CGIAR RESEARCH PROGRAM ON Fish
Led by WorldFish

Innovations

Common Results Reporting Indicators

Monitoring, Evaluation and Learning (MEL) and Data Team
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1. Definition

Research and development innovations are new or significantly improved (adaptive) outputs or groups of outputs - including management practices, knowledge or technologies. This could also refer to a significant research finding, method or tool. A significant improvement is one that allows the management practice, knowledge or technology to serve a new purpose or a new class of users to employ it, for example a new variety, a blend of fertilizer for a particular pond type, or a tool modified to suit a particular management practice.

2. Stages

Stage 1 - End of research phase (discovery/proof of concept)
Stage 2 - end of piloting phase (if relevant)
Stage 3 - available for uptake;
Stage 4 - uptake by next user

'Next users' are defined as actors such as national research institutions, extension organizations, NGOs and others, who access CGIAR products directly and can help CRPs reach end-users.

3. Types of Innovations

3.1 Genetic

Genetic innovations include new and adapted varieties, cultivars, lines, and breeds. The stages of reporting in this category include the successful production of a new or adapted variety that has, potentially, a substantial impact (whether through tolerance, efficiency, productivity or other) as evidenced in a paper due for publication (Stage 1); which are then tested more widely (Stage 2), if successfully tested then are ready for uptake - certification and licensing taken care of as necessary (Stage 3) and are then take up and used by the next user (Stage 4). Counting varieties and breeds will be by trait by agro-ecological zone. That is to say each unique trait in a zone can be counted as one innovation. The assumption being that the trait will be adapted sufficiently for each zone to be considered a separate innovation.

Example from the FISH CRP:

Title of Innovation	Innovation Description	Stage of Innovation	Description of this stage reached	Geographic Scope
DArTseq molecular genetic marker developed for rohu carp (Labeo rohita)	Analysis of DArTseq genetic marker data successfully identified and characterised single nucleotide polymorphisms (SNPs) and silicoDArT markers in rohu. The analysis identified an unexpectedly high level of sibship among breeding population founders and found no or low levels of divergence in SNPs among the three river populations of rohu carp (Labeo rohita) studied.	Stage 1: discovery/proof of concept	The sibling relationships identified will be used in pedigree-based genetic analyses of the WorldFish breeding populations to improve the accuracy of genetic parameter and breeding value estimates, and will be used in future parental selection and mate allocation to avoid inbreeding in the short and long term	Global

3.2 Production Systems and Management Practices

Production Systems and Management Practices includes Integrated Pest Management (including grafting), Sustainable Intensification (e.g. mechanization, small-scale irrigation, planting schedules, soil management, etc.), Livestock Management, Post-Harvest technologies or management practices for feed or food, Natural Resource Management, Vaccines and Animal Health Services. The innovation should be assessed and counted in terms of whether the research firstly identifies potential practices and system components to generate new/improved system components or management practices with the potential to be superior to current farmer practices in field testing under end-user conditions (Stage 1), which are then tested more widely (Stage 2), if successfully tested then are ready for uptake - certification and licensing taken care of as necessary (Stage 3) and are then take up and used by the next user (Stage 4).

Example from the FISH CRP:

Title of Innovation	Innovation Description	Stage of Innovation	Description of this stage reached	Geographic Scope
Climate smart culture of genetically improved tilapia through In-Pond Raceway System (IPRS)	An In-Pond Raceway System (IPRS) was developed in Egypt to recycle water within tilapia pond. The system is established using a raceway cells/units inside ponds and creating a water current in the cell. The open pond area is subdivided by dikes to allow full water circulation through the raceways. The system was developed to improve water use efficiency in tilapia ponds, particularly farms adopting genetically improved tilapia.	Stage 2: successful piloting	Testing of water efficient culture systems carried out in WorldFish research facility in Abbassa. Climate smart aquaculture system low cost In-Pond Raceway System (IPRS) tested. Project team provided technical support for three private fish farmers who established eleven IPRS units in three governorates (Behera, Kafr el Sheikh and Giza).	National - Egypt

3.3 Social Science

Social science innovations includes research concerning the effectiveness of agricultural policy options (policy research); research on the socio-behavioral, socioeconomic, or sociopolitical factors that influence decision-making; research concerning economic forces affecting farmer choices, technology and management practice adoption, etc. (economic research); Research or creation of new/improved tools for market access, including financial and insurance products (market access); and nutrition research. Further examples of innovation in social science research may include evidence and recommendations that program participants provide to influence changes in policy and regulatory frameworks; or methods, decision-support tools and models to design/improve programs and projects or to develop value chains, land use planning approaches, etc; or even the development of a new curriculum or development of behavioral change models that ultimately influence the design of educational/extension programs. The determination of a social science research innovation is around the uniqueness or value of the research finding(s) as evidenced in an article submitted for publication, working or conference paper (Stage 1). Replicating the research in other sites and/or testing it through examining causality and proxy / intermediate results through quasi-experimental or

experimental (randomized trials) techniques5 (Stage 2). The availability of the research to next users in an accessible form represents Stage 3, while the 4th Stage is demonstrated uptake includes any support for, or adoption by, the public and/or private sectors at any point during the reporting period.

Example from the FISH CRP:

Title of Innovation	Innovation Description	Stage of Innovation	Description of this stage reached	Geographic Scope
Gender Transformative Approaches in relation to small-scale fishery and small-scale aquaculture	An approach to engaging with gender within development that goes beyond 'business-as-usual' gender approaches in that it explicitly addresses, rather than accommodates, underlying gender barriers that perpetuate inequalities. Emerging findings indicate that the transformative approaches may contribute to more potent gender outcomes. GTA approach increased women's participation in fishing (from 5% to 75%) and increased women's contributions to intra-household decisions about the income generated from processing fish (49%).	Stage 2: successful piloting	The Gender Trasformative Approaches have been successfully piloted in Bangladesh and Zambia, and lessons have been included. Piloting phase is continuing in different contexts. As a result of these approaches, there was an increase in women's contributions to intra-household decisions about the income generated from processing fish (49%).	Global

3.4 Biophysical Research

Biophysical research is an interdisciplinary science that applies the approaches and methods of physical sciences to study biological systems and may include computational biology, decision support tools, and geospatial analysis.

Example from the FISH CRP:

Title of Innovation	Innovation Description	Stage of Innovation	Description of this stage reached	Geographic Scope
Life Cycle Assessment tool for analyzing future environmental impacts of aquaculture		Stage 3: available/ ready for uptake		National - Indonesia

3.5 Research and Communication Methodologies and Tools

Research and Communication Methodologies and Tools includes new or improved research and communication tools including Information Communication Technology (ICT) such as seed catalogues and nutrient content databases that are used to disseminate scientific information and research findings to the public and private sectors. Communication tools include approaches and tools that have innovations embedded within them.

Example from the FISH CRP:

Title of Innovation	Innovation Description	Stage of Innovation	Description of this stage reached	Geographic Scope
Big data technology and system (PeskAAS) to improve small-scale fisheries management in Timor Leste	A digital catch documentation system combined with tamper proof, solar powered trackers (developed by the partner Pelagic Data Systems) provided near-real time small-scale fisheries production and effort information to government fisheries managers on a decision dashboard using open-source software.	Stage 4: uptake by next user	National level uptake of the innovation by the government of Timor-Leste in May 2019 as their official fisheries monitoring system. There are approximately 5000 registered fishers, and many more seasonal and part-time fishers in Timor-Leste.	National - Timor-Leste

4. Important to Remember

This is a complex indicator that tracks new knowledge, new or significantly improved management practices and new or significantly improved technologies as they move through the research and development cycle from idea to widespread dissemination. This is often a very long process.

The biggest challenge with this indicator is defining what constitutes an 'innovation'. The decision on what should be reported as an innovation lies with the research management (e.g. CRP management). In many circumstances, an innovation may be identical to an output (as reported on MEL), but outputs may also be grouped together as a single innovation. The important thing to bear in mind is that the main objective is not to produce large numbers, but to put together a database that shows progress in a way that is clear to others. Research managers should not feel under pressure to 'over-report' innovations to boost counts. The main objective of this metric is to capture significant innovations in a database, rather than to place emphasis on the numbers, and it is well recognized that innovations vary tremendously in their importance and scope. The MEL team will be reviewing submissions to present good examples and help research programs to define, categorize, and exemplify innovation types as experience builds.

5. Examples from other CRPs from 2019

Title of Innovation	Low glycemic rice variety
CRP	RICE
Innovation Type	Genetic (varieties and breeds)
Innovation Description	Variety of rice that shows both low glycemic index and slow digesting properties after consumption.
Stage of Innovation	Stage 2: successful piloting
Stage Description	The effect of variety, parboiling soaking temperature and steaming time on physicochemical, nutritional and digestive properties of rice have been evaluated. Based on the results, more varieties have been selected and currently being evaluated both for parboiling regimes.
Geographic Scope	Global

Title of Innovation	Bean cultivar: NAROBEAN 7
CRP	Grain Legumes and Dryland Cereals
Innovation Type	Genetic (varieties and breeds)
Innovation Description	NAROBean 7 was developed and released in Uganda in 2019. it is drought tolerance and resistance to major diseases (anthracnose, BCMV, ALS and rust).
Stage of Innovation	Stage 3: available/ ready for uptake
Stage Description	The variety has been released and is available for the farmers to plant.
Geographic Scope	Natinal - Uganda

Title of Innovation	"Three-legged stool" approach, a combined intervention to improve food safety in informal or traditional markets
CRP	Agriculture for Nutrition and Health
Innovation Type	Production systems and Management practices
Innovation Description	The three aspects of the approach include (1) training and technologies, which include training, awareness raising and simple technologies such as disinfectants); (2) the enabling environment, meaning that regulatory authorities have to be on board with the intervention and there has to be some mechanism for institutionalisation and a means of quality assurance; and (3) motivation and incentives, which are essential but very context specific. The approach has potential to improve food safety at scale
Stage of Innovation	Stage 1: discovery/proof of concept
Stage Description	The approach was most successfully used with dairy vendors in Kenya. Training vendors produced acceptably safe milk and the licensing and certification scheme legitimised traders. Now this approach has been tailored to test in six value chains in Ethiopia (3), Kenya, Burkina Faso and Uganda:
Geographic Scope	Multi-national (Uganda, Burkina Faso, Ethiopia, Kenya)

Title of Innovation	Grazing management innovation to improve animal production and reduce GHG emissions
CRP	Climate Change, Agiculture and Food Security
Innovation Type	Production systems and Management practices
Innovation Description	This innovation is based on the optimization of dry matter intake by cattle and improving nutrient consumption per unit eating time. At certain grass heights (20 cm) the cows consumed larger bites and of better quality. The result was more propionate (precursor of milk) and less methane emissions. Delivering the farmer an instruction as simple as controlling grass height may impact improving milk productivity and reducing emissions. This innovation was awarded as outstanding PhD thesis
Stage of Innovation	Stage 1: discovery/proof of concept
Stage Description	The concept was proved that bites of 20cm of kikuyo grass improved milk productivity and reduced CH4 emissions compared to other grass heights. The next step will be piloting in farmers' field with representation of other grass species used for milk production in Colombia.
Geographic Scope	Regional - Latin America & the Caribbean

Title of Innovation	Contribution of community seed banks to socio-ecological resilience
CRP	Policies, Institutions, and Markets
Innovation Type	Production systems and Management practices
Innovation Description	In Guatemala, a network of community seed banks supported by the local NGO ASOCUCH is preserving, multiplying and distributing threatened maize and bean varieties. The innovation corresponds to the finding that the community seed banks have contributed to socioecological resilience through private seed conservation and provision of seeds during emergency situations
Stage of Innovation	Stage 3: available/ ready for uptake
Stage Description	Community seed banks are being promoted by ASOCUCH.
Geographic Scope	Sub-national - Guatemala

Title of Innovation	Guidelines for cactus pear establishment and maintenance in India
CRP	Livestock
Innovation Type	Production systems and Management practices
Innovation Description	Cactus pear as an alternative fodder reserve is a new concept for most farmers in India. In addition to changing perceptions, promotion of best agronomic practices is needed to facilitate wider adoption.
Stage of Innovation	Stage 3: available/ ready for uptake
Stage Description	Several nurseries have been established across India to evaluate promising accessions. Meanwhile intense program is taking place to enlighten decision makers, government officials and farmers about the importance of cactus pear. The demand has been created but we do not have enough plant material.
Geographic Scope	National - India

Title of Innovation	Agrobiodiversity Index, tool to measure agrobiodiversity and identify concrete actions to achieve diverse and sustainable food systems
CRP	Agriculture for Nutrition and Health
Innovation Type	Social Science
Innovation Description	The Agrobiodiversity Index (ABDI) is the first standard way of measuring agrobiodiversity and helps identify concrete actions to achieve diverse, sustainable and resilient food systems. The ABDI has 22 indicators, comprising three commitment indicators, four action indicators and 15 status indicators across three pillars, which are aligned with nine of the Sustainable Development Goals (SDGs). The ABDI aims to assess performance yearly and help companies/countries track their progress towards fostering sustainable food systems.
Stage of Innovation	Stage 3: available/ ready for uptake
Stage Description	In early 2019, Bioversity International published the methodology and a separate report summarizing data from ten countries. Several public and private collaborations to apply the ABDI are ongoing, including with six companies that are including this in their corporate platforms.
Geographic Scope	Global

Title of Innovation	Pilot database for management of drone (UAV) image data with basic functionality developed.
CRP	RICE
Innovation Type	Biophysical Research
Innovation Description	Pilot database management system for drone images and metadata has been developed and work is in progress for automated high-throughput phenotyping. Potential utilization of new CG group license with Pix4D with the database.
Stage of Innovation	Stage 2: successful piloting
Stage Description	The database has been tested with IRRI drone / UAV data and the moment and functionalities are being developed and others fine tuned, before upscaling to other data sources and functionalities and release.
Geographic Scope	Global

Title of Innovation	VirusDetect: high-throughput sequencing of small RNAs for virus detection
CRP	Roots, Tubers and Bananas
Innovation Type	Research and Communication Methodologies and Tools
Innovation Description	VirusDetect is a bioinformatics pipeline that efficiently analyzes large scale small RNA (sRNA) datasets for both known and novel virus identification. The technology has proven to be highly efficient, sensible and reliable in plant and animal virus detection
Stage of Innovation	Stage 4: uptake by next user
Stage Description	3 NARS have been applying the technology to identify viruses affecting important food crops: Mikocheni Agricultural Research Institute (Tanzania) for bean viruses; Gulu University (Uganda) and Crop Research Institute (Ghana) for sweetpotato viruses. Kenya Plant Health Inspectorate Service (Kenya) is planning to use the technology for sweetpotato viruses.
Geographic Scope	Global

For FISH CRP 2019, check Table 4 of Annual Report 2019

For more examples from the FISH CRP and other CRPs, please consult the CGIAR Results Dashboard

For more information about innovations, please consult the CGIAR reference on Innovations

Learn how to report innovations in MEL with this 1-minute PowerPoint presentation and this video