

# East Africa Food Energy and Water Conference



## The United Republic of Tanzania

### Ministry of Finance

## *Irrigation System Development in Tanzania*



**Dr. Rogers A. Lumenyela**

Prof. Dimoso, P; Dr. Mpogole, H; Prof. Shauri, T, Dr. Zakayo, E and Mr. Panga, S  
Institute of Rural Development Planning (IRDP)

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# About Institute of Rural Development Planning (IRDP)

- ▶ IRDP was established by the Tanzania Parliamentary Act No. 8 of 1980 (Cap. 174 R.E 2002)
- ▶ **IRDP Vision:** To be a center of excellence in planning for sustainable development
- ▶ The core functions of IRDP are threefold:
  - i) Conducting long and short-term training (23 non-degree, 15 degree programs and 12 graduate programs);
  - ii) Conducting research and disseminating research results; and,
  - iii) Providing consultancy and advisory services.



## Advisory Services

- ❖ It is one of the think tanks of the Ministry of Finance
- ❖ Supporting evidence-based planning and financing
- ❖ Support MoF and other ministries and the Private sector on MEL of strategic projects/programmes
- ❖ Has more than 256 members of academic staff with a broad range of expertise

# Introduction...

- Dependence on rainfall threatens growth, productivity and sustainability of crop production
- Only 2.5% of the 29.4 million hectares of irrigable land is under irrigation and only 5% of farming households irrigate (URT, 2022)
- The government has developed an agricultural transformation strategy (The agenda 10/30)

## **Agenda 10/30**

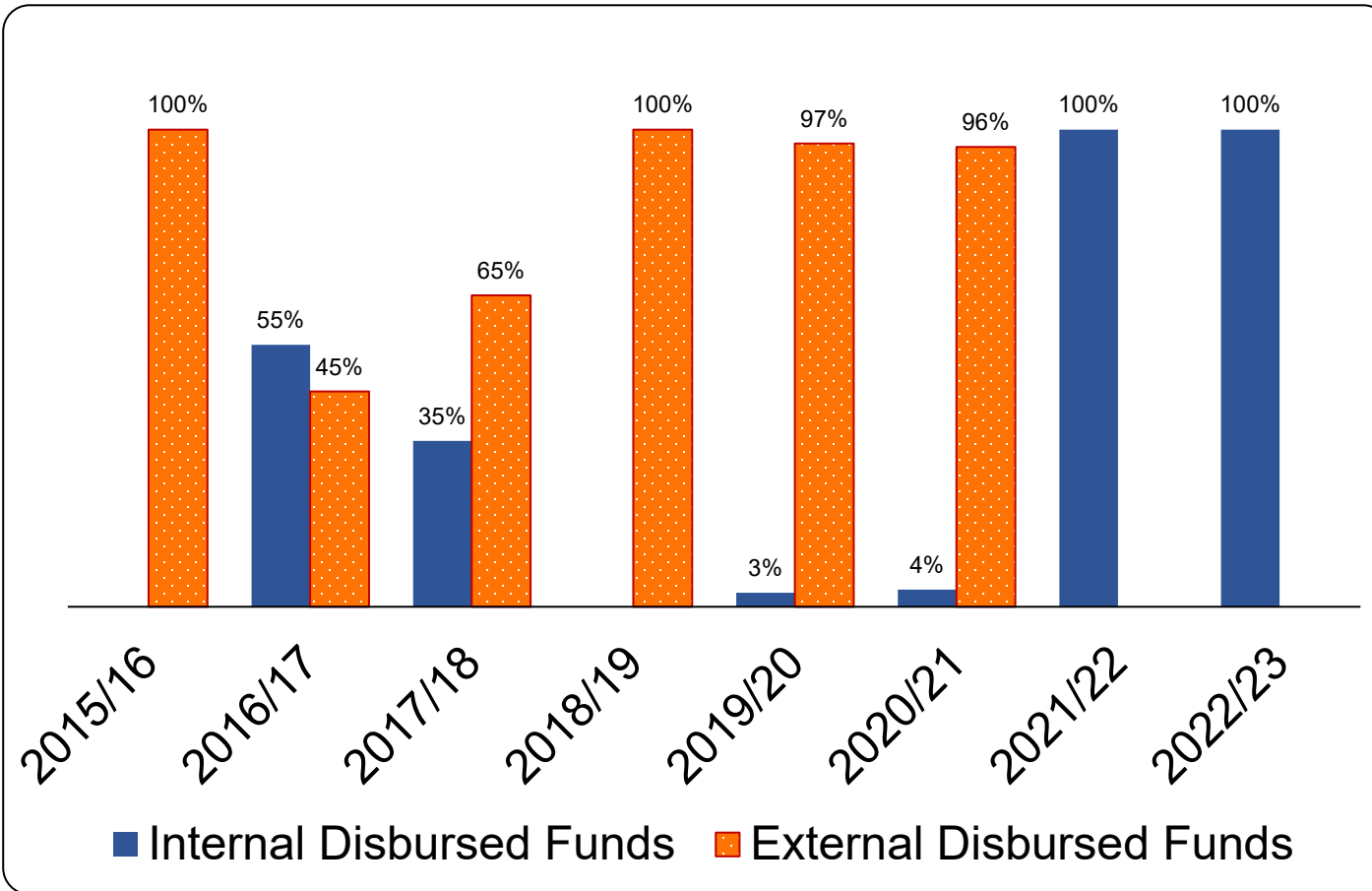
**...accelerate growth of the agricultural sector from about 4.5% currently to 10% in the Year 2030...**

- **Agenda Targets**

- ❖ Expanding the irrigated land by 65%
- ❖ Construct new irrigation infrastructure worthy USD 426 Mil

# Irrigation Scheme Financing...

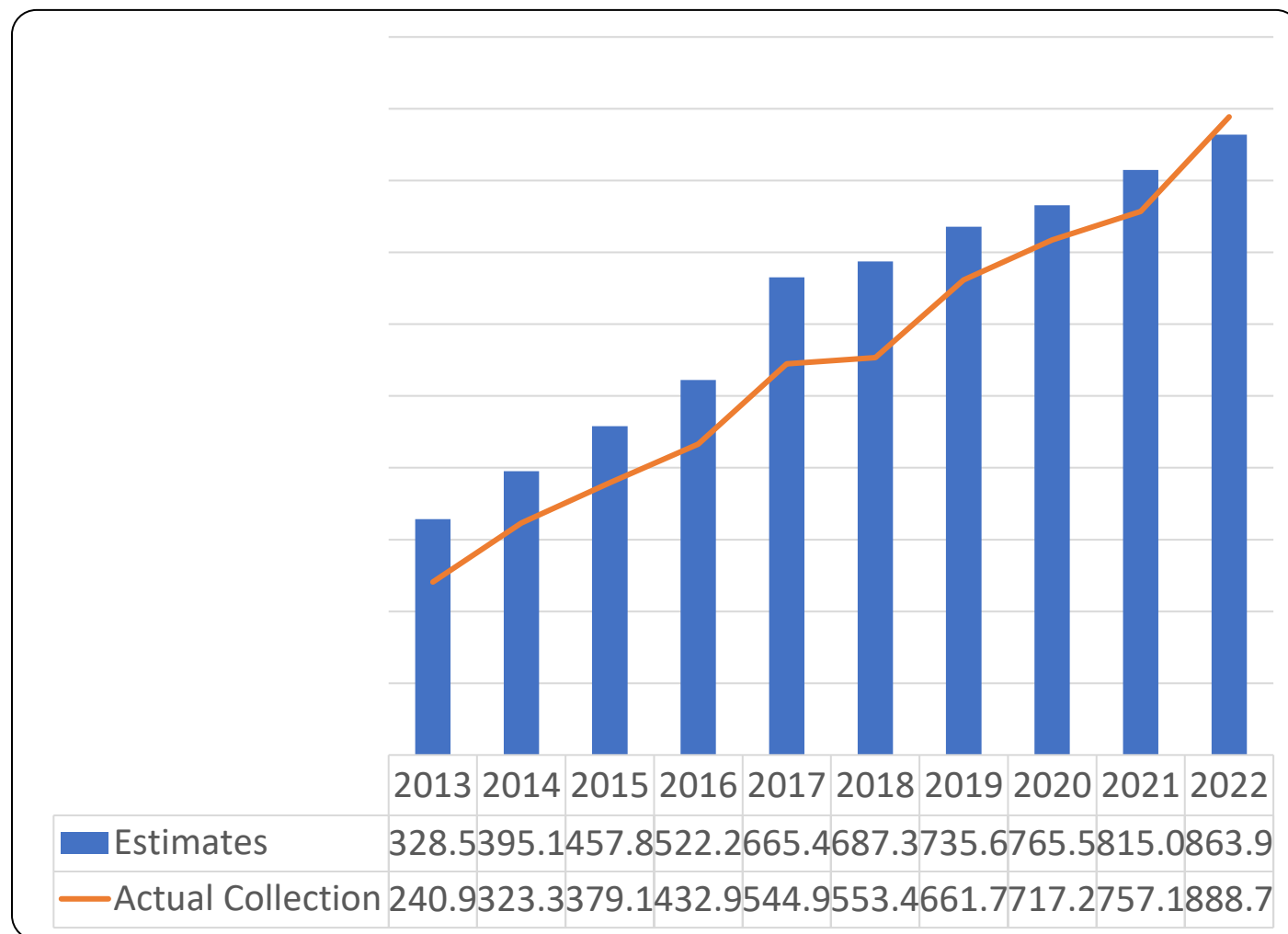
## Financial arrangements



...a response to decline of external financing increases the internal disbursement in the 2021/22 and 2022/23

## Irrigation Scheme Financing...

### Low contribution of LGAs to irrigation scheme maintenance



Collection in Billion TZS

Low contribution of LGAs to irrigation scheme, despite of the increasing own source collection

#### For instance:

Only two schemes (12.5%) were budgeted for irrigation development from their respective LGAs

- Same DC allocated TZS 88 Mil for Ndungu
- Simanjiro DC allocated TZS 30Mil for Lemkuna

# Irrigation Scheme Financing...

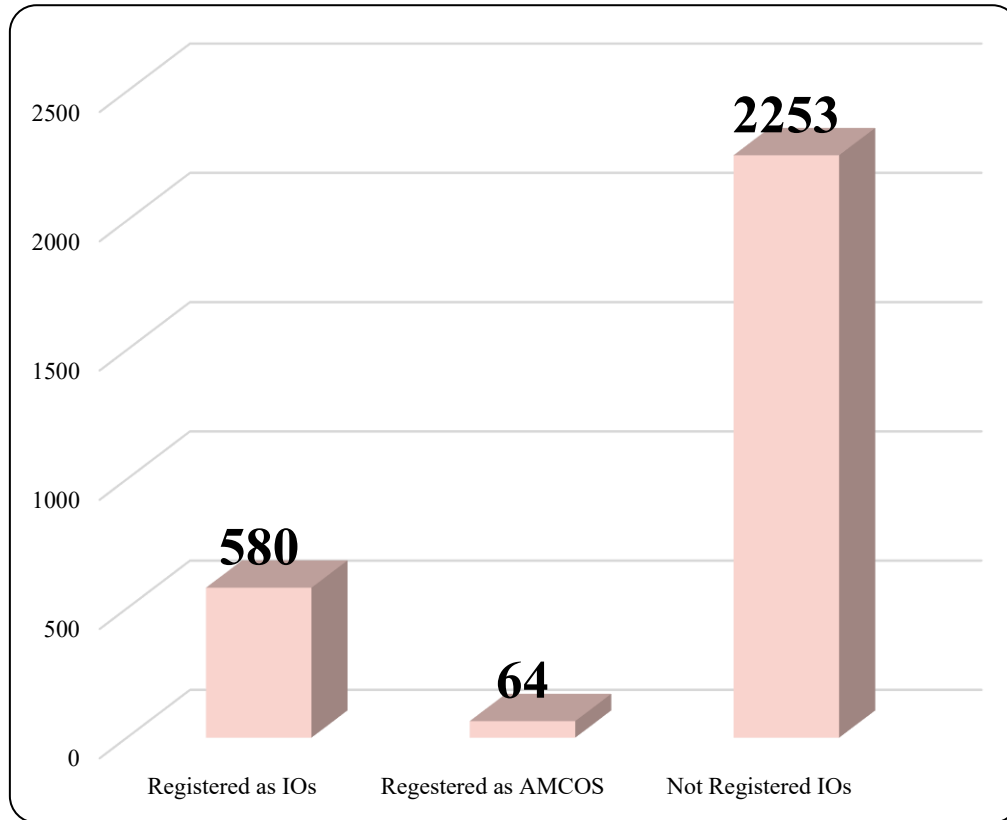
## Low private sector engagement

- ▶ PPP is not effective
- ▶ Strategy for Private Sector Engagement not yet developed
- ▶ No engagement in infrastructure development
- ▶ There is PPP potential

Strategic Objective	Participation of private sector in irrigation enhanced
Rationale	Private sector is one of the key players in Irrigation Sector in investing in irrigation development. They also provide consultancy and support services in Irrigation sector. Despite of its importance, private sectors are skeptical in investing in irrigation due to high initial capital for irrigation infrastructures, doubt on security to the right on land ownership, unreliable water sources and unfriendly business environment that led to low participation
Strategy	Establish engagement strategy for private sector participation in irrigation development
Target	<ul style="list-style-type: none"><li>• Engagement strategy for private sector in place by June, 2028</li><li>• Database for Private companies and Individual irrigators established by June, 2028</li><li>• Coordination link between private sector with financial institutions established by June, 2028</li><li>• Conduct assessment of policy and legislation affecting private sector participation in irrigation and recommend accordingly by June, 2028</li></ul>

# Governance and Management of Irrigation Schemes

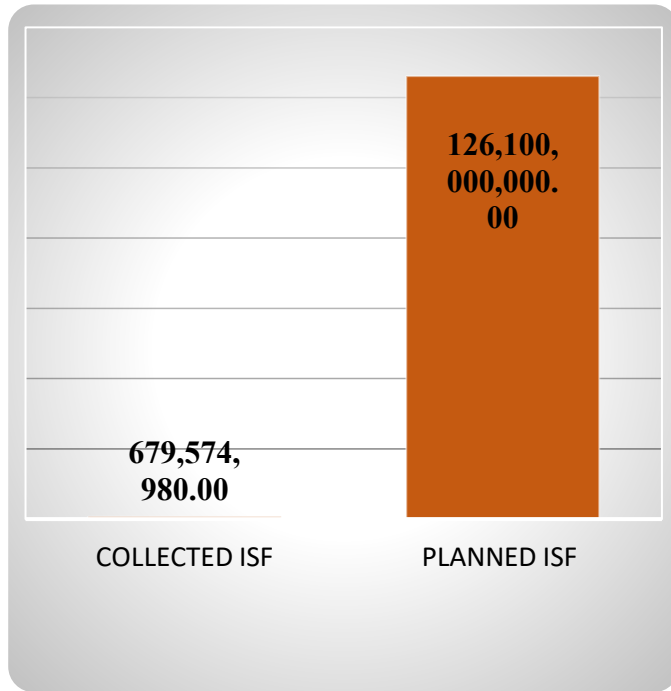
## Limited number of IOs' registered



Scheme	Key Effects
Nyambeho	Difficult in mobilizing irrigators to participate in maintenance of the irrigation scheme
Igence-Mbarika	Poor collaboration with village governments and other stakeholders in maintenance of irrigation infrastructures
Sawenge	Difficult in collecting irrigation service fee (ISF)
Butiama	Failure to enforce penalty for irrigators who do not pay or delay payments of ISF

# Governance and Management of Irrigation Schemes...

## Low irrigation service fee collection and willingness of farmers to Pay



**Dakawa paid to TZS 62,700,000**  
**Madibira paid TZS 101,656,250**  
**Sums 24%**

### Irrigation Act requirements for ISF

- Farmer has to pay ISF of 5% of produce/acre (equivalent to 1 bag, valued at 50,000 TZS)
- 75% of the ISF retained by IO for O&M
- 25% submitted to NIRC

### Why low?

- i. Not registering irrigation schemes and farmers
- ii. Limited understanding among farmers about the importance of irrigation services fee
- iii. Shortage of the electronic system to collection fees
- iv. Shortage of officers to supervise ISF collection

# Governance and Management of Irrigation Schemes...

## System Malfunctioning

- ▶ Overlapping of institutional responsibilities (NIRC, TCDC, Water Basin, and LGAs), require IOs to comply to different and sometime contradicting instructions which affects their efficiency.
- ▶ IOs are charged multiple fees
- ▶ Not all farmers who own land in irrigation schemes are registered as members of IOs (Bahi-sokoni, Igenge-mbarika, Nyambeho and Butiama)



# Capacity and Conditions of Irrigation Schemes

## Status of Water sources


Development phase		Single Water Sources							Multiple sources	Others	Total
		Perennial river	Seasonal river	Dam	Ground water	Lake	Spring	RWH			
2018-2025	No of schemes	253	41	31	9	14	15	10	83	13	469
	Acreage (ha)	188,569	20703	22550	4600	5683	4509	5,330	80,685	11,770	344,399
2026-2035	No of schemes	311	88	73	10	4	18	14	106	50	643
	Acreage (ha)	187,671	61,049	38,084	8,280	666	11,680	13,516	64,929	42,335	405,659
Total	No of schemes	564	129	73	19	18	33	24	189	63	1,112
	Acreage (ha)	376,240	81,752	38,084	12,880	6,349	16,189	18,846	145,613	54,105	750,058

**Perennial rivers are most reliable water sources**

# Capacity and Conditions of Irrigation Schemes...

## ► Current move to boreholes drilling needs precaution

- The government planned to drill 1,845 boreholes
- 184 districts to benefit
- Serving about 150 farmers/ borehole



The current move to borehole is not cost effective and its likelihood to benefit the country is minimal

## However

- Not in strategic plan of NIRC of 2018-2035
- Ground water not well researched (NIRC of 2018-2035)
- Low collective efforts including ISF collection, O&M and collective marketing
- Technical capability of farmers to run the scheme is low
- Integration of other irrigation packages is infeasible
- The available example is a total failure (eg Igingilanyi Irrigation Scheme-Iringa)

## A Case of Igingilanyi & Madibira irrigation schemes

Item	Borehole (Igingilanyi)	Run-off (Madibira)
Construction costs (TZS)	625 Mil	24 Bil
Irrigated land (Acre)	24	8,133
Average construction cost/ acre	26 Mil	3 Mil

### Challenges alongside boreholes construction (Igingilanyi)

- Failure to repair and replace batteries
- Economy of scale is jeopardized
- Inadequate of technical know how
- Low production
- Low ISF collection

**...This makes an investment of TZS 625,000,000 a waste...**



# Capacity and Conditions of Irrigation Schemes.....

## Condition of irrigation infrastructure

S/ N	Scheme	Potential Area (acre)	Irrigated Area after constructi on (acre)	Current irrigated area (acre)	Decline level (%)
1	Bahisokoni	3460	3000	950	68.33
2	Nyambeho	500	450	346	23.11
3	Butiama	1,650	750	30	96.00
4	Mbarika	107	40	40	0.00
5	Sawenge	700	345	294	14.78



# Capacity and Conditions of Irrigation Schemes.....

Lack of planning irrigation schemes alongside other allied activities

- ❖ Only two schemes have water points for other use
- ❖ No aquaculture integration
- ❖ There are no provisions in the National Irrigation Policy, 2013 and its Regulations that guide the integration of aquaculture in irrigation schemes



...aquaculture, tourism,  
recreation and  
hydroelectric  
production

# Utilization and Availability of Support Services...

## Land tenure systems and utilization

SN	Land tenure	Management of irrigation water	IOs' performance	Smallholders' participation	Commercial orientation	GAP practices	Production cycle extended
1	Scheme developed within farmers' land	Low	Low	High	Low	Low	No
2	Scheme developed in public land	Medium	Medium	High	Low	Low	No
3	Land and scheme owned and operated by a private company	High	Not applicable	Low	High	High	Yes
4	Scheme in land owned or managed by cooperative	High	Medium	High	High	High	Yes

# Utilization and Availability of Support Services...

## Support services in irrigation schemes

	Research and extension	Input Supply	Producers	Collectors and Stockists	Processors	Traders	Retailers	Consumers
Characteristics	Develop improved crop varieties/seeds. Testing/developing new technologies. Developing environmentally-friendly and good production practices for farmers.	Agro-dealers in rural areas face less competition. There are limited choices of inputs. Higher prices due to no competition.	Mainly smallholder farmers. Farm in small and fragmented plots. Cultivate multiple crops. Low literacy levels. Use rudimentary farm equipment.	Aggregators, some owning private storage facilities. Collect produce at farm-gates Extend credit for producers.	Mainly rice and maize millers. Mostly process 5 to 20 tons a day. Operate for about 5 months per year.	Mostly small to medium size traders, and exporters. Buy in large quantities mostly in harvest period. Have networks of stockist/processors.	Final link dealing directly with consumers. Purchases in bulk from traders and processors and retail to consumers.	Rural and urban low income population. Consumption by urban medium and high income consumers. Export market.
Gaps	Limited research on and production of improved seeds. Limited linkages between research and extension. Growing impact of weather variability and climate change.	Not adequately available at village level. High prices of inputs. Limited linkages between suppliers and farmers. Limited capital.	Aging farmers. Inadequate irrigation water. Low productivity. Limited marketing and commercial skills. Limited adoption of improved seeds. Weak IOs.	Poor or limited contractual agreement with farmers.	Limited supply due to low productivity. Poor milling quality and packaging. Power cut. Poor grading.	High transportation costs Multiplicity of levies.	Limited grading and packaging techniques.	Increasing food prices.
Opportunities	Increased government funding in research and extension services. Increasing supply of improved seeds. Availability of mobile phone and web-based agricultural extension platforms.	Improvement in road infrastructure. Access to credit Expansion of agro-dealers in rural areas. Extension services to sensitize farmers to use inputs.	Interest of youth to engage in agriculture. Block farming. Access to extension services. Availability of improved technologies Access to storage facilities for collective marketing. Cooperative societies.	Increasing demand for storage facilities.	Availability of new and quality processing technologies.	Improvement in road infrastructure. Access to credit.	Availability of services providers.	Increasing demand for locally produced and healthy foods.
<b>Institutional Actors:</b> National Irrigation Commission (NIRC), President's Office – Regional Administration and Local Government (PO-RALG), Tanzania Cooperative Development Commission (TCDC), Water Basins Authorities, Agricultural Research Centres/Institutes, Academic Institutions, Farmers' Associations, Financial Institutions, etc.								

# Utilization and Availability of Support Services...

## Irrigation value chain integration

- ❖ Stronger IOs effective to develop irrigation value chain integration
- ❖ O&M
- ❖ Ability to coordinate availability of inputs; even fertilizer importation
- ❖ Hiring tractors
- ❖ Coordinating fertigation, pest and weed control (all farmers act on the same day)
- ❖ Harvest and storage
- ❖ Collective marketing

**Storage added value from TZS 75,000 to TZS 120,000 bag of 100kg of onions**



Storage facility horticulture at Igomelo IO in Mbeya



## Utilization and Availability of Support Services...

### Implications of irrigation schemes to poverty reduction

Sn	Scheme	Irrigated crops	Cycles	Before	After
1	Dakawa	Paddy	1	1.84	2.24
2	Bahi	Paddy	1	0.6	0.6
3	Igomelo	Paddy	Yearly	1.2	2
		Maize		8	10.4
		Horticulture		1	1.4
4	Madibira	Paddy	1	1.7	2.4
5	Ndungu	Paddy	2	1.8	2.7
6	Mahande	Beans	Yearly	2.3	3.3
7	Lemkuna	Paddy	>2	1.5	2.6
		Maize		1.7	1.9
		Onions		2	2.88

- ✓ Irrigation can improve land productivity by 333%
- ✓ High multiplier effect

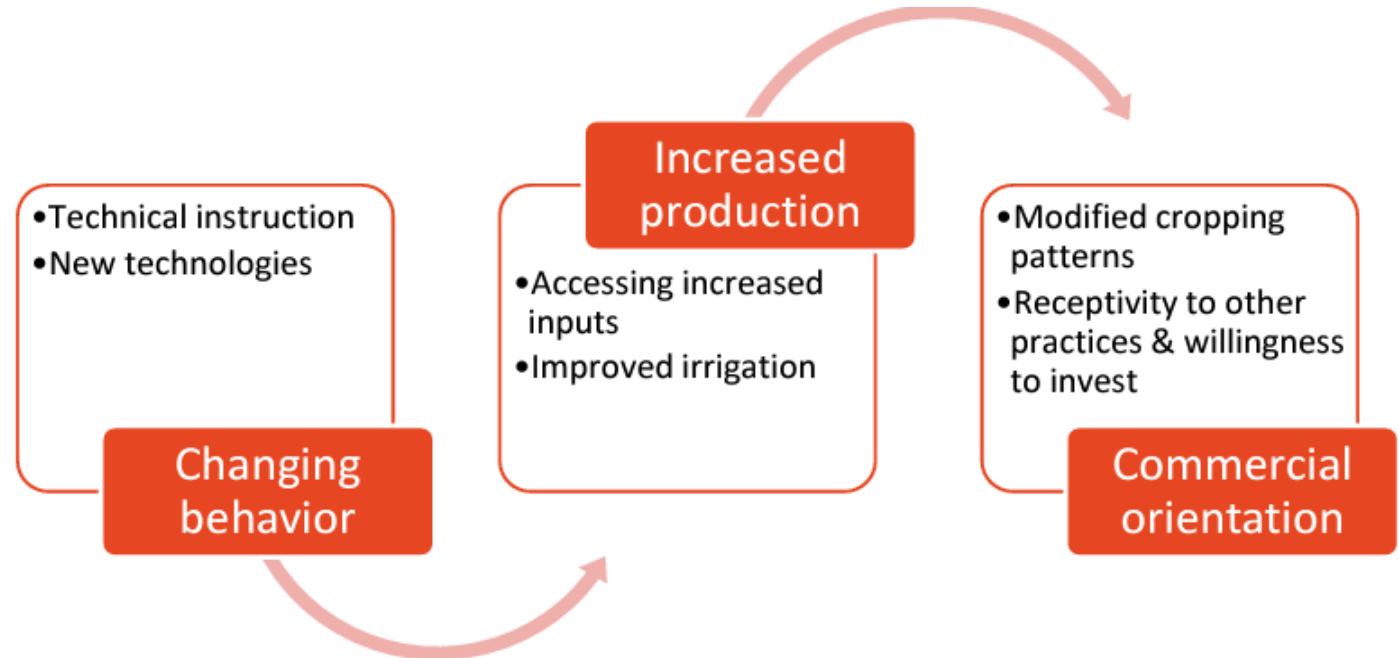


# Sustainability of Irrigation Schemes

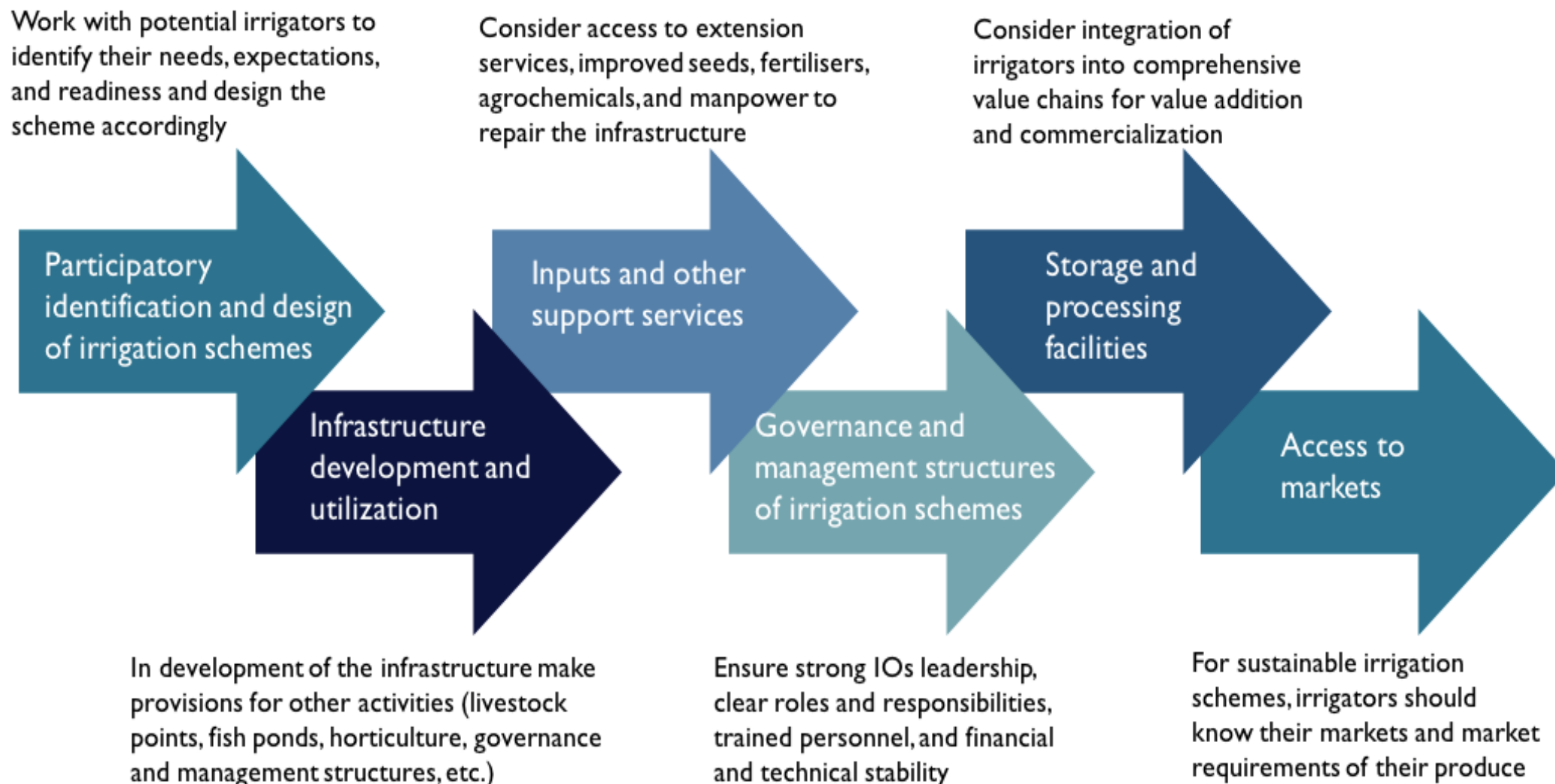
## Sustainability Aspects

- Design and Technical
- Participation and Ownership
- Governance and Management
- Financial

## Enhancement of Commercialization



# Suggested Model for Sustainable Irrigation Scheme



# Conclusion and Recommendations

## Conclusion

- ▶ There is a significant difference between what is allocated and what is being disbursed
- ▶ Low contribution of LGAs to irrigation scheme maintenance
- ▶ Private sector involvement in financing irrigation schemes remains limited
- ▶ There is overlap of institutional and unclear coordination between NIRC, TCDC and LGA
- ▶ There is low IOs registration, and poor collection of ISF
- ▶ Some old schemes remained uncompleted, no more budget is set for completion while budget is being set to construct new schemes
- ▶ Water run-off is the major and important water source for enhancing full capacity of the irrigation investment
- ▶ Limited integration of irrigation schemes with other economic activities
- ▶ Schemes developed, owned or managed by cooperatives and by private companies are highly effective and efficient
- ▶ Irrigation can triple land productivity with higher multiplier effect, if utilized efficiently
- ▶ Majority of irrigation schemes lack sustainability aspects

## Recommendations

- ▶ The government should comply to the guideline of undertaking feasibility, socio-economic viability and disburse funds according to the planned budget
- ▶ LGAs should support irrigation development from own-source funds
- ▶ NIRC has to develop PPP strategy that will enhance development of various PPP models
- ▶ Harmonizing coordination (NIRC, LGAs, TCDC, and water basins authorities)
- ▶ Strengthening the management capacity of irrigators' organizations for enhancing ISF collection and O&M
- ▶ Prioritizing finalization of uncompleted irrigation schemes before embarking on new projects
- ▶ Water runoff should be considered as the prime water source for irrigation. Investing in boreholes should be taken with a precaution as it needs further studies/ analysis.
- ▶ Strengthen the functionality of the agricultural value chain and integrate with other economic activities
- ▶ Irrigation infrastructure development should be undertaken on government owned land
- ▶ Sustainability of irrigation scheme requires adherence to good design and technical knowhow, beneficiaries participation and ownership, good governance and management of IOs, as well as proper financial management

***Kupanga ni .....***

***.....Kuchagua***

**....To Plan is to Choose....**

Emphasizes the idea that planning inherently involves making choices and prioritizing certain options over others

***...His excellence, Father of the Nation, Mwl.  
Julius Kambarage Nyerere***

**Asanteni  
kwa  
Kutusikiliza**

