Results-based Monitoring & Evaluation System

Defining the global concept

VERSION # 1.3
August 10, 2017

Contents

List of acronyms

AAS	CGIAR Research Programme on Aquatic Agricultural Systems
ADB	African Development Bank
BMGF	Bill & Melinda Gates Foundation
CB	Capacity Building
CBO	Community Based Organisation
CGIAR	Consortium Group on International Agriculture Research
CRP	CGIAR Research Programme
CSO	Civil Society Organisation
DFID	Department for International Development (UK)
FISH	CGIAR Research Programme on Fish Agri-food Systems
IDOs	Intermediate Development Outcomes
IDRC	International Development Research Centre
IEA	Independent Evaluation Arrangement of CGIAR
IPG	International Public Good
ISPC	Independent Science and Partnership Council
KIIs	Key Informant Interviews
MARLO	Managing Agricultural Research for Learning and Outcomes
M&E	Monitoring and Evaluation
MEAL	Monitoring, Evaluation and Learning System
MEL CoP	Monitoring, Evalutaion and Learning Community of Practice
MIS	Management Information System
NGO	Non-Governmental Organisation
NRI	Natural Resources Institute of the University of Greenwich, UK
PIM	Performance Indicator Matrix
PoWB	Plan of Work and Budgets
QA	Quality Assurance
QMS	Quality Management System
RBM	Result-Based Management
R4D	Research for Development
ROI	Return on Investment
SDG	Sustainable Development Goal
SLOs	System Level Outcomes
SRF	Strategy and Result Framework (of CGIAR)
SWOT	Strength, Weakness, Opportunity and Threat
SSF	Small Scale Fisheries
TA	Technical Assistance
TBE	Theory Based Evaluation

ToC	Theory of Change
ToR	Terms of Reference
TOT	Training of Trainers
UN	United Nations
VC	Value Chain
VfM	Value for Money
XC	Cross Cutting theme in FISH such as Nutrition, Gender & Youth, Capacity Development

1 Introduction

1.1 Purpose of this document

This document presents the results-based Monitoring and Evaluation System (M&ES) of the Programs[1] and Organizations[2], adopting the Monitoring, Evaluation and Learning (MEL[3]) Platform and it provides the staff of theses Programsand Organizations to the key concepts, methods, processes and tools that are important for the effective implementation of the M&ES.

This document is organised into eight chapters: The Introduction (1) describes the theoretical and organizational context in which the system is being developed. Chapter (2) provides the Strategic Objectives (SO), Clusters of Activities (CoA) and other models used in the operationalization and implementation of activities with their associated Impact Pathways (IP). This knowledge is essential to understand the way in which the M&ES was designed and developed. In chapter (3), the main elements of the system are defined with information on founding principles, objectives and functions, scope, components, approaches and methods provided under different section. Chapters (4) and (5) present the two main components that constitute the M&ES, respectively described as Output and Outcome monitoring. In chapter (6), the roles and responsibilities for the implementation of the system are defined and where applicable, we refer to the organizational structure of existing Programs and Organizations that have adopted the M&ES to illustrate and define the functions/positions that play a specific role in the implementation of the system. Chapter (7) is dedicated to data and describes the main data flow processes that are critical to implementation. Data analysis, storage and sharing are also discussed in this chapter. Finally, chapter (8) outlines examples of different reports that can be generated by utilizing data and analysis gathered through the system.

1.2 Theoretical context

Box 1 - What is Results-Based Management (RBM)?

RBM is a management strategy by which all actors, contributing directly or indirectly to achieving a set of results, ensure that their processes, products and services contribute to the achievement of desired results (outputs, outcomes and higher level goals or impact). The actors in turn use information and evidence on actual results to inform decision making on the design, resourcing and delivery of programmes and activities as well as for accountability and reporting.

[1] Program is defined as multi-donors & multi-partners action composed of one or more clustered levels of operations (i.e. Activities/Products). In the CGIAR Programs are often referred as CGIAR Research Programs (CRPs).
[2] Organization is defined as a legal entity implementing a project and or a program using funds from Donors or own resources. In the CGIAR Organizations are defined as a Center being the constituents of the CGIAR System Organization.
[3] https://mel.cgiar.org

Source: Definition given in the UNDG in "Results-Based Management Handbook", October 2011

The RBM approach is widely adopted by the research and development communities (e.g. IDRC, USAID, DFID, WB, FAO, UNDG, MfDR) as a management strategy to:

1. enable the improved efficiency and effectiveness in the implementation of research and development initiatives, and
2. to promote organizational transparency and accountability for the use of resources.

For research and development organizations, RBM frequently covers two levels of results and performance measures: the first level focuses on the immediate results stemming from the program interventions and activities of an organization. The second level considers the wider impact of these interventions by taking into account the broader context in which these interventions take place. It considers the changes promoted in the national, regional or international arenas in which research and development organizations are operating[4].

RBM aims to improve the way in which organizations operate throughout the life-cycle of their research or development intervention. For this reason, RBM helps to introduce critical improvements in the key phases of planning, monitoring and evaluation of the effective implementation of activities. The following figure shows the way in which the UNDG group represents the RBM life-cycle approach.

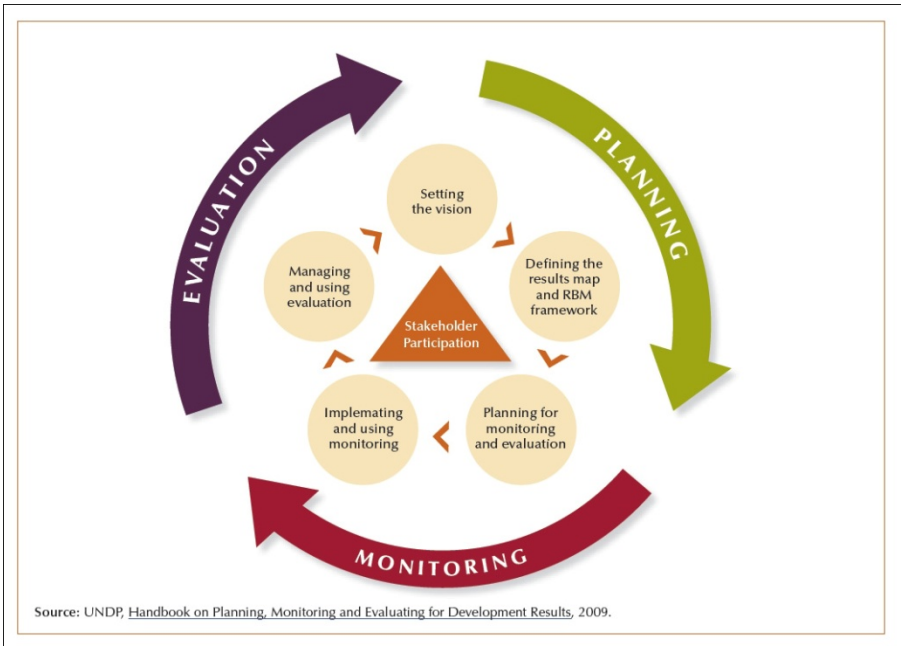


Figure 1 – The RBM life-cycle approach

[4] UN agencies go further to differentiate these two levels by referring to the first one with RBM and to the second level with Managing for Development Results (MfDR). In this document we use the RBM to refer to both dimensions.

Important in the design of research and development initiatives is the approach used to define goals, expected outcomes and impacts of a given program or project, as well as the way in which key stakeholders are involved and empowered to contribute to its achievements. Like many other research and development organisations[5], the CGIAR research centres and programs primarily use, the Theory of Change (ToC) approach[6], which is an outcome-based approach strongly grounded on the RBM methodology.

Box 2 - What is Theory of change (ToC)?

The Theory of Change (ToC) presents a hypothetical identification of the ways by which change is expected to occur from output to outcome and impact along an impact pathway. The ToC questions the assumptions about causality underlying the relationships between outputs, outcomes and impact. In ToC the assumptions present the mechanisms of change. There is no single method or presentational form agreed for ToCs. In research it is often used as a framework for testing hypotheses and incrementally building up the evidence base for the assumptions.

Source: IEA, CGIAR Standards for Independent External Evaluation, January 2015[7]

Research and development organizations and programs use the impact pathway to visualize and present the sequence of events and changes expected to happen due to a given set of activities or interventions, and thus causally linking research outputs and outcomes. The application of impact pathways in this way recognizes the existence of several factors of uncertainty, such as limited predictability of multiple stakeholders' interactions, dynamic biophysical, social and political environments, the large scale of expected changes, and so forth. Therefore, impact pathways are seen as dynamic models that should be regularly revised and adapted.

It is precisely this wide recognition of complexity that has led to the mainstreaming of ToC thinking and practice in the development community.[8] Uncertainty and complexity influence the way in which research and development organizations are rethinking the monitoring and evaluation strategies of their programs and initiatives. Particularly interesting is the case of the United States Agency for International Development (USAID). In a discussion note on complexity-aware monitoring[9], USAID propose a mix of approaches to face the challenges posed by research and development initiatives

[6] Among all the different way in which ToCs are developed and used, this guide provides an addtional innovative way for ToC in annex 5. Such approach is under experimentation and may not be applied to all portfolio of interventions.

[7] http://iea.cgiar.org/sites/default/files/Standards.pdf

[8] Two reviews of the use of ToC in international development have been conducted: James, C. Theory of change review: A report commissioned by Comic Relief. 2011 and Vogel, I. Review of the use of 'Theory of Change' in international development: Review Report commissioned by the UK Department of International Development (DFID). 2012

[9] Complexity-aware monitoring: Discussion Note – USAID Monitoring and Evaluation Series. Version 2.0 – December 2013

where the cause and effect relationships are poorly understood or where, given the high dynamicity of the context, an adaptive management approach is required.

Box 3 - Mix of monitoring methods proposed by USAID for Complexity-aware monitoring

Five monitoring methods – the use of sentinel indicators, stakeholder feedback, process monitoring of impacts, Most Significant Change, and Outcome Harvesting – can provide data useful for steering interventions operating in complexity towards results. Premised on an understanding of social change as a complex process involving multiple and mutually influencing factors and actors, these methods generate the information necessary for both accountability and learning for complex aspects of programs and contexts.

Complexity-aware monitoring: Discussion Note – USAID. Version 2.0 – December 2013

International research centres such as the CGIAR have generally not been accustomed to assess the long-term development outcomes to which they have contributed through their research, although some aspects of evaluation such as ex-ante impact assessment to prioritize research options and ex-post impact assessment have a long history in the CGIAR context. The introduction of RBM and ToC approaches in the research environment creates favourable conditions to better integrate organizational performances measurement, appraisal of short-term and long-term outcomes, and learning processes by reinforcing linkages between monitoring, evaluation and impact assessment.
Besides performing its core functions, M&ES may also support the design and the implementation of impact evaluations because it has been shown that the use of ToC allows the build-in of an outcome orientation in M&E thinking and practices.[10]
The following checklist on the types of information to be provided by M&ES is suggested as a starting point to facilitate linkages with impact assessment and evaluation of research or development activities.

Table 1 - Linking monitoring and evaluation to impact evaluation (Adapted from Perrin, 2012)

Baseline data
Identify the initial state along dimensions relevant to the intended impact of the program.
Nature of the program/intervention, as *actually* implemented
Identify changes from how the intervention was initially expected to be delivered, and to the extent possible, the reasons for these modifications. Identify other descriptive information about the implementation process, including phasing of various activities or variations across sites or types of beneficiaries.
Who did the program serve?
Disaggregate the beneficiaries' characteristics to the extent possible (e.g., gender, age, different tribal/cultural or socio-economic groups).
What else was going on that could affect the program's impact, positively or otherwise, e.g.:

[10] Perrin, B. Linking Monitoring And Evaluation To Impact Evaluation. Impact Evaluation Notes, No. 2. April 2012 (http://www.interaction.org/impact-evaluation-notes)

How has the program worked in conjunction with other agencies or programs, including identified partners? Have there been other factors – including interventions of other actors, government policies, private sector initiatives, natural and man-made disasters, etc. – that have affected the ability of the program to progress positively or negatively, or perhaps may have required a somewhat different approach than initially envisioned? To what extent have the above factors helped or hindered the program?
What outcomes or impacts can be documented, in the short-, medium- and long term?
Are these as intended, or not? Any data, or even subjective assessments, as to why this might be? Are impacts likely to be sustainable? What is the evidence for this? How strong is the data? What else is needed to make a more convincing case of impact following in some way from the program intervention?
What else happened (unintended/unexpected effects)?
To what extent were these positive or negative? To what extent were these potentially under the control of the program? Should the program design and the theory of change be revised to take these into account for the future?

Monitoring, evaluation and impact assessments assist in different ways in describing and measuring outputs, outcomes and impacts. CGIAR organizations, as well as several development agencies and NGOs are being increasingly asked to link this type of information with financial data in order to show how the "money" they use – the costs for mobilizing inputs – generates "value" – the contribution of each project and program in achieving long term goals.

The Value for Money (VfM) frameworks are closely linked with the ToC and Impact pathways[11] (see Figure 2). According to DFID, one of the biggest proponents of the VfM approach, "*Value for Money is about maximising the impact of each pound spent to improve poor people's lives".*[12]
The analytical VfM framework is commonly characterized by three main criteria: (1) Economy, (2) Efficiency and (3) Effectiveness, otherwise known as the 3Es . Recently, a fourth element, Equity (4Es) has been added to the VfM framework, particularly when applied to development initiatives.

[11] Antinoja, E. et al., Value for Money: Current Approaches and Evolving Debates, London School of Economics, 2011
[12] DFID's Approach to Value for Money, Department for International Development, July 2011

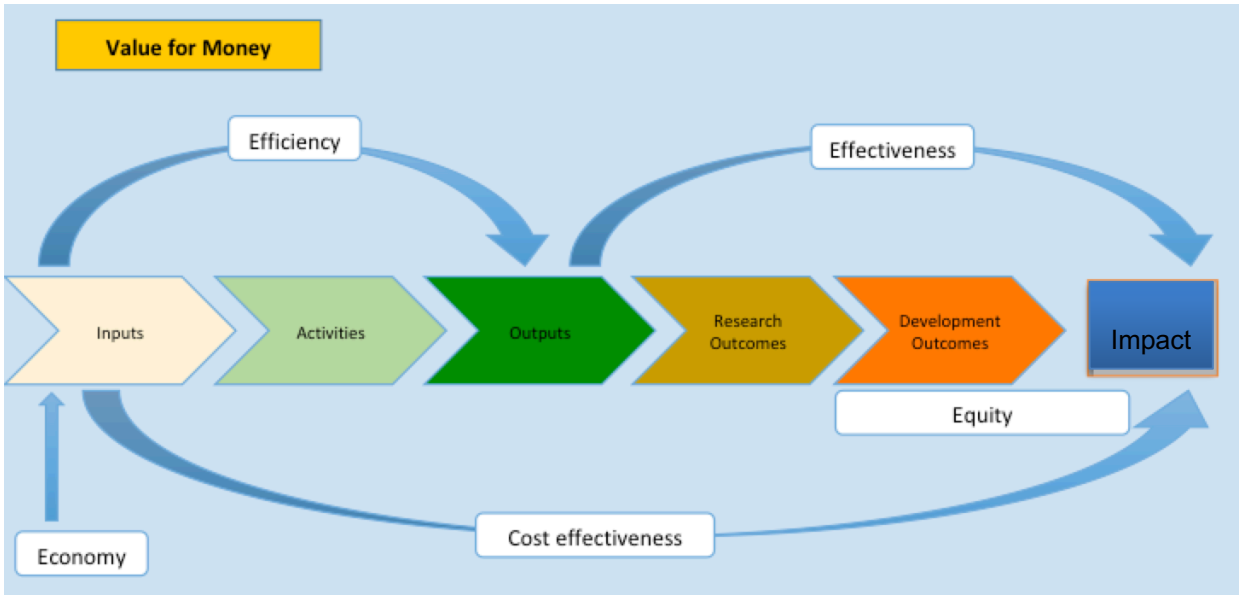


Figure 2 – Value for money framework (adapted from DFID, 2011)

The four VfM criteria may be briefly described as follow:

Economy: The cost of inputs used for an activity, with regard to maintaining quality.

Efficiency: The extent to which an intervention converted input into outputs by increasing output for a given input, or minimising input for a given output, with a regard for maintaining quality.

Effectiveness: The extent to which expected outcomes are achieved through the outputs obtained from an intervention.

Equity: The extent to which development outcomes have included the poorest, have reached the most vulnerable and have been gender-sensitive.[13]

The aim of VfM frameworks is to maximise each of the 4Es in order to support improved decision-making processes and maximise the cost effectiveness of a given intervention.

This RBM strategy will be complemented with a VfM framework that will be progressively developed and applied. It is important to note that not all the interventions implemented by Programs and Organizations have the same characteristics, however they can be broadly grouped into three main categories of interventions:

1. Upstream / basic research;
2. Research in development;
3. Scaling up and impact-oriented actions.

[13] Adapted from: DFID's Approach to Value for Money, Department for International Development, July 2011 and Jackson, P., Value for money and international development: Deconstructing myths to promote a more constructive discussion. OECD, 2012

In this context, the four individual VfM characteristic will have different degrees of relevance depending on the category of intervention outlined above. For example, the VfM analysis in basic research will focus on Economy and Efficiency, while for research in development interventions it will be important to develop indicators for all four criteria. For the last category of interventions, Effectiveness and Equity will probably be the most important criteria to examine. The following table synthesizes the relevance of these elements for each intervention type.

Table 2 – Relevance of VfM criteria applied to different RTB/CIP/ICARDA intervention

VfM Criteria	Intervention Category		
	Upstream / basic research	Research in development	Scaling up and impact-oriented
Economy	+++	+++	+
Efficiency	+++	+++	++
Effectiveness		+++	+++
Equity		+++	+++

Legend: **Higher number of + indicates higher relevance**

1.2.1 Measuring impacts of research: a reference framework, from SRF and SDGs

The United Nations' 2030 Agenda for Sustainable Development was adopted in September 2015. It is underpinned by 17 Sustainable Development Goals (SDGS) and 169 targets. It is worldwide accepted to refer to the SDG framework when looking to measure progress across the economic, social and environmental dimensions of sustainable development. The CGIAR however measures, for reasons expressed above, the capacity of its research to contribute to sustainable development worldwide through the SRF and specifically to a set of hierarchically nested sub-Intermediate Development Outcomes, Intermediate development Outcomes and System Level Outcomes. Despite important advantages, such as framing research within plausible impact pathways, when the CGIAR research process moves towards a practical implementation, it arises the need to confront each of our innovative solutions, if not the entire program, with the 2030 Agenda widely accepted and understood by donors, policy and decision makers and easier to be communicated. However, framing the interlinks between SRF and SDGs requires a wide range of tools and science-based analysis that can be applied only to specific cases in order to get clarity into the logical complexity of the causality that can be behind this thinking. It is worth to note as this exercise can also be incredibly useful to explore the nature of interlinkages between the same SLOs or, more interestingly, among SDGS. This can support a solid and effective decision-making process, and facilitate the related M&E of the related process. Indeed, Understanding possible trade-offs as well as synergistic relations between the different SDGs can open a vast thinking options for reading sustainability, to the effect of research and development outcomes. A multi-criteria approach that offers the chance of scoring effects on different

SDGs and human dimensions can help stimulating science-policy dialogue and drive toward more effective stakeholders interactions (private and public) for improved scaling opportunities.
The emerging body of literature that tracks interlinkages between SDGs gives us the opportunity to reflect on methodologies and possibilities to visualize SDGs interlinks. This last aspects can be perceived as a means of understanding the synergies and trade-off of implementing sustainable development interventions. In this guide we want to propose a framework to measure the linkages between SDGs based on the pathways and mechanisms outlined in Table SDG. The interlinks are represented as in Fig W and R. The figures are examples from a study carried out from the University of Tokyo. A mathematical model is currently piloted to consolidate a set of visualizations using arch diagram that can be used to show the number of SDG targets each mechanism addresses, as well as the strength of the links across all SDGs.

Box 4 – SDGs Underlying Principles

All sdgs interact with one another – by design they are an integrated set of global priorities and objectives that are fundamentally interdependent. Understanding the range of positive and negative interactions among sdgs is key to unlocking their full potential at any scale, as well as to ensuring that progress made in some areas is not made at the expense of progress in others. The nature, strengths and potential impact of these interactions are largely context-specific and depend on the policy options and strategies chosen to pursue them.

Source: "A guide to SDG interactions: from science to implementation" International Council for Science (ICSU), Paris, 2017[14]

[14] https://council.science/cms/2017/05/SDGs-Guide-to-Interactions.pdf

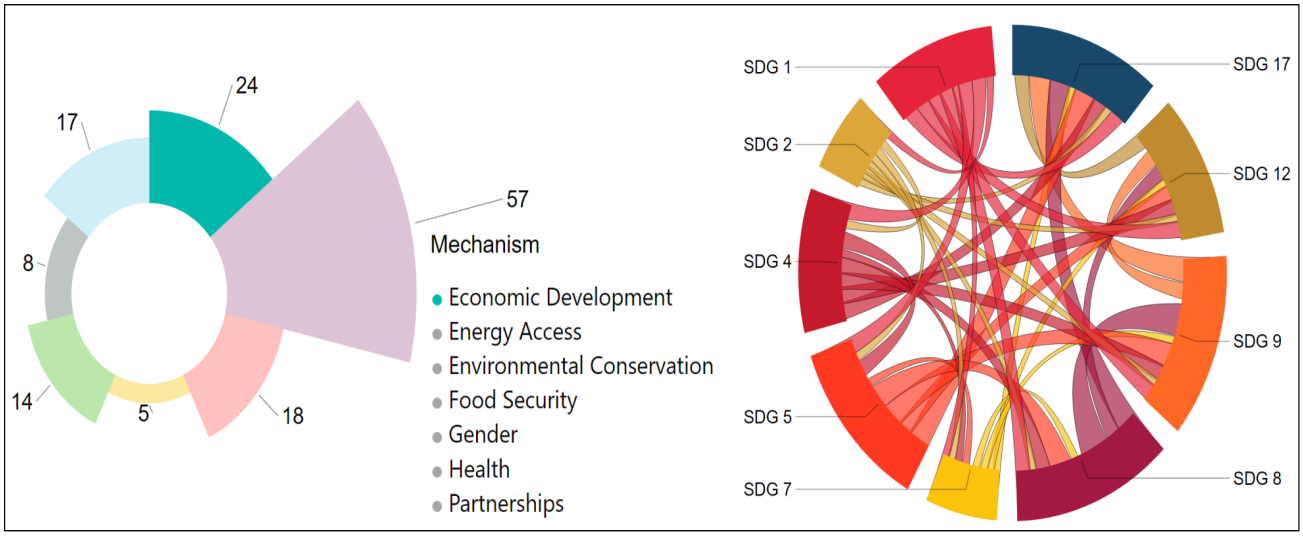


Figure 3 – Example of SDG interlinkages related to the Economic Development mechanism. The adoption of a new aquaculture technology can enhance the capacity of households to achieve basic needs (SDG 1.1, 2.3) and development skills (SDG 4.4, 12.a) through the influence of strong partnerships (SDG 17.7, 17.16).

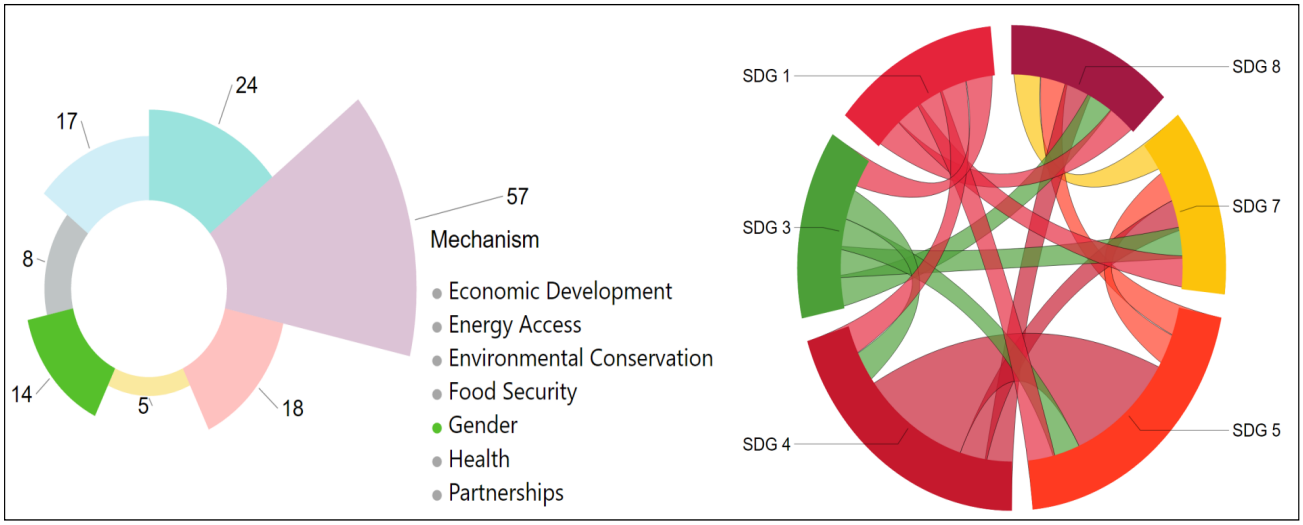


Figure 4 – Example of SDG interlinkages related to the Gender mechanism. The adoption of an improved aquaculture technology can benefit vulnerable groups to close gender equality gaps (SDG 1.b, 4.5, 5.1, 5.4, 5.c, 8.5).

1.3 Organisational background

In 2010 and after more than 30 years of scientific agricultural research contributing to reduce hunger and poverty in the developing world, the CGIAR initiated an important reform process to better respond to current and future global development challenges. The reform affected changes in the structure of the CGIAR, the way in which the CGIAR is governed and managed, the way in which research is prioritized and implemented, and the way in which funds are mobilized and allocated.

Result-based management was also introduced as management strategy for all CGIAR system levels. An overall Strategy and Result Framework (SRF) was developed in 2011 and updated in 2015. The CGIAR SRF outlined three System-Level Outcomes that will guide the definition of all research priorities and activities within the CGIAR. The CGIAR Research Programs were identified as an instrument to integrate the work of the centers and their partners, to avoid fragmentation and duplication of activities, and to better align the contributions of research outputs to global development outcomes.

Box 5 - System-Level Outcomes

- **Reduce poverty**
- **Improve food and nutrition security**
- **Improve natural resources and ecosystems**

Strategy and Results Framework 2016-2030[15]

Each CGIAR Organization and Research Program has defined its organizational structure. These are presented below.

1.3.1 CGIAR Research Program on Root, Tubers and Bananas (RTB)

The CGIAR Research Program on Root, Tubers and Bananas (RTB) started its 1st phase in 2011 with the aim of better facing, through research for development, three main challenges that hinder the full

[15] http://www.cgiar.org/our-strategy

expression of RTB[16] potential impact on rural poverty, food security, nutrition and sustainability of cropping and production systems. Identified challenges were:

1) Existing yield gaps;
2) Alignment between research objectives, farmers' and users' needs;
3) Contribution to climate change mitigation.

The program articulates the intervention of Bioversity International, the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA) and the International Potato Center (CIP), that is leading the program. The Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) joined the program in 2013.

The program (1st phase) is structured in 7 themes:

Theme 1: Unlocking the value and use potential of genetic resources
Theme 2: Accelerating the development and selection of cultivars with higher, more stable yield and added value
Theme 3: Managing priority pests and diseases
Theme 4: Making available low-cost, high-quality planting material for farmers
Theme 5: Developing tools for more productive, ecologically robust cropping systems
Theme 6: Promoting postharvest technologies, value chains, and market opportunities
Theme 7: Enhancing impact through partnerships.[17]

This structure reflects an output-focused research agenda sometimes inherited by the organization that centers already had before the design of the program. In 2012, RTB initiated an internal process to accompany the shift towards a new structure more respondent to an RBM approach. The new structure and the overall RBM framework are under construction and will be fully functional at the beginning of the 2nd phase. An extension phase (2015-2016) will allow completing the reorganization of RTB and, at the same time, the alignment to the structure proposed by the Consortium for all the CRPs. This structure foresees three main management levels: the global program management (level n); the Flagship projects (n-1); the Cluster of activities (n-2). At this moment[18], RTB is organising its activities in 23 Clusters of activities that are grouped in three types of Flagship projects (FP) described as follow:

- ***Discovery FP*** *focuses on well-targeted high potential upstream research contributing to outcomes in the longer run. Some of the products of the discovery flagship projects will mature into delivery clusters.*
- ***Delivery FP*** *features client oriented research to continuously improve the core and linked products (specific for each one of the Cluster of activities included) with strong orientation to*

[16] Bananas and plantains, cassava, potato, sweetpotato, yams, and minor roots and tubers.
[17] CRP-RTB 3.4 - Roots, Tubers, and Bananas for Food Security and Income. Revised proposal, 8 April 2011
[18] The appendix 2 presents the RTB phase 2 program structure.

impact. They identify the capacity development, partnerships and innovation environment for product delivery to take outcomes to scale. These flagship projects require articulation with value chains and client responsive seed systems to create demand pull.

- ***Impact at scale FP*** *enhances outreach from other flagship projects and learns from them in a continuous feedback loop leading to expanded outcomes.*

The development of clusters of activities included in the delivery Flagship projects may be described considering three stages. The scale of the impact, the role of RTB and the balance between research and development activities will evolve progressing from one stage to another as described in the following table.

Table 3 – Development stages characterising a Cluster of Activities

	Stage 1: Assembly and pilot	Stage 2: Scaling out	Stage 3: Scaling up
Scale of impact	<10,000 farmers	<100,000 farmers	1–10 million farmers
RTB role	Lead	Coordinate	Convene
Research emphasis	***	**	*
Outcome support emphasis	*	**	***

Note: * = significant, ** = important, *** = major emphasis

It's important to note that the same cluster of activities could be at different stages depending on the country considered and this matters in determining the frequency and the type of monitoring to be realised.

1.3.2 The international Potato Center

In November 2013, the Board of Trustees of the International Potato Center (CIP) approved the new Strategy and Corporate Plan (SCP)[19].

The strategy was developed bearing in mind the new global challenges (SDG framework, changing partnership landscapes including civil society and private stakeholders, growing ownership of national and regional partners on their own development strategies) and the CGIAR reform context characterised, among other elements, by the growing focus on food and nutritional security, the emphasis on development results and RBM.

According to CIP's SCP, six strategic objectives will shape CIP intervention for the next five years. Three strategic objectives (SOs 1, 2 and 3) focus on potato and sweet potato as promising crops to improve food and nutritional security in targeted geographies. They are R4D oriented and they are formulated as follow:

1. Combating Micronutrient Deficiency with Resilient, Nutritious Sweet potato;
2. Enhancing Food Security in Asia through the Intensification of Local Cereal-based Systems through the Adoption of the Early-Maturing Agile Potato;

[19] CIP Strategy and Corporate Plan. Research, Innovation and Impact. 2014-2018

3. Improving Livelihoods of Potato Farmers in Africa by Tackling Deteriorated Seed Quality through an Integrated Approach.

SOs 4 and 5 comprise upstream research lines developed by CIP:

4. Accelerating the Discovery of Game-changing Solutions for Enhancing Food Security;
5. Addressing the Food Security Challenge through Roots and Tubers: Transforming Vulnerability to Resilience.

The role and the vision of CIP in managing world potato and sweet potato collections are captured by the sixth SO.

6. Conserving Diversity for the Future—the CIP Gene-bank.

As for RTB Clusters of activities, Strategic objectives include Impact pathways clarifying the linkages with the CGIAR SRF and defining development outcomes at different levels. They also describe research products that will be delivered by CIP to achieve results. The first three SOs have a strong coherence with specific delivery clusters as defined in the RTB framework.

A process intended to reshaping the internal organisation of CIP according to new SCP is currently ongoing.

1.3.3 The International Center for Agricultural Research in the Dry Areas

In November 2016, the Senior Management Team of the International Centre for Agricultural Research in the Dry Areas (ICARDA) has initiated the process for the ICARDA Strategy 2017-2026 approved by the Board of Trustees in October 2017.

Aligned with the CGIAR SRF, the new ICARDA strategy will orient its research activities and organizational operation along the following Strategic Research Priorities and cross-cutting theme:

Strategic Research Priorities (SRP)

1. **Preserve, protect and use agricultural biodiversity** in the non-tropical dry areas in order to meet future climates and market related challenges.
2. **Develop climate-adapted crops and livestock** for greater food and nutritional security in the face of increasing water scarcity, climate change and changing markets.
3. **Build climate resilient, integrated crop-livestock farming systems** for improved and resilient livelihoods in order to optimize economic, social and environmental co-benefits in areas with high concentrations of poor people.
4. **Promote sustainable value chains, supportive policies and viable off-farm activities** for diversified incomes and improved livelihoods in the non-tropical dry areas.
5. **Support sustainable use and management of scarce water and land resources**, focusing on ecosystems and landscapes that offer significant opportunities to reverse environmental degradation and enhance sustainable intensification.

Cross-cutting Themes (CCT)

1. **Scaling-up proven technological packages** to realize impact at scale through innovation systems that improve links between research and development and expanded partnerships along well-designed impact pathways.
2. **Gender equality and youth engagement** to meet the needs and the aspirations of women and young people as key vulnerable groups, and to provide empowerment and better socio-economic opportunities to address inequality, including youth employment in agricultural services and agri-food supply chains.
3. **Capacity development** to build a strong and empowered cadre of young and talented researchers and thriving institutions. Equipping future leaders with the skills needed to be effective in research management and administration will be crucial to long-term success.
4. **Big data and ICT** to offer innovative solutions that meet the demands of future smallholder farmers for information critical for their production systems and decision making.

ICARDA adopted the M&ES and related MEL Platform to implement the RBM approach to operationalize of the strategy, as well as monitor and evaluate its expected outcomes and impacts.

1.3.4 The Project "Restoration of degraded land for food security and poverty reduction in East Africa and the Sahel: taking successes in land restoration to scale"

The project "Restoration of degraded land for food security and poverty reduction in East Africa and the Sahel: taking successes in land restoration to scale" started in 2015 with the aim of reducing food insecurity and improve livelihoods of poor people living in African drylands by restoring degraded land, and returning it to effective and sustainable tree, crop and livestock production, thereby increasing land profitability and landscape and livelihood resilience. The project, funded by IFAD and EU, is designed to operate through bringing key partners from the public and private sectors, across research, extension, market, and governance institutions to work together in an iterative co-learning cycle, where options are tested against context and lessons learnt fed back into the cycle. This requires capacity strengthening within these key institutions and locally, nationally and regionally to facilitate interaction amongst them, that forms the core of the proposal. The project articulates the intervention of the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), the International Center for Agriculture in Dry Areas (ICARDA), the International Livestock Research Institute (ILRI) and the World Agroforestry Center (ICRAF), that is leading the program.
The program is structured around 5 key outputs in 5 countries:

1. Enhanced understanding about what land restoration approaches work, by how much, where and for whom
2. Ingredients of success and gaps in knowledge
3. Nested communities of practice with refined tools, methods and guidelines for taking land restoration to scale
4. Tools for targeting out-scaling

5. Tools for targeting up-scaling

The project implements the M&ES and MEL since the beginning and envision to scale the methodology to other projects and partners in the target communities in order to ensure more sustainable results and reusability of knowledge generated.

1.3.5 The CGIAR Research Program on FISH Agri-Food Systems

The CGIAR Research Program on Fish Agri-Food Systems (FISH), aims to enhance the sustainability, productivity and resilience of fish agri-food systems to reduce poverty, enhance food and nutrition security, and improve natural resource systems and ecosystems services on which both depend. Fisheries and aquaculture contribute to livelihoods for 800 million people and provide 3.2 billion people with 20 percent of their animal protein. Fish is a rich source of micronutrients and essential fatty acids, which are critical to cognitive and physical development. In low-income and food-deficit countries, fish is often the cheapest and most accessible animal-source food. To meet future demand for fish, particularly in developing countries, production will need to double by 2030. The scale of this challenge requires research innovations across the whole spectrum of aquaculture and fisheries production systems and value chains. The overarching research question for the program is: How can we optimize the contributions of aquaculture and small-scale fisheries (SSF) to reduce poverty and improve food and nutrition security, while enhancing socio-economic and environmental sustainability? Research is focused on the two interlinked challenges of sustainable aquaculture (Flagship 1) and sustaining small-scale fisheries (Flagship 2), with integrated crosscutting themes of gender, youth, capacity development and climate change.
The strategic direction of FISH can be understood through three objectives, six-fold impacts, and five routes of change. The objectives of FISH for 2017-22 are three-fold:

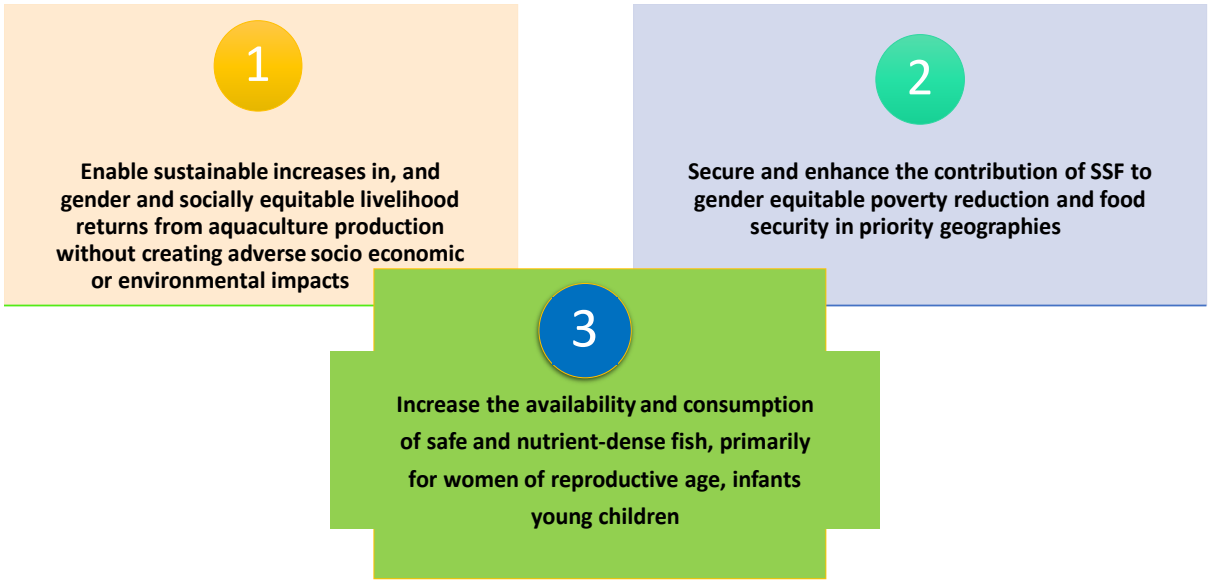


Figure 5 The objectives of fish 2017-2022 (*Source: Fish CRP Proposal 2017-2022***)**

FISH wants to achieve the following six impacts in this phase of its work:

Figure 6 – The fish impact targets (*Source: Fish CRP Proposal 2017-2022*)

These impacts are to be achieved through concerted research and development actions designed within five pathways or routes of change (over a period, during 2017-22):

- **Route 1 - Breeding:** Improving the availability and access of improved strains of tilapia and carp; integrated fish feed & health management packages *(Flagship 1)*
- **Route 2 - Co-management:** Implementing localised resource governance, alternative livelihoods and market access initiatives at wider-scale through partners and fishing communities *(Flagship 2; XC2.1.3, 4.1.2)*
- **Route 3 - Nutrition:** Wider-scaling the adoption of improved consumption and post-harvest management practices *(Nutrition and VC Research within Flagship 1 and 2)*
- **Route 4 - Policy influence:** Informing policy and practices through new research innovations (XC3.1.3, XC4.1.2)
- **Route 5 - Models and Technologies:** Promoting uptake of gender-equitable management practices and technologies and wider-scaling of models and programme initiatives (XC3.1.1)

Those five routes of change are initiated in and accelerated by the research carried out by FISH at specific flagship level and /or related to cross-cutting gender, youth and climate change. In this way, FISH can progress towards the six impacts and three objectives as mentioned above. The intermediate research achievements and innovations developed along each of the routes of change are the key milestones for measuring the success of the FISH CRP during the period 2017-22 and can be identified as Research Outcomes and Outputs in the FISH theory of change. In FISH the hierarchy of results, or in other words the relationship between research activities, outputs and outcomes, is nested from multiple lower level research results lead into higher level consolidated outcomes, and those flow into high level impact. The Fish CRP, led by World Fish, unites leading research organizations including IWMI and three advanced research institutes, namely Wageningen University, Natural Resources Institute/University of Greenwich, and the James Cook University as its managing partners. The CRP also aims to link to a convincing set of multi-stakeholder partnerships to harness emerging science in aquaculture and fisheries with the potential to deliver development outcomes at scale.

2 Impact pathways as basis for Monitoring &Evaluation

As shown in the RBM life-cycle approach (Figure 1), the development of impact pathways (IPs) is the basis for building the M&E framework. IPs present expected results and show how Organizations, partners and other stakeholders are changing their behaviours and contributing in achieving outcomes during and after the intervention.
In this chapter, the generic Organization and/or Program IP is briefly presented to introduce select concepts and explain the linkages with the M&E system.

2.1 Generic impact pathway

The generic IP underpins the overall intervention. The impact pathway generally consists of four main elements, these are described below for RTB/CIP as an example. However, this same approach would apply to ICARDA and other programs, noting that at the time of review of this document the strategy for the Centre was still under review.

1. Research products/activities – at the program level, the themes structuring the program (See section 1.3) are used to summarize the entire set of research products/activities. It means that each research product/activities presented in the IP stands for a family or a cluster of products/activities that can be crop specific (e.g. Integrated management of *Bemisia tabaci* – vector of Cassava Mosaic Disease and Cassava Brown Streak Virus in cassava) or consider more than one crop at the same time (e.g. Web-enabled pest and pathogen diagnostic platform for RTB crops). This structure is reflected in the product/activities portfolio where products/activities are organized in product lines by crop and for cross cutting domains;
2. Research outcomes – the changes happening as results of collaborative research or research uptaken by next users (NARS, NGO, farmers' organizations, private sector, etc.) are presented here. At this level, changes could range from the enhanced capacity of NARS in breeding and releasing new varieties to the integration of new integrated crop management strategies in the national extension programs or in new NGO's initiatives.
3. Development outcomes – here are described changes in capacities and behaviours happening at the end-users level (farmers, households, value chain actors, etc.). This level specifically takes into account the adoption of new technologies and practices as for example new varieties and quality planting material, sustainable management practices, farmers' inclusion in value chains, etc.
4. Sub- and Intermediate development outcomes – direct benefits for the targeted population or environment and changes in the enabling environment (policies and institutions) are considered at this level. Sub-IDOs and IDOs are coherent with the ones defined at the System Organization level to ensure the linkage between Organization and/or CRPs outcomes and System Level

Outcomes that are the higher result level defined in the SRF. The same approach is applied to link to the Sustainable Development Goal (SDG) framework and can be further expanded with other logical frameworks at country or donor level.

The process driving Organizations and Programs towards a more explicit RBM is influencing the program structure, which in turn enables a shift from research themes towards CoAs (Cf. Section 1.3). An important change is represented by the expected interaction among products/activities in achieving results. Where Themes are organised in output-oriented Product lines/activities, CoAs are conceived and visualized as "daisies" composed by a cluster of products/activities (research and outcome supporting) interacting and complementing their effects. In the same CoA, products/activities previously considered in different themes (as for examples new varieties, IPM technologies, gender-sensitive value chain approaches, analysis and recommendations on regulatory frameworks) are currently integrated to enhance their potential contribution towards research and development outcomes. The new organization by CoAs seems to maintain the same level of interconnection among themes, as presented in the Generic IP, adapting the level of complexity to a single crop, a specific agroecology, a given agricultural system, a cross-cutting theme.

2.2 Strategic Objectives – Clusters of Activities and their Impact Pathways

The CGIAR Strategic Results Framework as a whole could be represented as a group of nested elements (objectives and strategies) coherently built to ensure their orientation towards and contribution to a common set of outcomes. Each nested level provides additional specifications on the results to be achieved and clarify: the nature of the R4D intervention (crop-specific, system-oriented, policy an institutional analysis, etc.), the geographic dimension (global, regional, targeted countries), the stakeholders engaged and the partnerships developed.
We are conscious that the CGIAR SRF is coherent and represents a nesting level of other strategic frameworks, in particular the SDGs that overlay the SRF.

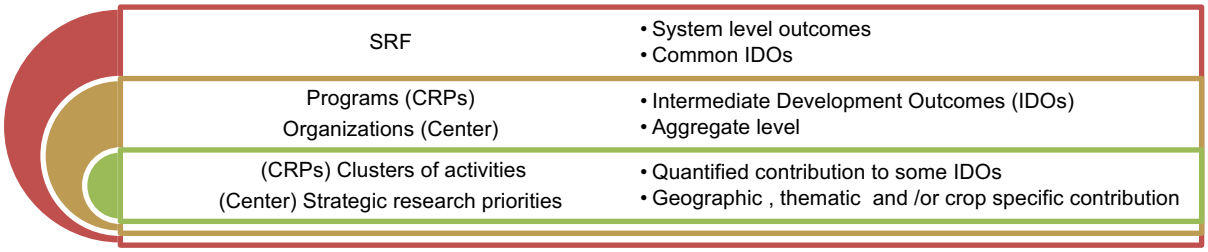


Figure 7 – Nested results framework

As shown in the image, we may consider Organizations and Programs SRP / CoA as the third level of nesting. Objectives defined at this level specify the geographic, thematic and crop-related characteristic of the intervention. They also determine targets and give a timeframe. For the example we may read on the CIP-SCP the formulation of the SO3.

Box 6 - CIP Strategic objective nº3

As a result of SO3's interventions, within 10 years at least 600,000 smallholder HH in SSA will increase their potato yields by 50% and HH incomes by at least US $800/ha per season. SO3 will facilitate innovative business arrangements at key points along the potato value chain that increase access to quality seed. Women and men will benefit from multiplying and using quality seed potato. Through multiplier effects, SO3 expects to impact three million HH.

When designing the IP for this level, CGIAR organisations and their partners are aware that their contribution will focus only on some of the IDOs considered by the whole program/Organization.

For example, SO3 takes into account its contribution to four IDOs. This image shows the impact pathway that the SO3 team constructed with a broad group of national partners from the public and private sectors in Kenya, Rwanda and Ethiopia. In addition to this visual representation of the IP, during a 3 day workshop, the group defined strategies (regional and country specific) and specified partnerships to support the scaling up of research and other relevant products.

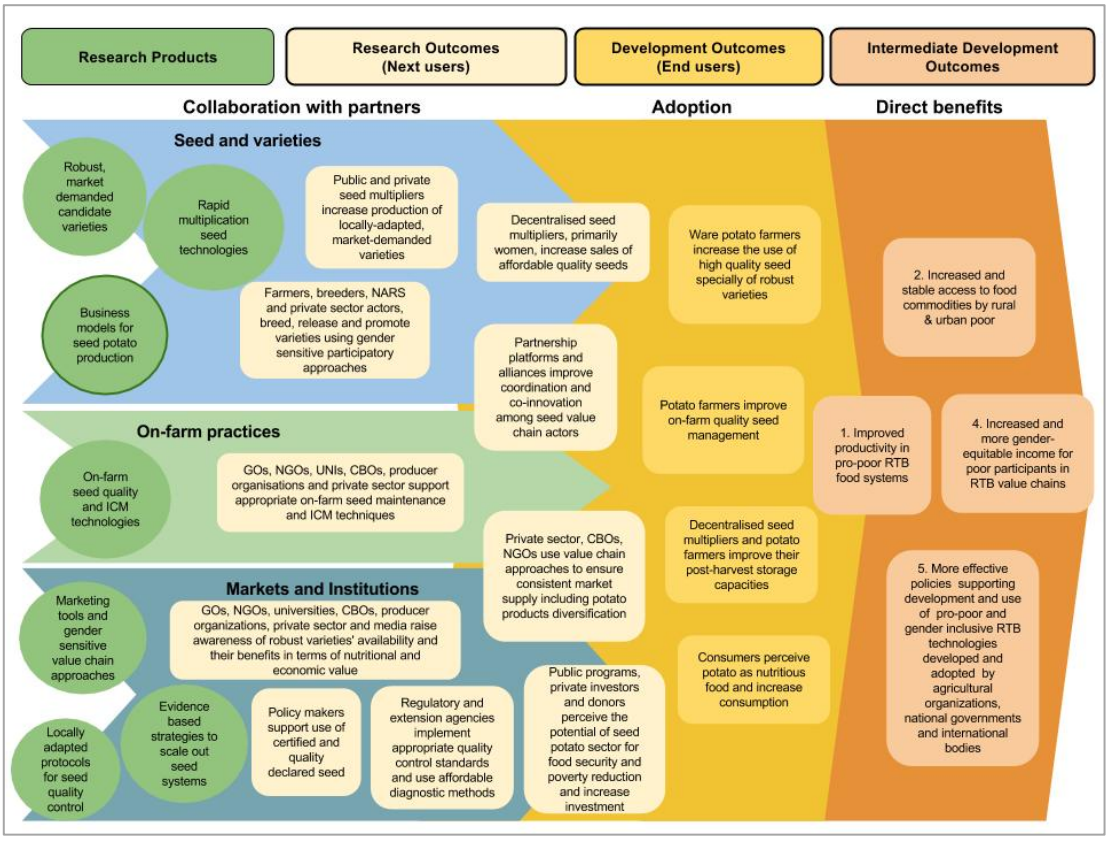


Figure 8 – CIP SO3 - Impact pathway visualized after the stakeholder planning workshop

At this level, the IP becomes a concrete input for the implementation of RBM. It represents the non-linear but stepwise map towards expected long-term results. It will frame the design of the 3-year Business Plan (BP) where inputs, activities and outputs will be defined to deliver research products or to support the achievement of outcomes along the pathway. It describes important changes that should reasonably happen at next-users (research outcomes) and end-users (development outcomes) level in terms of Knowledge, Attitudes, Skills and Practices when they will use products delivered by or with the contribution of CIP/RTB. These changes are casually linked to direct benefits in terms of productivity, income, access to food and enabling policies (the four IDOs). By monitoring progress at different levels, the Organization and/or program will verify the consistency of the IP internal logic and look for evidence of the impact of their intervention.

3 Monitoring & Evaluation System: main elements

3.1 Principles

The M&ES is founded on five principles. They are:

1. **Result orientation**
   The M&ES is designed to support the management functions of the Program or Organization, such as steering, planning and budgeting, coordinating, reporting, and to enable appropriate orientation and adjustment as necessary towards expected strategic results.
2. **Participation and alignment**
   The strategies of Programs or Organizations are aligned to relevant global SGDs, and national priorities. The M&ES is also aligned with national and international monitoring initiatives and, as far as possible, uses the same indicators, data collection methods and statistical services to monitor long-term outcomes.
3. **Gender sensitivity**
   The M&ES is gender-sensitive. In this respect, indicators are defined to measure outcome and impact on both women and men; gender specific indicators are included; and gender analysis is considered a key approach to examine the performance of research outputs.
4. **Viability**
   The M&ES has clear objectives to achieve and an adequate structure to be implemented. It is reasonably simple and cost effective to use and implement.
5. **Credibility**
   The M&ES generates credible results and show how outputs are contributing to outcome achievement. Mechanisms are implemented to check quality and consistency of data and data analysis.

Each principle has inherent standards and requirements that are presented in the following table. They guided the design of the M&ES.

Principles	Standards and requirements
1. Result orientation	
	Monitoring of the entire result chain with two main foci: 1. Outputs (focus on inputs, activities, milestones, outputs, products); 2. Research and development outcomes (focus on output performances, changes in Knowledge, Attitudes, Skills and Practices of next- and end-users, direct benefits)

Principles	Standards and requirements
	Regular assessment of assumptions and risks
	Accountability and Value for money frameworks for reporting to donors and stakeholders
2. Participation and alignment	
	Co-responsibility of partners in designing, steering and implementing the system
	Use and contribute to CGIAR, national and international M&E systems
3. Gender-sensitivity	
	Gender-sensitive data disaggregation
	Gender-sensitive and gender-specific indicators
	Gender analysis of outputs/products and results
4. Viability	
	Existing methodologies and tools will be examined and adapted
	Existing data will be always considered when their quality is acceptable
	Well defined samples to ensure a scalability of monitoring results
5. Credibility	
	Clearly define to what extent (geography, population) the program influence is realistic by documenting output delivery, uptake and adoption
	Define sound statistical analysis and collect relevant data
	By monitoring variables along the impact pathway accumulate evidences of the Program/Organization specific contribution in achieving results
	Combination of internal mechanisms for quality assessment and external evaluations

3.2 Objectives and core functions

The M&ES make explicit and coherent functions, structures and responsibilities to achieve three main objectives:

1. Support Organizations and programs strategic and operational management;
2. Improve organisational learning and knowledge sharing;
3. Promote transparency and accountability.

The core functions are described as follow:

1. Provide data, information, evidences on progress made towards defined targets to support decision-making and learning processes;
2. Review the consistency of IPs, document evidences showing causal relationships among outputs and outcomes, identify unintended outcomes;
3. Assess projects and program performances against defined targets;

4. Organize knowledge and experience sharing within the System Organization members and among partners;
5. Make available and understandable complex information on outputs delivery, outcomes achievement, and value for money.

Objectives and core functions were defined to respond to identified needs of different categories of users. The following table presents the expected use and the type of information needed by user category. Users are organized in two main groups: 1) Program and Organization users, 2) CGIAR and other users.

Main users	Type of use	Type of information needed
Program and Organization users		
Overall management		
Centre Boards Steering Committee Directors General Deputy Directors General Program Director	– Oversee program and centers performances and formulate recommendations – Oversee cross-centres synergies – Review progress and supervise implementation of Flagship projects/Disciplinary areas – Identify promising research products and partnership strategies – Report to Consortium and donors	– BP implementation by Strategic Objective – Annual progress towards defined targets (progress indicators, performance matrix, outcome indicators) and strategic contribution to SRF and CRPs – Outcome stories and other descriptive information
Flagship Project / management		
Flagship Project leaders DCE Leaders Regional Directors	– Review progress and supervise implementation of Flagship projects / Disciplinary Centers of Excellence (DCE) – Ensure quality of deliverables – Ensure data and knowledge management – Identify and promote relevant domain for cross-centers cross SOs synergies – Report to Program Director / DDG	– Plan of Work and Budget implementation by CoA, Organization – Annual information on developed products and other elements relevant for CRP progress indicators – Annual progress towards outcome targets (using indicators framework) by Cluster of activities – Outcome stories and other descriptive information
Cluster of Activities / Strategic Objective management		
CoA and SO Leaders	– Review progress and supervise implementation of Clusters of activities (activities and outputs) – Document results through outcome stories, evidences of program contribution to development outcomes – Report to Flagship Project Leaders, DDG and DG	– BP implementation – Bi-Annual information on developed products, outputs, milestones and deliverables – Annual progress towards outcome targets (using indicators framework) with data disaggregated by country

Main users	Type of use	Type of information needed
	– Communicate with national and regional stakeholders	– Outcome stories and other descriptive information (disaggregated by country)
Project management		
Project leader, Reporting scientist Country representative Scientist Technical staff	– Review progress, adjust implementation strategies, communicate with national stakeholders – Make explicit national and regional contribution to product delivery, outcome achievement	– Bi-Annual information on developed products, outputs, milestones and deliverables – Annual progress towards outcome targets (using indicators framework) with data disaggregated by country – Outcome stories and other descriptive information (disaggregated by country)
CGIAR Consortium and other users		
Consortium Board Other CRPs/Programs	– Oversee the CRPs performance and results – Oversee and promote cross-CRPs synergies – Share experiences, methodologies, tools and lessons learned – Make comparative analysis on results and value for money	– Plan of Work and Budget implementation – Annual information on CRP Progress Indicators and performance matrix – Annual progress towards defined targets (outcome indicators) and strategic contribution to SRF – Outcome stories and other descriptive information – Publications, descriptive documents and access to research products
Beyond the CG system		
Partners Donors Stakeholders General public	– Use information and data to feed their own M&E system and to support management processes – Be aware of progress towards expected results, products and services delivered – Informed participation in governance bodies and mechanisms – Use and adapt experiences, methodologies, tools and lessons learned – Make comparative analysis on results and value for money	– Data collected for monitoring indicators, adoption and impact studies – Annual progress towards defined targets (outcome indicators) and strategic contribution to SRF – Outcome stories and other descriptive information – Publications, descriptive documents and access to research products

Table 4 – Type of information needed and main uses specified by user categories

3.3 Scope

IPs are a schematic representation of complex organizational, scientific, social, economic and political processes. They help visualize and make explicit the assumptions and the underpinning logic used to foresee a series of changes and causal relationships among outputs, use of outputs, changes in users knowledge, attitudes, skills and practices, outcomes and impacts.

Even if IPs are sometimes visualized as linear, both in time and as cause-effect chain, it is important to keep in mind that: in general there are multiple pathways contributing to the achievement of the same outcome and the expected changes are not all happening at the same time; behavioural changes occur as result of long lasting processes, for this reason outputs that have been made available 5 or 10 years ago are often included in present interventions and are still in the process of adaptation and adoption.

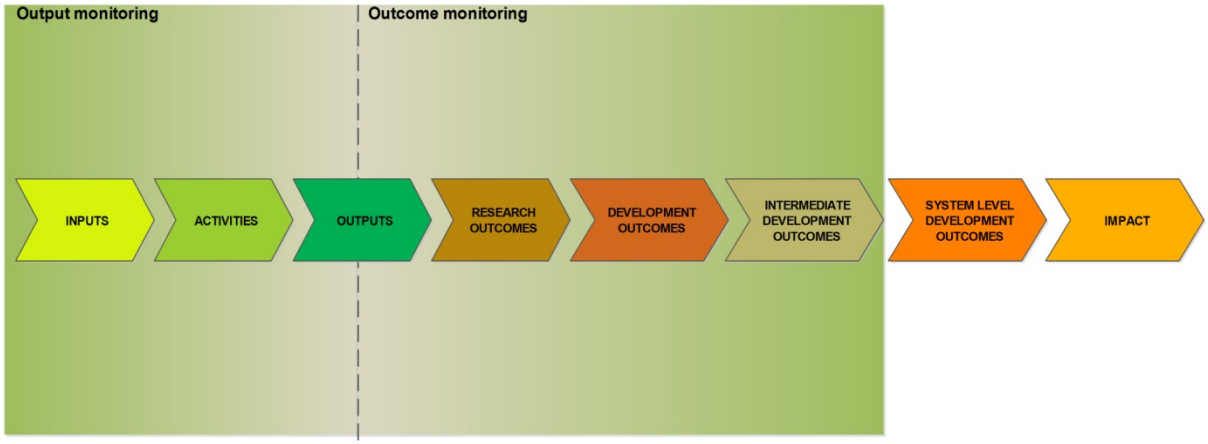


Figure 9 – Schematic representation of an Impact pathway and main components of the M&ES

The M&ES will consider the entire chain of elements presented in the IP, starting from inputs and ending with the Intermediate Development Outcomes. For conceptual and contractual reasons, higher levels of results (SLO, long-term impacts) would not be taken into account. In effect, the attribution gap between CGIAR outputs and development changes widens progressively along the result chain. The IDO level captures the "direct benefits" of the CRPs/Organizations intervention. After this level it becomes very hard to show causal linkages between use of outputs and outcomes. According to this logic CRPs and Organizations are asked, by the System Office and the donors, to show their contribution in achieving direct benefits.

As shown in the previous figure, outputs[20] have been defined as the linking element between the two components in which the system is articulated:

[20] The use of the two terms, *output* and *product,* might appear ambiguous in the document. Generally, we refer to *output* with a broader meaning and we include in its definition: technology and practices, tools, knowledge and data. We use *product* to emphasize the "scalability" of a specific research output and in particular referring to technologies and tools. The use of *product* may create confusion because we also indicate as products the main

1. Output monitoring component: tracking research progresses in delivering outputs;
2. Outcome monitoring component: tracking the use of research outputs and their effects.

The next section offers an overview of the two components.

3.4 Components, approaches and methods: an overview

The output monitoring component will support the tracking of inputs (funds, human resources) used to realize activities, engage partnerships, develop and deliver research outputs, contribute in achieving research and development outcomes (e.g. trainings, workshops, field days, communication and awareness campaigns, etc.). This component will use information generated when defining medium-term planning (three-year BP), annual planning (POWB, individual work plans) and budgets (financial information registered in tools such as OCS).

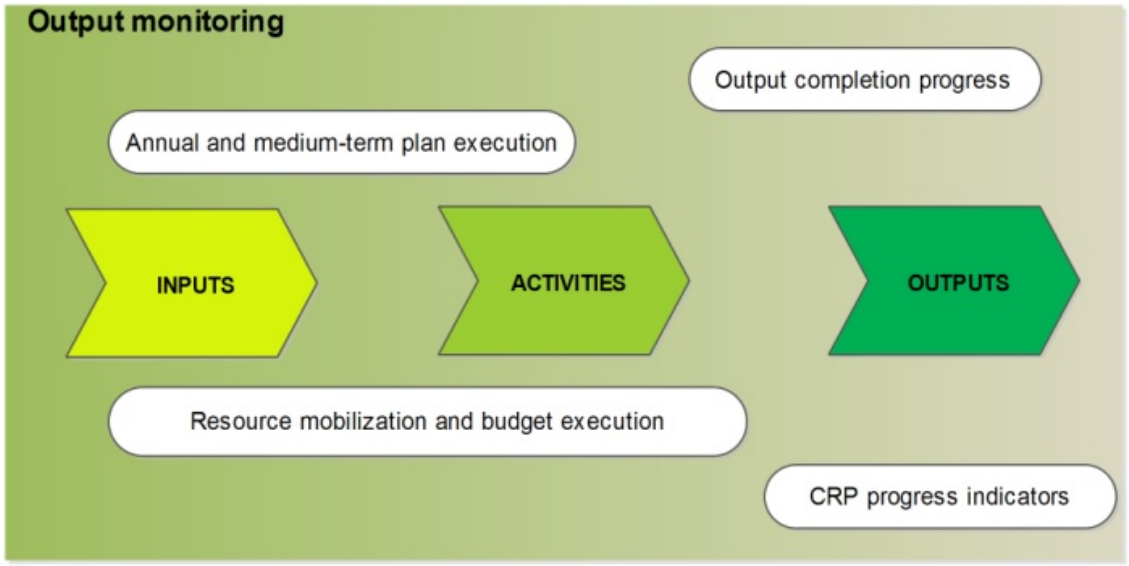


Figure 10 – Output monitoring: key monitoring approaches

The monitoring will focus on projects implementation and output development and completion. Most of the information will be generated and regularly (once or twice per year) registered by scientists. A web-enabled platform (MEL) facilitates data recording, storage and analysis.
Monitoring of progress indicators, as defined for CRPs (see Appendix 6), will partially be integrated in this component.

The Outcome Component will consider and complete the monitoring of progress indicators. This component will provide information on changes observed at next-users and end-users levels. Considered changes will have different natures, from research uptake to use of research outputs, from changes in knowledge, attitudes, skills and practices to direct benefits for the beneficiaries.

elements structuring the Clusters of Activities (See chapter 2 and 4). These inconsistencies will be addressed when defining the new Program Structure.

Three main approaches have been defined to capture and present the expected and unexpected effects of Organizations and Programs initiatives:

1) An output performances monitoring based on field trials;
2) An indicator-based monitoring, mostly quantitative, focusing on outcomes;

A descriptive, participatory monitoring looking at processes and causal relationships among outputs and outcomes.

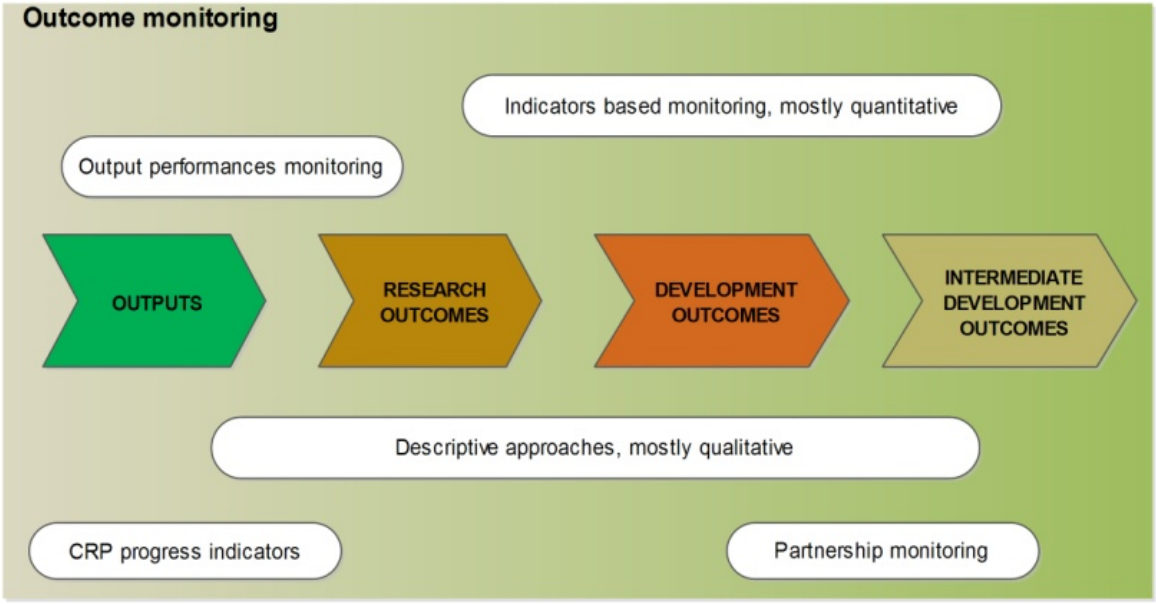


Figure 11 - Outcome monitoring: key monitoring approaches

Information on partners and partnerships will be considered in both components. When implementing output monitoring the focus will be placed on identification and description of partners, documentation and self-assessment of the collaborations. When realizing outcome monitoring, partners will be asked to evaluate the quality of the collaboration, their satisfaction with outputs and products delivered by the Organization or Program.

Chapters 4 and 5 give more details on the two components.

4 Output monitoring

The Output Monitoring component of the system has been designed to monitor the implementation of the planned activities and the effective delivery of expected research outputs and products[21]. For this reason and referring to the IP main elements introduced in chapter 3, this subcomponent will record, organize and analyse data on inputs, activities and outputs.

The linkage with other systems managing information on human and financial resources will be ensured. This is the case for the CIP-Talent Management System, where information on scientists' activities and individual work plans are stored, and OCS, where financial information is managed.

The present challenge is to ensure a coherent organization of data within these different systems to make them easily communicate and complement each other.

In the CIP case like other Organizations such as ICARDA and IITA, the overall framework to harmonize the systems is given by its Strategy (i.e. SCP) with the SOs, their IPs and the BPs. The Output monitoring component is organized in four modules.

4.1 Mid-year and annual review of planned activities

This module focuses on the implementation of annual activities and the production of expected deliverables. The module is managed by the Organization and could differ from one to another. In the CIP case, the structure of the planning is given by the BP that will be linked to the Talent Management System where the individual work plans will be registered. The linkage will be ensured by specifying the contribution of scientists' activities to the completion of milestones and outputs.

Data on activities and deliverables will be registered two times per year. The registration of these data will coincide with the preparation of progress assessments performed by technical staff with their direct supervisors. The scientist will define first his annual plan of work and the expected deliverables; for his mid-year review, the scientist will inform his supervisor on progress made and upload available documentation, including on deliverables; the third time (that should be coincident with the establishment of the new annual plan) the scientist will present the annual status of implementation of his plan and the corresponding deliverables. Each time, the supervisor will examine and validate the information provided.

4.2 Outputs and Products development and completion

Scientists having reporting responsibilities on outputs and products will fill an online template on output development and completion every six months.

[21] The use of the two terms, *output* and *product,* might appear ambiguous in the document. Generally, we refer to *output* with a broader meaning and we include in its definition: technology and practices, tools, knowledge and data. We use *product* to emphasize the "scalability" of a specific research output and in particular referring to technologies and tools. The use of *product* may create confusion because we also indicate as products the main elements structuring the Clusters of activities (See chapter 2 and 4). These inconsistencies will be addressed when defining the new RTB program structure.

They will provide a brief descriptive assessment of progress made. Achievement of defined milestones will facilitate the assessment. Using milestones as reference, scientists will express the estimated completion of the annual plans as percentage. The questionnaire will also ask for identifying and describing partners and partnerships, documenting the collaboration with partners (MoU, joint reports, etc.) and realize a simple self-assessment of these collaborations.
The template on products will have a first part constituted by the summary of the information on related outputs and an estimation of product completion calculated as average of the progress made on outputs. Reporting scientists will complete the questionnaire with a descriptive assessment of progress made, partnerships developed or maintained, expected outcomes (see 4.3).

Capacity development and innovation platforms

A specific section has been developed to capture information on activities intended to enable the research outputs uptake, use and dissemination. In particular, capacity development activities (number of people trained) and support to innovation platforms (number of innovation platforms supported) will be monitored here.
For trainings, the number of trainees is considered differentiating by: Short-term (workshops, field days, e-learning modules, etc.) and long-term programs (Master/PhD); sex; themes.
The number of supported multi-stakeholder R4D innovation platforms is, in its turn, be related to: interested agro-ecosystem, geographical focus; objective/theme.

4.3 Output Progress indicators (CRP progress indicators)

Scientists having reporting responsibilities on outputs and products also report on Output progress indicators through the same template. A specific section allows characterizing outputs and products using logic and categories defined by the System Organization (See Appendix 6).
Questions to be answered in the questionnaire are organized using the following structure.

Characterisation of outputs and products

Outputs and products with a substantial influence on the way stakeholders along the impact pathways think, allocate resources and implement activities should be identified as "Flagship product". All the outputs and products have to be examined and, when suitable, following categories have to be attributed.

Categories: Knowledge, tool, open access databases, technology/practice

When appropriate, explicit targets and special assessment approaches considered by the outputs/products will be underlined.

Explicit targets: Women farmers, NRM managers, climate change

Special assessment/approaches: Product assessed for likely gender-disaggregated impact, strategic value chains analyzed, agro-ecosystems analysed/characterised[22], approaches for

[22] An estimation of targeted population, the geographical location and agro-ecological zone have to be provided.

improving ecosystem services and for establishing positive incentives for farmers to improve ecosystem functions[23].

When an output/product is classified as technology/practice some additional information has to be provided. First, the main domain related to the technology: *agriculture-related /NRM-related /climate change adaptation and mitigation*. Second, the technology type: *Mechanical and physical/ Biological/ Chemical/ Management and cultural practices*.
Third, the status of technology, differentiating among technologies: *under research/ field tested/ released by public and private sector partners globally/ under implementation.*
The geographical focus and the targeted agro-ecosystem have also to be indicated as well as the number of potential beneficiaries of scaling up strategies (M/F).

Publications
Publications and other documents are uploaded and/or links provided to facilitate knowledge management and connection with institutional repository and data bases. The number of publications in ISI journals / number of published research output will be used as indicators.
This information will be processed to calculate the indicator values for the Program level and the contribution of each SO/CoA. The second aspect related to use publications as indicators is to enable and promote learning across the organization, program and with partners.

[23] Interested agro-ecosystem have to be indicated.

5 Outcome monitoring

Chapter 3 gave a global overview of the Outcome monitoring component; the three complementary approaches applicable for this component are described here.

5.1 Output performances monitoring

Ex-ante impact assessment[24] and identification of IPs have been preliminary steps in the definition of the Organization and/or Program research portfolio, expected outcomes and IDO targets. This process ensured a strong linkage among program design and projected impacts. The output performances monitoring, based on field trials, is intended to maintain this linkage between M&E and impact assessment.

Actually, data collection on output performances is a standard part of research evaluation. For example, productivity or input cost changes related to the introduction of a new variety are normally measured through experimental or participatory field trials. Such data, systematically collected all along the project cycle would be very helpful in the implementation of impact assessment exercises.

Based on the experience of priority setting exercise and considering IPs, main variables to be measured to assess impacts related to every SO/CoA may be identified at the beginning of the intervention. Taking into consideration data needs for IA would eventually influence and enrich the design of the field trials.

Within this framework, effort is required in the definition of standard protocol for data sampling, data collection and processing methods. Standard protocols ensure compatibility among data coming from different projects and country. This effort would also be useful to prepare data for sharing on open access platforms. It is suggested that such investment is undertaken by the organizations working on the same system and involve any related stakeholders/partners interested in M&E program management. It should be considered as a joint efforts across M&E and Data management officers.

5.2 Indicator-based monitoring

Using IPs as a basis, a set of indicators, whose number should be reasonable and cover the different outcome levels (research, development and intermediate development outcomes), is defined for each SO/CoA. Indicators are defined to monitor expected changes with the double aim of informing about progress made and questioning the consistency of IPs. This monitoring approach would not be able to capture unexpected effects of the intervention.

Indicators would be mostly quantitative and depending on the outcome level may focus on:

[24] Cf. Workshop report: Completing the Strategic Assessment of Research Priorities for the RTB. November 2013

Research outcome level

Research uptake by next-users;
Next-users satisfaction with CGIAR research outputs;
Partnerships and partnership's results;
Changes in Knowledge, Attitudes, Skills and Practices at next-users level.

Development outcome level

Changes in Knowledge, Attitudes, Skills and Practices at end-users level (e.g. Adoption of new technologies and cultural practices)

Intermediate development outcome level

Direct benefits at end-users level;
Changes in policy and institutions;
Changes in agricultural systems and their sustainability.

Defining the indicators framework, M&ES developed for bilateral projects, national and international initiatives will be considered to identify similarity and synergies.
Secondary data and directly collected data would be used in this approach.
The frequency of data collection and analysis will be determined considering two factors: 1) the different pace at which changes happen depending on the outcome level; 2) the stage of the CoA in the country (See Section 1.3.1).The table below presents the expected frequency of indicator measurements depending on the combination of these two factors.

Indicators level	**Frequency of measurement in years**		
IDO	x	5-10	5
DO	x	3-5	3
RO	1-2	1-2	1-2
Cluster stage	Assembly and pilot	Scaling-out	Scaling-up

Table 5 – Frequency of indicator measurements

5.2.1 Indicators frameworks

The following table summarize information on outcomes and indicators that used in the implementation of this sub-component for a sample SO: CIP-SO3/RTB-PO1.
The indicators framework is the result of the joint effort of one Organization (CIP) and one Program (CRPs) and their partners to define a common framework to measure the effects of their interventions.

Improving Livelihoods of Potato Farmers in Africa by Tackling Deteriorated Seed Quality through an Integrated Approach		
	OUTCOMES	**INDICATORS**
Goal	**As a result of SO3's interventions, within 10 years at least 600,000 smallholder households (HH) in SSA will increase their potato yields by 50% and HH incomes by at least US $800/ha per season. SO 3 will facilitate innovative business arrangements at key points along the potato value chain that increase access to quality seed. Women and men will benefit from multiplying and using quality seed potato. Through multiplier effects, SO3 expects to impact three million HH.**	
IDOs	Improved productivity in pro-poor RTB food systems	• Potato yield per farmer HH
	Increased and stable access to food commodities by rural & urban poor	• Annual potato production
	Increased and more gender-equitable income for poor participants in RTB value chains	• Potato income per farmer HH; • Annual profit of decentralized seed multipliers; • Potato income of vulnerable potato farmer HH
	More effective policies supporting development and use of pro-poor and gender inclusive RTB technologies developed and adopted by agricultural organizations, national governments and international bodies	• Quantity of potato certified seed and QDPM per country per year; • # countries with improved and/or adapted national regulations on standards for quality seed production
DOs	Ware potato farmers increase the use of high-quality seed of robust varieties	• % potato farmers growing robust varieties (with CIP origin) • % of potato farmers growing quality seeds
	Potato farmers improve seed management on-farm and adapt/adopt innovations in cropping systems and IPM	• Proportion of potato farmers using ICM/IPM technologies
	Decentralised seed multipliers and potato farmers improve their post-harvest storage capacities	• Proportion of farmers investing in post-harvest technologies
	Consumers perceive potato as nutritious food and increase consumption	• Annual potato consumption per capita (average)
ROs	NARS, NGOs and private sector organizations use the framework and strategies to improve the design and implementation of seed potato projects	• # of organizations using CIP's frameworks, models and strategies for project's design and implementation
	Breeders from public and private organizations release robust, market demanded varieties using innovative methods and tools	• # of varieties released • # of breeding organizations using new methods and tools developed with CIP contribution
	Public and private seed multipliers increase production of locally-adapted, market-demanded varieties	• Quantity of certified generation seed annually produced
	Decentralized seed multipliers, primarily women, increase sales of affordable quality seeds	• Quantity of quality seeds sold by DSM
	GOs, NGOs, UNIs, CBOs, producer organisations and private sector support appropriate on-farm seed maintenance and ICM techniques	• # of techniques (IPM and ICM) validated • # of National NGOs adopting and promoting IPM and ICM research in seed and ware potato
	Regulatory and extension agencies implement appropriate quality control standards and use affordable diagnostic methods	• # of inspection agencies adopting QPDM standards
	Private sector, CBOs, NGOs use value chain approaches to ensure consistent market supply including potato products diversification	• # of organisations using marketing tools (developed by/with CIP) to increase potato consumption and quality seed use
	Partnership platforms and alliances improve coordination and co-innovation among potato value chain actors	• Partnership Health Score

Table 6 –Information on outcomes and indicators. Example from CIP as Organization and RTB as program.

5.3 Descriptive monitoring based on participatory methods

Participatory methods help to bring together different perspectives for deepening the understanding of complex processes involving multiple stakeholders acting at different geographical and institutional levels.

In accordance with the Participatory Impact Pathway Analysis approach, which is currently being adapted by Programs and Organizations such as RTB and CIP for designing planning processes at SO/CoA level, a first element of participatory monitoring should be the periodical implementation of reflection workshops with stakeholders.

The overall logic of the impact pathways and progress made towards expected results should be examined in these meetings. Project, SO and CoA could be adequate levels to regularly engage in this exercise to adjust and refine the ToC and the implementation strategies.

These workshops could also give the opportunity of analysing and discussing about partnerships and partnership strategies. At the project level, qualitative tools designed for assessing partnership quality may be used to prepare specific working sessions[25]. At higher levels, the results of broader analysis, as the ILAC study on the RTB research networks[26], may also be used.

Where projects are engaged in implementing participatory approaches, the use of methods such as Most Significant Changes[27] and Outcome Harvesting[28] may allow interpreting in a different way outputs and outcomes by analysing the perception of different actors. These methods will also facilitate the identification of unintended outcomes and by doing so complement the indicator based monitoring.

[25] The Partnership “Health Check-Up” Tool is an interesting example developed by CIP. For more details see: The SPHI/SASHA Partnership “Health Check-Up” Tool - A simple, quick qualitative tool to assess the “health” of partnerships: Background and use. Margaret McEwan. October 2012

[26] Ekboir, J., Canto, G.B. and Sette, C. (2013) Monitoring the composition and evolution of the research networks of the CGIAR Research Program on Roots, Tubers and Bananas. Series on Monitoring Research Networks No. 01. Institutional Learning and Change Initiative, Rome, Italy

[27] Davies, R. and Dart, J. (2005) The 'Most Significant Change' Technique - A Guide to Its Use

[28] Wilson Grau, R. Britt, H. 2012, Outcome Harvesting, MENA Office, Ford Foundation

6 Roles and Responsibilities

Even if the monitoring and evaluation system is well designed, its usefulness will rely on timely availability of data and information and on their quality. Data and information have to be collected and flow through different stages of quality check, validation and analysis before being used for decision-making processes, learning exercises or accountability reports.
To make the system operational it is necessary to clearly define roles and responsibilities within the organizations and programs and ensure that people involved know and understand their role.
The following tables give a brief overview of main roles and responsibilities. Starting from this description, the SO/CoA teams have to clearly identify who assumes what responsibility, define more precisely tasks and formalize decisions taken in individual ToR.

The two management structures (CIP as Organization and RTB as CRP) have similarities and the presentation may sometimes appear redundant. Nevertheless, Programs needs to adopt an adaptive structure fitting with management levels defined by the System Management Office for CRPs and with enough flexibility to integrate internal rules and functions of all the Organization (e.g. Bioversity, CIAT, CIP, CIRAD, IITA).
The Organization needs to integrate disciplinary perspective, represented by DCE, and management perspective, represented by SOs, Regional offices, etc.
For these reasons, roles and responsibilities are presented in two different tables.
Four management levels were identified within Programs and three within Organizations:

1. Overall management (n)
2. Project management (n-1, only for Programs)
3. Cluster of activities management (n-2)
4. Component/Activities management (n-3)

The scheme, presented after the tables, presents the proposed relationships between different management levels and among the two structures.

Roles	Responsibilities
Within the Program	
Overall management	
Program Director	Oversee the Program-M&ES
Program Manager	Ensure the overall coordination of the Program-M&ES in communication with Organizations focal points and Flagship Project Leaders (n-1)
Organization Focal Point	Ensure the quality and availability of data and reports for the Organization, manage and recall deadlines and tasks to Cluster leaders (n-2) and reporting scientists (products and projects leaders)
Impact assessment Focal points	Advice and collaborate with M&E staff in order to ensure a well established communication and complementarity among M&E and IA Collaborate and ensure advice for the design and implementation of adoption studies and IDOs monitoring.
Project management	
Flagship Project leaders (n-1)	Review and consolidate reports (CoA leaders), analyse and interpret progress and results achievement
Cluster of activities management	
Cluster Leaders (n-2 – CoA)	Analyse and interpret progress and results achievement, CoA report (focusing on Lead/linked products and outcomes) preparation and transmission to Flagship project leaders
M&E officer (Country level)	Coordinate outcome-related data collection, data processing and data recording in the IT-platform, compilation of scientists' reports at country level
Component / Activities management	
Reporting scientists (Product Leaders)	Review and consolidation of reports (Outputs reporting scientists), Product report (focusing on Lead/linked products) preparation and transmission to Cluster leaders
Reporting scientists (Output leaders)	Responsible for data verification and validation, mid-term and annual reports (focusing on output level) review, validation and transmission to product leaders
M&E officer (project level)	Responsible for output- and outcomes-related data collection and analysis, collaboration with partners and supervision when data collection ensured by them Field reports compilation, mid-term and annual report preparation (project level)
Scientists with technical staff	Output- and outcomes-related data collection and analysis, collaboration with partners and supervision when data collection ensured by them
IT-system manager	Responsible for the technical maintenance and adaption of the web enabled platform. Provide online support to users.

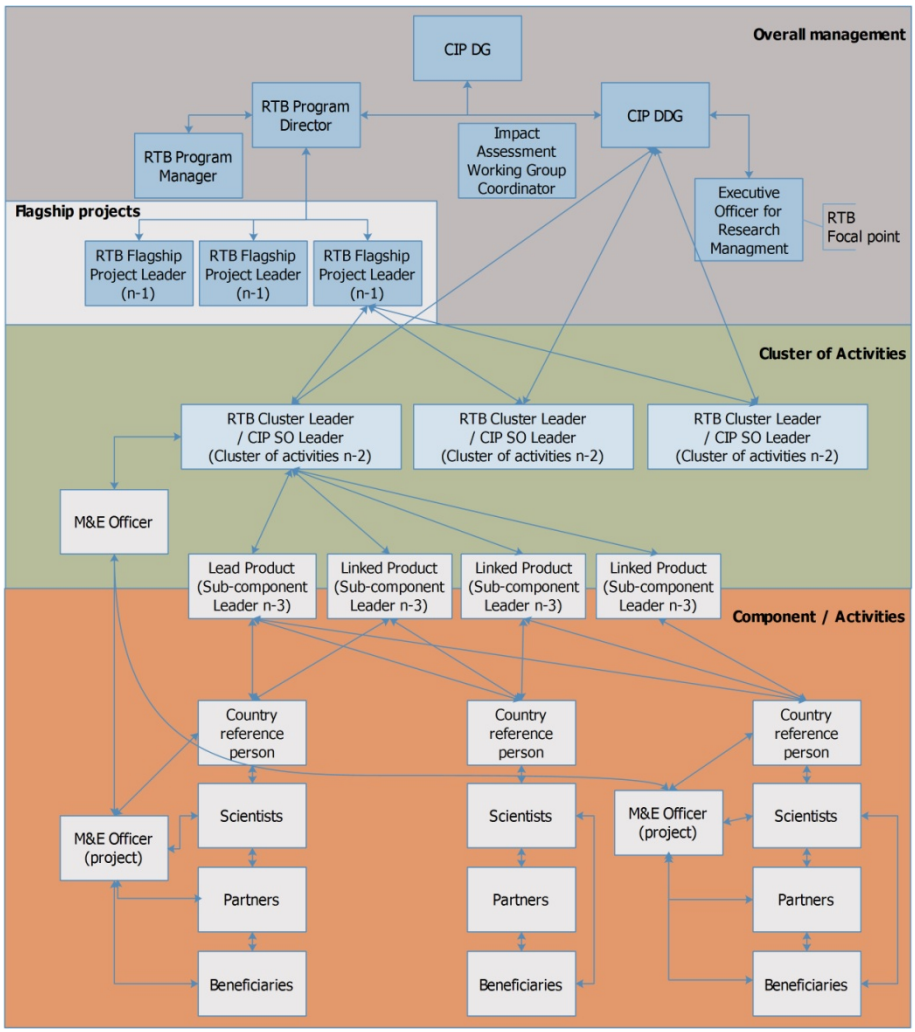
Table 7 – Roles and responsibilities within the program.

Roles	Responsibilities
Within the Organization	
Overall management	
Director General	Oversee the Organization-M&ES
Deputy Director General	Ensure the overall coordination of Organization-M&ES
Executive Officer	Support DDG in its functions. Ensure the communication with SO leaders, recall deadlines and tasks related to M&E.
DCE leaders	Support the definition of specific indicators for assessing the quality of science in respective disciplines. Report on the science component of project portfolio.
Regional Directors	Analyse and interpret progress and results achievement for improving Regional BP, partnership and fundraising strategies.
Impact assessment Sc.	Advice and collaborate with M&E staff in order to ensure a well established communication and complementarity among M&E and IA Collaborate and ensure advice for the design and implementation of adoption studies and IDOs monitoring.
IT-system manager	Responsible for the technical maintenance and adaption of the web enabled platform. Provide online support to users.
Strategic Objective management (CoA)	
SO Leader	Analyse and interpret progress and results achievement, SO report (focusing on Lead/linked products and outcomes) preparation and transmission to DDG
Country coordinator	Support SO leaders in coordinating the review and consolidation of scientists' reports (focusing on output level)
M&E officer (SO level)	Coordinate outcome-related data collection, data processing and data recording in the IT-platform, compilation of scientists' reports at country level
Component / Activities management	
Project leader / Product leader	Review and consolidation of reports (Outputs reporting scientists), Product report (focusing on Lead/linked products) preparation and transmission to Cluster leaders
Reporting scientists (Leaders for an output)	Responsible for data verification and validation, mid-term and annual reports (focusing on output level) review, validation and transmission to country coordinator
M&E officer (project level)	Output- and outcomes-related data collection and analysis, collaboration with partners and supervision when data collection ensured by them Field reports compilation, mid-term and annual report preparation (project level)
Scientists with technical staff	Output- and outcomes-related data collection and analysis, collaboration with and supervision of partners for data collection

Table 8 – Roles and responsibilities within the organization.

Figure 8 shows with different background colours the three management levels using CIP as Organization (Center) and RTB as Program (CRP).
For the Program we considered the Flagship project level as a sub-level in the Overall management.
As said in the introduction the example below present a mix structure where there is partial coincidence between Organization and Program structure (e.g. three of the six CIP-SO are in line with the RTB-clusters). In these cases the Cluster of activities level in RTB is coincident with the Strategic Objective level in CIP. Responsibilities within
A more complex and more frequent situation will be in place with other SO and in general with other Organizations where activities are not fully aligned to the Program structure. For these situations a specific arrangement should be developed and agreed between the Program and the Organizations.

Figure 8 - Management levels within CIP and RTB and linkages among different positions for the implementation of monitoring activities



7 Data Management

7.1 Data Flow

Depending on the monitoring level, data flows through specific steps and involve different users. We present here four of the main process planned to take place while implementing the M&E system.

7.1.1 Data flow for activities

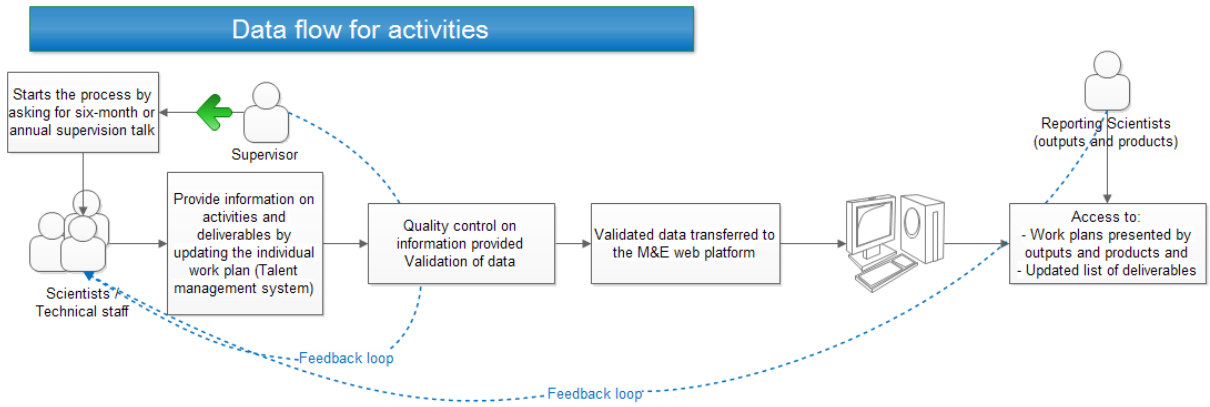


Figure 3 – Schematic flow of data collection and analysis when monitoring activities

The process for activity related data starts with the Supervisor sending a reminder to scientists and technical staff asking for an update of the status of the individual work plan implementation. This step is internally managed by the Organization. CIP for example uses the Talent Management System to facilitate the comunication between users. Scientists and technical staff will provide information on activities, deliverables and will upload relevant documents (reports, publications, etc.). Supervisors will check the quality and then validate the information recorded. Blue lines in the scheme represent feedback loops among users.

Validated data will be automatically transferred to the M&E platform and made visible for other relevant users (i.e. scientists with reporting responsibilities on outputs and outcomes). The process should take place every six months.

7.1.2 Data flow for outputs and products

SO/CoA start the process of periodic review of the progress made on outputs and products. Scientists having output reporting responsibilities will first provide information on output status, milestones achievement and available deliverables. They will compile and use information coming from the process previously described (see 7.1.2). They will fill an online questionnaire with different parts (See sections 4.2 and 4.3).

Scientists having product/activity reporting responsibilities will ensure a quality control on information provided on outputs (blue lines in the scheme represent feedback loops among users). After revising, they let the information flow through the M&E platform. The web platform will

aggregate data on ouptuts at the product level and reporting scientists provide a descriptive overview on the status of the products based on these data. They also fill an online questionnaire (See sections 4.2 and 4.3).

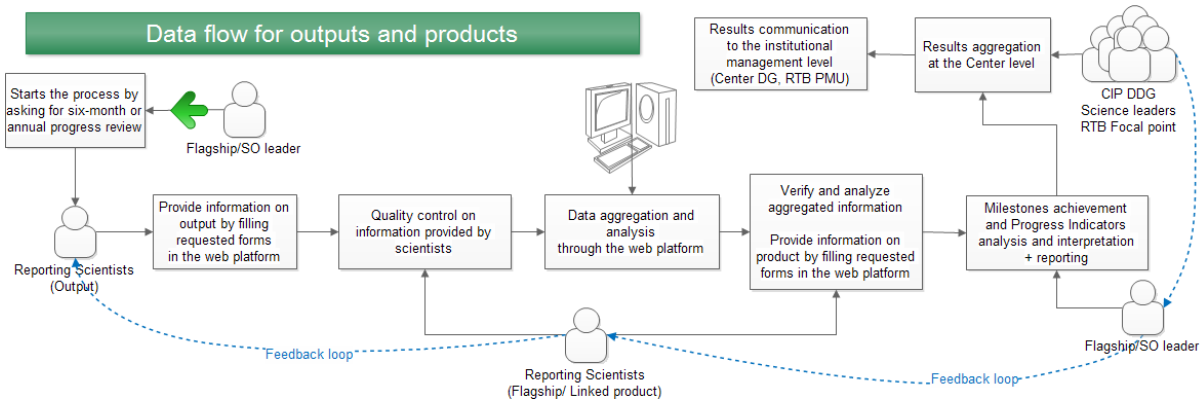


Figure 4 - Schematic flow of data collection and analysis when monitoring outputs and products

SO/CoA receive, through the M&E platform, aggregate data on outputs and products. The M&E platform will support the calculation of the values for the output progress indicators (aggregate at this level (n-2)).

Data validated and transmitted by SO leaders will be received at the center level by the DDG, the Science leaders and the Program focal points. At the same time and without any other formal validation process, data will also be available for the Organization-DG and the Program Management (PMU) unit of the Program.

The process should take place every six months.

7.1.3 Data flow for indicators

Considering the nature of certain indicators we do not have all the information available to give a complete view of the processes needed to collect, verify, record, aggregate and analyze a broad range of data types. Because of the differences in the nature of data and in the measurement frequency, measurement of indicators will follow at least two different processes. The first one designed for the research outcome level and the second one for the development outcome level (DO and IDO). We exemplify the two processes in this section.

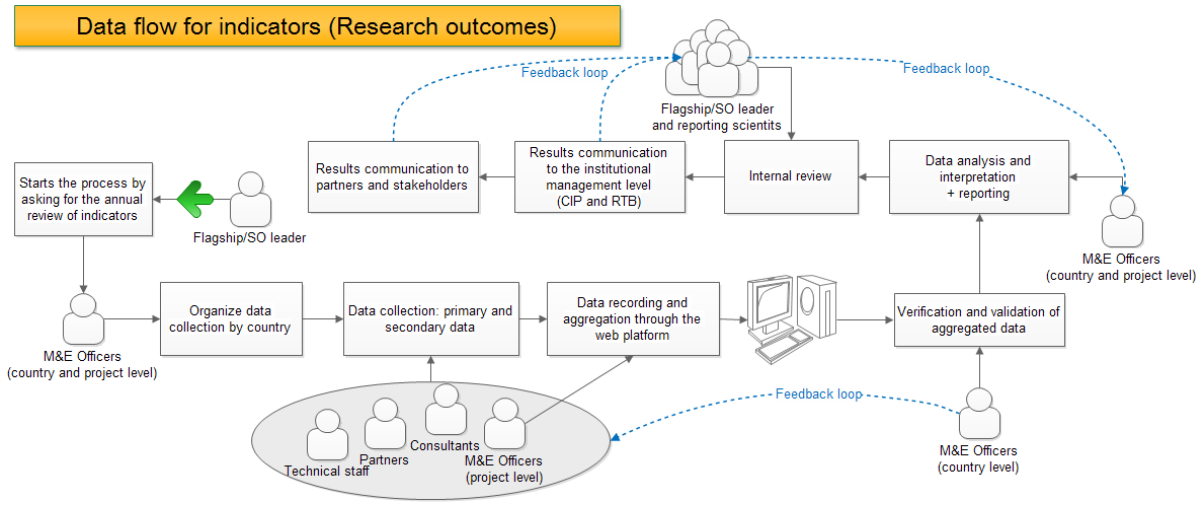


Figure 5– Schematic flow of data collection and analysis when monitoring research outcomes

SO/CoA start the process of annual review of indicators (research outcomes level). M&E officers at country and project level are in charge of the organization and the coordination of data collection. At the project level, the M&E officer coordinates the work with colleagues, partners and consultants. Primary and secondary data are collected and analysed following standardised methodologies. M&E officers (project level) record into the M& Platform the value of the indicators and upload documents on raw data and data analysis. The M& Platform won't be designed to process and analyse raw data. Raw data is uploaded as files.

In a given country and for a given SO/CoA, a defined list of indicators will be applicable every year. M&E officers (country level) verify and validate data provided on all the applicable indicators.
The set of indicators (RO level) for a SO/Cluster is analysed and the results interpreted by the M&E officers. They prepare and submit a report for internal review. The internal review is conducted under the responsibility of the SO/CoA leaders and with the participation of reporting scientists (output and product level). The internal review is not intended to influence the results of the monitoring but will ensure the quality control on data collection and analysis.
SO/CoA leaders communicate monitoring results to institutional management and they follow the publication and communication to partners, stakeholders and donors.

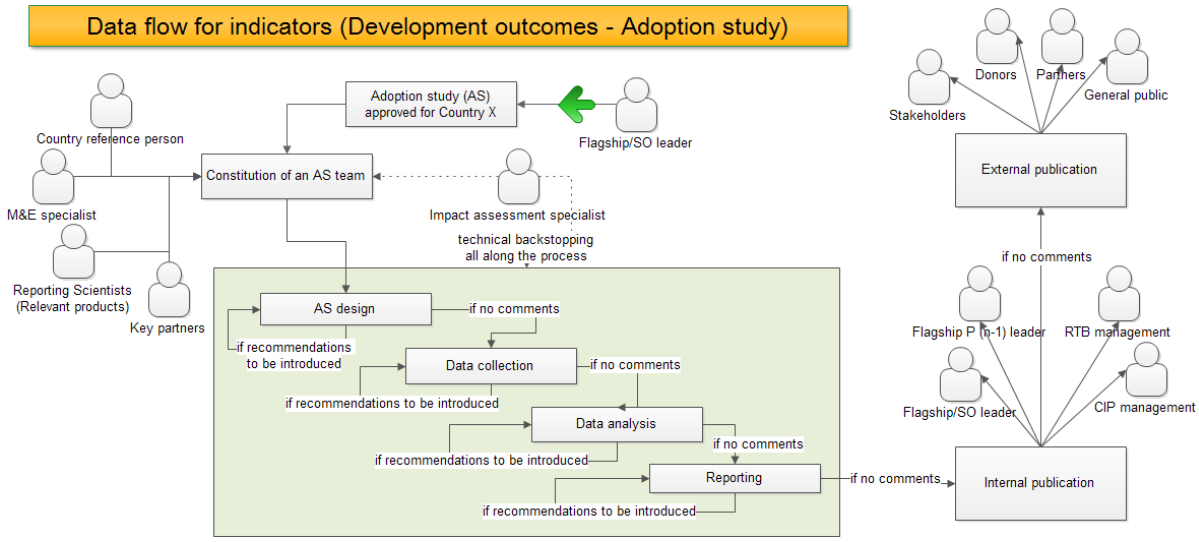


Figure 6– Schematic flow of data collection and analysis when monitoring development outcomes

The image above exemplifies the case of indicators at DO and IDO level. According to the stage of development of the cluster of activities in targeted countries, the SO/CoA team decide every year (t-1) which indicator to be taken into account and measured during the following year (t) (See also the table in section 5.2 on measurement frequency). On year (t) the SO/CoA leader starts the process by facilitating the creation of a team that is in charge of designing and implementing the activities to update the indicator's value (in this example, a study on the adoption of a new technology).

As shown, the group is composed of the program's staff and some key partners and supported by an Impact assessment specialist. The specialist should ensure technical backstopping throughout the process until the completion of the study. When finalized, the study is internally reviewed before its publication.

7.1.4 Annual timeline

MONTH	1	2	3	4	5	6	7	8	9	10	11	12
Program	**Annual report**								**Annual meeting**			**POWB**
CoA/SO						**Adoption and impact studies (DO, IDO)**						**Decision on DO and IDO to be monitored Y+1**
									Annual outcome monitoring (RO)			
		Annual PIPA workshop			**Six-month monitoring outputs, products**						**Six-month monitoring outputs, products**	
Center		**Annual report**				**Mid-term review**			**Annual meeting**		**Business Plan**	
	Individual work plans				**Six-month monitoring activities**						**Six-month monitoring activities**	

This annual timeline summarizes the implementation of monitoring activities showing the Program level, a common level constituted by SO/CoA[29] and the Organization level.

[29] This level corresponds to CoA (n-2) in the CRP terminology.

The annual cycle of program management starts with the elaboration of planning documents (POWB, BP, Individual work plans), this phase takes place in the last months of the year (t-1) and the first months of year (t).
The first quarter of the year is also characterized by the reporting phase of the year (t-1). Both the Organization and the Program will prepare during this phase their annual report.
In the second quarter of the year the mid-term review of the activities included in the individual work plans will be realized. It constitutes the first step for the revision of progress made in outputs and products development and delivery.
In the third quarter of the year, annual meetings (program and Organization level) are organized. The annual meetings should allow to: share the results of mid-term reviews; define orientation for the planning of the year (n+1). This trimester also sees the implementation of the outcome monitoring. The measurement of indicators defined at research outcome level (RO) starts here and is pursued until the end of the year (t). Indicators at higher level (DO and IDO) will need more demanding studies which are planned at the end of the year (t-1) and implemented throughout the year (t).
Monitoring activities in the last quarter of the year should be: the annual review of activities, outputs and products and the finalization of the indicators' measurement. Monitoring findings enhance the reporting documents and also the planning phase of the year (t+1) that starts in this trimester.

7.2 Data analysis

The M&E Platform supports the data storage and analysis at different levels but won't be designed to process raw data referring to more demanding studies carried-out to monitor indicators at the outcome level.
The M&E Platform would provide essential information on inputs (human and financial resources), activities, outputs and outcomes. It will facilitate the organization (e.g. program hierarchy, defined categories and metadata, etc.), the aggregation (e.g. by program levels, geographic dimension, grouping by categories and other metadata, etc.) and the analysis (e.g. progress against targets, of data registered). Data search and selection is enabled and supported by filtering functions.
The M&E Platform allows the presentation of data graphically, including time series of data referring to indicators, progress made against targets, etc.

7.3 Data storage

Data will be stored in a database accessible online through the M&E Platform.
Regular backups on the Organization/Program server are planned by default as a database function. Backups allows to secure data and also access to historical data that, for some reasons, have been removed from the online version of the database.
Data registered through the M&E Platform will be stored using tables. The entire database with the defined relationships among tables is exportable (by the Administrators of the system) as well as single tables and queries (by users with standard processes – Excel format). Uploaded documents duly categorized (reports, publications, raw data, etc.) are stored in a specific database repository.

The M&E Platform is in communication with other systems (i.e. Talent Management System, OCS) and selected data will be periodically exchanged avoiding the duplication of data-entry.

7.4 Data sharing and learning

The access level to the M&E Platform is defined according to the user category. Access to data also depend on the user rights. Category and rights are defined having in mind both CG and external users (e.g. partners, donors).

In general, access to data is facilitated to all the staff and only personal or confidential data responds to specific rules. The rules already established for other systems (i.e. Talent Management System and OCS) with which MEL will communicate will be enforced.

Monitoring findings will be made public after internal reviews (See section 7.1). The overall architecture is design around modules that enable learning such as the knowledge sharing and survey. The knowledge sharing module includes the sub-sections on Blogs, Outcome Stories, Resource Packs, Knowledge evaluation and MEL Space. The survey module includes instead thematic sub-section to engage users in learning feedbacks. Finally the discussion module and live chat allow the users to ensure that information are shared and feedback used by management to adapt planning and implementation of projects.

8 Reporting the findings

This chapter presents the different types of report that will be a "standard output" of the M&E system. This translates into a process and specific formats for reports. It also means that data and information stored in the system is accessible by users (depending on their access level) and used to develop other customized reports.

Depending on the level along the Impact pathway and the pace of data entry, information is updated in accordance with a specific frequency and available as showed in the table.

All the reports are available on a web site to online consultation and download. Printable versions of online reports would be made available.

Reporting level	Frequency per year
Outcomes	Once
Products and outputs	Once
Activities and inputs	Twice

8.1 Reports

Annual Report

- Performance matrix based on Programs progress indicators
- Outcome indicators
- Outcome stories

IDO report

<u>One page IDOs presentation</u>

- IDO list with a short introductory text

<u>One page summary for the selected IDO</u>

- List of Flagship projects and CoA/ SO contributing to the selected IDO
- Indicators organised by crop / metric
- Targeted countries

Flagship projects report

- List of Organization and annual budget
- List of Scientists collaboration
- Outcomes and Targets
- Targeted countries

Cluster of Activities/ Strategic Objective report

CoA/SO selection and listing page

- Multiple criteria filter tool
    - Flagship project
    - Type (delivery, discovery, learning and support),
    - Geography (regions, countries)
    - Crop
    - Center
- CoA/SO shown in the filtered list will be described by their title and a short text
- Links to: 2 pager or other documents presenting the CoA/SO

Three pages summary for the selected CoA/SO

- Impact pathway (table or visualized IP)
- Indicators (with targets and measured values)
- Products and outputs
- Cluster of activities leader and team
- Partners (purpose/area/country)
- Targeted countries (organized by stage)
- Budget

Lead and Linked Product report

Product selection and listing page

- Multiple criteria filter tool
    - Flagship project, CoA/SO
    - Category and keywords (e.g. tool, technology, gender-sensitivity, climate change, etc.)
    - Geography (regions, countries)
    - Crop

One page summary for the selected product

- Completion status compared to annual target (general and with output details)
- Link to all available deliverables (organised by output)
- List of categories (e.g. tool, technology, gender-sensitivity, climate change, etc.)
- Reporting scientist and team
- Targeted countries

Outcome stories

- Defined in accordance with CGIAR template.

Output report

Output selection and listing page

- Multiple criteria filter tool
    - Flagship project, CoA/SO, Product
    - Category (e.g. tool, technology, gender-sensitivity, climate change, crop, etc.)
    - Geography (regions, countries)
    - Crop

One page summary for the selected output

- Completion status compared to annual target
- Link to available deliverables
- List of categories (e.g. tool, technology, gender-sensitivity, climate change, crop, etc.)
- Reporting scientist and team
- Targeted countries

Publications list

Publication selection and listing page

- Multiple criteria filter tool
    - Flagship project, CoA/SO, Product
    - Category (e.g. tool, technology, gender-sensitivity, climate change, crop, etc.)
    - Document type (e.g. article, book, report, policy brief, methodological guide, etc.)
    - Geography (regions, countries)
    - Crop

Appendices

A 1 Definition of key terms

Cluster of activities – The level n-2 in CRPs' management structure. They include strategic objective, theory of change and impact pathway. They require a work package comprising both the research needed to develop and improve the products and the capacity development which is also required to achieve the strategic objective.

Evaluation – The systematic and objective assessment of an on-going or completed project, program or policy, its design, implementation and results. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making processes of major stakeholders.

Flagship project – The level n-1 in CRPs' management structure. They are organized around research with high impact potential. They are comprised of one or more clusters of activity (level n-2).

Impact pathway – The causal pathway that outlines the expected sequence of events to achieve desired objectives. It begins with inputs, moves through activities and products, and culminates in outcomes and impacts (SLOs).

Indicator – A quantitative or qualitative variable that represents an approximation of the characteristic, phenomenon or change of interest (for instance, efficiency, quality or outcome). Indicators can be used to monitor research or to help assess for instance organizational or research performance. (E.g. Quantitative: # of varieties released; # farmers adopting a new technology; % yield increase. Qualitative: next-users satisfaction with research outputs or collaboration; consumers' perception of new commercial product; seed producers' opinion on changes in hygiene regulations).

Monitoring – A process of continuous or periodic collection and analysis of data to compare how well a project, program, or policy is being implemented against expected results, in order to track performance against plans and targets, to identify reasons for under or over achievement, and to take necessary actions to improve performance. Monitoring is usually the responsibility of program management and operational staff, while evaluation as defined in this Policy and Standards is carried out by external evaluators. Monitoring is also used for research purposes to guide decisions on research design and adjustment.

Outcomes:

- **Research outcomes** (RO) represent uptake and further use of research outputs by next users targeted by the CRP, such as NARS, researchers and national policy makers. They are generated as a result of research, capacity building and advocacy activities by the CRP.

- **Development Outcomes** (DO) represent capacity and behavioural changes concerning end-users. They include the adoption of new technologies (e.g. varieties, IPM technologies) by farmers or changes in competencies such as their ability to assess post-harvest losses.
- **Intermediate development outcomes** (IDO) represent changes that occur in medium term (5 to 10 years) that affect positively the welfare of the targeted population or environment (direct benefits) or the enabling environment (policies and institutions). They result, at least in part, from research carried out by the CGIAR and its partners.
- **System Level Outcomes** (SLO) represent the high level impact goals of the CGIAR: Reduction in rural poverty; Increase in food security; Improving nutrition and health; and more sustainable management of natural resources.

Output – A product or service resulting from a research activity or a set of related activities attributable to the Organization or the Program that could be used by a partner or other stakeholders. Outputs are of different types:

- **Knowledge** (e.g. frameworks and concepts that could change the way in which users/stakeholders think and act)**;**
- **Tools** (e.g. decision-support tools, guidelines and training manuals that could change the way in which users/stakeholders allocate resources and/or implement activities);
- **Data** (e.g. open access databases maintained);
- **Technologies and practices** (e.g. agriculture-related and NRM-related technologies and innovations including those that address climate change adaptation and mitigation, management and cultural practices).

Product – Significant, measurable and time bound deliverables which are made available to next users (i.e. outside of Program and/or Organization). Must be based on the result of a research activity or set of related activities attributable to the Program and/or Organization (as opposed to adopting or using products that have been developed elsewhere), which is clearly specified and distinguishable from other research products.

Products are organized like a daisy. There is a central lead product and a series of linked products, the petals, which jointly are necessary to achieve the outcomes described in the impact pathway.

Result – The output, outcome or impact (intended or unintended, positive and/or negative) of an intervention.

Results based management (RBM) – Results-based management is a management strategy by which all actors, contributing directly or indirectly to achieving a set of results, ensure that their processes, products and services contribute to the desired results (outputs, outcomes and higher level goals or impact) and use information and evidence on actual results to inform decision making on the design, resourcing and delivery of programmes and activities as well as for accountability and reporting. 5

Target – The performance or results targets are the more specific results that are expected to occur over a multi-year timeline as a result of the CRP's efforts. They would relate to the various levels of results described in the IPs/ToCs. The time frame involved is 3, 6, 9, 12 years. Targets need to be set along the impact pathway from the CRP research outputs to the common IDOs 2.

Theory of change (ToC) – ToC explains why it is expected that an intervention will bring about the desired results. It articulates the theory behind the intervention. A ToC is a model of how the interventions work, a model of the causal linkages behind the intervention. As such, ToC involve a hypothesis about how the intervention works that need to be periodically revisited and validated (working group IDOs 2013). ToC has a number of components:

- *Impact pathway*— The causal pathway for the cluster of activity that outlines the expected sequence to achieve desired objectives beginning with inputs, moving through activities and products, and culminating in outcomes and impacts (SLOs).
- *Assumptions* — the events and conditions understood as necessary for the link in the intervention ToC to occur. They are developed from a mix of stakeholder and social science theories. Along with the activities they comprise the intervention causal package. There is a causal package for each link in the theory of change.
- *Risks* - external events and conditions that could put the link at risk.
- *Other Explanatory Factors* — other factors or conditions that might explain the occurrence of the observed result other than the influence of the intervention causal package.
- *Unintended effects* — positive or more usually, negative unanticipated effects that occur as a result of the interventions activities and results

Adapted from the following sources

RTB Memo 08-2013
RTB Business Case template for Cluster of Activities, October 2014
A Results-Based Management Framework for CRPs. Draft document. May 2014
ISPC-CGIAR - Strengthening strategy and results framework through prioritization. 2012
OECD/DAC - Glossary of Key Terms in Evaluation and Results-Based Management. 2010
UNDG - RBM Handbook. 2011

A 2 Tools

Questionnaire on Activities	
Purpose	Collect information on implementation of activities and deliverables
Answered by	Scientists and technical staff
Verified by	Direct supervisor
Time line	Every six months

Questionnaire on Outputs and Products	
Purpose	Describe and characterize outputs and products, collect information on progress made, achievement of milestones, partnerships
Answered by	Output and product reporting scientists
Verified by	Product reporting scientists Cluster/SO Leaders
Time line	Every six months (After the revision of the activities)

Secondary data	
Purpose	Provide information for calculating indicators values
Sources	National and international statistics, partners reports and databases
Verified by	M&E officers
Time line	According to the indicators monitoring frequency

Annual Partner questionnaire	
Purpose	Collect a feedback on partners' satisfaction, qualitative appreciation of research uptake
Answered by	Partners representatives
Verified by	M&E officers
Time line	Once a year

Surveys	
Purpose	Collect data on indicators
Answered by	Depending on the needs defined by indicator
Verified by	M&E officers
Time line	Every 1-2 years for Research outcomes; Every 3–5 years for Development Outcomes; Every 3-5 years for IDO

Field trials	
Purpose	Provide information on research output performances
Answered by	Scientists and technical staff
Verified by	Direct supervisor
Time line	

Adoption and Impact studies	
Purpose	Collect information on indicators (Development outcomes and IDO level)
Answered by	IA teams
Verified by	Internally peer reviewed
Time line	Annually determined for each Cluster/SO

Outcome stories	
Purpose	To document outcome achievement in a format suitable for broader dissemination
Answered by	Scientists involved in a Project / Product
Verified by	Communication Focal points
Time line	Outcome completion (yearly)

Case studies, special studies	
Purpose	Analyze specific topics, systematize information on successful strategies, conduct gender analysis on identified technologies, etc.
Answered by	Ad-hoc teams
Verified by	CoA/SO leaders
Time line	Annually determined for each CoA/SO

A 3 Indicator sheet

RESEARCH OUTCOME INDICATOR SHEET EXAMPLE

Cluster of Activities	SO3-PO1 Improving Livelihoods of Potato Farmers in Africa by Tackling Deteriorated Seed Quality through an Integrated Approach
Country	Kenya
Related outcome	RO Farmer breeders, NARS, and private sector actors breed, release, and promote varieties using participatory approaches
Indicator	# pro-poor potato varieties released (data disaggregated by country, CIP-related varieties, release by private sector/NARS)
Definition	Explanation of the indicator
Unit	A standard to express the magnitude of a measurement
Baseline (2014)	4 varieties (1 private sector; 3 NARS)
Data requirement and sources	Name of released varieties Parental lines Year of release Name and category of company / NARS Source: KEPHIS registry for released varieties http://www.kephis.org/
Data Collection process and tools	Link to available documentation
Data users	
Responsible	Data collection and registration: M&E specialist Data analysis and reporting: Country leader Quality control:

A 4 CRP indicators of progress, with glossary[30]

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
KNOWLEDGE, TOOLS, DATA		
All	1. Number of flagship "products" produced by CRP	Glossary: These are frameworks and concepts that are significant and complete enough to have been highlighted on web pages, publicized through blog stories, press releases and/or policy briefs. They are significant in that they should be likely to change the way stakeholders along the impact pathway allocate resources and/or implement activities. They should be products that change the way these stakeholders think and act. Tools, decision-support tools, guidelines and/or training manuals are not included in this indicator. Specify what type of products, from above glossary, you have included in the number indicated under 2013; if relevant specify geographic locations
All	2. % of flagship products produced that have explicit target of women farmers/NRM managers	Glossary: The web pages, blog stories, press releases and policy briefs supporting indicator #1 must have an explicit focus on women farmers/NRM managers to be counted Provide concrete examples of what you include in this indicator
All	3. % of flagship products produced that have been assessed for likely gender-disaggregated impact	Glossary; Reports/papers describing the products should include a focus on gender-disaggregated impacts if they are to be counted Provide concrete examples of what you include in this indicator
All	4. Number of "tools" produced by CRP	Glossary: These are significant decision-support tools, guidelines, and/or training manuals that are significant and complete enough to have been highlighted on web pages, publicized through blog stories, press releases and/or policy briefs. They are significant in that they should be likely to change the way stakeholders along the impact pathway allocate resources and/or implement activities Based on the glossary, describe the types of outputs you include in this indicator
All	5. % of tools that have an explicit target of women farmers	Glossary: The web pages, blog stories, press releases and policy briefs supporting indicator #4 must have an explicit focus on women farmers/NRM managers to be counted
All	6. % of tools assessed for likely gender-	Glossary: Reports/papers describing the products should include a focus on gender-disaggregated impacts if they are to be counted

[30] Source: Templates for annual reporting for the years 2012 and 2013 from the Consortium to the Fund Council concerning the CRPs – annex 1

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
	disaggregated impact	
All	7. Number of open access databases maintained by CRP	Indicate the type of data bases (e.g., socio-economic survey data; crop yields in field experiments…) you are reporting on in the following columns
All	8. Total number of users of these open access databases	
All	9. Number of publications in ISI journals produced by CRP	
1,2,3, 4, 6	10. Number of strategic value chains analyzed by CRP	Clearly indicate the type of value chains you are reporting on in the next columns
1,5,6,7	11. Number of targeted agro-ecosystems analysed/characterised by CRP	Specify the type of system, using its main products as descriptors (e.g., mixed crop, livestock system; monoculture of XX; agroforestry with maize, beans, etc..; mixed cropping with upland rice, cassava, etc...)by geographical location and agroecological zones (FAO typology)
1,5,6,7	12. Estimated population of above-mentioned agro-ecosystems	
CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS		
All	13. Number of trainees in short-term programs facilitated by CRP (male)	Glossary: The number of individuals to whom significant knowledge or skills have been imparted through interactions that are intentional, structured, and purposed for imparting knowledge or skills should be counted. This includes farmers, ranchers, fishers, and other primary sector producers who receive training in a variety of best practices in productivity, post-harvest management, linking to markets, etc. It also includes rural entrepreneurs, processors, managers and traders receiving training in application of new technologies, business management, linking to markets, etc., and training to extension specialists, researchers, policymakers and others who are engaged in the food, feed and fiber system and natural resources and water management. Include training on climate risk analysis, adaptation, mitigation, and vulnerability assessments, as it relates to agriculture. Training should include food security, water resources management/IWRM, sustainable agriculture, and climate change resilience Indicate, from the above list, the general subject matters in which training was provided .
All	14. Number of trainees in short-	(see above, but for female)

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
	term programs facilitated by CRP (female)	
All	15. Number of trainees in long-term programs facilitated by CRP (male)	Glossary: The number of people who are currently enrolled in or graduated in the current fiscal year from a bachelor's, master's or Ph.D. program or are currently participating in or have completed in the current fiscal year a long term (degree-seeking) advanced training program such as a fellowship program or a post-doctoral studies program. A person completing one long term training program in the fiscal year and currently participating in another long term training program should be counted only once. Specify in this cell number of Master's and number of PhD's
All	16.Number of trainees in long-term programs facilitated by CRP (female)	(see above, but for female)
1,5,6,7	17. Number of multi-stakeholder R4D innovation platforms established for the targeted agro-ecosystems by the CRPs	Glossary: To be counted, a multi-stakeholder platform has to have a clear purpose, generally to manage some type of tradeoff/conflict among the different interests of different stakeholders in the targeted agro-ecosystems, and inclusive and clear governance mechanisms, leading to decisions to manage the variety of perspectives of stakeholders in a manner satisfactory to the whole platform. Indicate the focus of each platform in this cell, including geographical focus
TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT		
All	18. Number of technologies/NRM practices under research in the CRP (Phase I)	Glossary: Technologies to be counted here are agriculture-related and NRM-related technologies and innovations including those that address climate change adaptation and mitigation. Relevant technologies include but are not limited to: • Mechanical and physical: New land preparation, harvesting, processing and product handling technologies, including biodegradable packaging • Biological: New germplasm (varieties, breeds, etc.) that could be higher-yielding or higher in nutritional content and/or more resilient to climate impacts; affordable food-based nutritional supplementation such as vitamin A-rich sweet potatoes or rice, or high-protein maize, or improved livestock breeds; soil management practices that increase biotic activity and soil organic matter levels; and livestock health services and products such as vaccines; • Chemical: Fertilizers, insecticides, and pesticides sustainably and environmentally applied, and soil amendments that increase fertilizer-use efficiencies; • Management and cultural practices: sustainable water management; practices; sustainable land management practices; sustainable fishing practices; Information technology, improved/sustainable agricultural production and marketing practices, increased use of climate information for planning disaster risk strategies in place, climate change mitigation and energy

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
		efficiency, and natural resource management practices that increase productivity and/or resiliency to climate change. IPM, ISFM, and PHH as related to agriculture should all be included as improved technologies or management practices. New technologies or management practices under research counted should be only those under research in the current reporting year. Any new technology or management practice under research in a previous year but not under research in the reporting year should not be included. Clearly indicate, from the list above, the type of technology and geographical location that you are reporting on in next columns
All	19. % of technologies under research that have an explicit target of women farmers	The papers, web pages, blog stories, press releases and policy briefs supporting indicator #x must have an explicit focus on women farmers/NRM managers to be counted
All	20. % of technologies under research that have been assessed for likely gender-disaggregated impact	Reports/papers describing the products should include a focus on gender-disaggregated impacts if they are to be counted
1,5,6,7	21 Number of agro-ecosystems for which CRP has identified feasible approaches for improving ecosystem services and for establishing positive incentives for farmers to improve ecosystem functions as per the CRP's recommendations	Use the same classification of agro-ecosystem as for indicator 11 above, including geographical location and agro-ecological zone
1,5,6,7	22. Number of people who will potentially benefit from plans, once finalised, for the scaling up of strategies	Indicate the potential number of both women and men
All, except 2	23. Number of technologies /NRM practices field tested (phase II)	Glossary; Under "field testing" means that research has moved from focused development to broader testing (pilot project phase) and this testing is underway under conditions intended to duplicate those encountered by potential users of the new technology. This might be in the actual facilities

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
		(fields) of potential users, or it might be in a facility set up to duplicate those conditions. Clearly identify in this cell the type of technology and the geographical locations of the field testing/pilot projects reported in next columns
1,5,6,7	24. Number of agro-ecosystems for which innovations (technologies, policies, practices, integrative approaches) and options for improvement at system level have been developed and are being field tested (Phase II)	Clearly identify in this cell the type of technology and the geographical location of the field testing/pilot projects, and use the same classification of agroecosystem as for indicator 11, specifying the type of agroecosystems in which field testing is taking place
1,5,6,7	25. % of above innovations/approaches/options that are targeted at decreasing inequality between men and women	
1,5,6,7	26. Number of published research outputs from CRP utilised in targeted agro-ecosystems	
All, except 2	27.Number of technologies/NRM practices released by public and private sector partners globally (phase III)	Glossary: In the case of crop research that developed a new variety, e.g., the variety must have passed through any required approval process, and seed of the new variety should be available for multiplication. The technology should have proven benefits and be as ready for use as it can be as it emerges from the research and testing process. Technologies made available for transfer should be only those made available in the current reporting year. Any technology made available in a previous year should not be included. Clearly identify in this cell the technologies/practices thus released (scale up phase), the geographical areas concerned
POLICIES IN VARIOUS STAGES OF DEVELOPMENT		
All	28. Numbers of Policies/ Regulations/ Administrative Procedures Analyzed (Stage 1)	Number of agricultural enabling environment policies / regulations / administrative procedures in the areas of agricultural resource, food, market standards & regulation, public investment, natural resource or water management and climate change adaptation/mitigation as it relates to agriculture that underwent the first stage of the policy reform process i.e. analysis (review of existing policy / regulation / administrative procedure

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
		and/or proposal of new policy / regulations / administrative procedures).Please count the highest stage completed during the reporting year – don't double count for the same policy. Clearly identify in this cell the type of policy, regulations, etc. from the above list
All	29. Number of policies / regulations / administrative procedures drafted and presented for public/stakeholder consultation (Stage 2)	….. ……that underwent the second stage of the policy reform process. The second stage includes public debate and/or consultation with stakeholders on the proposed new or revised policy / regulation / administrative procedure. Celarly identify in this cell the type of policy, regulations and so on, and the geographical location of the consultations
All	30. Number of policies / regulations / administrative procedures presented for legislation(Stage 3)	: … underwent the third stage of the policy reform process (policies were presented for legislation/decree to improve the policy environment for smallholder-based agriculture.) Clearly identify in this cell the type of policy and the country/region concerned
All	31. Number of policies / regulations / administrative procedures prepared passed/approved (Stage 4)	: …underwent the fourth stage of the policy reform process (official approval (legislation/decree) of new or revised policy / regulation / administrative procedure by relevant authority). Clearly identify in this cell the type of policy and the country/region concerned
All	32. Number of policies / regulations / administrative procedures passed for which implementation has begun (Stage 5)	: …completed the policy reform process (implementation of new or revised policy / regulation / administrative procedure by relevant authority) Clearly identify in this cell the type of policy and the country/region concerned
OUTCOMES ON THE GROUND		
All	33. Number of hectares under improved technologies or management practices as a result of CRP research	Clearly identify in this cell the geographic locations where this is occurring and whether the application of technologies is on a new or continuing area
All	34. Number of farmers and others who have applied new technologies or management	Clearly identify in this cell the geographic location of these farmers and whether the application of technologies is on a new or continuing area and indicate: 34 (a) number of women farmers concerned 34(b) number of male farmers concerned

CRPs concerned by this indicator	Indicator	Glossary/guidelines for defining and measuring the indicator, and description of what the CRP includes in the indicator measured, based upon the glossary
	practices as a result of CRP research	

A 5 Theory of Change from project to program: a nested approach for a plausible plan

The process to develop a ToC within the CGIAR context, but not only, is meant to serve more than one purpose. First of all, it is meant to help articulate the strategic orientation of a project, or, on a wider scale, of a program at country or regional level, which can support future strategic programming and strategic communication. Second, and related to the above, it enables presenting the variety of projects in which CG centers are active as all contributing to certain strategic focus areas, and overall to a specific research programme. Third, it helps identify the way in which projects and country programs seek to contribute to higher-level objectives, in particular in relation to the global impact ambitions (2022) of the CRPs to which all projects, country and regional programs make a specific contribution (See fig 12).

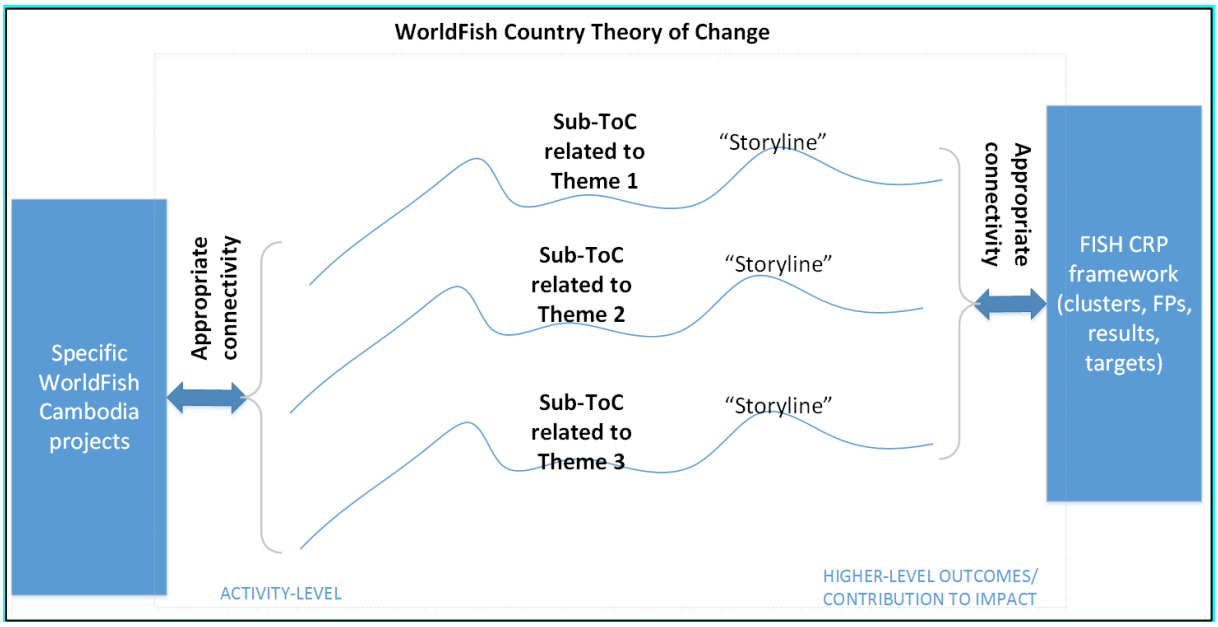


Figure 12 – Essential idea for developing country-level ToCs (the example of WorldFish Cambodia)

The development of a theory of change in terms of the interactive process is the first and most important part of what a ToC can do for a project or for a program. It provides a platform for interactively - as staff and with partners – develop a shared understanding about change processes and what and who is expected to play what role in this. ToC developing processes can be quite time consuming thus they require an appropriate approach to take in consideration deadlines and staff-time required to consolidate a sufficiently good ToC. In addition, by connecting a project and country programme ToCs to the shared CRP framework means looking not only at leading centers but also to management partners and others.

The basic ToC template for a country program ToC: an example from the FISH CRP

During 2018, the FISH CRP has implemented a set of country level TOC.

The process has been consolidate and it is now ready to be shared with a specific publication. This wants therefore be a brief description of the main steps at the base of that process. One of the first steps to take in order to develop a ToC for a country program is to identify appropriate country (strategic) themes. Consider to which FISH CRP related impact the theme contributes to tune the storyline to the relevant level of ambition. For each theme, explore a plausible storyline in figure 13. In effect, the ToC development process aims to develop an image of the anticipated unfolding change story (into the future) in relation to strategic focus areas.

Most of the country programs opted for following the FISH CRP's flagships of aquaculture and small-scale fisheries in terms of strategic focus areas around which to develop a theory of change.

Figure 14 presents the template as was used in the ToC development process in all participating country programs. It is meant to strike a balance between being sufficiently comprehensive and being sufficiently simple to prevent getting lost in too much detail.

It is important to note that it appears to present a linear idea about how change happens. That is one of the drawbacks of trying to stylise a visual outline of a theory of change in this way. It is essential that this is addressed in any explanation about related ToCs: the ToC in this type of template is a simplification of more complex realities. Some outcomes will need to become reality before some research activities can start, for example. The ToC outline is meant to help create overview and a shared understanding among staff and partners about what needs to be considered and addressed if change is to take place. But it is, by nature, a reduction of the realities which the program faces.

That is one of the key reasons why the ToC needs to be revisited from time to time, to update it with improved understanding about how change is happening in reality as the program unfolds.

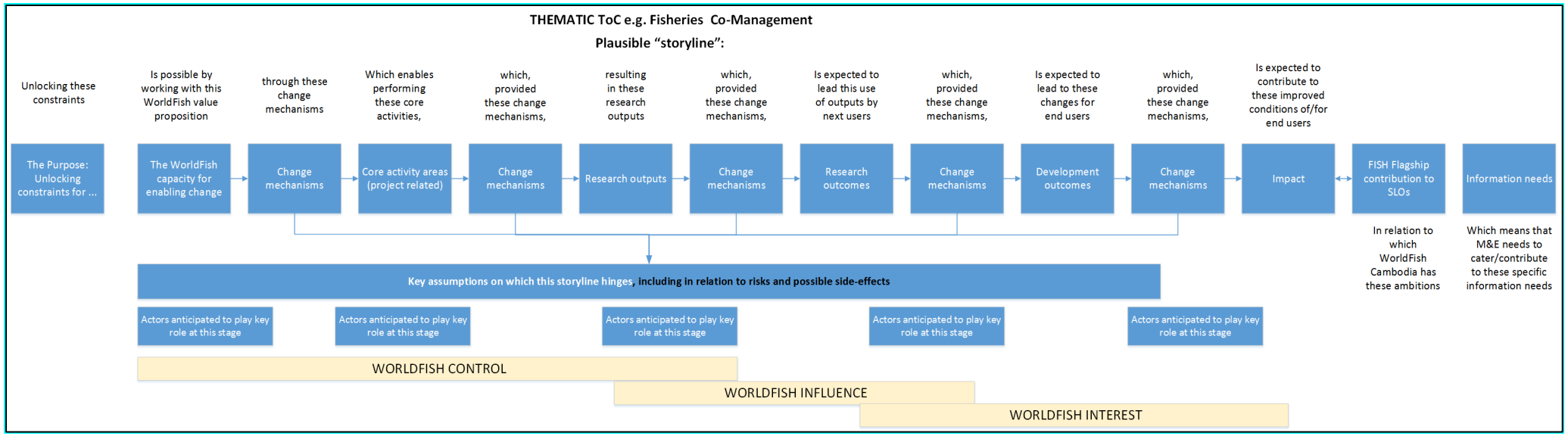


Figure 13 –An impression of an anticipated unfolding story which is essentially what the ToC seeks to articulate.

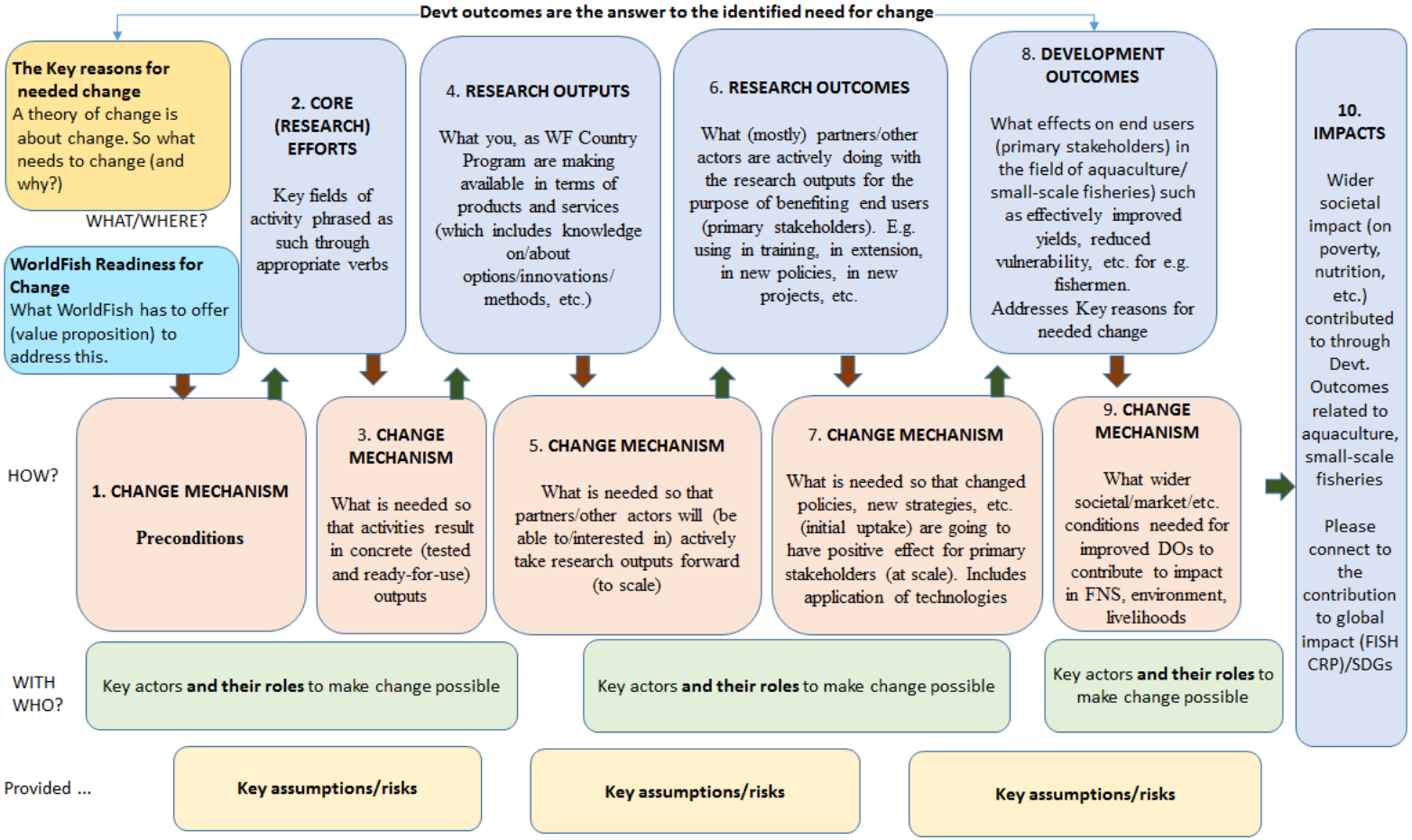


Figure 14 – The visual outline of the theory of change as applied in all participating country programs.

The following provides additional guidance on exploring dimensions of the theme-related theory of change:

1. **Readiness for change.** This is about the key value proposition of WorldFish Cambodia. What do we have to offer/what have we put in place which forms a potential for contributing to positive impact in Cambodia in the field of aquaculture and small-scale fisheries?

Examples: Facilities, expert staff, agreements with so and so, established collaboration/partnership with so and so, international network with …, experience, etc.

2. **Change mechanisms connecting value proposition with core activity areas.** This is about what makes it possible to use the WorldFish potential towards key activity areas (project-related).

Examples: Access to funding, organisational structures, experienced field staff, good relationships with fish farmers/fishermen, good relationships with partners, etc. You will need to identify what the core activity areas are before identifying related change mechanisms.

3. **Core activity areas**. In what are the core fields of activity under this theme (relates to the envisaged outputs).
4. **Change mechanisms connecting core activity areas to research outputs**. This is about what makes it possible to produce good quality outputs as result from core activity areas. It may be the same as the defined change mechanisms, but may also require additional change mechanisms. E.g. involvement of end users and/or of scaling partners in design.
5. **Research outputs**. Research outputs related to this particular theme. Consider how these align with the FISH CRP related research outputs.

Taking the following steps will benefit from using the following overviews as a background:
https://fish.cgiar.org/theory-change-sustainable-aquaculture
https://fish.cgiar.org/theory-change-small-scale-fisheries
https://fish.cgiar.org/crp-level-impact-pathways-and-theory-change-overview
Concrete examples of change mechanisms are further elaborated on in the FISH CRP proposal (see e.g. pages 45-46, and 71-72; even though there is no FP3 anymore, change mechanisms as described on page 95 may still be useful to consider). The following steps move from sphere of control to sphere of influence to sphere of interest of WorldFish Cambodia.

6. **Change mechanisms connecting research outputs to research outcomes**. What will it take to see research outputs become used/applied by next users in their operations? How to engage with (scaling) partners so that research outputs get a life beyond the research project? How to get a buy-in from (scaling) partners and other actors (fish farmers, fishermen) so that innovations are taken forward by them.

Examples: Appropriate knowledge/understanding about use of research outputs convincingly communicated.

7. **Research outcomes**. What are the direct outcomes hoped for in terms of what partners and stakeholders are doing differently because of research outputs? So it is about the use/application of research outputs. E.g., a particular partner provides training on a management practice which was part of the research outputs.

8. **Change mechanisms connecting research outcomes to development outcomes**. What will it take to see changes in next users (such as scaling partners) lead to wider benefits enjoyed by end users (primary stakeholders) from the introduction of the research outputs? This e.g. relates to capacity development support to partners. The way in which this is done affects scope of effectiveness.
9. **Development outcomes**. Please consider the list of examples from the FISH CRP ToCs. This is about the change (indirect outcomes) which happened because of what partners and stakeholders started to (be able to) do differently. E.g. fish farmers attended training which was organised by partner, and as result they now manage their fish ponds differently (e.g. enabling higher productivity).
10. **Change mechanisms connecting development outcomes to development impact**. What will it take to see development outcomes contribute to positive impact (at scale)? Great if farmers can produce more fish in their fish ponds, but is that the same as improving their livelihoods, etc.? E.g., how about market access, prices in the market, consumer preferences, labour, etc. Will they eat it themselves, or sell in the market (in case of hoped-for effect on nutrition)? Etc.
11. **Contribution to impact**. How does this affect primary stakeholders' situation in terms of Poverty & Livelihoods; Food & Nutrition Security, and/or Natural Resource Systems and Ecosystem Services? Describe key envisioned impacts along those lines.