April 2020 restructuring modified two PDO indicator targets as follows: (i) additional quantities of rice produced in Zanzibar from 9,660 tons to 6,000 tons, and (ii) direct beneficiaries, from



33,069 smallholder farmers to 30,000 smallholder farmers. The reason for the second adjustment was that, at appraisal external financing from Exim Bank was planned to support irrigation schemes in Zanzibar to cover approximately 1,524 ha under another program; support to seeds and farmers training was to be provided by this project; however, during implementation, this financing did not materialize; hence there was no need for training and seed provision and reductions to the targets was needed in Zanzibar. Similar to the ICR, a split assessment is not going to be conducted; as the first restructuring increased the PDO indicator targets and the second restructuring was necessary because the irrigation investment to be funded by the Exim Bank did not materialize, which led to adjusting the smallholder beneficiaries and rice production levels downwards but only in Zanzibar. This adjustment ensured that the revised targets reflected the level of available financing. In addition, the second restructuring extended project closing date by 9 months, from April 30, 2020 to January 31, 2021, to allow for completion of the project activities, particularly irrigation works.

3. Relevance of Objectives

Rationale

The project development objectives were and remained highly relevant to country and World Bank strategies.

Country and Sector Context. At the time of appraisal and currently the agriculture sector has been key to Tanzania's economic growth, food security and poverty reduction. The sector contributed to 75 percent of employment, 25 percent of GDP and 35 percent of export earnings recently (ICR page 5). Tanzania has 7.1 million hectares (ha) of high and medium potential land suitable for irrigation. Of the 2.3 million ha classified as high potential, only 461,326 ha had improved irrigation infrastructure in 2015. The growth of the agricultural sector had been hampered by low productivity of land and labor due to poor production techniques; underdeveloped markets, market infrastructure and farm-level value addition; poor rural infrastructure; and insufficient agricultural finance, including public expenditure. During the time of project appraisal, smallholder crop yields stagnated at only 20 to 30 percent of their potential. Only 16 percent of farmers in Tanzania used improved seed varieties, 17 percent used organic fertilizer and less than 1 percent farmers were exposed to improved agricultural technologies, with limited irrigation infrastructure across the country. The use of productivity enhancing agricultural inputs was among the lowest in the Sub-Saharan Africa region (ICR page 5).

As the ICR notes (paragraph 4), the rice subsector was and remains a strategic priority for agricultural development in Tanzania. Rice was grown by over 1 million farmers in the Mainland and 72,000 farmers in Zanzibar. On the Mainland, rice was the second most important cereal after maize, recognized as a valuable food and cash crop and preferred staple in the urban markets. In Zanzibar, rice was the most important cereal grain. However, similar to the overall agriculture sector, yields were low, with average rice yields around 1.2 to 2 tons/ha against a demonstrated on-farm potential of 6 to 8 tons/ha. This was due to limited improved seed availability and extremely limited improved technologies including System of Rice Intensification (SRI); and farmers only growing one cropping season due to poor irrigation infrastructure and water management. Most of the rice was grown by smallholders under rain-fed conditions, with women playing a critical role in the labor force.



Relevance to Government Strategies. The Expanding Rice Production Project reflected the Tanzania's priorities, which identified rice as a strategic crop for improving food security. The National Rice Development Strategy (2009) aimed to double rice production to meet domestic demand and expand rice exports. The PDO was also aligned with National Strategy for Growth and Reduction of Poverty, the Long-Term Perspective Plan 2011/12-2025/26, and the Tanzania Five Year Development Plan 2011/12-2015/16. Each of these commitments highlight agriculture's importance to the Tanzanian economy and emphasize the need to commercialize the agricultural sector through productivity growth and expanding trade.

Relevance to World Bank Strategies. The project development objective was realistically pitched in terms of its ambition and fully aligned with the World Bank's Tanzania Country Assistance Strategy (2012-2015). This was reflected under Objective 1 (promoting inclusive, sustainable private sector-led growth through increasing productivity and income), and Outcome 1.2 (increasing productivity and commercialization of agriculture). It continued to align with the Country Partnership Framework (CPF, 2018-2022), under Focus Area 1 (enhancing productivity and accelerating equitable and sustainable development), which included promoting agricultural diversification and commercialization. The project was also in line with the World Bank's Strategy for Africa, contributing to the theme on competitiveness and employment.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To increase the productivity and production of rice among smallholders in targeted areas of Morogoro and Zanzibar.

Rationale

Theory of Change (TOC): The TOC of the project was retrospectively constructed in the ICR (page 8), and it was overall logical with activities, outputs, outcomes and impacts linked with each other with mostly reasonable assumptions. Accordingly, the activities aimed at achieving a sustainable seed production and marketing systems were expected to lead to increased availability of improved varieties of certified seeds; efforts on promotion of improved varieties were expected to lead to increased adoption of improved cultural practices and technology uptake; rehabilitation and expansion of irrigation structures and capacity building for irrigation system management and maintenance were expected to lead to increased irrigated area under irrigation; activities under the marketing component to construct market infrastructure and facilitate market linkages would lead to increased volume of rice traded. All of these outputs were expected to lead jointly to the increase in yields and production of rice; the long-term outcome would be increased food security and farm incomes. Assumptions were in general logical, i.e. farmers were highly interested in adopting the technologies, market friendly subsidies to boost technology adoption (though they were later terminated), qualified service providers to support irrigation /roads /warehouse works as supported by the project. However, the private sector interest in production of rice certified seeds was limited and most support for rice



seed delivery system in the TOC remained public centric (ICR, paragraph 44). In an exchange with IEG during the preparation of this review the Bank project team explained that because rice is self-pollinating farmers can reproduce their own seed from an initial purchase of improved seed. This technical aspect reduces marketing opportunities for seed companies and dampens their interest in the rice seed market. In addition, the TOC did not discuss specifically smallholders, despite the fact that the PDO was about the smallholders.

Outputs:

Irrigation Infrastructure:

- The project provided 271.2 ha of supplemental (or new) and improved irrigation (or rehabilitation) of 1,501.7 ha – all providing increased area under irrigation and drainage. Irrigation development has served as a climate change mitigation measure as droughts had become a common phenomenon in Tanzania. A total of 9 schemes were supported in Zanzibar, and 5 in Morogoro (Mainland), bringing a total hectareage of 1,772 ha under irrigation (1,579 ha in Morogoro (Mainland) and 194 ha in Zanzibar), surpassing the project target of 1,640 ha. The project mostly switched to irrigation rehabilitation rather than new irrigation schemes and respective targets were adjusted accordingly.
- The ICR argued that the increased water availability led farmers to cultivate paddy twice a year, as opposed to only one cropping season, before the project (ICR, page 16). .
- However, infrastructure works were delayed as most of the irrigation schemes were not completed until the final year of the project, limiting full impacts to be realized in the short term. The delays emanated from inadequate capacity of Government institutions in terms of procurement, design, and supervision of works. With inadequate capacity, efforts to decentralize design and supervision of irrigation works (in line with decentralization policy) led to errors which had to be corrected by engaging private sector entities after the MTR.
- The project supported the creation of 56 Irrigator Organizations (IOs) which were strengthened to support operations, maintenance, and general use of the irrigation schemes. A total of 2,867 water users were provided with new/improved irrigation and drainage services. On the latter, the achievement was lower than the target of 4,403 because some big schemes like Mbogo Komtonga were dropped due to lack of complementary investments by other sources of funding.

Adoption of Good Agricultural Practices (GAPs) and System of Rice Intensification (SRI). GAPs and SRI were promoted through trainings, exchange visits and demonstrations. SRI is a multi-practice package of technologies for increasing productivity of irrigated rice by changing the management of plants, soil, water, and nutrients. An estimated 17,776 farmers in Morogoro and 2,253 farmers in Zanzibar adopted SRI against the target of 3,300 and 1,385 farmers respectively (ICR, page15).

Adoption of new rice varieties promoted by the project: Adoption increased among project beneficiaries from 51 percent to 74 percent, with a modest spillover effect among non-beneficiaries as well (from 25 percent to 44 percent). Use of local varieties dropped among beneficiaries as compared to nonbeneficiaries. Most of the farmers sourced improved rice seeds through agro-dealers and were greatly satisfied with the quality. Overall, the project contributed to 27,079 farmers adopting new rice seed varieties in Morogoro (Mainland) (against a target of 20,000 farmers), and 4,991 farmers in Zanzibar (against a target of 6,000 farmers) (ICR, page 17).



Institutional strengthening of rice seed delivery system: The project strengthened the capacity of Government institutions for effective basic rice seed production, seed certification and quality control. A seed laboratory at Agriculture Seed Agency (ASA) in Morogoro as well as in Zanzibar was updated.

Additional quantity of rice marketed in targeted areas: A total of 68,361 tons of additional rice was marketed by the end of the project, above the target of 45,200 tons. Marketing activities were implemented only in Morogoro (Mainland), which was assumed to have market surplus. The project constructed 6,700 tons capacity public (warehouses and associated roads which were finalized towards the end of the project. There was significant price difference with value addition (from paddy to polished rice). The unit price for paddy in Morogoro among beneficiaries was approximately 532 TZS, while that of polished rice was 1,209 TZS. Farmers preferred storage facilities that also provided milling services, hence were able to keep rice in storage and defer sales until prices increased.

Capacity building and farmer mobilization: The project trained 210 farmers, 75 extension staff from 40 irrigation schemes on rice pre- and post-harvest management, as well as 140 farmers and 20 extension officers on warehouse management and operations. Farmers were organized in groups in the respective irrigation schemes to manage the warehouses. Consequently, farmers were able to pull their produce together in warehouses, although the extent of participation was still limited. By the end of the project, limited linkages with buyers were observed, as well as lack of involvement of farmers in using warehouse receipt systems to access finance based on rice stored in the warehouses as collateral (ICR, page 19)).

The project improved the capacity of the Government to oversee irrigation works at national and operational levels. In Morogoro, Engineers from the MoA, National Irrigation Commission and Local Government Authorities were trained to oversee technical supervision on rehabilitation and construction works at targeted irrigation schemes.

At operational level, the project created and strengthened 56 water user associations (irrigators organizations), above the target of 13. These played a leading role to support irrigation operations and maintenance.

Outcomes:

The project substantially achieved its objective. The basis for this conclusion is that the project exceeded its targets for rice yields and production in Morogoro, with substantial achievements in Zanzibar, compared to baselines and to a random control group of non-beneficiary farmers. This was achieved via project's contribution to high rates of adoption of good agricultural practices, and access to water for irrigation. The ICR noted that as finalization of most irrigation infrastructure works took place towards the end of the project, there is an expectation that there will be more benefits in terms of yield and production, in the medium- to long-term upon full utilization of the irrigation schemes.

The following specific achievements were recorded in the ICR for the PDO indicators

- PDO Indicator 1: Average yields of targeted smallholder farmers growing paddy – with a target of 3.5 tons/ha in Morogoro (revised to 5 tons/ha), and 5.5 tons/ha in Zanzibar. This was achieved. In Morogoro rice yields increased by approximately three times, from baseline of 1.8 tons/ha (in 2015/16) to 5.7 tons/ha (in 2019/20) exceeding the project target of 5 tons/ha. In Zanzibar, the rice yield achieved more than doubled from a baseline of 1.8 tons/ha in 2015/16 to 4.9 tons/ha, representing a substantial achievement of 89 percent, as compared to the Project target of 5.5 tons/ha. A comparison



between project beneficiaries and non-beneficiaries indicated substantial yield increase by farmers supported by the project (ICR, Table 4). During the dry season, beneficiaries in Morogoro realized rice yield of 1.4 tons/ha more than non-beneficiary farmers. In Zanzibar, they realized almost 9 times more than non-beneficiaries. Similar trends applied during the wet season. The effectiveness of irrigation improvement was observable during the dry season when irrigation was the only source of supply for crop water requirement. Based on the overall yield, it can be concluded that project beneficiaries had their yields at least twice more than nonbeneficiaries. Interventions that promoted input uptake, GAPs, including SRI were perceived by farmers as great drivers towards increased rice production and yield.

- **PDO Indicator 2:** Additional quantity of rice produced in targeted areas – with a target of 56,500 tons in Morogoro, and 9,660 tons in Zanzibar (revised to 6,000 tons for Zanzibar). In Morogoro (Mainland), there was substantive progression on additional rice produced from 36,055 tons in 2016/17 to 61,074 tons in 2018/19 and further to 88,637 tons in 2019/20. The final achieved rice production exceeded the project target of 56,500 tons. In the first two years, there was no additional rice production achieved as the Project was being set up, with more focus on establishment of demonstration plots and associated farmer trainings. Farmers were able to harvest two crops per year as opposed to one, with additional hectareage utilized due to irrigation rehabilitation and development, leading to rice production increases. As most irrigation schemes were finalized towards the end of the project, there was scope for increased future production at higher levels than achieved in the final year. Similar achievements were observed for Zanzibar, where irrigation development had already been completed and rice production increased in all the targeted districts, approximately three fold over the baseline values. A comparison between beneficiaries and non-beneficiaries (refer to Table 4) further indicated that beneficiaries produced more rice (average 2,105 kg/household) than non-beneficiaries (1,302 kg/households). In Zanzibar, beneficiaries produced approximately three times more than non-beneficiaries, with the same trend in Morogoro). The ICR mentioned (page 16) that availability of improved inputs and technology provided greater scope for increased adoption, and the introduction of the input subsidy in the earlier years of the project provided incentives for technology adoption as the inputs (like seeds and fertilizers). However, the impact of the input subsidy is not clear in the ICR, as the government discontinued input subsidies after 2015. .).
- **PDO Indicator 3:** Additional quantity of rice marketed in the targeted areas in Morogoro was 68,361 tons compared to the target of 45,200 tons over the project period. Marketing activities were conducted only in Morogoro as this was a surplus production area whereas Zanzibar was not.
- **PDO Indicator 4:** Number of direct beneficiaries (disaggregated by gender) – with a target 33,069 (of which 50 percent female), (revised to 30,000 people, 50 percent female). The project reached 41,485 direct beneficiaries out of the revised target of 30,000 representing achievement rate of 138 percent. Total beneficiaries for Morogoro were 36,421 and 5,064 for Zanzibar.

Rating
Substantial

OVERALL EFFICACY

Rationale



Overall, the project's efficacy is rated as Substantial. This is based on the fact that the project exceeded its targets for rice yields and production in Morogoro, with considerable achievements in Zanzibar, compared to baselines and non-beneficiary farmers. This result was achieved via the project's support to farmers to implement good agricultural practices, and access to water for irrigation. While there are some concerns regarding institutional and financial sustainability regarding irrigation structures in terms of their operation and maintenance, the ICR also noted that (page 20) as finalization of most irrigation infrastructure works took place towards the end of the project, there is an expectation that there will be more benefits in terms of yield and production upon full development and utilization of the irrigation schemes associated with this project.

Overall Efficacy Rating

Substantial

5. Efficiency

Financial and Economic Efficiency: The PAD prepared an ex-ante financial analysis that evaluated productivity gains associated with the adoption of improved irrigation systems and the adoption of improved seed, fertilizer, better weed control and better water management in a technology package broadly characterized as SRI. Eight farm models were developed, and these were calculated for both Morogoro and Zanzibar. In Morogoro the analysis additionally measured the expected gains resulting from the construction of grain warehouses that would allow farmers to sell paddy in bulk and later in the season when prices tended to be higher. The analysis assumed that farmers would not all have adopted the mix of SRI packages and thus allowed for a phased approach. Eight models evaluated the 'without project/baseline situation' in which farmers had yields of 1.2 tons/ha under informal irrigation / rainfed situation. The incremental 'future' yields and production achieved due to irrigation infrastructure were estimates based on similar irrigation schemes in Tanzania and supplemented by FAO data. All models generated positive incremental returns.

The ex-post economic analysis for the country as a whole was conducted on the basis of (i) a 12 percent discount rate equal to the opportunity cost of capital for Tanzania, and (ii) a 20-year timeframe corresponding to the life of the irrigation and other large facilities rehabilitated. On the cost side, only direct investments associated with improved performance for farmers were considered (i.e. Components 2 and 3). However, activities under seed system development (Component 1) were also directly related. In addition, project management costs (under Component 4) needed to be included as well to be able to measure the overall economic value added of the project. The ICR did not, however, present NPV and ERR for the project based on total project costs and benefits.

The ex-post economic analysis calculated in this way resulted in a Net Present Value (NPV) of US\$9 million at a discount rate of 12 percent and an Economic Internal Rate of Return (EIRR) of 36 percent. In Morogoro the NPV achieved was US\$12 million, with EIRR of 51 percent, while in Zanzibar, the NPV achieved was US\$0.5 million with the EIRR of 25 percent (ICR, paragraph 50). The largest share of benefits was generated in Morogoro given more hectareage under irrigation and the potential gains accruing from the warehousing schemes there. Also, the rate of return was lower in Zanzibar due to flooding. The indirect benefits associated with spillover gains to a broader range of producers, consumers and marketing agents were not included in the analysis which



only included the direct beneficiaries. The ICR (page 21) suggested that as the irrigation systems come into full use, the improved yield gains should result in spillover benefits.

The Bank project team provided IEG with NPV and EIRR estimates resulting from an economic analysis that included the total project costs and benefits. Accordingly, the estimated overall EIRR was 27.4 percent (with Morogoro at 39 percent but Zanzibar only 4 percent).

Administrative and Operational Efficiency: The project had operational and administrative inefficiencies. There were significant delays in the execution of irrigation infrastructure and warehouses, which (as the ICR noted in paragraph 52) will need further public support for effective operations and maintenance to ensure long term sustainability, in particular for the irrigation investments. The delays were due to inadequate capacity of Government institutions in terms of procurement, design, and supervision of works. Coupled with not very successful efforts to decentralize design and supervision of irrigation works in line with government decentralization policy. These efforts led to errors which had to be corrected by engaging private sector entities, or sometimes led to cancelation of tenders. There were also delays by Ministry of Finance to pay contractors on time after certification of various irrigation works.

Due to these serious administrative and operational inefficiencies which held back the project's irrigation development and also constrained improvements in the productivity and production of rice among smallholders, this project's efficiency is rated modest.

Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	35.00	100.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	36.00	70.00 <input type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The project's objective is **highly** relevant to the strategies of the World Bank and the Government both at appraisal and at closing. The Efficacy in achieving the development objective is rated as **substantial** based on the evidence of increases in productivity and production of rice for smallholders that exceeded targets in Morogoro and partly in Zanzibar. Efficiency is rated **modest** based on shortcomings in the project's administrative or operational performance, despite the relatively high estimated economic rate of return for



Morogoro. Overall there were moderate shortcomings in the project's efficiency and therefore the project's outcome is rated **moderately satisfactory**.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

Several risks to the sustainability of development outcomes were identified by the ICR (page 33) and these are concurred by IEG and summarized as follows:

Operational and Financial Risks: There is a risk of sustaining the investments in general due to limited public funds. Although the Government has written to all implementing partners requesting them to mainstream project activities in their budget, the provision of funds will depend on the availability of public resources.

In addition, regarding irrigation infrastructure, while the project established and trained 50 irrigation operators (IOs), they need further support for them to be functional and operationally and financially sustainable. To ensure sustained operations and functionality of irrigation schemes, further public funding for irrigation and maintenance will be needed, as well as enforcing the National Irrigation Act (2013) which requires that IOs collect an irrigation fee for operations and maintenance in irrigation schemes.

Furthermore, the absence of a seed revolving fund remains a gap to sustain production of breeder and foundation rice seed. The absence of such a fund (especially for breeder seeds) would mean that Government or donors will have to support production of early generation seeds which cannot be sustainable. Also, the absence of a vibrant private sector seed industry constrains the development of a sustainable seed marketing system for certified rice seed.

Disaster Risk: Tanzania remains vulnerable to climate change shocks. For example, floods that occurred in 2019/20 wiped out most of the rice production gains in Zanzibar. Droughts have also created problems in some years which reduced rice production and yields. In addition, the COVID-19 outbreak is likely to hold back the attainment of the anticipated development outcomes in the short-term. The pandemic resulted in increased vulnerability for consumers, and also will be negatively impacting food supply chains and thus will adversely affect the smallholder farmers and sustainability of project outcomes.

8. Assessment of Bank Performance

a. Quality-at-Entry

The project design reflected lessons from past projects on irrigation, agricultural subsidies, technology delivery systems and particularly benefited from initial phase of the Agriculture Sector Development Program (P085752), Accelerated Food Security Project (P165848) and Participatory Agricultural Development and Empowerment Project (P067103). The Project design also considered the national



agricultural development policy, its strategies and investment plans. A detailed mapping of donor projects was done, which identified collaborative partnerships. However, two shortcomings created challenges for the project: (i) The project assumed there would be complementary investment by development partners, which did not materialize, hence some targets had to be adjusted downwards. (ii) Sustainability issues including irrigation operation and maintenance, as well as private sector involvement in seed development and delivery were not addressed in advance.

In addition, major risks were identified but underestimated at appraisal, particularly procurement related risks. The key risks included weak Government capacity to supervise the project. The project was prepared at a time when Government was using its own institutions (i.e. National Irrigation Commission) to design and supervise projects which resulted in some errors in design and estimated budgets. During project implementation, it became clear that it would be difficult to attract competitive bidders for construction works due to low budgets. Further, local Government had limited capacity to manage procurement, led to subsequent cancellation of tenders. Specifically, the capacity of local Government to effectively design and supervise the irrigation infrastructure works was not examined.

On the other hand, the project had a robust monitoring and evaluation (M&E) system, capable of collecting and reporting adequately on the project's implementation progress

Due to the shortcomings mentioned above, the QAE is rated moderately satisfactory.

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

Project performance was slow. Performance only improved after the Mid Term Review (MTR) in October 2018. The first years were associated with change of Task Team Leaders (TTLs), while Government took time to ensure that proper staff were assigned and seconded to lead the Project. Until the MTR the disbursement was only at 29 percent. The MTR highlighted the significant implementation delays and gaps. Following the MTR, the task team became proactive and initiated two restructurings after which led to subsequent improved project performance. The assignment of a TTL based in-country helped to assist the client to catch up with the implementation of the project.

The post MTR period the World Bank showed strong engagement and hands-on support. In total 11 supervision missions were conducted. Aide- Memoires and ISRs were timely and contained relevant information, including the status of disbursements, implementation progress and flagging issues for management action. In addition to supervision missions, the task team provided support and flexibility in addressing problems, even during the COVID-19 pandemic. According to the ICR communications and consultations with the client were regular, open, and transparent; and virtual missions were conducted during the pandemic. The Bank team provided extensive hands-on support to the client including in areas such as FM, procurement, safeguards and M&E. Also, the Bank's technical specialists provided necessary and timely advice to the client. Due to the inadequate supervision and lack of support for implementation at the start of the project when inadequate quality at entry needed to be rectified, quality of supervision is rated moderately satisfactory.



Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The M&E system had two main components. Firstly, it included monitoring of achievement of expected results, through baseline study, mid-term evaluation, end of Project evaluation, with annual surveys to supplement tracking annual progress of key results indicators. Secondly, a simple Management Information System (MIS) established in the Ministry of Agriculture Food Security and Cooperatives and the Ministry of Agriculture and Natural Resources to track implementation progress, including disbursements and procurements.

While the PDO indicators were adequate to measure the achievement of the objective of productivity and production increases in rice, the targets were not realistic as some targets in Zanzibar were based on external financing that was beyond the control of the project. Those targets were revised during the second restructuring. While the indicators directly measured the objective of productivity and production, as the ICR suggested, measurement of higher -level results as well, such as incomes and poverty reduction would have better captured the impact of the project on food security.

b. M&E Implementation

The M&E system was functional, with baseline study, annual surveys and mid-term evaluation and end year survey was carried out as planned. The project annual surveys helped to update the status on various indicators in the RF and provided good input into the implementation support missions. While the final Project annual survey done internally, and results submitted in March 2021, after Project closure; an external end of Project evaluation survey would be needed to better capture impacts of the Project (i.e. on food security, income), at least after two years after project closure. This would also capture the impacts from irrigation works that were delayed and completed towards the end of the project.

c. M&E Utilization

The M&E data and annual survey results were used for decision making. These results informed areas to adjust during implementation, and informed subsequent changes during project restructurings. Harmonized data collection and reporting in Morogoro and Zanzibar made it easy to consolidate and compare results achieved from Morogoro and Zanzibar, while providing overall project status and learning. The project captured results stories and case studies which helped to confirm results achieved.



M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

The Project was classified as Environmental Category B and the following safeguards policies were triggered: (i) Environmental Assessment (OP/BP 4.01); (ii) Natural Habitats (OP/BP 4.04), (iii) Pest Management (OP/BP 4.09); and (iv) Involuntary Resettlement (OP/BP 4.12). There were no major safeguard problems anticipated in the Project. Grievance Redress Mechanisms (GRM) were set up, for Mainland and Zanzibar and functional. Overall, Environmental and Social risk was assessed as moderate and the final rating during last mission was Moderately Satisfactory, but the ICR provides no explicit statement regarding compliance with these safeguards.

The Environmental and Social Management Framework (ESMF) highlighted the need to prepare environmental impact assessments prior to development of new infrastructure works. The Integrated Pest Management Plan (IPMP) was developed to guide on the use of pesticides and fertilizers to ensure safe agrochemical usage. The IPMP was disseminated and served as an important tool towards management of pollution and safeguarding health of farmers.

The ICR noted that (page 30) each sub-project developed an Environmental and Social Management Plan (ESMP) and was adhered to in a satisfactory manner. Safeguards' activities such as water testing in irrigation schemes and safety of farmers were adequately implemented. All infrastructure works complied with the ESMPs, including use of Personal and Protective Equipment with timely reporting. The project did not record any incidences regarding Occupational Health and Safety.

In terms of social safeguards, in view of limited and localized resettlement arising from limited expansion of some irrigation schemes, the Resettlement Policy Framework (RPF) was developed. The Project developed three Resettlement Action Plan (RAPs) for the irrigation schemes which resettled farmers and the ICR reported that (page 30) by the end of the Project, all resettlement issues were concluded satisfactorily. The Grievance Redress Mechanism was set up and operational, with complaints registers updated, and grievances addressed. The project had sound citizen engagement, with structures established to the village level.

b. Fiduciary Compliance

Financial Management (FM): The responsible agencies were considered to have enough capacity and experience in implementing World Bank-funded projects, thus FM risk was moderate during appraisal. However, there was continuous low budget utilization at the beginning of the project due to implementation delays. Bureaucratic delays were also observed on effecting changes on new signatory authorities from Government, as well as untimely payment of funds to contractors by the Ministry of Finance and Planning. Nevertheless, performance and disbursements improved overtime. The FM risks were mitigated through training of staff in World Bank FM procedures and adequate adoption of sound FM procedures. Annual project audit reports, and Interim Financial Reports (IFRs) were submitted on time and all outstanding



issues were resolved within the project period. The last ISR rated the FM performance as moderately satisfactory (ICR page 30).

Procurement: According to the ICR the project was confronted by a number of procurement challenges. Procurement risk was grossly underestimated at appraisal as moderate (ICR, paragraph 97) because in the event procurement and contract management capacity was limited at the national and local government levels. Contract management was also a challenge. In particular, timely monitoring of contracts under implementation, and ensuring that works and services were completed on time was a shortcoming leading to the inefficiencies in the project's performance mentioned in Section 5 above. In addition, as paragraph 73 in the ICR noted, "The project experienced late submission of procurement documents which were also of low quality. Efforts to devolve procurement functions to local government level resulted in further procurement challenges, leading to cancellation of some procurement of works". The World Bank team provided regular procurement and contract management training, with strong supervision support from the World Bank and the Government. Independent procurement audits and technical support were also provided. These efforts were apparently successful because procurement performance in the final ISR was rated Satisfactory (ICR, paragraph 98).

c. Unintended impacts (Positive or Negative)

No unintended results were reported in the ICR, nor identified by this review.

d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	Substantial	

12. Lessons

The ICR identified various lessons, most relevant ones are summarized as follows:

Combining investments on hardware (irrigation infrastructure) with software (improved agricultural technology) leads to more benefits in terms of higher agricultural yields and production. The project provided a combination of improved seeds and good agronomic practices



(including SRIs), which created a strong foundation for impactful irrigation infrastructure investments. A self-standing irrigation investment would not have added much value without complementarity 'software' investments.

To increase incomes of farmers improvements to productivity are not sufficient catalysts for creating impact unless marketing and value addition are included in the program. The end of project review confirmed that incomes and revenues increase more when farmers are also supported with market linkages and value addition. For example, warehouses help farmers to improve storage and defer sales to when prices are high, while mobilizing farmers in groups and linking them to off takers provides an opportunity for bargaining prices.

A long-term approach to irrigation and agriculture development is key to ensure developmental impact. This project's experience showed that development of irrigation infrastructure and long-term viability of intermediate outcomes need adequate time, and more than 5 years, to achieve developmental impact. Thus, sustained efforts are needed to institutionalize intermediate outcomes, sustain operation and maintenance for irrigation schemes as well as, link farmers to markets, and create a sustainable seed production system.

13. Assessment Recommended?

Yes

Please Explain

In order to verify project impacts from irrigation works that were completed towards the end of the project and thus could not be thoroughly assessed at project closing.

14. Comments on Quality of ICR

The report was concise, and its structure followed the guidelines. The quality of evidence and analysis was robust in general, results were given for 'without project' situation as well, which provided the counterfactual and thus incremental benefits from the project support. The ICR developed a theory of change of the project that helped to understand how the outputs, outcomes and impacts were linked and the ratings were reached. The ICR's lessons were clear and based on evidence. However, there were some weaknesses in terms of quality of evidence and analysis: (i) the contribution of project beneficiaries to project costs as well as exit of the Exim Bank from the project needed explanation; (ii) the project support for and results of private sector involvement in seed production and marketing systems, the impact of government input subsidies at the start of the project and after they were withdrawn, and the linkage between project results and the adoption of good agricultural practices; as well as the extent to which market linkages were achieved not described well; (iii) the economic analysis did not consider all the project costs.

Despite some shortcomings the quality of the ICR is rated substantial.



a. Quality of ICR Rating
Substantial