The Irrigation Operator of the Future: A Toolkit

Information Pack for Irrigation Service Delivery Performance Assessment and Planning

WORLD BANK GROUP

GWSP
GLOBAL WATER SECURITY & SANITATION PARTNERSHIP

About the Water Global Practice

Launched in 2014, the World Bank Group's Water Global Practice brings together financing, knowledge, and implementation in one platform. By combining the Bank's global knowledge with country investments, this model generates more firepower for transformational solutions to help countries grow sustainably.

Please visit us at www.worldbank.org/water or follow us on Twitter: @WorldBankWater.

About GWSP

This publication received the support of the Global Water Security & Sanitation Partnership (GWSP). GWSP is a multi-donor trust fund administered by the World Bank's Water Global Practice and supported by Australia's Department of Foreign Affairs and Trade, Austria's Federal Ministry of Finance, the Bill & Melinda Gates Foundation, Denmark's Ministry of Foreign Affairs, the Netherlands' Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency, Switzerland's State Secretariat for Economic Affairs, the Swiss Agency for Development and Cooperation, and the U.S. Agency for International Development.

Please visit us at www.worldbank.org/gwsp or follow us on Twitter: @TheGwsp.

Click to download the **full toolkit folder**

1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000; Internet: www.worldbank.org

Please cite the work as follows: Waalewijn, Pieter, Francois Onimus, IJsbrand de Jong, Remi Trier, Jonathan Denison, Florence Deram Malerbe, Philippe Saura, Etienne Dressayre, Eeman Amjad, and Svetlana Valieva. 2022. *The Irrigation Operator of the Future: A Toolkit; Information Pack for Irrigation Service Delivery Performance Assessment and Planning*. World Bank, Washington, DC.

Cover photo: Tom Fisk / Pexels

The Irrigation Operator of the Future: A Toolkit

Information pack for irrigation service delivery performance assessment and planning

WORLD BANK GROUP

Contents

Preface

A new paradigm for irrigation scheme management

– ***Pieter Waalewijn*** *(outgoing Global Lead, WiA GSG)*

A changed view of irrigation management is fast evolving, one that is geared to customer service delivery rather than water control, and with a clear pathway to achieving higher performance into the future. Irrigation operators globally face a tough reality with perpetual demands for higher performance alongside water competition, limited finances, and declining infrastructure condition. Climate change is not only impacting water resource uncertainty but triggering shifts in agricultural demands and regulations. Operators must adjust to these new realities and the needed evolution is captured in the idea of an 'irrigation operator of the future' – an operator who provides quality and efficient services in a tough and fast-changing world. Irrigation operators of the future will have to use best-fit practices while being innovative, inclusive, and market and customer oriented. They will have to be able to respond quickly to water-users' different needs and to external changes.

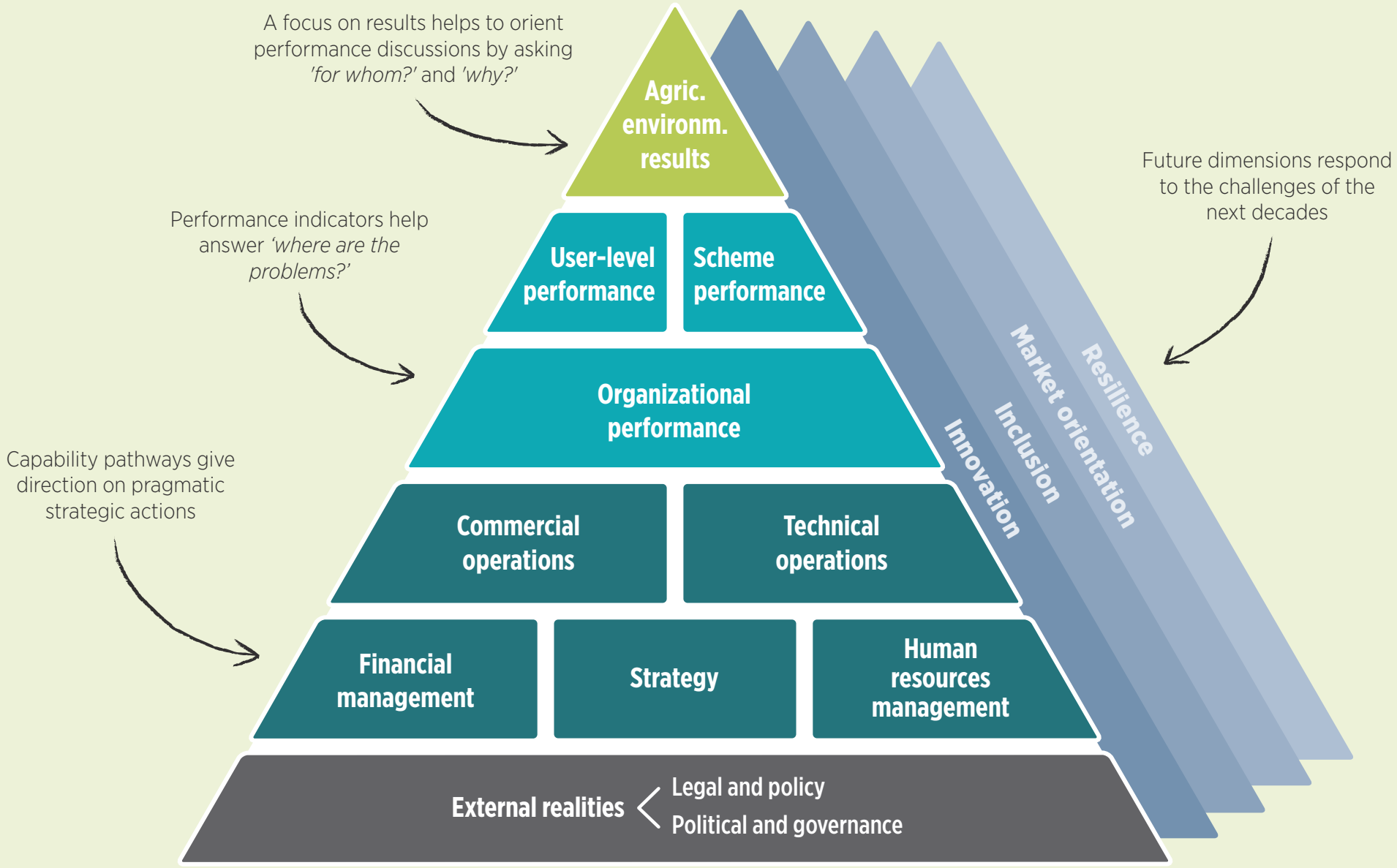
We have designed the Irrigation Operator of the Future (iOF) Toolkit with our partners in AFEID to support such aspirant operators of the future to assess their performance, prioritize problems by using problem-driven approaches, and then plan strategically and act decisively to meet the dynamic challenges ahead. The approach is based on the World Bank's Water Services Utilities of the Future program and the Governance in Irrigation and Drainage resource book. The iOF Toolkit includes a wealth of operational material to inform and inspire operators and describes a facilitated process of engagement from initial performance assessment through to formulation of a 5-year investment plan. We hope that use of the iOF Toolkit will trigger transformation that goes beyond mere 'improvement' and help to bring a new service-oriented operational paradigm for irrigation and drainage (I&D) schemes into working reality.

Refinement of the toolkit through operational engagement

– ***Amal Talbi*** *(incoming Global Lead, WiA GSG)*

The iOF team has field-tested part of the iOF Toolkit with irrigation operators in Albania, Tajikistan, and Georgia to support their assessment of performance problems. The second phase of development, in FY22–23, will engage many more operators with the full iOF process, on multiple continents and in diverse irrigation schemes. We will also be working with INSPIRE (the International Network of Service Providers for Irrigation Excellence), to ensure that the next version of the toolkit benefits from the ongoing knowledge exchange among managers of irrigation and drainage (I&D) systems.

As more countries and operators become engaged in the iOF program, we will draw on their insights and capture operational innovations. The toolkit will be refined and updated frequently so we can continue to support operators to chart their own way to service-delivery excellence.



The iOF framework pyramid and how it helps operational transformation

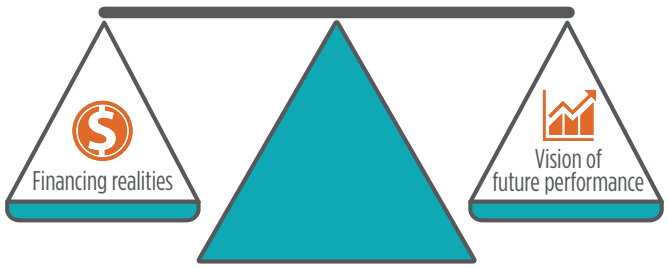
1 Need for the iOF toolkit

Fast-changing realities

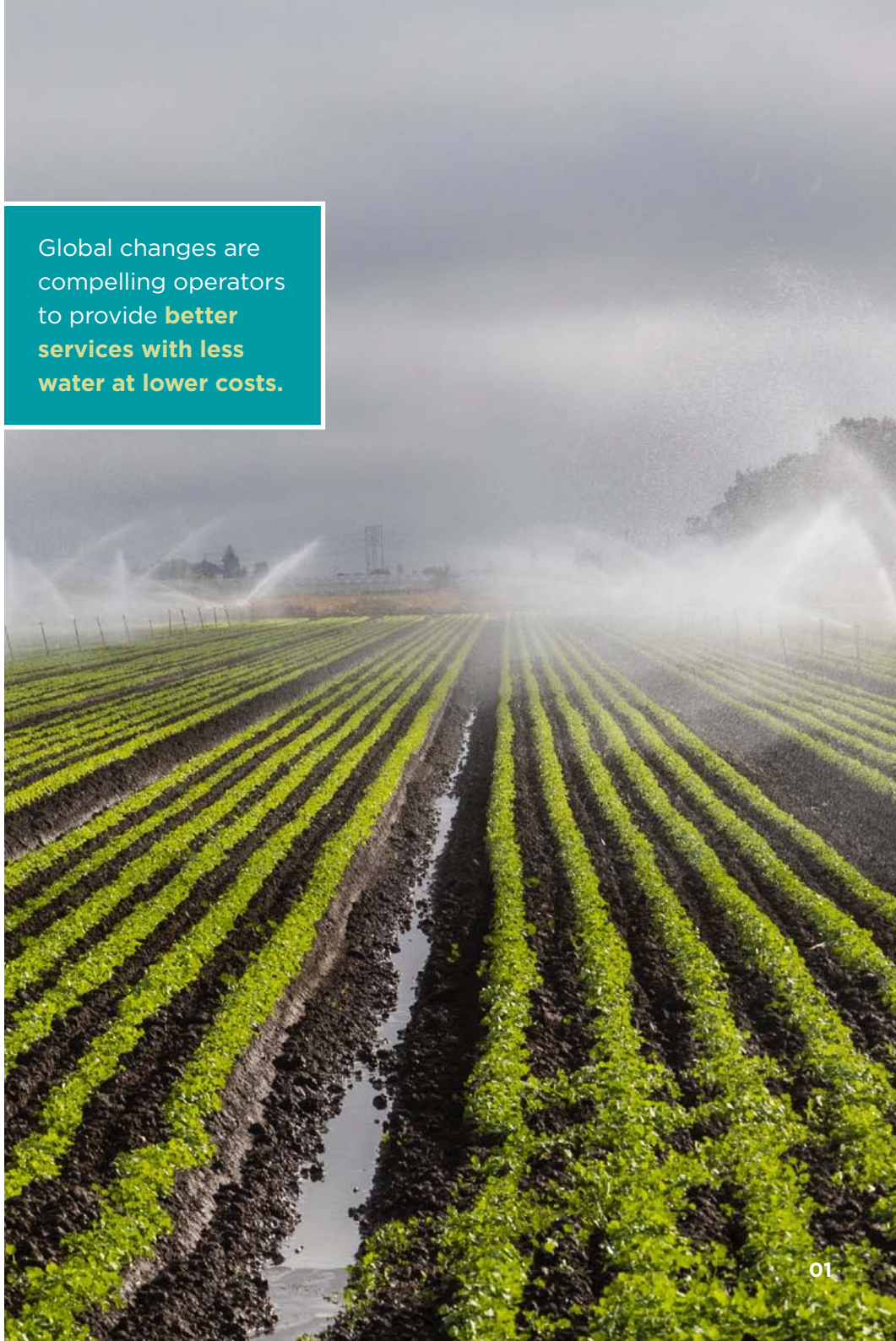
Irrigation operators everywhere are under pressure to perform better. There is demand for more – and more reliable – water alongside greater resource scarcity and uncertainty. Infrastructure investment is increasingly constrained by dwindling government financial support and, in many cases, farmer willingness or ability to pay. New environmental, climate, and social priorities have shifted the policy and regulatory environment. These realities bear heavily on operators and call for quick and innovative solutions to solve their problems. Defining realistic strategies based on operator capability and resources remains a major challenge.

Where to invest time and resources and why

Operators intent on taking a more decisive role in future irrigation water supply must first understand their performance status and identify the core problems that explain performance shortfalls. They can then define their priorities for action that must find *a balance between investment that is likely to be available in the future, and the operators' vision of their role and performance targets*. The iOF aims to support operators to find that balance and to plan a realistic pathway for change.



Global changes are compelling operators to provide **better services with less water at lower costs.**



2 The iOF in brief

A toolkit and a process

The Irrigation Operator of the Future (iOF) Toolkit has been compiled to support operators to identify priority problems and define pragmatic responses to deal with them. It is both a repository of operational information and a facilitated process of engagement. Performance self-assessment is first used to gain insight into core problems, then followed by a strategic planning process to resolve key problems. A future vision is formed with the help of inspirational options for change, leading to short- and long-term action plans.

Main iOF outputs

- rapid performance assessment – ongoing
- strategic capability
- a 100-day action plan
- a 5-year investment plan.

The whole operating eco-system

The facilitated iOF approach encompasses the whole operational ecosystem – policy, governance, technical, and financial – to inform better practices and performance outcomes. The process can be rapid, using qualitative methods and flash discussions, or comprehensive, using remote-sensing, field data and deep dive sessions. The flexibility and scope of the iOF makes it different from other useful performance frameworks developed in the last 20 years that lean more towards hydraulic performance with an infrastructure emphasis.

The iOF approach relies more on the **operator's knowledge and experiences** than on outside experts.

The iOF toolkit comprises the following main elements:

Click to download the **full toolkit**

- A guide to the iOF facilitated problem-centered approach
- Characterization of the operator's context, role and functions
- A suite of 18 performance indicators to select from as needed
- Performance data entry portal with graphical outputs
- Capability and progression pathways for visioning and strategic planning
- A framework for facilitated action planning

Figure 1
The iOF user's guide and Excel spreadsheet

Ind. No.	Indicator Name	Description	High-level	Measurement	
A	Service delivery performance (user / farm level)			Remote sensing	Primary data (quant. or qual.)
1	Adequacy irrigation	**Seasonal volume:** Amount of water supplied by the operator in relation to the farmers' demand (or allocation if not demand-based)	y	Relative Et = Seasonal Eta / Seasonal Etp	ratio = supplied volume for the season (cu.m) / expected volume (cu.m)
		Peak flow: The rate of supply during the peak period is adequate to irrigate the whole field			ratio = supplied flow rate in peak week (cu.m/s) / expected flow rate (cu.m/s)
		Pressure: The pressure (pipeline) or level difference (canal) is sufficient for the farmer to irrigate his/her preferred system			ratio = actual pressure (m) / desired pressure (m)
		Drainage: Excess water in the fields does not hinder production			ratio = 1 – (no. of days x area that is flooded / (total days in season x total irrigated area)
B	Scheme performance (perimeter level)			Remote sensing	Primary data (quant. or qual.)
4	Equity	**Performance data variance option:** Combined set of data on spatial *variance* of adequacy and reliability, applied to relevant blocks/units/WUA boundaries	y	Water Consumption Uniformity (WCU), coefficient of variation of Eta over the season	1 - [Highest Std Dev. of either adequacy or reliability / mean]

1 Context | 2 Role | 3 Infra. diag | 4 Indicators | 5 Indicator data | 6 CAP.Commercial | 7 CAP.Technical | 8 CAP.Strategy | 9 CAP.Financial | 10 CAP.HRM | 11 CAP.External

Context and problem diagnostic

Performance indicators

'Capability' tabs with 117 topics and progress pathways

3 Who is the operator?

The iOF is used to support operators who are responsible for medium- and large-scale irrigation schemes in developing countries. They include both government and private sector entities. More specifically, the iOF would be useful to operators characterized as follows:

a. **They employ professional staff,** including technical, administrative and management personnel. They are usually larger than 1,000 hectares, typically tens or hundreds of thousands of hectares in size. Farmer-run schemes operated largely by farmer volunteers (such as Irrigation Organizations or Water User Associations) are not the expected target users. Where devolution through irrigation management transfer has taken place, often at secondary or tertiary unit level, these organizations would participate as water-user representatives in the iOF process.

b. **They manage irrigation, drainage and multiple use systems (MUS).** Customers include irrigation farmers, water-user associations, corporate agribusiness entities, urban or rural domestic water supply providers, and fish-farmers.

c. **They deal with a wide range of technologies in their operations,** including dams, groundwater installations, pump stations, pipelines, and canal transmission, distribution and control systems of many types.

4 The iOF scope of operator roles

Irrigation operators have many different roles and responsibilities, depending on country and context. Functions that are included and excluded in the iOF scope are listed in Table 1. The functions that are excluded are considered to be peripheral ones. While important in some contexts, these are less commonly found, and are not covered in this first version of the toolkit.

Table 1

Operator functions and responsibilities in relation to the iOF Toolkit

Functions	Detail		
Irrigation and drainage service	Operation	Withdrawal and conveyance	INCLUDED IN iOF
		Delivery	
		Drainage	
	Maintenance	Withdrawal and transport	
		Delivery	
		Drainage	
	Financial management		
	Commercial		
	Human resources		
Assets and projects ownership	Extensions / rehabilitation / modernization projects		
	Engineering		
	Works		
	Asset management		
Environmental management	Water resources		
	Water discharge		
	Soils, biodiversity		
Peripheral functions	Water supply and sanitation services		NOT INCLUDED IN iOF
	Land management		
	WUA support	Technical	
		Administrative	
		Organization	
	Farmers' water management support		
	Agricultural development		
	Value chain development		
	Credit		

5 The iOF framework

The main elements of the iOF framework are depicted in a pyramid with the external environment at the base and the ultimate outcomes at the peak. The framework was informed by the World Bank's Utilities of the Future Toolkit (UoF) (Cordoba et al. 2022) for the water services sector, and the World Bank's Governance in Irrigation and Drainage resource book (Waalewijn et al. 2020). The connected levels are:

External environment (base layer): this is the set of external realities that describe the enabling (or disabling) environment in which the operator functions. Understanding the external environment can be important in identifying the root causes of problems. The operator has some influence here, if not control.

Organizational activity and infrastructure (middle five areas): includes the operator's internal, commercial, technical, financial management, human resources management, and strategic activities. The operator has direct control in this domain. Organizational performance (i.e., backward looking) is measured with a set of indicators. The organization's functional status, and indicative tactics that they can adopt to achieve their aspirations for improved performance (i.e., forward looking), are assessed with a set of 'capability matrices'. The fundamental premise is that increased capability results in better outcomes.

Irrigation services performance (top): cuts across three sets of outcomes within the boundary of the scheme (i.e., organizational performance, user-level performance, and scheme-level performance) as well as beyond the scheme boundary, in the agricultural/environmental results. The last group *is not controlled by the operator* but service-delivery performance is a key influence on these outcomes. The performance in these categories is measured with a set of iOF indicators.

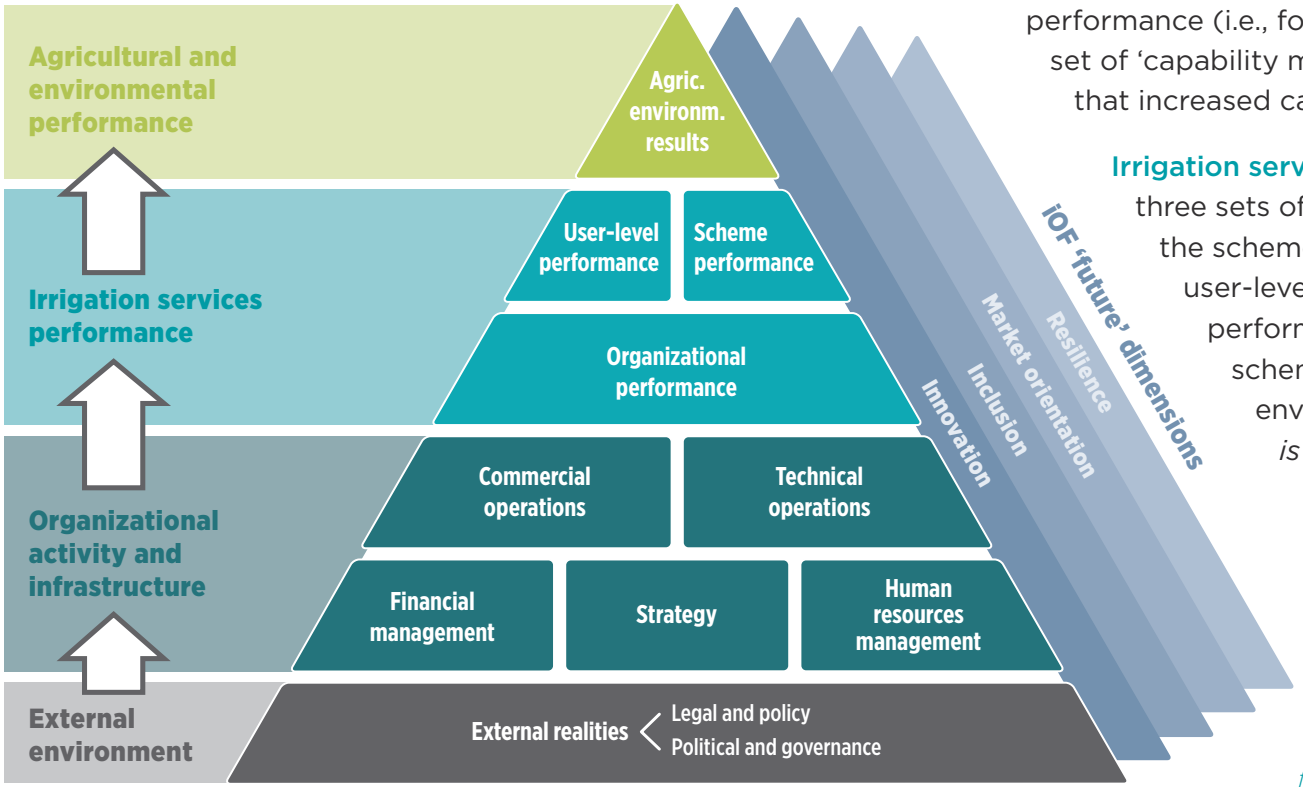


Figure 2 iOF framework pyramid and future dimensions

Future dimensions (in grey) can be visualized as layers of a third dimension that cuts across and applies to everything on the face of the pyramid. These are mainly used in relation to the operator's vision of the future. They extend beyond quantifiable service delivery aspects and include less easily measured qualitative expectations from forward-looking irrigation operators.

iOF future dimensions

- **Innovation** – ability to introduce novel methods.
- **Inclusion** – ability to improve the opportunity, dignity and ability of people who have been disadvantaged due to their identity, to take part in society.
- **Market orientation** – operator's capacity to operate like an enterprise in a competitive market.
- **Resilience** – operator's capacity to prepare for disruptions, recover from shocks and stresses, and adapt to and grow from a disruptive experience.

6 The iOF toolkit spreadsheet arrangement

The iOF framework pyramid is linked to the Excel spreadsheet section of the toolkit (Figure 3). The **performance indicators** (at the top of the pyramid) are detailed in a descriptive Excel tab, with a data-entry tab to generate graphs on performance.

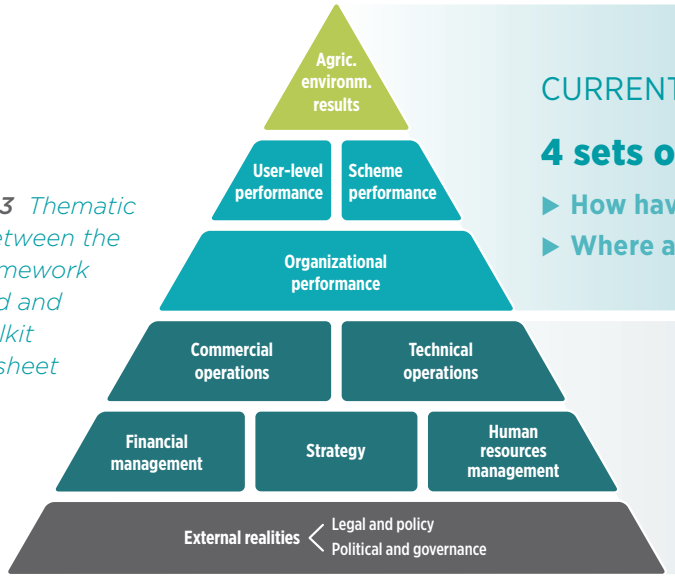
The five **organizational functions** and the **external environment** (bottom of the pyramid) are reflected in six capability tabs that relate to aspirations and tactics to improve service delivery outcomes. The order of the tabs follows the iOF engagement process sequentially – as discussed later.

A	B	C	D	E	F
Ind. No.	**Indicator Name**	**Description**	**High-level**	**Measurement**	
A	**Service delivery performance (user / farm level)**			**Remote sensing**	**Primary data (quant. or qual.)**
1	**Adequacy irrigation**	**Seasonal volume:** Amount of water supplied by the operator in relation to the farmers' demand (or allocation if not demand-based)	y	Relative Et = Seasonal Eta / Seasonal Etp	ratio = supplied volume for the season (cu.m) / expected volume (cu.m)
		Peak flow: The rate of supply during the peak period is adequate to irrigate the whole field			ratio = supplied flow rate in peak week (cu.m/s) / expected flow rate (cu.m/s)
		Pressure: The pressure (pipeline) or level difference (canal) is sufficient for the farmer to irrigate his/her preferred system			ratio = actual pressure (m) / desired pressure (m)
		Drainage: Excess water in the fields does not hinder production			ratio = 1 – (no. of days x area that is flooded / (total days in season x total irrigated area)
B	**Scheme performance (perimeter level)**			**Remote sensing**	**Primary data (quant. or qual.)**
4	**Equity**	**Performance data variance option:** Combined set of data on spatial *variance* of adequacy and reliability, applied to relevant blocks/units/WUA boundaries	y	Water Consumption Uniformity (WCU), coefficient of variation of Eta over the season	1 - [Highest Std Dev. of either adequacy or reliability / mean]

1 Context | 2 Role | 3 Infra. diag. | 4 Indicators | 5 Indicator data | 6 CAP.Commercial | 7 CAP.Technical | 8 CAP.Strategy | 9 CAP.Financial | 10 CAP.HRM | 11 CAP.External

Scheme context description and role

The first three context tabs in the spreadsheet are a semi-structured guide to collecting general information on the operator's situation



CURRENT STATE

4 sets of performance indicators

- ▶ How have we done?
- ▶ Where are the problems?

FUTURE STATE

6 sets of capability matrices

- ▶ What is our organizational status?
- ▶ What do we want to do in the future?

Figure 3 Thematic links between the iOF framework pyramid and the toolkit spreadsheet

7 The iOF indicators

Indicators are used to get a grip on performance. **In the iOF process, the indicators are intended to prompt critical reflection, debate, and self-diagnosis of problems – leading to solutions for the future.** This is different from technical benchmarking methods which are geared more to comparative assessment.

The iOF indicators aim for a time- and cost-efficient performance assessment process across the technical, organizational, and environmental ecosystem of a scheme.

18 iOF Indicators: There are 18 indicators that are used to measure performance. Descriptions, units and methods of measurement are detailed in the 'Indicator Tabs' of the iOF Excel toolkit. The indicators are grouped into four categories that align to the top of the iOF pyramid framework (Figure 4):

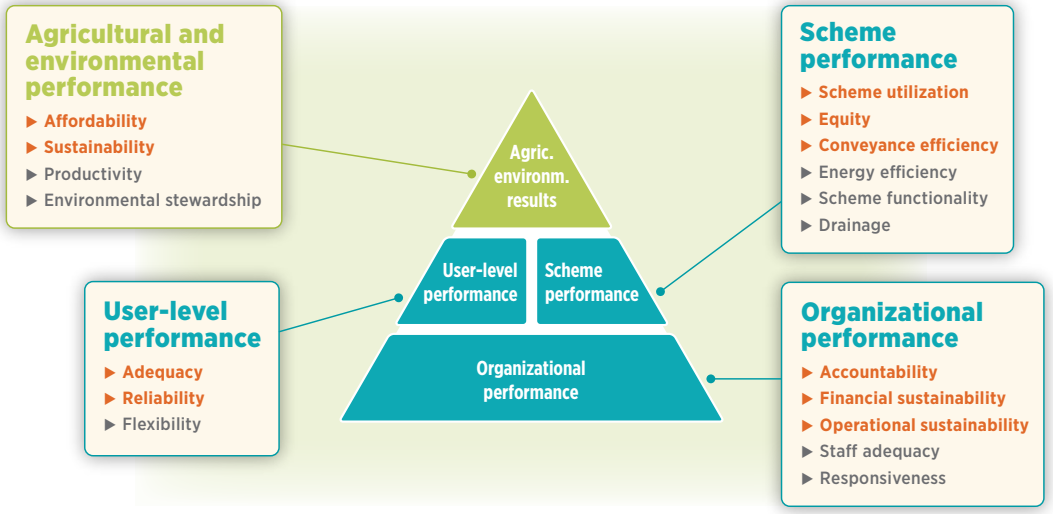


Figure 4 iOF Indicators in four performance groups (high-level in orange)

Organization scale **Organizational performance** relates to the operator's internal functions (i.e., technical, commercial, human resources, strategies, and financial management) with five indicators.

Farm scale **User-level service delivery** is the performance from the farmer's or water-user's perspective, with three indicators.

Scheme scale **Scheme performance**, with six indicators, includes those that are measured at the wider scheme perimeter, or perhaps block level, as opposed to the more localized farm or user scale.

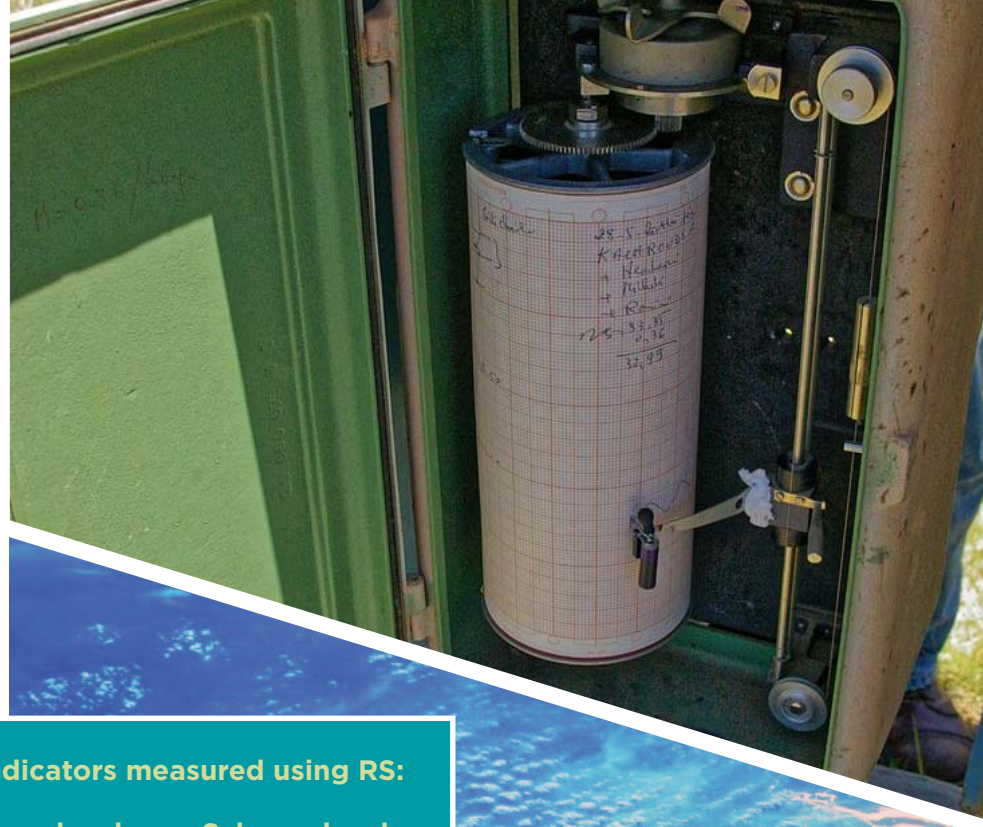
Wider scale **Agricultural and environmental outcomes** such as crop-production, water quality, and water resource status in the catchment are not under the control of the operator alone but are inevitably influenced by the operator's performance. The economic and environmental impact of a scheme is important to understand when planning for the future. This final group of outcomes is located at the top of the pyramid (i.e., the end of the results chain) and is measured with four indicators.

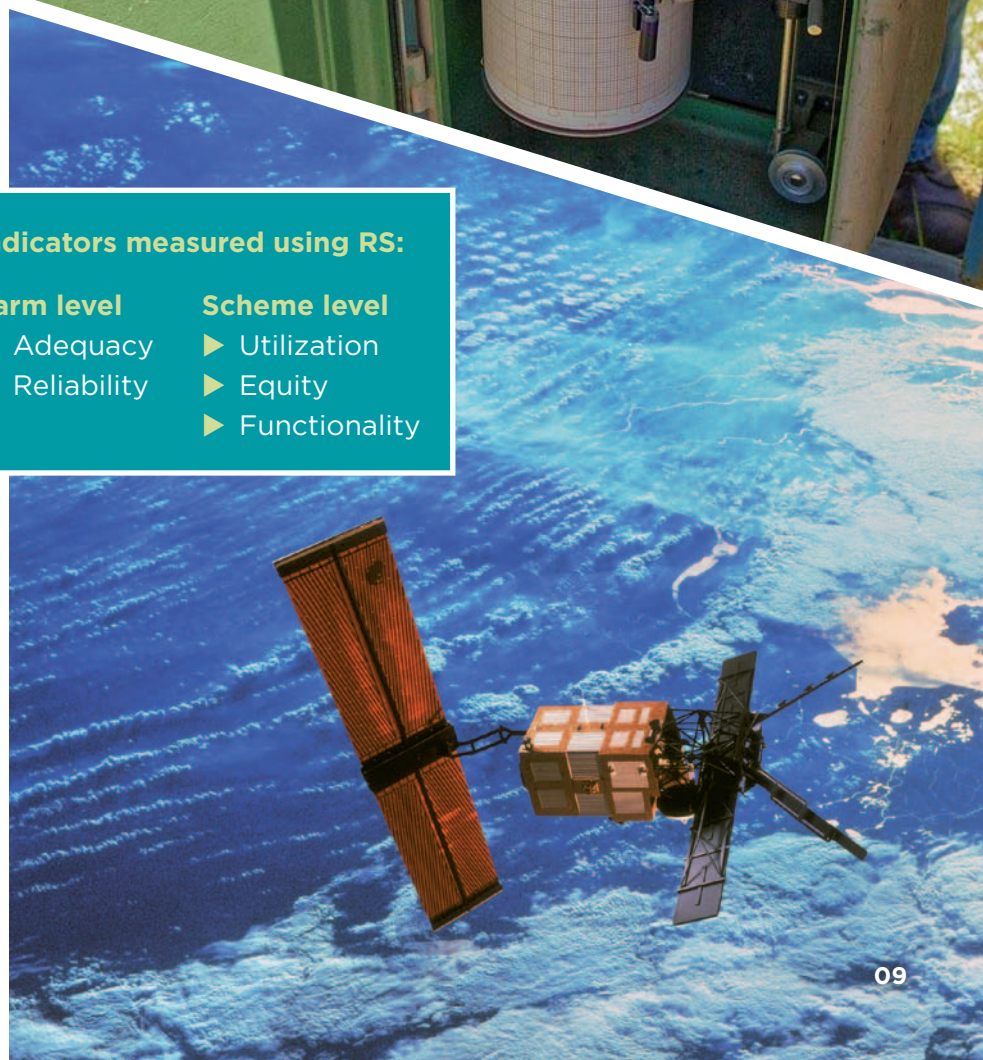
Ten priority indicators: Where data, or resources to collect data, are limited then **ten high-level indicators** can be prioritized. These should provide the minimum of information on the operator's performance across the whole eco-system, as needed for self-assessment and reflection on the underlying core problems.

8 Data for performance assessment

The use of indicators is primarily intended to prompt reflection and debate. While high-resolution reliable data is always best, the iOF perspective is that any data is better than no data. In the case of many of the indicators, qualitative ranking, or estimations, can be collected relatively easily. Does some inaccuracy make any difference to the conversations prompted by the results? In most situations probably not. The idea is that the operator's personnel will interrogate the findings, and on the basis of that discussion, find avenues of change to improve their performance.

- **Remote sensing:** A key data source for the iOF is remote sensing (RS). Out of 18 indicators, five can be measured using RS methods. An initial desktop RS assessment (i.e., without any field verification) can be easily generated and then used as a 'discussion starter' with the operator early in the iOF process. More detailed RS assessments can be made in subsequent stages of the iOF process, involving ground-truthing and supplementary data collection on the scheme. These more accurate results can contribute to the detailed discussions on performance problems and priorities.
- **Qualitative:** Where the indicator requires, or where time and money is short, the iOF indicator data entry tab enables qualitative assessments via interviews with operator staff, farmers, water users, and other stakeholders.
- **Quantitative:** Data can also be drawn from administrative and technical records, collected by the operator as an interim activity within the iOF facilitated process, or estimated by experienced personnel and informants.





Indicators measured using RS:

Farm level
- Adequacy
- Reliability

Scheme level
- Utilization
- Equity
- Functionality

9 Graphical outputs to inform operator reflections

A set of graphs and tables is generated as an output from the iOF spreadsheet (Figure 5). Graphs are simple and give input into the problem-identification and prioritization discussions of the **iOF facilitated process**. Graphical outputs can optionally include:

- Google Earth maps with RS overlays highlighting hotspots
- Likert-scale qualitative assessments (e.g., 5-stage scoring)
- Quantitative graphs in percentages for comparison and prioritization in relation to other indicators (e.g., efficiency, cropping intensity etc.)
- Comparative measures of *performance achieved* versus *operator intentions*.

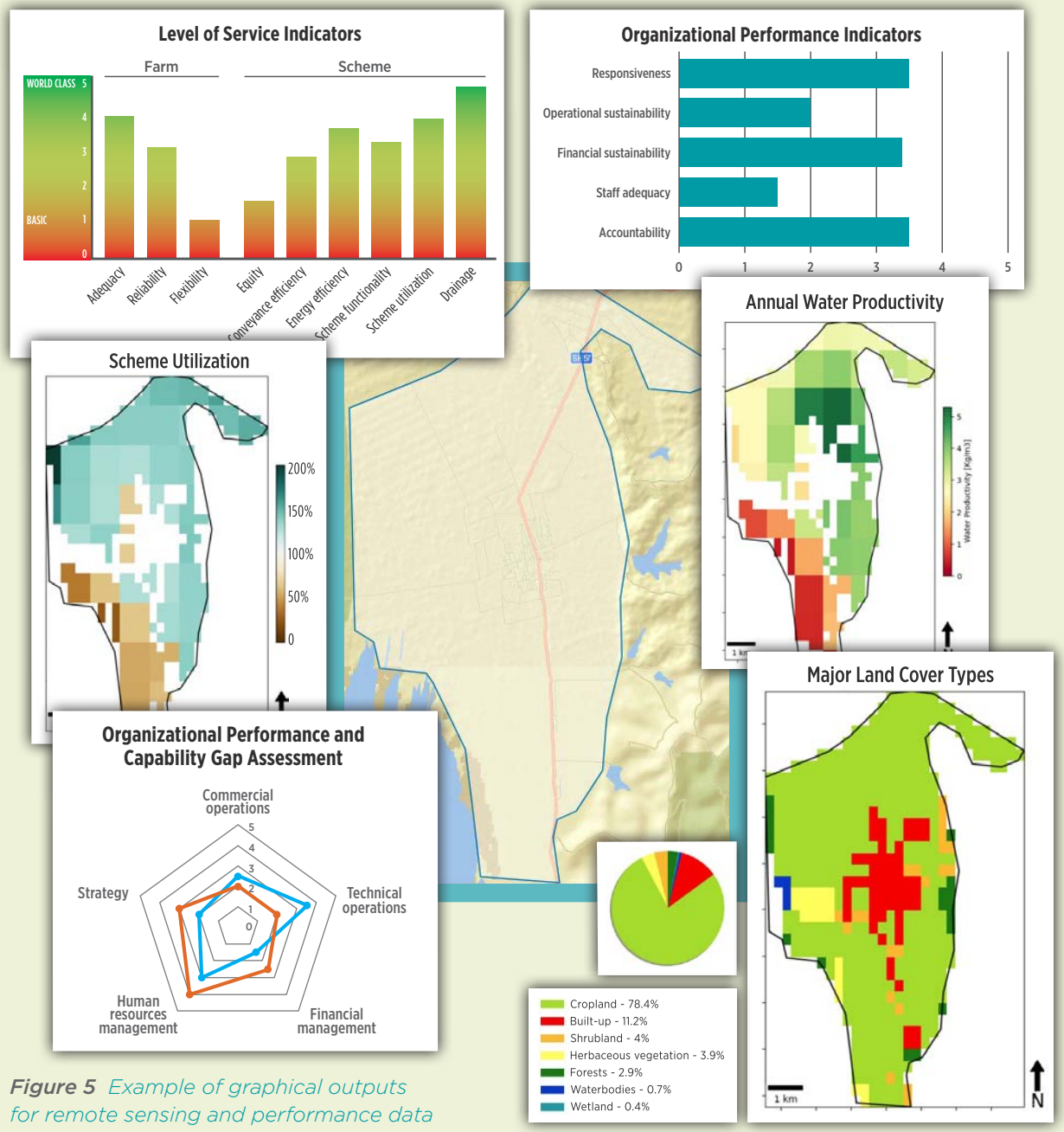


Figure 5 *Example of graphical outputs for remote sensing and performance data*

10 Increasing capability for better outcomes

Better performance is achieved through increased capability to deliver services. The concept of capability is illustrated in Figure 6 and comprises characteristics of *behavior*, *internal processes*, *abilities*, *tools*, and *influence*, thus encompassing both internal organizational characteristics and the external enabling environment (Kayaga et al. 2013, amended by the authors).

The toolkit spreadsheet includes 117 capability topics under six headings (Table 2) that correlate to the bottom half the iOF pyramid. Each topic contains a description of the characteristics of a possible capability improvement trajectory on a five-step scale comprising: developing, implementing, sustaining, advancing, and innovating levels. The set of 117 topics and the five-point capability progression for each, are termed the 'iOF capability matrices'. The scale is adapted from the Service Capability and Performance Model (SCPM) (Doss and Kamery 2006) and more information on each step is presented in Annex 2.

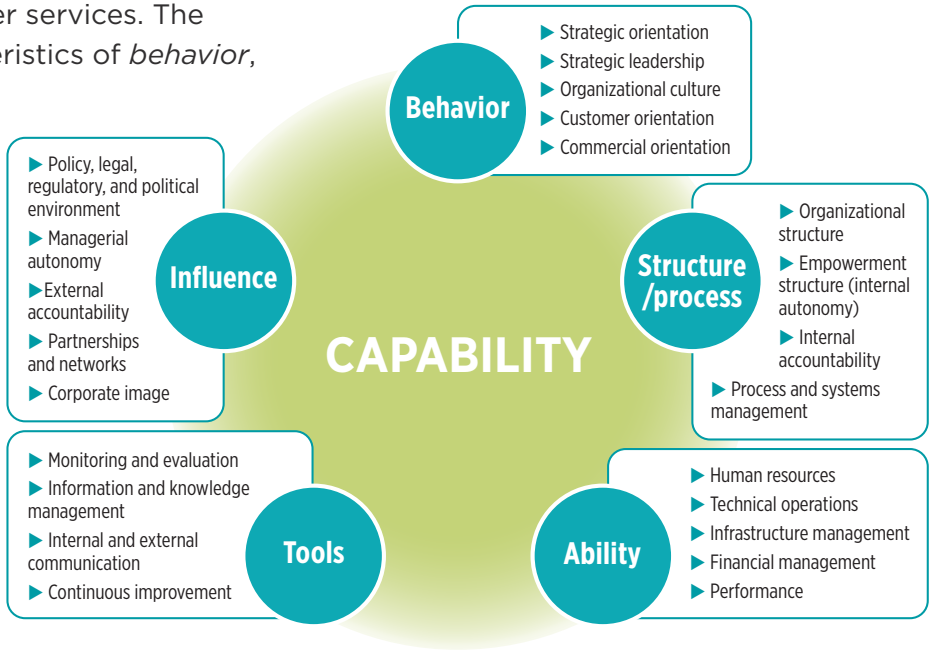


Figure 6 *Characteristics of institutional capability (adapted from Kayaga et al. 2013)*

Table 2
Six capability themes with 117 topics to support action planning for improved performance

Commercial operations	Technical operations	Strategy	Financial management	HR management	External
▶ Customer relationship ▶ Metering ▶ Billings ▶ Collections	▶ O&M procedures ▶ Irrig. perf. monitoring ▶ Water resource management ▶ Operations ▶ Maintenance and renovation ▶ Non-revenue water ▶ Hydraulic control	▶ Mission and Vision ▶ High-level strategy ▶ Asset management ▶ Commercial policy ▶ Business planning ▶ Organizational structure ▶ Processes	▶ Budgeting ▶ Cash flow ▶ Financial reporting ▶ Auditing and risk management ▶ Modeling and forecasting	▶ HR management ▶ Recruitment and promotion ▶ Compensation ▶ Performance management ▶ Well-being management	**Legal & policy** ▶ Service standards ▶ Tariff setting **Political & governance** ▶ Institutional setup ▶ Financing ▶ Autonomy / accountability

Capability topics that are relevant to the operator's priorities are selected during the facilitated iOF process based on their problems and interest areas for service delivery improvement. The information in the capability matrices is then used to prompt discussions on how the operator might strengthen its capability in order to enhance service delivery.

Two examples of the iOF capability topics are shown in Figure 7. The iOF facilitator and operator's staff would use the capability matrices to identify their existing status, and then identify the step, or steps, they want to take to increase their capability. That step up in capability to a desired FUTURE state translates to an action item that is included in the planning process that follows.

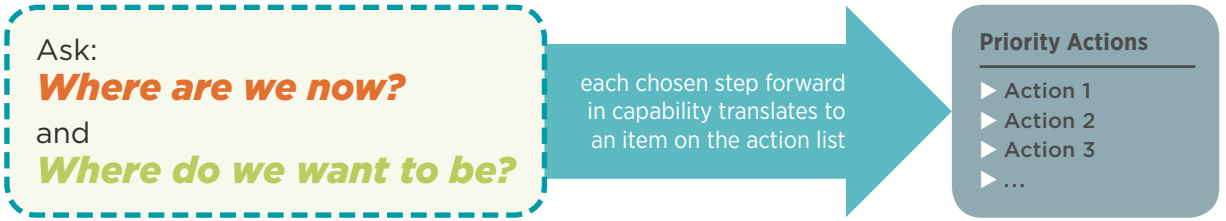
iOF Capability – Commercial Operations

Topic	Capability Levels (select one)					iOF Dimensions (select all that apply)			
	☐ Developing	☐ Implementing	☐ Sustaining	☐ Advancing	☐ Innovating	☐ Innovation	☐ Inclusion	☐ Market orientation	☐ Resilience
Customer satisfaction feedback	None.	Collected sporadically through satisfaction surveys.	Collected on at least an annual basis through satisfaction surveys.	Collected on at least an annual basis through a variety of channels (e.g. surveys, customer advisory groups) and used to assess performance and adjust approaches.	Collected on an ongoing basis through active engagement with customers on how to improve the customer experience.	Automatized collection through a variety of channels and regular analysis with action plans to address issues.	Uses collection of feedback to disaggregate customer preferences (quality, pressure, means of communication) by sub-groups.	Results of feedback publicly accessible. Feedback used to make management and operational decisions. Informs the public about how the feedback was acted.	

iOF Capability – Technical Operations

Topic	Capability Levels (select one)					iOF Dimensions (select all that apply)			
	☐ Developing	☐ Implementing	☐ Sustaining	☐ Advancing	☐ Innovating	☐ Innovation	☐ Inclusion	☐ Market orientation	☐ Resilience
Water allocation management and monitoring	Water allocations to users are not regulated.	Water allocations are regulated poorly.	Water allocations are well regulated and monitored.	Observed water resource levels are used to inform water users' allocations, which are set up rationally at the scheme level.	Same as 'Advancing' + water resource forecasts are used to inform operations strategy.	Strategic planning is prepared considering climate change.	Fragile clients are treated specifically.		Climate change vulnerability assessment is used to inform operations strategy.
Management of water shortage	Water resource at intake is not monitored. Water shortage is not managed.	Water resource levels are monitored but not used. Water shortage is managed on a short-time basis at local level only.	Water resource levels are monitored and used. Water shortage is managed at the scheme level.						

*Figure 7 Examples of capability progression for the topics of **customer satisfaction** (Commercial operations element of the operator's scope of activities) and **water resource management** (Technical operations element of the operator's scope of activities)*



11 The iOF process

The iOF process involves three main rounds of facilitated engagement with the operator that cover: i) problem identification and performance assessment, ii) visioning of actionable goals, and iii) options analysis and strategic plans. These are shown in Figure 8 and explained thereafter.

iOF facilitation techniques are described in Annex 3.

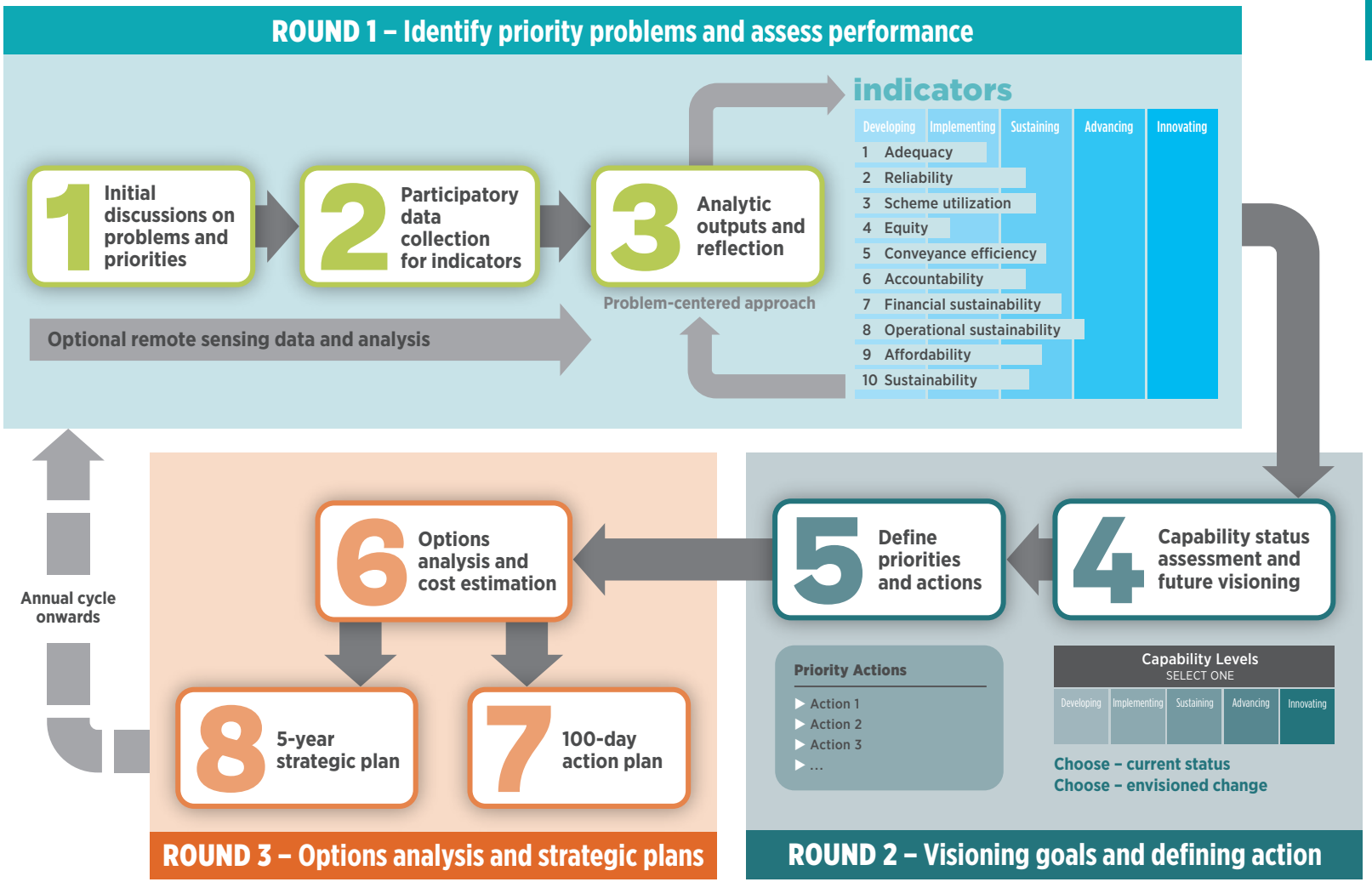


Figure 8
The iOF process

ROUND 1
Identify priority problems and assess performance

1 Initial discussions on problems and priorities

Get grounded: The facilitator must first orient him/herself and get familiar with the scheme context. The aim is to be prepared before talking with the operator staff. It is important to be seen as interested and informed – so do the groundwork before asking obvious, even irritating questions. Being informed early on will establish rapport from the start. Try drafting stakeholder maps, get a good understanding of the layout of the scheme, the history, and the broad organizational structure.

XLS Tab 1 – **Context**
XLS Tab 2 – **Role and function**
XLS Tab 3 – **Infrastructure condition**

The first three XLS Tabs in the toolkit aid the preliminary research and can be used as semi-structured guides in discussion. ***They do not need to be comprehensively covered – just use what is useful!***

Preparation would include:

- desktop work (review of reports, maps)
- setup of Google Earth KMZ files for later group work on problems
- remote-sensing water accounting assessments (desktop or plan for more detailed work)
- key informant interviews with staff and water users (remote calls or in person).

Initial mini-workshops with a cross-section of stakeholders: The facilitator would initially hold a series of short interviews and small group sessions with a range of stakeholder groups. These would include government authorities, different units of the operator (staff and management), water users, and sub-basin stakeholders. Workshops will also fill gaps in the desktop acquired context.

Enthusiasm and inclusion: The role of the facilitator is to work with the operator and other stakeholders and is key to achieving successful outcomes. The facilitator will help to identify stakeholders and support the problem-diagnostic process, setting priorities, working through capability assessments, and defining the subsequent action plans.

The views of participants, ranging across operator staff, authorities and management, and water users, will be divergent. The facilitator (or facilitation team) must have both the technical knowledge to support a meaningful problem diagnostic, and the personal awareness and communication skills to negotiate differences and help arrive at shared pathways for change.

Characteristics and competencies of a good facilitator, and some key techniques for problem-solving, are listed in Annex 3.

Outcomes from Step 1

- A long list of problems
- Selection of iOF indicators relevant to the problems (XLS Tab 4)
- An action plan for data collection (remote sensing, qualitative, quantitative)
- A working group including operator staff for indicator data collection and input

2 Participatory data collection for indicators

Data collection: Once indicators are defined in Step 1, a working group will collect performance data. The data will help in getting a grasp on performance across technical, financial and governance areas linked to the high-level problems.

The data-collection questionnaire and data-input sheet in the XLS Tab 5 (Indicator data) will aid data entry and the graphical output of results. The plan for data collection could include:

- documents that need to be collected.
- a list of stakeholders that need to be consulted for interviews.
- remote-sensing analysis requiring field-data collection and crop mapping.

Choose relevant indicators where data can be obtained

Not all of the iOF indicators will be relevant to the main problems and in some cases data will likely be sketchy. Pragmatism is important.

The aim of indicator measurement is to prompt discussion and reflection – so there is no need for over-exacting quantification.

Subsequent sessions can disagree with measured outcomes, and that discussion – around problems and possible solutions – is the main purpose of indicator measurement, not the metric itself.

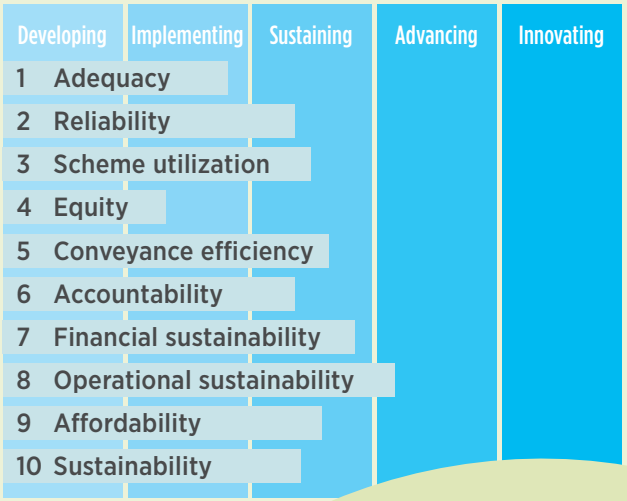
3 **Analytic outputs and reflection**

Performance and problems: The third step is to analyze results and produce graphical output of the performance indicators. This will help inform the critical task of problem definition. Sessions would use problem-based enquiry to dig deep into why performance differs from what is wanted. Facilitation techniques are critical here and should be used as needed (more detail in Annex 3 and the Governance in Irrigation and Drainange resource book):

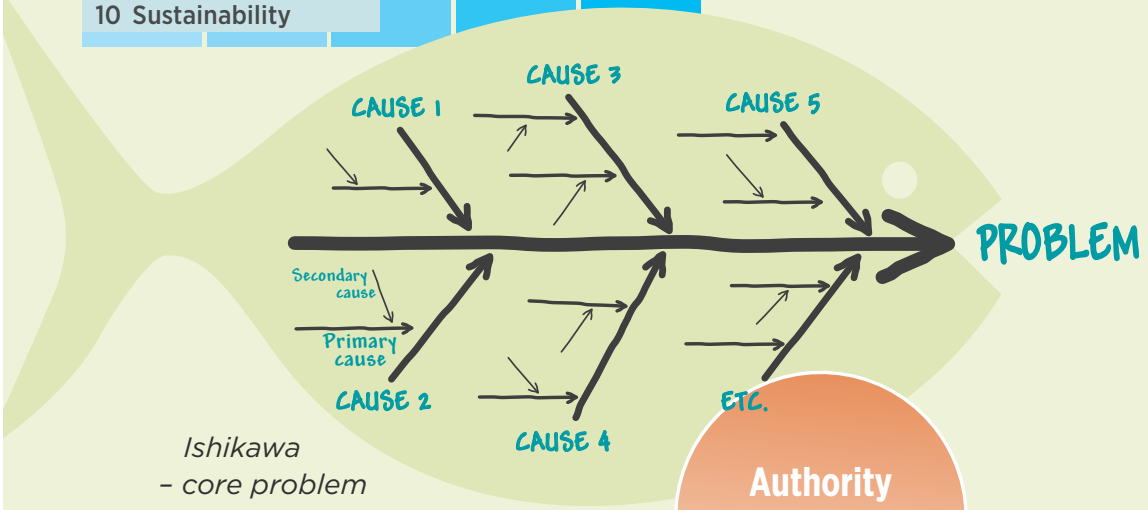
- Ishikawa 'fishbone', to dig down through five layers into the real underlying problem.
- The Triple A of *authority*, *acceptance*, *ability*, to understand where change can realistically be made.
- Prioritization mapping that considers impact versus time and effort.

Outcomes from Steps 2 and 3

- The core problems defined and prioritized
- A set of relevant indicators for ongoing performance tracking
- An assessment of the challenges in tackling the problems (AAA)



High-level performance indicators



Ishikawa – core problem

Triple A pragmatism

ROUND 2
Visioning goals and defining action

4 Capability status assessment and future visioning

Status and future vision of the operator: The fourth step moves from the prioritized problems to the progression 'topics' in the capability matrices. The capability topics help develop a future vision of what the operator must change in order to deal with problems. The facilitator will be able to guide the group to relevant topics in the XLS Tabs 6 to 11, based on the priority problems identified coming out of Round 1.

The operator's team would consider the topics, and where a step-up in capability is wanted, the actions and implications are explored. Pragmatism is key and can be assessed using Triple A (see Annex 3). In short, pragmatism is invoked by asking:

- is this supported by *authority*?
- is it *acceptable* to those involved?
- do we have the *ability* to get this done?

6 CAP.Commercial | 7 CAP.Technical | 8 CAP.Strategy | 9 CAP.Financial | 10 CAP.HRM | 11 CAP.External

FUTURE STATE

6 sets of capability matrices

- **What is our organizational status?**
- **What do we want to do in the future?**

Outcomes from Step 4

- Set of relevant topics that relate to problems
- Capability status now
- Goal for future capability
- List of actions

5 Define priorities and actions

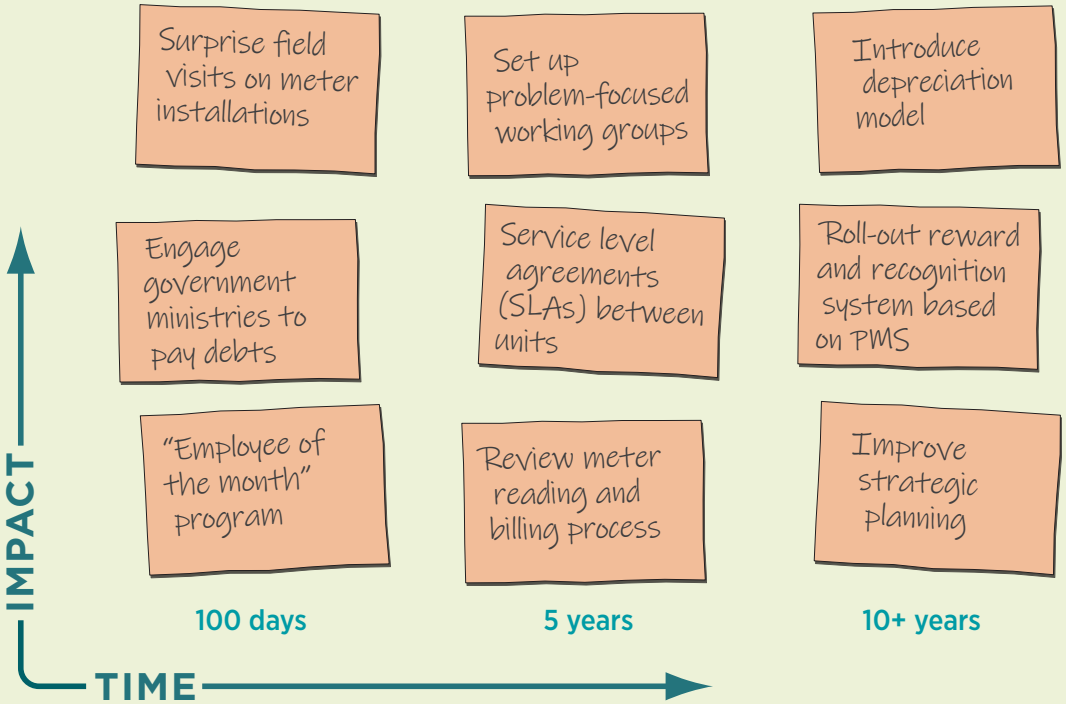
Action planning and prioritization: Each jump in maturity addresses a problem and translates to an action. List and prioritize the actions by their importance and identify what can be done in the short-term and what needs time, financing, and other resources to achieve.

The action prioritization process is done in semi-structured workshops with operator staff and other stakeholders as appropriate. A set of facilitation techniques to aid this includes those below, with more detail given in Annex 3:

- effort versus impact mapping
- effort versus timeline
- Triple A pragmatism (again).

Outcomes from Step 5

- Prioritized actions assessed pragmatically
- List of actions for rapid action (100-day)
- List of actions needing time and financing (5-year)



ROUND 3
Options analysis and strategic plans

6 Options analysis and cost estimation

Detailed assessment of actions and costs: Once the envisioned actions for change are prioritized, a more detailed activity sequence to achieve the outcomes, with cost estimates, needs to be developed. *Cost estimation feeds into decision-making on what activities go into the 100-day action plan, and what will need more resources, thus the 5-year plan.* Timelines are established for the activities, best done in the form of GANTT charts.

7 100-day action plan

The 100-day action plan is a consolidation of the short-term iOF planning work and includes those actions that can be achieved *using existing resources, including: personnel, financial, and the leveraging of political relationships, etc.* This rapid plan would include sets of activities with related timelines, and assign tasks to actors. Interim milestones to monitor progress and achievement, and clear reporting lines would be established.

8 5-year strategic plan

The 5-year strategic investment plan encompasses all the actions and investments needed to achieve the operator's vision for a new role and function in the future. The 100-day plan could include tasks that input to the 5-year plan. Achieving the 5-year goal would, in most cases, require resource mobilization, financial investment and, probably, changes in the external environment involving political, policy and governance spheres.

12 The iOF – Wrapping up

The iOF is about supporting an operator and other irrigation actors to envision a new role and develop practical actionable plans. The three rounds of the iOF process are a roadmap to achieving transformed service delivery.

The iOF uses performance measurement of selected indicators to trigger discussion and identify the real problems. It does not rely on accurate performance benchmarking, but rather gets to the real problems through facilitated techniques. Teams are then supported to map out responsive actions in short- and medium-term plans. The aim is always to ratchet up performance, but actions and intended outcomes are also checked to be widely acceptable to authority, and based on the operator's realistic ability to drive intended changes to completion.

The iOF process presents an opportunity to instill a reflexive approach for dealing with performance challenges. This can be prompted by including selected indicators (from early rounds) into ongoing monitoring in action plans, along with milestones for review and replanning, based on performance progress that has been achieved.

While the operator is the subject specialist and the focus of the iOF engagement process, the facilitation is key to success. The facilitator must (i) spark interest; (ii) ensure centrality of the operator's views; (iii) guide problem interrogations; (iv) shed light on possible pathways of change; (v) resolve and find ways through conflicting viewpoints; and (vi) forge common purpose – all translated into stepwise, practical plans. iOF facilitation techniques are described in Annex 3.

The facilitator is a guide in the iOF process. He/she must unlock the operator's experience, but also challenge perspectives and push boundaries to **reframe 'performance' and how to achieve it.**

We hope that the iOF guides meaningful engagement and leads to real success. Good luck!

13 References

Cordoba, L.C., G. Saltiel, and F. Perez Penalosa. 2022. *Utility of the Future, Taking Water and Sanitation Utilities Beyond the Next Level. A Methodology to Ignite Transformation in Water and Sanitation Utilities.* Washington, DC: World Bank.

Waalewijn, P., R. Trier, J. Denison, Y. Siddiqi, J. Vos, E. Amjad, and M. Schulte. 2020. *Governance in Irrigation and Drainage: Concepts, Cases, and Action-Oriented Approaches – A Practitioner's Resource.* Washington, DC: World Bank.

Kayaga, S., J. Mugabi, and W. Kingdom. 2013. 'Evaluating the institutional sustainability of an urban water utility: A conceptual framework and research directions'. *Utilities Policy* 27 (2013): 15–27.

Doss, D.A., and R. Kamery. 2006. 'The Capability Maturity Model (CMM) Architecture and Framework within Traditional Industrial Environments: An overview'. Allied Academies International Conference. Academy of Educational Leadership. Proceedings; *Arden* Vol. 11, Iss. 1, (2006): 155-160.

Annex 1

iOF Indicators

The four categories of indicators described below are related to **user-level service delivery** as well as **scheme- and organizational-level performance** of I&D infrastructure and their management systems. The infrastructural element comprises irrigation water supply (and drainage water removal) supporting, along with other inputs, crop production. Resulting farmer income, in turn, leads to the ability to pay the irrigation service fee (ISF) and support the management, operation, and maintenance (MOM) or replacement of the I&D infrastructure. Doing so sustainably further enhances the longevity of I&D systems.

Farm scale

Three indicators from the farmer's or water-user's perspective gauge the extent to which users are able to select and change the level of service according to their demand, while the service provider is able to control the service delivered to each user and, if necessary, stop the service.

Adequacy measures the ability of users to receive sufficient volumes (and flow rates) of water of suitable quality, as conveyed and distributed by system operators, and to remove excess water through drainage.

Reliability relates to the ability of systems to meet users' needs (and crop water requirements) to ensure timeliness of irrigation.

Flexibility pertains to the degree of control and regulation of water delivered to users in terms of the adjustments allowed by systems in response to the changing needs of users and other factors.

Scheme scale

Six indicators assessed at perimeter level relate to the capacity of the infrastructure and management structures to optimally and robustly deliver the level of service required by farmers.

Equity represents a measure of fairness in the distribution of water to all users being served by the scheme and inclusive representation of stakeholders.

Conveyance and distribution efficiency measures the physical losses of water (through seepage and evaporation) during its transport from the head structures to the intermediary level outlets (conveyance) and through to irrigated fields (distribution).

Energy efficiency gauges the level of energy expenditures inherent in the operation of the I&D system.

Scheme functionality measures the condition of the I&D infrastructure and proportion in which it holds the capacity to serve its designated command area.

Scheme utilization pertains to the level of usage of the infrastructure against its original designed capacity.

Drainage is the removal of excess water from the soil to maintain an adequate supply of oxygen that permits optimal plant growth and crop development conditions.

Organization scale

Five indicators reflect the operator's organizational performance in relation to their internal functions and their relationships with water-users.

Accountability represents the ability of users to voice their concerns with service providers, obtain an appropriate response, and take part in decision-making. Includes the

presence and enforcement of (both formal and informal) service agreements and monitoring systems that ensure adequacy of service standards.

Staff adequacy pertains to ensuring that necessary skills, incentives, and motivations are in place as part of systems management arrangements.

Financial sustainability relates to the efficiency with which system managers use resources that enable service provision (cost effectiveness) and the extent to which they can recover their MOM costs (through ISF collection from water users and other means). Includes sufficient resource mobilization and budgeting.

Operational sustainability pertains to the level of sensitivity of the system to various constraining factors (flow fluctuations, malfunction, etc.) and its resilience in maintaining service in response to such conditions (efficiency of water, energy, and financial resources). May include the presence of asset management plans.

Responsiveness pertains to an operator's capacity to modify goals and service delivery parameters in response to changing conditions or demands from users.

Wider scale

Four indicators provide a measure of some of the broader consequences of performance of the irrigation scheme. The operator does not have direct control, but their performance has a major impact on these wider scale agricultural and water resource outcomes that are important to society as a whole.

Productivity: The indicator is split into *water productivity* and *land productivity*. Water productivity is a measurement of the crop yield obtained per unit of water used. Land productivity is reflected by the yield gap, which is the difference between the average yield (in tonnes per area) and the maximum (realistically) *achievable* yield for the locality. Two or three of the most common crops would be selected to reflect the overall land and water productivity.

Affordability: The indicator provides information on the cost of irrigation and drainage services relative to the return that the farmer gets from farming. The cost of services is reflected as a percentage of the crop gross margin (which is total crop revenue less production costs).

Environmental stewardship: Irrigation schemes almost always have significant impact on the natural water regime, through abstraction, and on water quality, through tail-water releases and groundwater recharge. The indicator reflects the operator's engagement with water basin management activities and the water quality differential upstream and downstream of the scheme.

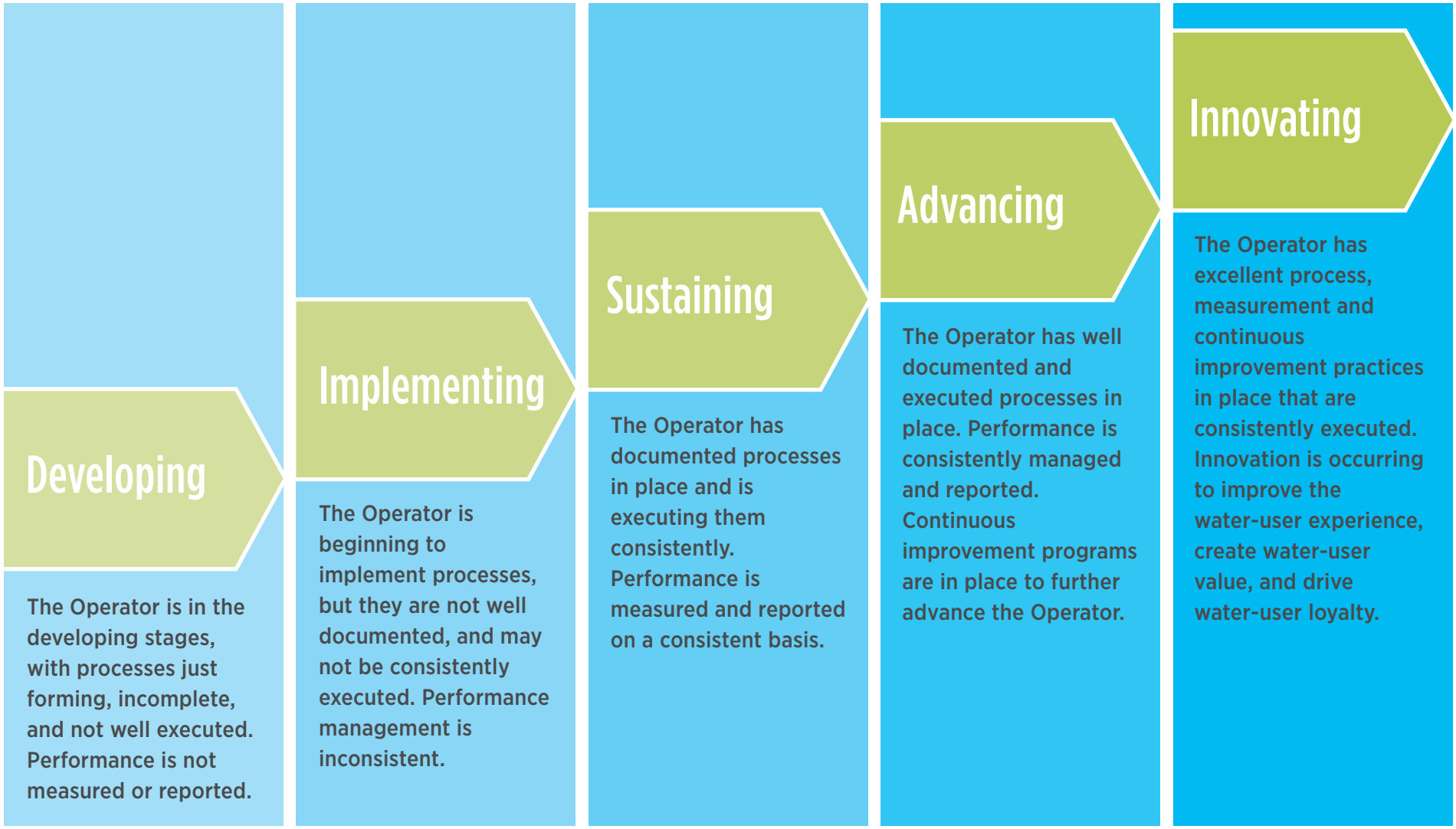
Sustainability: The final indicator provides a high level indication of sustainability in the broadest sense – the result raises a red, orange or green flag in regard to the future sustainabilty of the scheme. Sustainability is tied to many factors, but four determinants are selected as proxies and point to the extent that sustainability is a threatening issue or not. These are the indicators of adequacy (indicator 1), accountability to users (indicator 10), operational sustainability (indicator 13), and affordability (indicator 16). The indicators are ranked, and the lowest two are then averaged to provide a measure of sustainability.

Ind. No.	Indicator Name	Description	High-level	Measurement	
A	**Service delivery performance (user / farm level)**			**Remote sensing**	**Primary data (quant. or qual.)**
1	**Adequacy irrigation**	**Seasonal volume:** Amount of water supplied by the operator in relation to the farmers' demand (or allocation if not demand-based)	**y**	Relative Et = Seasonal Eta / Seasonal Etp	ratio = supplied volume for the season (cu.m) / expected volume (cu.m)
		Peak flow: The rate of supply during the peak period is adequate to irrigate the whole field			ratio = supplied flow rate in peak week (cu.m/s) / expected flow rate (cu.m/s)
		Pressure: The pressure (pipeline) or level difference (canal) is sufficient for the farmer to irrigate with his/her preferred system			ratio = actual pressure (m) / desired pressure (m)
		Drainage: Excess water in the fields does not hinder production			ratio = 1 – (no. of days x area that is flooded) / (total days in season x total irrigated area)
2	**Reliability**	**Frequency of disruptions:** Service disruptions do not hinder irrigation activity	**y**	Coefficient of Variation of Eta / Etp	ratio = 1 – (no. of days x area that services are disrupted) / (total days in season x total irrigated area)
		Timeliness of supply: Water is available at the agreed times			Likert scale: v.poor to v.good (1 to 5)
3	**Flexibility**	**Seasonal flexibility:** Ability to adjust the water requirement in advance of the irrigation season			Likert scale (1 to 5) : 1=not at all; 5=fully-flexible
		Dynamic flexibility: Ability to adjust the water requirement within the irrigation season			Likert scale (1 to 5) : 1=not at all; 5=on-demand (i.e.<3hrs)
		Contract flexibility: Ability to adjust the water services contract (and therefore payments) within the irrigation season			Yes or No
B	**Scheme performance (perimeter level)**			**Remote sensing**	**Primary data (quant. or qual.)**
4	**Equity**	**Performance data variance option:** Combined set of data on spatial *variance* of adequacy and reliability, applied to relevant blocks/units/WUA boundaries	**y**	Water Consumption Uniformity (WCU), coefficient of variation of Eta over the season (3 to 4 year trend if possible)	1 - [Highest Std Dev. of either adequacy or reliability / mean]
5	**Conveyance efficiency**	**Transport efficiency:** Efficiency of bulk water transmission system (boundary with distribution system to be defined in each scheme)	**y**		Actual water delivered from bulk system to distribution system / Gross abstraction volume at bulk water intake (%)
		Distribution efficiency: Efficiency of distribution to the water-user offtake (delivery boundary to be defined for each scheme, i.e. farmer / WUA / other)			Actual water delivered to users (or offtake) / water delivered from bulk system to distribution system (%)
6	**Energy efficiency**	Energy cost per cu.m and metre of elevation gain			Context-specific for local comparison
7	**Scheme functionality**	**Functional area:** Proportion of the original command area that can be supplied with irrigation services		Irrigated area (ha) / serviceable area (ha)	Irrigated area (ha) / serviceable area (ha)
8	**Scheme utilization**	**Utilization (WET):** Portion of the functional command area irrigated in the prior wet season		Irrigated area mapping - time-series trend (min 4 years)	Irrigated area (ha) / serviceable area (ha)
		Utilization (DRY): Portion of the functional command area irrigated in the prior dry season		Irrigated area mapping - time-series trend (min 4 years)	Irrigated area (ha) / serviceable area (ha)
		Cropping intensity (ANNUAL): Total cropped area over the calendar year in relation to total functional command area	**y**	Irrigated area mapping - time-series trend (min 4 seasons / years)	[sum of all crop areas that were irrigated in the year (ha)] / serviceable area (ha)

Ind. No.	Indicator Name	Description	High-level	Measurement	
9	**Drainage**	Proportion of the command area (that could otherwise be cropped under irrigation) that is 'lost' to salinization or waterlogging		SAR (waterlogged area analysis) and also possible for salinity mapping	Sum of waterlogged and salinized areas not suited for production / command area
C	**Organizational performance (perimeter level)**			**Remote sensing**	**Primary data (quant. or qual.)**
10	**Accountability**	**Explicit water supply contract:** The extent to which the terms of service are explicit and formalized contract			Likert scale (1 to 5) : 1=no contract; 5=explicit written contract
		Inclusion in processes: Extent to which water users are involved in accountability processes; involving elements of awareness and trust	y		Likert scale (1 to 5) : 1=no involvement; 5=participate with agency
11	**Staff adequacy**	**Capacity:** Number of degree qualified professional personnel employed by the operator per unit of irrigated area			No. of professionals (degree/diploma qualified / 10,000 ha) based on different types of irrigation schemes
		Salaries: Salaries paid relative to industry standard / minimum wages			Average of ratio: calculated from salaries of selected representative senior positions (management, technical, administrative) relative to industry standards
12	**Financial sustainability**	**Fee collection ratio:** Reflects the payment ratio of water-user payments versus the billings issued	y		Total revenue (USD) / total billings (USD)
		Operating revenue ratio: Revenue generated against actual O&M costs			Total revenue (USD) / Total O&M expenses (USD) (excl. depreciation)
13	**Operational sustainability**	**O&M expenditure ratio to capex value:** Adequacy of O&M expenditure in relation to the total CAPEX value (usually 2-5%)	y		Total O&M expenses (USD) (excl. depreciation) / Total CAPEX value (USD)
14	**Responsiveness**	Index of the operator's ability to respond to customers' queries and address issues arising			– % of satisfied customers – % of grievances resolved within 7 days
D	**Agricultural and Environmental performance**			**Remote sensing**	**Primary data (quant. or qual.)**
15	**Productivity**	**Water productivity:** average crop yield per unit of water evaporated		water productivity = Yield (kg/ha) / (ETa (mm/season) x 10)	
		Yield gap: average crop yield for area of land for two or three relevant 'indicator' crops		Relative Yield Gap = 1 - (seasonal Ya / Ymax or Yp)	
16	**Affordability**	Cost of water service as a % of crop gross margin (for two or three selected 'indicator' crops that inform re affordability)	y		Price of water (USD/ha) / Gross Margin for three indicator crops (USD/ha)
17	**Environmental stewardship**	Water quality of drainage releases measured by proxy of a salinity index (downstream / upstream salinity)			Salinity of downstream releases / salinity of upstream sources
		Water resource management engagement: Active involvement in basin and sub-basin water resource management activities			Number of meetings attended for engagement with basin-level challenges in the last 12 months: Likert scale (1 to 5) : 1=none; 5=monthly
18	**Sustainability**	Composite measure from indicators: 1.Adequacy (seasonal volume); 10.Accountability (awareness/trust); 13.Operational sustainability; and 16.Affordability	y		Average of the lowest two (of four) indicators

Annex 2

Organizational capability progression



Source: Developed by the authors based on the Capability Performance Model (based on Doss and Kamery 2006 and Cordoba et al. 2022)

Annex 3

Guidance for facilitation of the iOF process

Problem-driven thinking is part of engineering DNA but *facilitating* problem-driven processes is different. Facilitation of the iOF will probably be a whole new way of working for many iOF facilitators, especially those from an engineering background. Rather than solving problems yourself, as a facilitator you'll have to hold back on your analysis and solutions to ensure the operator finds his/her own way.

The client leads, the facilitator facilitates: Clients must own the problem, the diagnostic, and the solutions. The facilitator's role is to support operators to perform their own analysis and develop plans to transform service delivery. Facilitators must balance the requirement for supporting participants' own thinking, while also challenging rigid or pre-set ideas where necessary throughout the process. So, ask questions rather than offer solutions.

Focus on outcomes, functions, and performance: A 'good' problem is not necessarily the absence of a solution but refers to a real performance deficiency that cannot be ignored. Facilitators must maintain focus on functional aspects of performance by questioning around measurable outcomes – i.e., what the institution does, not what it looks like.

Let the operator solve their own problems: Old habits are hard to break and a 'solution drive' to development assistance shapes the clients' approach to the problem. Rather ask 'why?' until you get to the underlying issues than provide the answer yourself. Example questions may include: Why do we need to organize differently? Why do we need to line up more canals? Why do we need to charge more for water?

Data keeps the focus on performance: When facilitating, elicit examples and ask for data. Ask: 'How do we know this problem is real? What evidence will we need to prove that the problem exists? And how will we know when the problem is solved?'

Pay careful attention to authorization, ownership, and coordination: Adaptive problems cannot be solved by external actors. Authorizers, those who impact the operator's decision-making, play a critical role and must participate in problem identification. They are the ones who 'break barriers' for staff and hold them accountable for results. The role of frontline staff is to validate the findings, explore causes, identify solutions, and learn through action.

- **Problem-driven processes** from the Building State Capability Program
- **Function vs form** from the Building State Capability Program
- **Measuring success** from the Building State Capability Program
- PDF **Supporting government to use evidence** from the WBG

Tips – Working with leadership

Leadership role: Have an upfront discussion with leadership to ascertain their role. Ask yourself if you are convening the right authorizers (is anyone with veto power missing?)

Engagement: Make small concrete asks to test their engagement (e.g., assemble a change team, convene your first workshop, join the conclusion of the workshop to hear the results of problem deconstruction).

Facilitation skills are critical for orienting the group on problem-driven approaches, provoking meaningful and candid discussion, and guiding a participating group with prompting questions.

Norms for meetings and workshops

Be present: no phones or computers during training sessions; stay in the room for the duration of the session (barring emergencies).

Be engaged: actively participate, keep an open mind, define the problem before trying to solve it.

Be focused: use evidence-based statements, no interrupting (i.e."yes/and" vs "no/but").

Learn through Action ...

- Ask: what can be done with the people and resources we have now?
- Think big but start small: break actions into manageable next steps for the operator to tackle.
- Move quickly into action: test the understanding of the problem by tackling a manageable element (i.e., a unit or block) and learn from that.

Facilitator self-awareness

* Respect all group members, regardless of their age, rank, skills, culture, gender, etc.
* Listen actively, paraphrasing, questioning, and summarizing key points.
* Neutrality – set aside preconceived notions about problems and solutions.
* Biases – put aside own biases and fears to find viable alternatives.

Make sure ...

- Map out results and process: make sure all steps are clearly illustrated, results are identified, and records are available and shared (?).
- The Client is in charge: make sure the Client IS and FEELS in charge of all decisions.
- Divergent perspectives are to be understood: make sure all stakeholders views are aired and respected.

Ishikawa fishbone diagnostic – Problem identification

An *Ishikawa* or *Fishbone Diagram* can be used to visualize your problem, and help identify and map out the causes and sub-causes.

1. Having agreed on the problem statement, put this at the far right of your flipchart.

2. Now draw the basic bones of a fish. Referring to the problem statement, ask *'why does this happen?'* for identifying at least 3 distinct and significant causes (to start with – there may be more!). Sometimes, people like to think about their major causes by using generic headings (for example, drawing from the iOF framework), but you shouldn't feel restricted by this.

3. Next, for each of these major causes ask, *why does this happen?* and identify at least 4 major sub-causes. Brainstorm all the major sub-causes, asking *why does this happen?* As each idea is given, write it as a branch from the appropriate category. Causes can be repeated in several places in the diagram if they relate to multiple challenges. Continue asking *'why?'* to identify the underlying root causes. Once the group runs out of ideas, focus attention on places in the chart where ideas are few, in order to generate more detail.

Clean up the fishbone and present back to the group for validation

A hands-on session with flip charts, post-it notes, and markers can generate excellent information, but fishbones can be messy So, clean up. Carefully capture ideas while honoring the content:

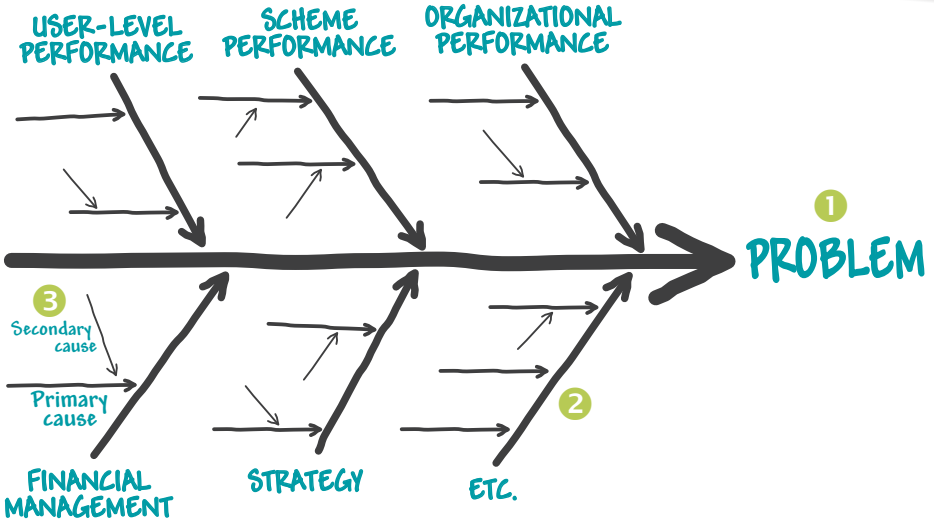
- Can it be read easily the next day?!
- Are there two causes that might be one?
- Are there so many sub-causes along the spine that the diagram may need to be split in two?

Keep it dynamic!

A fishbone is a dynamic schematic that should ideally be regularly updated.

Updating helps resist the idea of a 'perfect' diagnostic – since real-world problems are best tackled adaptively as more information is gathered.

Think about data gaps and uncertainties. Update the problem analysis through data collection, rapid innovation cycles, testing, and learning.



Try using **Liberating Structures** to identify facilitation tools to engage everyone simultaneously in generating questions, ideas and suggestions

Also, check out **1-2-4-All**

Authority, acceptance and ability – The space for change

Using the concepts of Triple A – *authority*, *acceptance* and *ability* – helps to identify if any proposed solution is achievable given realities of power, personnel and financial resources, timelines and wider stakeholder expectations.

Some info on **authorization** from the Building State Capability Program

In considering the Triple A, opinions will likely vary. This exercise helps to bring many hidden issues to the surface and trigger a frank conversation about the technical *and* adaptive aspects of a performance problem.

Extend the boundaries of debate

Don't be afraid to ask provocative questions that prompt participants to think outside of their comfort zones – but do so respectfully

Ask participants to work through the AAA worksheet individually for 10–15 minutes, to identify weaknesses in their arguments.

Get them to vote individually on the level of ability, authorization, and acceptance for each cause.

Discuss why participants voted as they did, challenge them, and allow them to change their votes if needed.

Authority
The political, legal, organizational or personal support needed for reform or policy change.

Ability
The need for time, money, skills and other resources needed to start any kind of intervention.

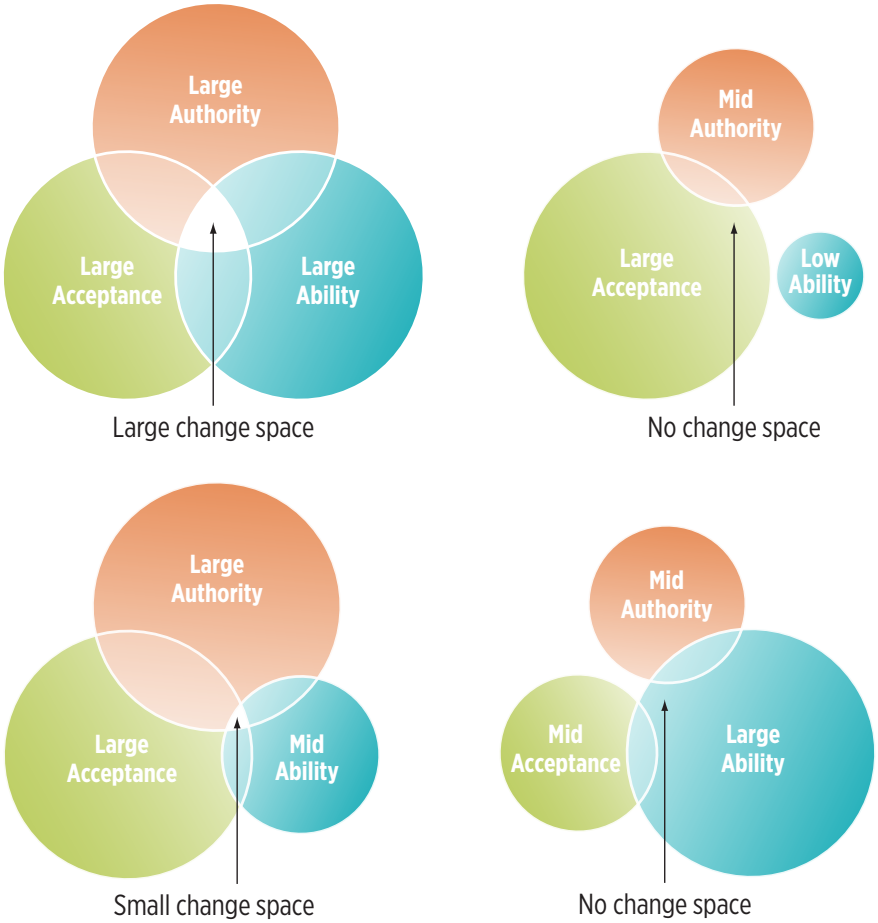
Acceptance
The extent to which those who will be affected by changes accept the reasons and implications of change.

Where do we start? – Techniques for prioritization

Sometimes we may feel a bit paralysed by the complexity and magnitude of issues at hand. We know one big solution isn't going to fix it all, but we don't know where to start!

How do we know where to begin? How do we stage and time relevant activities in a strategic manner?

Avoiding the waterfall: It is easy to get stuck perfecting a plan and designing a solution. Spending too much time on the diagnostic and design stage is sometimes called the 'waterfall model'. For adaptive problems, it's possible to use up all your resources, good will, and momentum, only to find that the context has changed, your diagnostic did not fully capture all aspects of the problem, or your solution doesn't work as expected (going 'over the waterfall'). Adaptive processes focus on good enough planning and sequencing of action. They anticipate mistakes, knowledge gaps, and failures, and use these as an opportunity to learn and improve.



What is my space for change? Your assessment of abilities, authorization and acceptance can help identify where the most space for change is – i.e., areas that are most ready for action. It can also help identify gaps that need to be closed – should our first steps focus on identifying resources, reaching out to users, building coalitions for change? Assessing the space for change is dynamic. Continually assess your space for change, test solutions and learn what works.

Start small, think big, learn fast. Moving quickly into action is another form of data collection to quickly test our assumptions about what causes the problem and what might address it. One way to sequence action is by starting with a microcosm of your performance problem that allows you to test all the assumptions in your fishbone. Starting small requires less 'space for change' to get started, reduces the stakes for failure, allows a little more room for innovation, and can build momentum to scale up what works.

Check out these operational notes on

PDF **iterating understanding of a problem**

and

PDF **iterating implementation for impact**

from the WBG MELAYANI Program in Indonesia

PDF Download the World Bank's **Governance in Irrigation and Drainage** resource book for other useful guidance.

Feasibility vs impact:

Another option is to map ideas according to their potential impact and the time and resources needed to implement. Often (but not always) some progress can be made with the staff and resources at hand, which can be revealing about the true binding constraints. Other solutions, for example, may require investments in large infrastructure, more time, and resources to implement.

Acronyms and terms

AAA	"Authority, Acceptance, Ability"
AFEID	Association Française pour l'Eau l'Irrigation et le Drainage
DNA	deoxyribonucleic acid
GWSP	Global Water Security and Sanitation Partnership
I&D	Irrigation and Drainage
iOF	Irrigation Operator of the Future
KMZ	Zip-compressed .KML file
OMM	"operations, management and maintenance"
RS	remote sensing
SCPM	Service Capability and Performance Model
UoF	Utilities of the Future
WBG	World Bank Group
WiA GSG	Water in Agriculture Global Solutions Group (of the World Bank)
WUA	Water User Association
XLS	Microsoft Excel spreadsheet (used in reference to the iOF toolkit spreadsheet)

Acknowledgments

The iOF Toolkit was prepared under the leadership of Pieter Waalewijn, Francois Onimus, IJsbrand H. de Jong, and Remi Trier of the World Bank. The project team included Jonathan Denison (lead consultant), Florence Deram Malerbe, Philippe Saura and Etienne Dressayre (all from AFEID), and Eeman Amjad and Svetlana Valieva (from the World Bank).

The approach used for this publication was based on the World Bank's Utility of the Future (UoF) program and the Governance in Irrigation and Drainage Practitioner's Resource Book. We received valued input from Federico Perez Penalosa of the UoF team, with guidance from Gustavo Saltiel, Camilo Lombana Cordoba, and Norhan Mohamed Sadik. The team also gratefully acknowledges conceptual support from Diego Arias, time input and review effort from members of the World Bank Water in Agriculture Global Solutions Group, and other World Bank colleagues throughout the development process. Key contributions were received from Rachel Ort on problem-driven facilitation approaches, and from Poolad Karimi on the use of remote sensing. The team is also grateful to Ranu Sinha, Pierrick Fraval and Farzona Mukhitdinova for supporting early piloting efforts in their projects. The graphic design and layout for the publication was provided by Dudu Coelho, and editing by Elana Bregin. The team would also like to thank Kanny Diaby for the administrative support provided. This work was made possible by the financial support from the Global Water Security and Sanitation Partnership (GWSP) of the World Bank.

Photo credits

Cover: Tom Fisk / Pexels

Page ii: Loren King / unsplash

Page 01: u_cq5nour74s / Pixabay

Page 03: Faseeh Shams / IWMI

Page 04: CODEVASF / Water Alternatives

Page 06: François Molle / Water Alternatives

Page 09 (top): Sylvain Massuel / IRD

Page 09 (bottom): European Space Agency / wikimedia

Page 14: Nabin Baral / IWMI

Page 15: Tom Fisk / Pexels

Page 17: Chris Austin / Water Alternatives

Page 19: Khoa Tran Anh / Pixabay

Page 20: Crystèle Léauthaud, Cirad / wikimedia

Page 21: Frederico Celente, CODEVASF / Water Alternatives

Page 31: Max Brassfield / Pexels | Tommaso Picone / Pexels

Page 32: Moritz Hofstetter / wikimedia

Page 33: Mountainash / unsplash

Page 34: François Molle / Water Alternatives

Page 35: Prashanth Vishwanathan / IWMI

WORLD BANK GROUP

GWSP
GLOBAL WATER
SECURITY & SANITATION
PARTNERSHIP