



AFRICAN DEVELOPMENT
BANK GROUP

Government of Malawi

SMALLHOLDER IRRIGATION AND VALUE ADDITION PROJECT

(SIVAP)

PROJECT COMPLETION REVIEW

DRAFT REPORT

FOR

Ministry of Agriculture, Irrigation and Water Development

P.O. Box 30134

Lilongwe 3

Tel. No.: (265) 1 789 033

Fax. No.: (265) 1 789 390

November, 2019

Project data

Project name: GAFSP Smallholder Irrigation and Value Addition Project		
Project code: P-Mw-AAO-026	Instrument number(s): GAFSP:5570155000151 : ADF:9900011301	
Project type: Infrustructure Development	Sector: Agriculture	
Country: Malawi	Environmental categorization (1-3):	
Processing milestones – Bank approved financing only (add/delete rows depending on the number of financing sources)	Key Events (Bank approved financing only)	Disbursement and closing dates (Bank approved financing only)
Financing source/ instrument1: GAFSP	Financing source/ instrument1:GAFSP	Financing source/ instrument1:
Date approved: 13.03.2013	Cancelled amounts:	Original disbursement deadline: 31.12.2018
Date signed: 05.04.2013	Supplementary financing:	Original closing date: 31.12.2018
Date of entry into force: 05.04.2013	Restructuring (specify date & amount involved):	Revised (if applicable) disbursement deadline: 31.12.2019
Date effective for 1st disbursement: 04.10.2013	Extensions (specify dates): 30.06.2019 30.09.2019 31.12.2019	Revised (if applicable) closing date: 31.12.2019
Date of actual 1st disbursement: 19.02.2014		

Financing source/ instrument2:	Financing source/ instrument2:	Financing source/ instrument2:		
Date approved: 13.03.2013	Cancelled amounts:	Original disbursement deadline: 31.12.2018		
Date signed: 05.04.2013	Supplementary financing:	Original closing date: 31.12.2018		
Date of entry into force: 05.04.2013	Restructuring (specify date & amount involved):	Revised (if applicable) disbursement deadline: 31.12.2019		
Date effective for 1st disbursement: 04.10.2013	Extensions (specify dates): 30.06.2019 30.09.2019 31.12.2019	Revised (if applicable) closing date: 31.12.2019		
Date of actual 1st disbursement: 19.05.2015				
Financing source/instrument (add/delete rows depending on the number of financing sources):	Disbursed amount (amount, UA):	Percentage disbursed (%):	Undisbursed amount (UA):	Percentage undisbursed (%):
Financing source/ instrument1:GAFSP	28,053,771.43	99.18	231,942.86	0.82
Financing source/ instrument2:ADF	212,068.90	84.00	40,931.10	16.17
Government:	3,073,800	100	0	0
Beneficiary:	21,700	100	0	0
TOTAL	31,361,340.33	99.14	272,873.96	0.86

Financing source/instrument (add/delete rows depending on the number of financing sources):	Committed amount (UA):	Percentage committed (%):	Uncommitted amount (UA):	Percentage uncommitted (%):
Financing source/instrument1:				
Financing source/instrument2:				
Government:				
Other (eg. co-financiers). Add rows as needed.				
TOTAL				
Co-financiers and other external partners:				
Executing and implementing agency (ies):				

II Project performance assessment

A Relevance

1. Relevance of project development objective

Rating*	Narrative assessment (max 250 words)
4	The African Development Bank ten year strategy (2013-2022) has included “Feed Africa” is one of the High5s which are its priority areas. The Malawi Growth and Development Strategy II (2011-2016) identified agriculture, irrigation and water development as some of the key priorities and drivers of economic growth and poverty alleviation. Likewise the Malawi Growth and Development Strategy III (2017-2022) has agriculture, water development and climate change management is one of its key priority area. The Government formulated Agricultural Sector Wide

Approach (2011-2015) as the priority investment plan for the agriculture sector which focussed on (i) food security and risk management (ii) commercial agriculture, agro-processing and market development and (iii) sustainable land and water management and support services. As one of the active Development Partners in the agricultural sector, the Bank is supporting the implementation of ASWAp. SIVAP falls under ASWAp SIVAP is in line with the Bank's Long Term Strategy (LTS: 2013-2022) on infrastructure development, private sector, inclusive growth and green growth. SIVAP supported Government's efforts in promoting irrigation development for diversified crop production, agro-processing and value addition thus enhancing household food security and increasing smallholder farmers' income. The project was implemented along the green belt which is always a prioritised area for agricultural investments. The selected districts were also under the National Adaptation Program of Action (NAPA). The goal of contributing to food security, increased income levels and poverty reduction resonates very well with key government policies and strategies.

**For all ratings in the PCR use the following scale: 4 (Highly satisfactory), 3 (Satisfactory), 2 (Unsatisfactory), 1 (Highly unsatisfactory)*

2. Relevance of project design

Rating*	Narrative assessment (max 250 words)
4	SIVAP investments have been made with reference to the broader policy framework including the National Irrigation Policy (NIP, 2016), Irrigation Master Plan and Investment Framework, the Malawi Growth and Development Strategy (MGDS II), the National Agriculture Policy (NAP, 2016) and the ASWAp. Under the MGDS II, the Government of Malawi investment in the agricultural sector should focus on (i) food security and risk management, (ii) commercial agriculture, agro-processing and market development, (iii) sustainable land water management and support services. SIVAP has addressed these focus areas as follows: Component 1 has addressed sustainable land and water management (iii). Component 2 has addressed food security and risk management (i) and commercial agriculture, agro processing and market development (ii). Component 3 has focused on support services. SIVAP has addressing these issues in the seven participating districts and, more importantly, constructing new irrigation schemes and rehabilitating the old ones to address the related issues in selected districts of the country. Apart from producing crops, the SIVAP also embarked on value addition activities so that high value products are produced through agro-processing moving away from a tradition of

<p>selling raw produce.. Farmers have always “produced and sold”, they hardly “produced to sell”. SIVAP has marked a paradigm shift and total transformation of the livelihoods of the farmers it has reached. This shows that the programme (SIVAP) is highly relevant to the agricultural sector in Malawi.</p>

3. Lessons learned related to relevance

Key issues (max 5, add rows as needed)	Lessons learned	Target audience
1.	Projects should be based on existing government priorities, policy and national development frameworks	AfDB, GoM
2.	Implementation of projects should always involve mobilisation and sensitisation of local leadership. Conflicts that arise in the scheme are better addressed by local leadership i.e browsing animals cases are dealt at village leadership levels.	GoM
3.	Projects should aim at filling existing gaps in capacities of farmers in terms of institutional strengthening, capacity development, infrastructure, knowledge and skills. The benefiting farmers have from time immemorial been growing the crop enterprises which SIVAP promoted but the new dimension which SIVAP brought has seen the farmers improve their livelihoods greatly.	GoM
4.	Multisectoral projects are bound to be more successful than projects that are narrowly focused in a particular sector. SIVAP focused on value chain approach which saw various sectors participate ie health, agriculture, trade and this served the farmers so well.	AfDB/GoM

B Effectiveness

1. Progress towards the project's development objective (project purpose)

Comments

The Project Development Objective (PDO) of SIVAP was to contribute to food security, increase income levels and poverty reduction for beneficiaries at both household and national level. The specific objectives of SIVAP were to increase agricultural production and productivity through intensification of irrigation, crop diversification, value addition and capacity building.

The Project had three main components including:(1) Sustainable land and water management;(2) Crop diversification and value chain development; and (3) Institutional strengthening and capacity building.

SIVAP, under component one, has successfully developed 12 new irrigation schemes and rehabilitated 5 existing irrigation schemes against a target of 12 new irrigation schemes and 5 old schemes rehabilitated. This has increased hactarage under irrigation by over 3,380ha. The irrigation schemes are currently benefiting over 10, 390 farmers (6216 males and 4174 females) with production of rice, maize, soya beans, beans, pigeon peas, cassava, sweet potatoes and vegetables.

Under component two, the project has increased production of certified seed for the 5 main crops as follows; (i) Groundnuts,196.4 (MT) which represents 315.2% achievement;(ii) Rice 540.2(MT) represents 900% achievement; (iii) Pigeon peas 212.2(MT) represents 427.6% achievement; (iv) Soya beans 77.7(MT) represents 101% achievement; and (v) Cassava 2,850,595m of cuttings, represents 161% achievement. The main reasons for the high achievements relate to introduction of high yielding varieties for example in pigeon peas. Good agricultural practices were also intensified in all the crops. Rice farmers were introduced to systems of rice intensification which substantially contributed to high achievements. Introduction of inoculant in groundnuts and soya saw the production of the two crops rise to very high levels.

The project has achieved 20,301 ha under rain-fed production against 16,600ha target (122% achievement). To date, 78,310 farmers (35,788 females) out of 58,700 target have benenefited from rainfed production representing 133%. This has been facilitated by availability of high quality seed in the areas. A total of 7 Value Addition Centres (VACs) have been established under Agro-processing and value addition. The project has linked cooperatives to over 15 markets under Support to Market Linkages component. To date, over MK 720,000,000 of revenue has been realised from sales by the 17 cooperatives and WUAs supported by the project.

2. Outcome reporting

Outcome indicators (as per RLF; add more rows as needed)	Sub indicator	Baseline value (Year) (A)	Most recent value (B)	End target (C) (expected value at project completion)	Progress toward target (%) realized) $[(B-A)/(C-A)]$	Narrative assessment (indicative max length: 50 words per outcome)	Core Sector Indicator (Yes/No)
Improved food security	Average months of household food security	3.2 months-National Range of 1.2 to 5.8 months in SIVAP districts	Average of 6 months for SIVAP Project sites	Average of 5 months for SIVAP Project sites	156	<i>There is a greater improvement in the number of months households are food secure. This can be attributed to the ability to grow crops under irrigation</i>	Yes
Outcome 1: <i>Increased crop production and productivity</i> (mt)	Rice	0.095	0.39	0.35	117	<i>There has been a huge improvement in production of all the five key crops owing to adoption of improved breeds, technology like the use of inoculant and following of good agricultural practices in general. Farmers have adopted Systems of Rice</i>	Yes
	Cassava	4.6	6	5	350		
	Soya beans	0.1	0.2	0.15	200		
	Groundnuts	0.4	0.9	0.5	500		
	Pigeon peas	0.23	9	8	113		
	Beans	0.13	0.43	0.2	429		
Crop Yield (t/ha)	Rice	1.7	5	4	143	<i>There has been a huge improvement in production of all the five key crops owing to adoption of improved breeds, technology like the use of inoculant and following of good agricultural practices in general. Farmers have adopted Systems of Rice</i>	Yes
	Cassava	22	27	24	250		
	Soya beans	1.0	1.9	1.5	180		
	Groundnuts	1.1	1.8	1.5	175		
	Pigeon peas	1.2	1.95	1.7	375		
	Beans	0.5	2.3	1	360		

						<i>Intensification for growing rice and that has increased yield of rice</i>	
<i>Percent change value added for each crop (% value added)</i>	Rice	5	12	10	140	<i>Opearionalisati on of VACs is solely responsible fo this achievement. The figures are likely to go up as the remaining non operational VACs are commisioned. Again when more produce is agregated at the district level reaching out to non cooperative members will increase % of processed crops</i>	.Yes
	Cassava	6	22	20	114		
	Soya beans	3	23	20	118		
	G/nuts	3	17	10	200		
	Pigeon peas	3	18	15	125		
	Beans	2	13	10	138		
Outcome 2: <i>Enhanced incomes</i>		USD280 per farm family (Rain fed)	USD600 per farm family (Rainfed)	USD550 per farm family (Rainfed)	119		Yes
		USD280 per farm family (Irrigation)	USD1,305 per farm family (Irrigation)	USD1,016 per farm family (Irrigation)	139		
	Rating* (see IPR methodology)	Narrative assessment					
	4	The set targets have been beaten by wide margins. However there is room to achieve even more had it been that all the machines in the VACs were functional with power and water fully provided. It is expected that more produce will be agregated from non cooperative members who will make the cooperatives enjoy economies of scale.					

3. Output reporting

Output indicators (as specified in the RLF; add more rows as needed)	Sub indicator	Most recent value (A)	End target (B) (expected value at project completion)	Progress towards target (% realized) (A/B)	Narrative assessment (indicative max length: 50 words per output)	Core Sector Indicator (Yes/No)
Output 1: Irrigation schemes developed	No. of new schemes	12	12	100	The project has developed twelve (12) new irrigation schemes covering 2150 ha against the targeted 2050 ha. However, some of these schemes are for supplementary irrigation during the rainy season only due to damage caused by cyclone IDAI (Naming'azi, Zumulu A etc)	Yes
Output 2: Irrigation schemes rehabilitated	No. of rehabilitated schemes	5	5	100	The rehabilitated irrigation schemes cover 1,170 ha, which is 90.3 percent of the targeted 1295 ha. Some of the rehabilitated schemes are only used for supplementary irrigation during the rainy season e.g. Zumulu A, Mikoko, and Nkhandwe due to poor construction of the intake and land level of the first section of the conveyance canal.	Yes
Output 3: Amount of seed selected/multiplied						
Output 3: Amount (Mt) of seeds of materials selected/multiplied	Groundnuts	196.4	110	179	There has been high production during the past two seasons due to favourable weather Over time SIVAP was getting more organised on the timely distribution of seeds to the farmers. This also excited the farmers to participate in seed multiplication as it generated them more money.	Yes
	Rice	540	160	338		
	Pigeon peas	212.2	150	142		
	Soya beans	77.7	70	111		
	Cassava	2,850,595 m	7,132,000	250		

Output 4: Rain-fed area (ha) planted to high value seeds	Area	20,301	16,600	122	More area was cultivated due to improved availability of seed through revolving seed groups	Yes
number of farmers (>50% women) planting high value seeds	No. of farmers	78,310	58,700 (29,350 women)	133	Established revolving seed groups has resulted in substantial increase in participation	Yes
	No. of women	35,788	16,411	218	Through intensification of the household approach, number of women participating in rain fed cropping was impressive	Yes
Output 5: Length (km) of access roads rehabilitated	Length	132	133	99	Target slightly missed due to outstanding works in karonga on bridges and roads at Wovwe and Chiwombwe	Yes
Output6: Agroprocessing and value addition supported	VACs	7	7	100	Various agro processing machines were installed depending on value chains analysis conducted. Not all the machines that were installed are functional. Mphinga VAC is undergoing electrification and no capacity building on oil expeller at Lifidzi VAC. In all the VACs, the solar water pumping systems are not functional.	Yes
Output 7: %age reduction in post- harvest losses						
	G/nuts	4	3.75	107	Farmers are now aware of various options for post-harvest management including Perdue Crop Storage Bags and Chemicals	Yes
	Rice	6	5	120		
	Pigeon peas	3.98	3.75	106		
	Soya beans	5	3.75	133		
	Vegetables	6	5	120		

	Cassava	5	7	140		
Output 8: No of private sectors/valuable addition entities networked	No of marketing networks	7	9	129	The VACs are now connected to notable super markets in the country where they supply various products including Shoprite. Framers have also participated in various national level Agriculture Fairs where they have exhibited their products and made business deals	Yes
Output 9: No of Water Users Associations and cooperatives formed.						
Water Users Associations	WUA	17	17	100	All the targeted WUAs were formed Timoti, Mphinga, Hara, Ukanga, Wowwe, Funde, Bua, Mikoko, Naming'adzi, Kamwaza, Nkhande, Zumulu A, Likhubula, Mwamphazi, Chilengo, Masenjere, Manthimba Water Users Associations.	Yes
Cooperatives	Cooperatives	9	9	100	All the targeted Cooperatives were formed and registered and these are; Mphinga, Bua, Lifidzi, Nsanama, Nthabwa, Manthimba and Masenjere Cooperatives.	Yes
Output 10: HIV & AIDS and Malaria Awareness campaigns (No of farmers)	Farmers	12,132	11,368	107	The project was able to reach out to more farmers through the establishment of community talk groups where farmers exchanged ideas	Yes
Output 11: No of M&E systems established and operationalized	M&E systems	1	1	100	System in place. Consolidation of data was undertaken	Yes
Output 12: Technical Assistance, vehicles and	Technical assistance	6	9	150	The PIU facilitated the processes with the help of the procurement unit. Several contractors and service providers were engaged for implementation of SIVAP. All this was possible due to the coordination	Yes

equipment procured.					mechanisms set between the Ministry, PIU and African Development Bank		
	Vehicles	7	7	100	The PIU facilitated the processes with the help of the procurement unit. Several contractors and service providers were engaged for implementation of SIVAP. All this was possible due to the coordination mechanisms set between the Ministry, PIU and African Development Bank	Yes	
	Motorcycles	10	10	100	The PIU facilitated the processes with the help of the procurement unit. Several contractors and service providers were engaged for implementation of SIVAP. All this was possible due to the coordination mechanisms set between the Ministry, PIU and African Development Bank	Yes	
	Assorted equipment	53	34	156			
	Rating* (see IPR methodology)	Narrative assessment					
	4	The achievement for the outputs have been over 100%. Through the coordinated work of various stakeholders, the investments were adequate enough to bring results within the life span of the project					

4. Development Objective (DO) rating

DO rating (derived from updated IPR)*	Narrative assessment (indicative max length: 250 words)
4	The goal of the project was to contribute to food security, increase income levels and poverty reduction for beneficiaries at both household and national level. The specific objectives of SIVAP were to increase agricultural production and productivity through intensification of irrigation, crop diversification, value addition and capacity building.

	<p>Reaching this far each of the components has been able to produce results as follows:</p> <p>Through sustainable land and water management, SIVAP has been able to rehabilitate 5 existing irrigation schemes and constructed 12 new irrigation schemes. This has increased hactarage under irrigation. Both males and females are benefiting from the irrigation investments.</p> <p>The project has increased production of certified seed for the 5 main crops as follows; (i) groundnuts, (ii) rice (iii) pigeon peas (iv) soya beans (v) cassava.</p> <p>The project has achieved 20,301 ha under rain-fed production. To date, 78,310 farmers have benefited from rainfed production. A total of 7 Value Addition Centres (VACs) have been established under Agro-processing and value addition. The project as linked cooperatives to over 15 markets under Support to market linkages. To date, over MK 720,000,000 of revenue has been realised from sales by the 17 cooperatives and WUAs supported by the project.</p>
--	--

5. Beneficiaries (add rows as needed)

Actual (A)	Planned (B)	Progress towards target (% realized) (A/B)	% of women	Category (eg. farmers, students)
78,310	58,700	133	45	Farmers

6. Gender equality

Assessment on the performance of gender equality in the operation (indicative max length: 250 words)

Gender equality had been mainstreamed and results can be seen. An achievement of 45% female representation is close to the 50/50 aspirations of Malawi. Given the background of gender inequality and females discrimination when it comes to growing of cash crops and other valuable ventures like processing, packaging, the achievements of the project needs to be commended. There is need to build in mechanisms that in the long term more decision making positions are taken up by females just like the male counter parts. Females have to be conspicuously found in WUA and Cooperative executive positions. This needs to be

sustained by mainstreaming relevant by laws that give a quota of the executive positions to females.

7. Unanticipated or additional outcomes (add rows as needed)

Description	Type (eg. gender, climate change, social, other)	Positive or negative	Impact on project (High, Medium, Low)
Adoption of technologies (new varieties of maize, rice, pigeon peas, cassava etc)	Economic	Positive	High
Emergence of vibrant trading centres close to the VACs for example Mapalera, Livunzu, Thabwa, Uliwa and Nsanama amongst many other	Social and economic	Positive	High
Reduced cases of malaria outbreak	Health	Positive	High
Access to electricity to many private business and individuals through the connection lines to the VACs	Economic	Positive	High
Access to processing machines to the general public in the VACs	Social and economic	Positive	Medium

8. Lessons learned related to effectiveness (add rows as needed)

Key issues (max 5, add rows as needed)	Lessons learned	Target audience
Delayed start of project implementation at community level	Implementation time needs to be observed so that beneficiaries are taken through a transformational path which takes time.	AfDB/GoM
Delayed commissioning of the processing plants in the VACs	The beneficiaries need to be given more time to have a full cycle of experience so that they deal with all challenges to be encountered with machines installed. At PCR stage,	AfDB/GoM

	<p>Mphinga VAC is yet to get connected to the nation electricity grid while in some VACs, some machines are yet to be operated. Over time farmers have also started looking for complementary sets of machines to be installed for example machines that grade rice</p>	
<p>Advance planning for activities that require other services providers.</p>	<p>There is need to plan in advance for activities that involve other stakeholders or service providers e.g ESCOM. Most of the Vacs had just been operational a few months as at the time of the PCR. There were a number of factors responsible. One of which was delayed ESCOM Power connection to VACs i.e Mphinga. ESCOM Power connection could be included in the BOQs for contractors for VAC structures to fast track power connection Contractors would be bound by the power connectivity and they would do anything in their capacity to finalise the process and be certified for payment.</p>	GoM
<p>Community involvement is always key</p>	<p>Getting the community involved at all stages of the project cycle is key. Development facilitators need to listen and satisfy the wishes of the communities for proejct success.</p>	ADD/DADO
<p>Enhanced supervision during infrasture development</p>	<p>To reduce cases of sub-standard work by contractors, a robust system of supervision should be put in place. Issues witnessed in most VACs where the solar pumping systems are non-functional would not have happened if robust</p>	GoM

	supervision by relevant government officers was taking place.	
Selection of capable and proven contractors	Selection process of contractors should be strict to ensure that only capable contractors with prior experience in the sector are recruited. Due diligence should be followed in the selection of contractors and consultants. From the PCR task, it was clear that others have strength in construction of earth roads and struggle with irrigation scheme construction. A typical example is Zumulu A (Machinga) and Naming'azi – good earth access roads but substandard irrigation infrastructures constructed.	GoM

C Efficiency

1. Timeliness

Planned project duration – years (A) (as per PAR)	Actual implementation time – years (B) (from effectiveness for 1st disb.)	Ratio of planned and actual implementation time (A/B)	Rating*
5	6	0.83	3

Narrative assessment (indicative max length: 250 words)

The project has been implemented for six years instead of the five years it was planned for. A no-cost extension was granted largely because at Mid Term Review new activities were incorporated into the project including the piloting of Integrated Value Chain Governance (IVCG). There were a set of activities that required a full year to be rolled out including procurement of a contractor to manage the platform. The other reason include delayed electrification of Mphinga VAC which had not been completed so was the construction of the Mphinga bridge. In some VACs, equipment was not yet installed whilst the project was at its end. The contributing factors include delayed disbursement of project funds.

It can be observed that even at six years, project implementation activities were still taking place. In five years however with proper planning and funds disbursement, it was possible to complete all the project activities. This is evidenced from the fact that by the fifth year, most of the major activities had been completed in most cases surpassing the set targets.

2. Resource use efficiency

Median % physical implementation of RLF outputs financed by all financiers (A) (see II.B.3)	Commitment rate (%) (B) (See table 1.C – Total commitment rate of all financiers)	Ratio of the median percentage physical implementation and commitment rate (A/B)	Rating*
100	97.3	0.973	4
Narrative assessment (indicative max length: 250 words)			
Implementation of physical outputs of the project exceeded 100%. This happened yet the overall disbursement rate, including all partners, had not reached 100%. To some extent this means that SIVAP made efficient use of project resources, which made it possible for most project outputs to be achieved and contribute to the realization of the overall development objectives of the Project. The ratio of the median percentage physical implementation and commitment rate is 0.973, which means that that the Project delivered its outputs within the provided financial resources.			

3. Cost benefit analysis

Economic Rate of Return (at appraisal) (A)	Updated Economic Rate of Return (at completion) (B)	Ratio of the Economic Rate of Return at completion and at appraisal (B/A)	Rating*
46	33	0.72	3
Narrative assessment (indicative max length:250 words)			
The EIRR at completion is lower than anticipated at approval (33% at PCR against 46% at the appraisal). The PCR figure could actually be higher had it been that some project's activities were not changed at MTR making original assumptions less consistent.			

4. Implementation Progress (IP)

IP Rating (derived from updated IPR) *	Narrative comments (commenting specifically on those IP items that were rated Unsatisfactory or Highly Unsatisfactory, as per last IPR). (indicative max length: 500 words)
2	Connection of power by ESCOM to Mphinga VAC has delayed and this has affected operationalisation of the processing machinery. This has affected the quantities processed under value addition component of the project.
2	<p>At the time of the PCR, Solar water pumping systems were not functional in some VACs (Mphinga, BUA (using electricity for water pumping), Lifidzi, Masenjere and Thabwa VACs). At Nsanama VAC, the submersible pump was stolen. There are problems that need fixing so that the solar water system is working. Some of the problems include the following;</p> <ul style="list-style-type: none"> i. Improper installations of the solar systems. ii. Poor quality of materials used for the solar systems. iii. Electrical faults with the connections – inverter-battery and solar PV connections. <p>The failure to have water running properly means that hygiene is compromised. In the absence of water, it means that Malawi Beureau of Standards can not certify final products from the VACs.</p>
2	Damage of irrigation structures in Chikwawa, Machinga and Nsanje District due to heavy floods which came as a result of cyclone Idai
2	Poor workmanship on Access Road (bridge) to Manthimba Irrigation Scheme. A bridge close to the VAC was recommended for reconstruction by the Roads Authority due to poor workman ship. There is need to engage the National Constrution Inductry Council (NCIC) for arbitration.
3	The IDAI Cyclone was so strong that a large factor of safety was supposed to be build-in in the designs. However, this would hve raised the costs associated with construction. Siting of irrigation infrastructure is also key to ensuring that the irrigation structures can withstand such forces of nature. Typical examples are Masenjere and Ukanga irrigation schemes. There is need for multiple approaches to the design, construction and implementaion of resilient irrigation

	infrastructures. Engineering considerations coupled with good environmental management can reduce the susceptibility of the irrigation infrastructures to floods.
3	Delayed migration of project data to MS ACCESS. This led to some confusion in terms of the M&E system followed at the PIU. The M&E system kept of changing over time because there was not one proper system to follow before MS ACCESS.
2	Inadequate funding for catchment management. Most financial resources were dedicated to infrastructure ie VACs, Schemes and access roads. The feeling of stakeholders is that less financing was committed to catchment management, capacity building and institutional strengthening. It is suggested that financing right stakeholders be identified and supported with resources to manage its sector for example financing for catchment management should be allocated to land resources and conservation. Irrigation projects such as SIVAP should have a large component on catchment protection and management to safeguard the irrigation investments.

5. Lessons learned related to efficiency

Key issues (max 5, add rows as needed)	Lessons learned	Target audience
Delayed financing to the stakeholders (ADDs and Districts)	Stakeholders needed to have adequate budgets to carry out various activities in good time	GoM
The project delayed in setting up a functional M&E System.	Functional M&E system, including comprehensive data collection and validation system, including an electronic database aligned to the KPIs should be established right at the onset of the project. Likewise recruitment of a full time M&E Specialist was supposed to be done in the first year of the project and not in the 3 rd year of the project.	AfDB, GoM
Supervision of construction works	To enhance construction supervision of the infrastructures	

	<p>under SIVAP and knowing the staffing challenges with the Department of Buildings, officers from the Department of Irrigation assisted in the construction supervision of Value Addition Centers (VACs). This improved resource use efficiency especially on sites that had both VAC and irrigation scheme construction.</p>	
--	--	--

D Sustainability

1. Financial sustainability

Rating*	Narrative assessment (indicative max length: 250 words)
3	<p>The VACs constructed and the machines provided under the project are one major source of financial sustainability for the farmers. The cooperatives are self sustaining through membership fee payments, purchase of shares, seasonal contribution of produce and milling at a fee for non-cooperative members. Considering the levels of business in the VACs, it was found that sustainability questions need to be considered when one looks at the level of costs for staff, machinery and electricity. Currently the price of milling in the VACs is far much lower than what the private businesses are offering for the same services in their areas. If this is not checked then the cooperatives may run at a loss and fail to manage the facilities. Challenges Worldwide is also subsidising the Cooperatives by paying some of their bills. While this is providing relief to the baby cooperatives, it may affect their sustainability in the future. The is need to have a clear exit strategy which should be phased in a way as not to completely withdraw support but continuously build capacity while handing over certain bills.</p> <p>All the irrigation schemes constructed are providing an easy way for the farmers to produce several crops in a year through irrigation. In the fourth quarter of 2018-2019 reporting period, scheme utilization rate increased from 64% last quarter to 81%. Actual Utilization in hectares was at 2,686 hectares of the 3,320 ha developed. A total of 6,929farmers (3,170 females) had benefited from the irrigation schemes. The</p>

	<p>WUAs charge membership fee amongst others to realise income that is used for scheme maintenance to ensure that the farmers are financially sustainable.</p> <p>The farmers have been trained in gross margins and other finance related matters, however it is important that follow ups are made to check the selling prices of their produce and services in the VACs.</p> <p>On the other hand government through the local councils should continue to maintain the schemes and the roads accordingly using public funds because the farmers may not be able to realise as much money in the short term. The cooperatives have managed to open bank accounts and it is imperative on the leadership to be as accountable as possible so that financial abuses are avoided. It is also pleasing to note that the cooperatives and WUA have regular meetings where they discuss various issues including finances. This is one effective way of ensuring checks and balances.</p>
--	--

2. Institutional sustainability and strengthening of capacities

Rating*	Narrative assessment (indicative max length: 250 words)
3	<p>Implementation of the SIVAP was done through use of the Government of Malawi's decentralised structures. The implementing district councils took leadership with technical support from the ADDs. The district level structures were both beneficiaries/facilitators and implementers at the same time. By being both facilitators and beneficiaries, the officials have broadened their capacities and experiences.</p> <p>The Project provided adequate resources for training of all the technical staff from the participating Ministries (Agriculture, Trade, Health and Nutrition), at all levels, who in turn supported the farmers' institutions as well as the involvement of the private sector (i.e Umodzi Consulting) in the project in addition to technical expertise being outsourced. The Department of Irrigation, ADD, the DAES, the DADO and EPAs have therefore been strengthened for long term performance in related projects. In addition, SIVAP was an interministerial initiative whose benefits have been spread across several sectors. Ministries of Agriculture, Ministry of Health, Ministry of Trade and Department of Nutrition have all benefited in one or the other.</p> <p>The associations and cooperatives created have demonstrated their ability to grow as the membership had kept on increasing. Some local cooperatives have managed to mobilise more membership to form regional level rice growers union comprised of several cooperatives. Lower Shire Rice Growers Union has set a very good example.</p>

	<p>The main challenge that affected institutional sustainability is the issue of the quality of networking. There are reported cases of non consultation in some cases by consultants. Consultations and engagement were being made when and if it suited the leading institutions. It was not properly mainstreamed and thus needed to be strengthened.</p> <p>The project established a robust M&E System to strengthen data collection and management. The system mainly consisted of field data collection tools and MS Access database. The project trained and provided skills transfer to ADD and district staff with regard to data collection, validation, entry and analysis. The system has led to improvement in quality and timing of report submission. However achievements have been limited due to delayed introduction of the system. This system needs to be maintained by the Ministry of Agriculture, Irrigation and Water Development so that project outputs can be tracked even after SIVAP phases out.</p>
--	---

3. Ownership and sustainability of partnerships

Rating*	Narrative assessment (indicative max length: 250 words)
3	<p>The partnerships created in the implementation of the SIVAP have shown the potential to be sustainable for a number of reasons.</p> <p>Firstly sustainability is ensured due to community participation in the design and implementation of initiatives. Community members have participated in the baseline, design and implementation of the project.</p> <p>Secondly, facilitation and support of the Ministry of Agriculture’s local structures is key as the local staff will include the activities in their routine work.</p> <p>Thirdly organisations like Challenges Worldwide have offered to provide a smooth transition for service provision for SIVAP beneficiaries to the exit point. In this way farmers are appreciating their role in the process and are bound to carry over after project completion. Lifidzi, Nsanama and Thabwa are beneficiaries of the work of Challenges Worldwide.</p> <p>Partnerships created across ministries and departments are very crucial for sustainability of SIVAP. Within Ministry of Agriculture there has been participation of extension, crops, land resources, agribusiness, irrigation amongst many others. Across the ministry, it has also been noted that Department of Nutrition, HIV and AIDS have played crucial roles in the project implementation.</p> <p>Over 15 formal Market linkages have been established and this has potential to lead to huge profit margins being obtained and that will push more farmers to stay in</p>

	<p>business. With basic business knowledge it means farmers will reinvest in their business or yet better they will be able to expand into other business ventures. That means they will be diversifying their incomes.</p> <p>There is need to mobilise more farmers across the district to partner with members of Cooperatives to take advantage of the capacities of machines which require more produce to be supplied and processed so that VACs can pay their own costs. Produce from far and wide needs to be aggregated and supplied to the VACs for processing. This calls for more agribusiness skills amongst cooperatives but also more capital investment into the cooperatives so that cooperatives are able to purchase produce from the members. Also more farmers need to be mobilised within the radius of the scheme as at the time of the PCR there were many members in the WUA who were not members of the cooperatives. Mphinga Irrigation is an example in this respect where the Cooperative shares rice seed with non-members of the scheme so that they produce and process rice at the mill of the VAC.</p> <p>Few members of WUA belong to the Cooperatives which are managing the VACs and this calls for serious mobilisation strategies so that all WUA members become part and parcel of the bigger business entity. Issues of mistrust seem to be running high amongst WUA members just like the lack of entrepreneurial desire to invest in the cooperative. If these issues are handled cooperatives will become sustainable business entities which enjoy economies of scale.</p>
--	---

4. Environmental and social sustainability

Rating*	Narrative assessment (indicative max length: 250 words)
3	<p>Environmental and social sustainability were very critical for the SIVAP project. In this respect several safeguards were put in place to ensure social sustainability. Environmental and Social Management Plans were developed for each irrigation site. Hot spots were Identified and interventions implemented. Flow of water was properly managed so that it does not cause run-off and destroy infrastructure.</p> <p>The various trainings on for example leadership, association and cooperative and management, Climate change Cyclone Idai. SIVAP had capacity building activities of beneficiaries which increased the knowledge base and guarantee sustainability. Environmental and social sensitisation of the beneficiaries and inclusion of environmental safeguards issues helped sustain positive environmental behaviour</p>

	and ensure sustainable utilisation of natural resources. Gender sensitisation ensured that women continue to participate and benefit equally from planned activities. An achievement of 50% women participation is recorded for the project. The HIV and AIDS awareness and advocacy component helped to reduce the prevalence of the pandemic, thereby contributing to increased and sustained smallholder agricultural production. Afforestation and catchment management coupled with climate change resilient agriculture managed to foster agricultural biodiversity which made critical contribution to agricultural and environmental sustainability.
--	--

5. Lessons learned related to sustainability

Key issues (max 5, add rows as needed)	Lessons learned	Target audience
Major infrastructure investments must be done early enough in the project life.	The farmers have not had enough experience to run the machinery for long periods of time to acquire a broad range of experiences. There is need to make investments early enough in a project. The process from conceptualisation of the procurement of contractors, procurement of machines need to start early enough in the project.	AfDB/GoM
Institutional strengthening and capacity development is key	Capacity development in form of knowledge and skills is important to transform the mindset and inculcate a culture of agribusiness. The project has organised farmers and strengthened their associations and cooperatives through provision of various trainings and strengthening the leadership in this indigenous organisations.	GoM

<p>Mobilisation and sensitisation of stakeholders</p>	<p>Participation of various stakeholders has helped the project to be successful. Mobilisation should go together with corresponding financial support to enable partners play their roles. Various stakeholders have participated including extension, agribusiness, nutrition, health. Land resources may have participated in a limited way. This group needs to be mobilised and financially supported in these kind of projects.</p>	<p>DADO</p>
<p>Matching capacities and infrastructural support</p>	<p>The capacities of the machines in VACs are high as compared to production levels of the farmers at the time of the PCR. The arrangement of the project has been to boost various crop production across the project targeted districts through the seed multiplication program. This is will only be possible if non scheme members across could be mobilised to sell their produce to the VAC to take advantage of the high processing capacities of the machines. At the same time there is need for awareness creation amongst members to allow them register farmers outside the scheme so that in unity they enjoy economies of scale. Mphinga Irrigation Scheme farmers have demonstrated that they are receptive to outside farmers in their cooperative by sharing them seed. This model needs to be up scaled across the country.</p>	<p>AfDB/GoM</p>

Quality of investments and selection of contractors	Quality of the schemes and the infrastructure is key to sustainability. While there are many infrastructure cases that can be cited, a classical case is a bridge constructed at Manthimba where a bridge was recommended for reconstruction by National Construction Industry Council. Almost all VACs had construction issues in one way or the other.	AfDB/GoM
---	--	----------

III Performance of stakeholders

1. Bank performance

Rating*	Narrative assessment by the Borrower on the Bank's performance, as well as any other aspects of the project (both quantitative and qualitative). See guidance note on issues to cover. (indicative max length: 250 words)	
3	<p>The Bank's performance was satisfactory in disbursement of resources. However there has been some notable delays in replenishment of the project special account and direct payments to seed suppliers plus contractors over implementation pperiod of the project. Contractors and consultants need to satisfy contract requirements in good time but also submit claims knowing the bank has delayed payment processes.</p> <p>Comments to be inserted by the Bank on its own performance (both quantitative and qualitative). See guidance note on issues to cover. (indicative max length: 250 words)</p>	
Key issues (related to Bank performance, max 5, add rows as needed)	Lessons learned	

2. Borrower performance

Rating*	Narrative assessment on the Borrower performance to be inserted by the Bank (both quantitative and qualitative, depending on available information). See guidance note. (indicative max length: 250 words)	
	Comments to be inserted by the Borrower on its own performance (both quantitative and qualitative). See guidance note on issues to cover. (indicative max length: 250 words)	
	Bureaucratic management procedures have resulted in limited access of funds, it takes long to process activity resources hence slow progress of project implementation. There may be need to streamline levels of authority. The ministry could appoint one person to be responsible for the project at Management level so that less time is used in approvals.	
Key issues (related to Borrower performance, max 5, add rows as needed)	Lessons learned	

3. Performance of other stakeholders

Rating*	Narrative assessment on the performance of other stakeholders, including co-financiers, contractors and service providers. See guidance note on issues to cover. (indicative max length: 250 words)
3	The quality of work by contractors and service providers varied greatly. Although there is that variation, the general finding is that each one of them left some gaps that needed to be filled accordingly. There are uncompleted access roads at Timoti and Bua Irrigation schemes while some VACs have uncompleted fittings and machinery e.g Lifidzi (wash basins), Mathimba (roof airvents and machinery), For the service provision on institutional strengthening and capacity delopment, there was a problem of coordination with the ADD and district level staff. Most communities alleged that contractors in the construction sector left their sites without completing their works. In some of the cases, communities claimed further that there was no proper handover of infrastructure. Apart from the failure to complete the works, there was clearly lack of capacity by the community members to manage the facilities post completion on their own. Close supervision of the works was crucial to have the work to be done perfectly

Key issues (related to performance of other stakeholders, max 5, add rows as needed)	Lessons learned (max 5)	Target audience (for lessons learned)
Intensify supervision of consultants and contracts	There is need to intensify supervision of the consultants and contractors so that their work meets desired standards.	ADD/DADO/DO I
Value for money	There was a general feeling amongst district level staff that some contractors and service providers did not provide quality work. There is need to assess the real value for money when engaging service providers. It was felt that some of the capacity development initiatives could easily be facilitated by the Ministry of Agriculture, Irrigation and Water Development structures at district and community levels. The impression at the district level is that capacity building initiatives could be handled without involving a consultant. The comment was based on a reflection of the interactions and quality of investment of consultant.	GoM/PIU
Harmonising efforts of various stakeholders	There were several circumstances that various stakeholders did not work as a unit during SIVAP implementation. This has potential suffocate collabotive efforts at the community level. There is need to harmonise efforts of contractors, DOI, ADD and District level staff so that they work as a unit.	PIU
Expanding the type of stakeholders and intensified community mobilisation	There is need to include issues of security of farm produce for both human theft, vandalism and livestock damage. This calls for need for community policing and serious by laws that punish lawlessness.	ADD/DADO

IV Summary of key lessons learned and recommendations

1. Key lessons learned

Key issues (max 5, add rows as needed)	Key lessons learned	Target audience
Project investments	<p>Most of the VACs have just been operationalised in the 4th and 5th year of the project. There has not been much time to run the equipment while the project was operational. The farmers haven't had a full cycle of experiences with the machinery and that can affect sustainability. Funds for equipment and other infrastructure development should be disbursed in the second year of the project so that by the end of project beneficiaries should be able to have a full cycle of operation experience. This includes investments in ICT Challenges Worldwide involvement has bridged a gap after SIVAP. It has also allowed the farmers to understand the functionality of the machines and operations bearing in mind that in most VACs, machines were installed when the project was phasing out. Challenges Worldwide has brought an opportunity for farmers to continue learning the operation and management of the VACs.</p>	AfDB
Contractors supervision	<p>Periodic supervision of contractors can help production of quality work. In both cases of service providers and contractors there were reported cases of compromises on quality.</p>	PIU/Ministry of Agriculture, Irrigation &

	Producing durable and sustainable results should always be key. Key issues about engineering works are provided in Appendix 1 & 2.	Water Development
Strengthening partnerships	Contractors and service providers were by passing the ADD and District level staff when implementing activities. This dilutes coordination benefits. There is need to strengthen partnerships between PIU, contractors and ADDs/Districts	PIU
Technology dissemination and adoption has been enhanced	It has proved easier for farmers to adopt innovations (SRI and new technologies) through the investments in the project	Ministry

2. Key recommendations (with particular emphasis on ensuring sustainability of project benefits)

Key issue (max 10, add rows as needed)	Key recommendation	Responsible	Deadline
Certification of VACs	The VACs need to have agroprocessed products certified to fetch a good price on the local and international market. This requires that Malawi Bureau of Standards be engaged and all its certification requirements immediately satisfied to have the VACs process, package and export quality products	PIU	
Improving quality of consultations with farmers	There were several irrigation scheme problems which were reported during the PCR regarding choices made by the contractors ie where to place intake etc. The locals tried to advise but were ignored and ultimately the problems that arose from the same, local people were vindicated. There is need to place much emphasis on	PIU/Ministry/Consultants	

	consulting with farmers. Most of the problems facing the schemes in relation to works were foretold by the farmers and ignored by the engineers and consultants		
Fair share of investment resources amongst the project components	<p>More project resources were committed to investments in infrastructure and other equipment and very limited resources were committed to investments in catchment area protection, human resources capacity development at all levels.</p> <p>There is need to design and run fully fledged environmental management projects which should run in parallel to irrigation scheme development projects. This is important because the people who are found upstream at the source of the water are not the same people that derive benefit from irrigation schemes. This group of people at the source of water require own projects which should be led by environmental experts with full benefits.</p>	PIU	
Empowerment of partners	There is need to empower district level stakeholders (DADO/DIO) through more capacities and financial management. Employment of an accountant and procurement personnel at the district could be useful in managing small district level procurements ie cassava seed which had to be imported across districts	GoM	
Mindset change	There is need to intensify training to change attitudes of farmers to depart from traditional practices and embrace technology. Processing cassava has conventionally involved soaking in the river, now with the machinery in VACs that is no longer going to be the same.	DADO	

Commercialisation of VACs	Produce processing prices at VACs need to be based on cost benefit analysis. So far the prices are lower than commercial rates charged by private millers in the same areas	DADO	
Entrepreneurial spirit	There is need to inculcate the entrepreneurial spirit amongst farmers. They need to embrace the idea of “produce to sell” rather than “produce and sell” phenomenon	DADO	
Contingency maintenance plans	Thyolo, Chikhawa and Nsanje are prone to climate shocks. This means that there is need to have contingency plans to take care of eventualities such as climate change which through Cyclone Idai destroyed scheme water intakes in Thyolo, Chikhwawa and Nsanje	PIU	
Establishment of farmers unions	Farmers need to be more organised to take advantage of the VAC capacities for value addition. With VACs fully operational there is need to mobilise farmers beyond localised cooperatives. District level cooperatives need to come together to make use of the equipment so that operational costs are met but also the facilities benefit many farmers. This is only sustainable if there is a clear organisational structure that extends beyond the schemes	DADO	
Relationship between WUA and Cooperatives	Cooperatives are not trusted by most WUA members and very few WUA members join them. This means VACs which are owned by Cooperatives will benefit very few farmers and yet WUAs have large membership. There is need for proper orientation and training of WUA and Cooperatives on their roles and relationship.	Ministry/ADD/ DADO	

Appendix 1: STATE OF VALUE ADDITIONAL CENTRES FOR SIVAP PROJECT



SIVAP PCR INFRASTRUCTURE ASSESSMENT

Introduction

The Value Additional Centres (VAC) were constructed with the aim of adding value to the produce which were cultivated in the irrigation schemes built under the SIVAP Project. The aim was to equip local farmers to open up cooperatives which in turn were supposed to run the VAC as part of their income generating activity for the cooperatives. The VACs were built in such a way that they serve not only the beneficiaries of SIVAP schemes but also any other farmer who might want to use the services of the VAC at a reasonable fee for income generating to the cooperative.

SIVAP constructed the VACs in Karonga, Nkhotakota, Salima, Machinga, Thyolo, Chikwawa and Nsanje. The VACs were constructed following one uniform design although some of the VACs in some districts were bigger than others.

Following the aim of the exercise, the VACs were visited, and a checklist was used to assess the status of the structures across selected VACs across the country. The names of the VACs and the district in which they are situated are presented in Table 1 and 2.

Table 1 Value Addition targeted crops

Name of VAC	District	Targeted crops
Wowwe	Karonga	Rice
Bua	Nkhotakota	Rice, Cassava
Lifidzi	Salima	Rice, Sunflower
Nsanama	Machinga	Rice, Cassava
Masenjere	Nsanje	Rice, Cowpea
Manthimba	Thyolo	Cowpea
Thabwa	Chikwawa	Rice

Table 2 Machines installed at each VAC

No	Name of VAC	Machines Installed
1	Mphinga, Karonga	HQCF Mill, Rice Mill
2	Bua, Nkhotakota	HQCF Mill, Rice Mill
3	Lifidzi VAC, Salima	HQCF Mill, Rice Mill, Seed Oil Processing Machine, Livestock feed mill.
4	Nsanama, Machinga	HQCF Mill, Rice Mill, Seed Oil Processing Machine, Livestock feed mill, Dhal Mill
5	Manthinba, Thyolo	Dhal Mill
6	Thabwa, Chikwawa	Dhal Mill, Rice Mill
7	Masenjere, Nsanje	Rice Mill, and Dhal Mill

Mphinga VAC

Construction of the structure was finished some years ago, the problem they have access to electricity. At the time of the assessment, the VAC was not yet connected but, there were signs that the structure would be connected to power. At the time of the assessment, ESCOM were conducting line alignment for electricity poles to the VAC. The structure itself had some minor cracks inside as well outside walls. The drying and loading bay was sub standardly constructed (Poor mixing of cement and sand). The loading bay is not strong enough to support a one tone vehicle carrying rice to the VAC for offloading. It was alleged by the VAC committee that the bay was constructed at night by the Contractor to escape supervisory attempts by the locals. This was a reason given when the committee was asked as to why they allowed such substandard construction to happen. The machines which were installed in the building have not been tested and the committee does not know if they work or not.

Poor workmanship was noticed for the water reservoir. Instead of using HDPE pipes to and from the overhead water storage tank, the contractor used PVC pipes. The PVC pipe is now brittle as it can't stand solar radiation.

BUA

The structure was constructed well and almost all machines are working perfectly. The solar system is not functional. At the moment, the cooperative is using ESCOM electricity to pump water. There are some few cracks on the floors but not very worrisome. Farmers experience frequent problems with the sanitation system due to poor quality of plumbing pipes used that often result into water leakage and the materials used break easily. The VAC has no pit latrine as a fall-back plan in case of problems with the water closet system.

The VAC was designed in such a way that there is no wall between the packaging room and the milling section hence the packaging room is usually polluted by dust from the milling room. Thereby affecting the quality of the final processed product.

Lifidzi VAC

The structure is currently working well and only the rice milling machine is working. The sunflower press has never been tested. The cassava mill is being used for milling maize now. The submersible pump on this site is broken and currently not running. The wash basin sink within the structure is not yet installed and hence there is no proper cleanliness of the workers when packing. The operators have no PPE and hence very dangerous to operate. The pipes/exhaust which throws out the rice husks are very short that rice husks get back to the rice milling room if there is wind.

Nsanama VAC

Nsanama VAC is managed by Challenge Malawi, and they have a manager on site to run the daily affairs of the VAC. They have a groundnut sheller which is currently perfectly running, and it is being used as one of the IGAs of the VAC. The Hammer Mill is not operational at the moment and the installation of other machines is not yet complete. Observation showed that the communities were not involved in the whole process of deciding the machines to procure and the installation. The Oil extractor/pressing machine has

some leakage of oil in certain parts. The rice mill has serious issue with its destoner. Luckily, the VCA is benefiting from the presence of Challenge Malawi as they are responsible for the operation and maintenance of the machines as well as the whole structure. The structure was constructed just like the others, at this centre, the pump was stolen hence there is no running water. The W/C toilets are closed due to absence of water. The drain pipe was poorly done.

Masenjere VAC

The structure is smaller in size than the rest. It has two machines installed, these are rice milling and cowpea processor (Dal machine). At the moment the rice milling machine is working but it has connection in its set up that were done using common Sellotape to complete the joints, in other points a masking tape was used. The Dall machine has never worked as the farmers/beneficiaries as well as the others do not cultivate cowpeas for them to use it. The multi crop thresher was used once when it was being tested but it is no longer in use as it is too heavy and needs a tractor to move it to the field. In all the VACs visited, similar observation was made. The inside floor has cracks and the sink was not properly installed and is not working. The solar system is not working properly and there are ventilation issues around the structure. With high temperatures in the area, it would have been good if the windows were to be bigger to allow for proper ventilation. The copies of operation and maintenance manual of the machines were not shared with the cooperative hence they do trial and error in case of breakdown and requires attention by a technician.



Figure 1 Groundnut Sheller and Multi crop thresher that require a tractor for pulling

Manthimba VAC

The structure has similar dimensions to the rest but here it is equipped with the Dal making machine. There is water supply although the water basin (sink) inside the structure is not yet installed. The pump works intermittently hence the cooperative executive committee was forced to close the W/C toilets. The gate valve which allows water in and out of the tank is broken. There are crack on the walls both interior as well as exterior of the structure. The roof Air Vents at the time of the assessments had not been installed on one side of the VAC. This a huge problem considering the rainy season.



Figure 2 Roof Air vents not installed at Mphinga VAC

Thabwa VAC

The structure is well built just like the rest of the structures and being run/operated by Challenge Malawi NGO. The only major problem is the site where it was built becomes water logged in the rainy season as the soils under it have drainage problems. The structure, just like the other VAC have water problems as the solar powered water system is not functional hence the W/C toilets were closed and only the pit latrines are the ones in use. The VAC was installed with two solar panels but now one of the panels is broken hence not enough power to run the submersible pump. In some rooms (office), the ceiling is not painted yet, and there is no provision of installing a light bulb for the room. There is no proper access road for heavy duty vehicles to access the loading bay. The area is usually a free range for animals, there was need for a fence to protect the crops when they are being dried at the drying bay.

The machines are working but the beam fillers in certain spots of the structures have cracked and the roof is not strong enough. The issues associated with the Multi Crop Thresher is the same as reported for the rest of the VAC.

General Observations Across the VACs

The following general issues are applicable to most of the VAC assessed during the infrastructure assessment

- 1) The Multi-crop thresher is not being used due to its huge size hence the need for it to be pulled by either tractor or a car for it to be mobile and worthwhile to be used in the field.
- 2) Most of the VACs have water supply issues, either the pumps were stolen or the solar system not working perfectly are the main challenges observed. The solar powered water systems installations left a lot to be desired.
- 3) It seemed that there was no to limited consultation on the type of machines to be installed in the VACs. There was too much generalisation in deciding where a particular machine to be installed. It was apparent that in some areas, value chain analysis was not detailed enough to establish which main crops to focus on e.g. Pigeon peas for Mathimba VAC instead of Beans.
- 4) Beneficiary involvement during construction lacked in all the VACs visited. The communities were not trained on how to monitor and supervise construction works, if it was there, then it was not involved as a measure of monitoring the construction and installation of the structure and its accessories. There are hardly operation and maintenance manuals to help the users.
- 5) The VACs do not have adequate ventilation especially considering the location of the VAC and that the machines generate heat during production.
- 6) The Rice Milling Machines should have included a component for grading of rice. Currently, the farmers manually grade the rice by removing broken rice. This is a tall order considering the quantity of rice that they process.
- 7) The Rice Milling machines that were installed have a short waste pipe that is supposed to carry the husks safely outside the VACs. However, the waste pipes are shorter that the rice husks are deposited just outside the VACs and that n windy days, the husks are blown back into the process room of the VAC.



Figure 3 Poorly designed waste pipes for Rice Milling Machines

Appendix 2: Expert opinion of the infrastructure

The infrastructure assessment of irrigation structures for irrigation schemes developed by SIVAP was conducted as part of the PCR assignment. The sore of the exercise was to assess the state of the infrastructure a couple of since their construction. Amongst the criteria used for the assessment, appearance of cracks on the structure, scouring, functionality of the irrigation gates and other hydraulic structures, missing components of irrigation structure, condition of the pipelines if the conveyance is a pipe and general layout of the scheme including location of water abstraction points.

The assessment of the irrigation infrastructure will therefore follow a typical layout of an irrigation scheme from the project headworks to the drainage drains. The assessment focused on eight irrigation schemes that were constructed or rehabilitated by SIVAP. These are Timoti, Funde, Naming'azi, Bua, Zumulu A, Masenjere, Mwaphanzi and Mathimba.

Intake Headworks

Overall the construction quality of the intakes for all the schemes is good except with Zumulu A irrigation scheme. The intake was constructed with rock gabions on the sides on the weir. Water leaks through the gabions to the downstream side of the intake. The leak is substantial that water does not pond in front of the intake to divert through the intake gate into the first section of the conveyance canal.



Figure 1 Rock gabions at Zumula A irrigation scheme and the damaged Dyke at Naming’azi Irrigation scheme in Machinga.

At Naming’azi irrigation scheme, the intake has serious scouring on the downstream of the intake. Part of the dyke constructed on the intake was washed away by water. The dyke was not compacted well enough as the soil is still setting down and there are cracks on the dyke. The rock gabions installed to offer additional support the force of water fell short of covering the entire length of the dyke. The scheme is unusable during the winter season as water does not pond in front of the intake to divert into the conveyance canal.

The intakes at Masenjere and Mwamphazi were solidly constructed but the floods following cyclone IDAI destroyed the intakes either partially (Mwamphazi) or completely as in Masenjere. IDAI brought torrential rains to South Eastern Malawi as a tropical depression. These areas saw above-average rainfall in January, enhancing the risk for floods. However, the location of the intakes on the rivers for both schemes increased the risk of wash away. The intakes were sited at places where the rivers were wide with a large capacity of runoff floods capable of washing down the intakes.



Figure 2 Intake at Naming'azi irrigation Scheme

Poor maintenance by the scheme beneficiaries has also contributed to the deterioration of the intake structures. It was observed that the intake at Timoti has sediments deposited just close to the diversion of water into the conveyance pipe. A similar observation was made at Bua Irrigation scheme in Nkhotakota where slowly sediments are accumulating at the intake that will limit the diversion of water into the conveyance canal.



Figure 3 Damaged intake headworks at Masenjere Irrigation scheme.

Hydraulic Structures

The schemes visited have various hydraulic structures that were in cooperated to manage the flow and distribution of water to farmer fields. It was clear during the assessment that the structures were built of good quality and strength however, lack of maintenance by the WUA has made the structures to deteriorate (Figure 4).



Figure 4 Hydraulic structures with gate components missing.

In some rare instances, build quality was compromised resulting in leakage of water from the hydraulic structures. A typical example was the sedimentation basin at Bua irrigation scheme.



Figure 5 Fully functional Hydraulic Structures Timoti Irrigation scheme

Scheme utilisation

Table 1, 2 and 3 presents utilisation and scheme members for the SIVAP irrigation. It must be noted that the utilisation of the schemes is during the times the schemes are used for supplementary irrigation during the rainy season.

Table 1 Utilisation and membership of new schemes-Phase 1

Scheme	District	Area (ha)		Registered Farmers			Utilization %
		Developed	Utilized	Male	Female	Total	
Masenjere	Nsanje	125	125	288	181	469	100
Mikoko	Machinga	56	52	41	667	108	93%
Naming'azi	Machinga	43	43	125	132	257	100%
Kamwaza	Machinga	130	124	212	289	501	95%
Nkhande	Machinga	68	68	53	97	150	100%
Timoti	Karonga	27	27	90	107	197	100
Ukanga	Karonga	61	61	131	84	215	100
Mphinga	Karonga	300	300	406	201	607	100

Utilisation of phase 2 schemes both during the winter and rainfall season is lower than expected. This because of the Phase 2 schemes were affected by IDAI Cyclone.

Table 2 Utilisation and membership of new schemes-Phase 2

Scheme	District	Area (ha)		Registered Farmers			Utilization %	Remarks
		Developed	Utilized	Male	Female	Total		
Chilengo	Chikhwawa	240	113	13	6	19	47	Intake and conveyance structure destroyed by floods
Mwamphanzi	Chikhwawa	147	123	7	3	10	85	Intake and conveyance structure destroyed by floods
Likhubula	Chikhwawa	400	276	0	0	0	69	Intake and conveyance structure destroyed by floods
Lifidzi	Salima	540	220	112	98	210	100	Fully utilised

Table 3 Utilisation and membership of new schemes-Phase 3

Scheme	District	Area (ha)		Registered Farmers			Utilization %	Remarks
		Developed	Utilized	Male	Female	Total		
Wovwe	Karonga	417	417	972	648	1620	100	
Hara	Karonga	230	230	584	104	688	100	
Bua	Nkhota-kota	300	284	474	198	672	95	Fully utilized
Zumulu A	Machinga	110	110	90	150	240	100	Not functional in winter season
Manthimba	Thyolo	113	113	161	205	366	100	Functional in both season

The following general issues are applicable to most of the irrigation schemes assessed during the infrastructure assessment;

- i. Impact of the IDAI cyclone on irrigation sites in Chikwawa and some in Machinga was huge that the intake headworks and the conveyance canals were destroyed.
- ii. Community supervision is key to overcoming issues of lack of proper supervision. However, the communities will have to be trained on what to look for during community supervision. In most cases, communities only focus on mixing of cement and sand and not on the quality of fittings, quality of construction and completion of works.
- iii. There is need for a comprehensive dual diligence assessment of contractors and Consultants for construction works. In some sites, works of poor workmanship was done resulting in structures that are not strong enough and poor-quality fittings.
- iv. Empowerment of WUAs to spearhead maintenance of the irrigation infrastructures and catchment conservation after construction of the irrigation infrastructures.