



Annual Plan of Work and Budget (POWB) for 2017

CGIAR Research Program on Fish Agri-Food Systems (FISH)



WAGENINGEN UR
For quality of life



Lead Center:



FISH Annual Plan of Work and Budget (POWB) for 2017

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A. CRP LEVEL

A1. Delivery

A1.1 Adjustments/ changes to your Theories of Change

No significant adjustments have yet been made to the ToC¹ presented in the [FISH proposal](#) but changes to the ToC and impact pathways will be made during 2017 to make them more operational, and to account for W1-2 funding changes. The 2017 CGIAR Financing Plan provided W1-2 funding to FISH FP1 (Sustainable Aquaculture), but no W1-2 budget for Flagship 2 (Sustaining Small-Scale Fisheries). FP2 will be pursued solely through W3/bilateral funding in 2017 limiting the ability for cross-cluster syntheses and investment in MEL, gender and some key research activities. FP3 (Enhancing the Contribution of Fish to Nutrition and Health of the Poor) was not approved by the CGIAR in 2017. FISH will seek to deliver some SLO-2 related nutritional outcomes through links with the WorldFish Research Program on Value Chains and Nutrition. Operational details will be developed during 2017.

A1.2 Highlight expected Outcomes and Outputs

FISH is a new CRP, with new areas of research, and outcomes delivered through expansion and scaling of products, knowledge and services from partnerships and research of CRP Phase 1, particularly the L&F and AAS CRPs. Outputs are a mix of journal articles, working papers and briefs and practical notes, manuals and tools catering to a spectrum of research and development users. Highlights in the **Sustainable Aquaculture** flagship are the development of genomic selection methods and tools for our tilapia genetic improvement research, establishment of baseline carp breeding populations, the integration of biosecurity measures into tilapia breeding programs in response to newly emerging diseases, and integrated aquaculture assessment methods and tools. W3/bilateral investments in the **Sustaining Small-Scale Fisheries** flagship will be directed towards building evidence of the development outcomes of small-scale fisheries research in preparation for a rebid for 2018 W1-2 funding. Gender research will deliver new methods, tools and capability for gender-focused end user needs assessment for fish breeding (FP1) and identification of barriers and opportunities for gender equitable governance and assets in poor fishery dependent communities (FP2). Youth and capacity assessments will provide knowledge, capability and research questions for future integration of these key activities in FISH.

A.1.3 Use of different Funding Sources

In 2017, an estimated 79% of funds will come from bilateral/W3 sources, and 21% from W1-2². A blend of bilateral/W3 and W1-2 sources supports FP1, but only W3/bilateral resources are used for FP2. Bilateral/W3 funds are mostly used to address issues of importance to a specific donor or client. W1-2 facilitates the integration across clusters and the program and covers strategically key areas not funded by bilateral/W3 funds, including new research areas, global syntheses, cross-country collaboration and partnerships, as well as management and support costs. Table 1 provides a financial summary.

A1.4 Planned Revisions to your Program of Work

FISH management assumes that all efforts will be made to realize the CGIAR 2017 Financing Plan communicated to CRPs on 24 November 2016, according to which FISH will receive USD3.8 million of W1-2 funding for 2017. The lack of W1-2 funding for FP2 constrains progress within that Flagship towards all planned cross-cluster and cross-CRP synthesis. The amount of bilateral/W3 funds (USD14.712M) is slightly above that projected in the FISH proposal document for FP1&2 (USD13.864). Milestones and outputs have been adjusted in 2017 given the lack of W1-2 allocation to FP2 in 2017, as well as the removal of any funds related to FP3.

¹ The 2017 plan is based on the revised set of 2017 milestones as provided to the SMO in November 2016

² Based on funding secured by 31 January 2017, and proposals with a high funding probability.

Table 1: CRP planned budget (USD) by flagship for 2017

Flagship Name	Planned Budget 2017 (USD Million)		
	W1-2	W3/bilateral	Total
FP1: Sustainable Aquaculture	3.344	7.903	11.247
FP2: Sustaining Small-Scale Fisheries	0	6.809	6.809
CRP Management & Support Costs	0.456	0	0.456
Total	3.800	14.712	18.511

A2. Collaboration and Integration

A2.1 Contribution to and from Platforms

FISH will focus on three Platforms during 2017. FISH collaboration with the **Big Data Platform** will be pursued to identify collaborative opportunities and co-develop workplans. FISH will continue to support CGIAR efforts for compliance to the open access/open data policy, and through the Organize Module of the Platform will collaborate, especially around fish genetics and aquaculture data. Under the Inspire Module, FISH has prioritized mobile technology based data collection from aquaculture farmers on disease, performance assessments and satellite imagery data for spatial planning for potential challenge grants. FISH will engage with the **Excellence in Breeding Platform** through participation in the Expert Advisory Groups for Modules 1 (Breeding program excellence) and 2 (Trait discovery and breeding tools and services), particularly in the development of an animal oriented breeding assessment form. FISH will implement expert assessment of its tilapia breeding programs to set new breeding directions beyond 2017 and contribute to documentation of best practices in each of the platform modules in relation to fish and to project proposals as appropriate. FISH will engage with the **CGIAR Gender Platform**, with further details to be established as the new Platform's mandate and plans are developed. FISH will participate in the Gender Platform, facilitating information sharing, including gender Webinars, Gender Research Coordinator virtual meetings and gender capacity development opportunities (eg Penn State gender training).

A2.2 Cross-CRP interactions

Work with other CRPs in 2017 will conform to the outlines presented in [Annex 3.7](#) of the FISH proposal through coordination with other CRP researchers and co-investment in selected research. **PIM** FISH FP1 collaboration will involve co-funded research on foresight approaches, with special focus on future fish supply-demand models and aquaculture projections in Africa, and with FP2 on fisheries governance reform, notably in Myanmar. **CCAFS** cooperation with FP1 and FP2 will focus on making use of CCAFS Learning Platforms, connecting CCAFS-funded research with FISH bilateral projects in the Mekong region and Bangladesh, production of a paper on mitigating GHG in aquaculture, as well as joint resource mobilization. **RICE** collaboration will focus on rice-fish systems in Bangladesh and the Ayeyarwady delta in Myanmar and also with **RTB** in exploration of new ingredients for fish feeds. **LIVESTOCK** collaboration will focus mainly on fish feed ingredient assessments, and gendered ownership and assets in fish and livestock value chains. FISH will explore more cross-CRP collaboration as the year moves ahead, including with **A4NH** and **WLE**. FISH will engage with significant gender-related **multi-CRP** collaborative initiatives: i) FISH team members leading a cross-CRP Gender PDF Capacity Development Initiative to inform CGIAR breeding programs; ii) Membership in the Gender & Breeding Innovation Workshop Organizing Committee; and leading case contributions from

Bangladesh and Philippines contributing to CGIAR's cross-CRP **GENNOVATE** 2017 outputs.

A2.3 Expected Efforts on Country Coordination

FISH will support CGIAR country coordination during 2017, as described in the FISH Proposal and guided by the recommendations of the SMB working group (expected mid-March 2017). With only limited W1-2 funding to be deployed, FISH will focus initially on Bangladesh where WorldFish is actively engaged in the CGIAR coordination committee. In other countries, where relevant, we will focus on strengthening/clarifying the CRP participation in the country coordination teams, confirming the FISH representative, and establishing lines of communication with other non-target countries, as appropriate. An early emphasis will be on sharing plans for FISH M&E in target countries to explore opportunities for synergies. In addition, the FISH representative in relevant country coordination teams will explore how CGIAR-internal communication and planning can be improved to identify opportunities for cross-CRP synergies, and how joint engagement with national stakeholders and alignment with national priorities can be efficiently and effectively executed.

A3. Management, Governance and Monitoring, Evaluation, Learning

A3.1 Relevant Changes in Management and Governance

No changes will be made to the management and governance structures detailed in the FISH proposal. FISH managing partners include two CGIAR Centers (WorldFish and IWMI) and Wageningen University (WUR), James Cook University (JCU) and the Natural Resources Institute (NRI) at the University of Greenwich. Those remain despite the lack of W1-2 funding and the fact that Flagship 3 (Enhancing the Contribution of Fish to Nutrition and Health of the Poor) was not approved. The partners will work on rebids during 2017. No separate FISH program management unit will be established, but administrative support is being provided to the Director and MC through the research support, finance and administrative functions of WorldFish, with clear specifications of services through allocation of program budget, and planned semi-annual review of those services for quality and cost-effectiveness. The Independent Steering Committee (ISC) will be appointed in April 2017.

A3.2 Monitoring, Evaluation, Impact Assessment and Learning Plans

FISH will develop its MEL system during 2017 through recruiting a full-time M&E senior scientist to lead the development of the MEL framework, methods, tools and approaches, including an assessment of MARLO, taking account of any revisions to the ToCs and impact pathways and the finalized sub-IDO targets. No W1-2 or W3/bilateral funding is being assigned to evaluations this year. Key FP1 impact assessments to be funded largely by W3/bilateral sources during the year are (i) an assessment of GIFT tilapia dissemination in Bangladesh and Egypt; and (ii) completion of a SPIA research grant initiated under L&F to assess impacts of improved tilapia dissemination with genomics tools. W3/bilateral funds will be used for a multi-country assessment of small-scale fisheries research investments, as part of FP2 focus during the year on building an evidence base, updating the ToC and impact pathway, and strengthening the case for future investment in SSF research for development. An annual program review and planning meeting will be used to monitor progress at CRP and flagship level, within the framework of FISH's overall theory of change.

B. FLAGSHIP LEVEL

Flagship 1: Sustainable Aquaculture

B1. Delivery

B.1.1 Expected Annual Milestones towards Outcomes 2022

In 2017, FISH FP1 will implement research on fish breeds and genetics, fish health, nutrition and feeds and aquaculture systems, contributing to FP 2022 outcomes as detailed in Table 3.

Key 2017 milestones for *Fish breeds and genetics* research include the development of a genomic selection strategy for improved tilapia breeding programs; completion of impact assessments of prior tilapia dissemination activities in Bangladesh and Egypt to provide new knowledge on yield gaps for future research; dissemination of existing improved strains and completion of a gender-integrated end user preference review that has equipped FISH research teams in Bangladesh, Egypt and Zambia to conduct user preference research. Dissemination of improved tilapia breeds in Bangladesh and Egypt will also continue, and the planning for dissemination programs with national partners in Cambodia and Myanmar accelerated. Those under the *Fish feeds and health* research include the identification of yield limiting disease of tilapias and new biosecurity measures implemented for tilapia breeding programs in Bangladesh, Egypt and Malaysia; identification of high potential novel fish feed ingredients, and packaging and wide dissemination of "best management practices" for feed and health management. Those under *Aquaculture systems* research include completion of assessments of GHG emissions and water and nutrient use efficiency in tilapia and carp aquaculture; establishment of partnership platforms for aquaculture in four focal countries; a set of gender-integrated aquaculture systems assessment tools; and fish supply demand models to inform future FISH aquaculture research in Africa. The FISH MEL system and capacity being developed during 2017 will monitor progress towards corresponding SRF Sub-IDOs and targets specified in Table 2, as well as progress towards annual milestones.

Global and national partners will contribute significantly to FP1, and we expect the number of FISH partners to grow during 2017. Key advanced research partners include Scotland's Rural College (SRUC), the Roslin Institute, University of Stirling (UoS), WUR, CIRAD and Swedish University of Agricultural Science (SLU) in fish breeds and genetics research; WUR, UoS, Exeter University and the Center for Environment, Fisheries and Aquaculture Science (CEFAS) for feeds, fish nutrition and health research; and Stockholm Resilience Center (SRC), Auburn University (AU), UoS and the BoP Innovation Center for aquaculture systems research. Foresight modeling collaboration with IFPRI/PIM and the Australian National University (ANU) will continue. Gender partners include the Institute of Development Studies (IDS) and KIT. NARES partnerships will continue to be a focus, with the Department of Fisheries (DOF) and Bangladesh Fisheries Research Institute (BFRI) in Bangladesh, Department of Fisheries (DoF) in Cambodia, Central Laboratory for Aquaculture Research (CLAR) in Egypt, DoF and the Myanmar Fisheries Federation (MFF) in Myanmar and the DoF in Zambia. Private sector collaboration will also be pursued with Merck/MSD on fish disease treatments, Skretting for feeds development and Aquaspark for financing and business models.

B.1.2 Output towards Outcomes 2022

FISH FP1 outputs and their connection to 2022 outcomes are provided in Table 4. Key outputs from the CoA 1.1 *Fish breeds and genetics* are: a research strategy for tilapia genetic improvement programs aimed at incorporating new traits through genomic selection; assessment reports of on-farm performance in Bangladesh and Egypt; and methods, tools and research capacity for analysis of gender sensitive end user preferences to guide future fish breeding work. Base populations for new genetic improvement programs in Catla carp and Silver carp will be produced in Bangladesh and genomic databases developed for these two species. SPIA-funded research on the use of SNP markers to assess farmer adoption of improved tilapia strains in the Philippines and Bangladesh will be published. Plans for dissemination of improved tilapia will be prepared with partners in Cambodia and Myanmar.

Key outputs from the CoA 1.2 *Feeds, fish nutrition and health* are: Best practice (BMP) guidelines for health and feed management for farming of genetically improved tilapia; epidemiological assessments of tilapia disease in Bangladesh and Egypt leading to new knowledge on yield limiting tilapia diseases and practical biosecurity plans for hatcheries, nurseries and farmers on improved disease control measures; and an inventory of fish feed

ingredients for future research through screening across FISH focal countries. BMP guidelines for tilapia developed during L&F will be packaged as user-friendly tools and guidelines for wide dissemination through partners. Key outputs from the CoA 1.3 *Aquaculture systems* are: an integrated systems framework for assessing the performance of aquaculture in fish food systems, with reference to poor farmers and value chain actors; results from baseline assessments of GHG emissions and water/ nutrient use efficiency in tilapia and carp farming; and futures models for aquaculture in Africa.

Key gender outputs include a set of methods and tools for gender-integrated end user assessments for fish breeding; consolidated mixed method tools for assessing gender and women's empowerment; and new and consolidated knowledge on gender in relation to aquaculture, in particular regarding gender norms and assets and women's empowerment, gender and aquaculture value chains, and preliminary outcomes of gender transformative strategies in aquaculture extension. A FISH youth strategy will be prepared. Capacity development outputs are integrated within many projects within both FPs.

B.1.3 Contribution of W1-2 Funds

Table 3 provides a breakdown and allocation of W1-2 and W3/bilateral funds. Table 3 provides a breakdown and allocation by actual outcomes and outputs.

Flagship 2: Resilient small scale fisheries

B2. Delivery

B.2.1 Expected Annual Milestones towards Outcomes 2022

FP2 has no W1-2 funding in 2017. The absence of W1-2 funds in 2017 constrains FP2's ability to leverage outcomes through limiting its cross-country and cross-project synthesis and limiting integration of key activities such as MEL, gender and youth. Nevertheless, a fully funded W3/bilateral portfolio for FP2 in 2017 will contribute towards FISH 2022 outcomes as detailed in Table 3.

Key 2017 milestones for FP2 are the completion of assessments of adaptive management and livelihood interventions through small-scale fisheries (SSF) research in marine and inland fisheries systems in FISH focal and scaling countries; the identification of barriers to gender-equitable governance and assets in fishery-dependent communities; development of new knowledge and partnerships with RICE in the emerging area of rice-fish systems; and building a conceptual framework for SSF in fish food systems, leading to an empirically-evidenced strategy, ToC and impact pathways for future investment in SSF research.

Managing partners (JCU, IWMI), and new global (FAO) and national partners across the three FISH regions and focal countries will collaborate in achieving these milestones (see Table 2), contributing to the formation of an active and influential coalition of practitioners engaged in SSF research in development.

B.2.2 Output towards Outcomes 2022

FISH FP 2 outputs will derive completely from bilateral projects in FISH focal and scaling countries. In 2017, our focused assessments of SSF are driven by two priority research questions that span the three research clusters: "*have past investments in SSF led to equitable improvements to livelihood and nutrition for poor people?*" and "*how can future investment in SSF research contribute to positive and equitable impacts on the livelihoods and nutrition of the poor?*" Answering these questions will provide guidance on value-for-money proposition inherent in SSF research for development.

Key outputs for CoA 1 *Resilient coastal fisheries* include methods and frameworks for improving adaptive capacity of coastal fishing communities, livelihood diagnostic tools, analysis of micro-finance in livelihood improvements and assessments of the development

outcomes from management interventions by bilateral projects in coastal regions of FISH focal countries in Asia and the Pacific. Key outputs for CoA 2 *Fish in multifunctional landscapes* will include a synthesis of interventions in rice-fish systems, based on bilateral projects in Bangladesh, Cambodia and Myanmar, development of user friendly products to disseminate research findings, and assessments of the development outcomes from bilaterally-funded research and management interventions within inland multifunctional landscapes.

CoA 3 *Fish in regional food systems* will bring together partners (including FAO, JCU, IWMI) that will together generate a series of key global and multi-case syntheses and methods on SSF within fish food systems. Firstly, researchers from Asia, Pacific and Africa will collectively review global case studies built on bilateral investments in FISH focal countries and critically analyze the development outcomes from SSF research in development. Analyses will integrate gender and nutrition, and will span scales of engagement (from local to international levels), including cases from Africa, Asia and the Pacific. This initiative will result in individual cases for publication and a peer reviewed, multi-case journal publication on enhancing the development impacts of SSF through research-in-development. Analysis will assess the role of SSF research in contributing to SLO outcome targets within the SRF. The information collated across W3/bilateral projects and partner cases will be used to refine the ToC and impact pathways for FP2.

In collaboration with FAO, FP2 will also prepare (a) review of methodologies as a journal article; and (b) design a research strategy to fill the global data gaps to quantify and describe employment, participation and economic roles of SSF beyond 2017. This is expected to lead to a larger bilaterally funded research effort in 2018 to update components of the “Hidden Harvests”/“Big Numbers” study completed in 2011 (World Bank/FAO/WorldFish, 2012).

Other FP2 outputs planned for 2017 include: Analyzing and collating global data of the nutritional value of wild-capture fish, particularly those harvested by SSF, in collaboration with JCU, FAO and UoL. This will result in four high impact outputs and associated communications products, with connections to FP1, as well as the WorldFish Value Chains and Nutrition Program; and contributing nutrition and value chain dimensions to a rigorous analysis of research and development investment in SSF in food systems. Here we will draw on evidence collated in other 2017 bilateral projects and outputs to develop a revised and better evidenced proposition for SSF research-in-development within broader programs of fish for nutrition research. The partner consultations and outputs generated through FP2 in 2017 will be used for the preparation of a case for W1-2 investment in FP2 beyond 2017.

Key gender outputs in FP2 are new knowledge on gender barriers and implications in fisheries-dependent communities, surfacing hidden micro-level barriers to equality in fisheries management and innovation that will contribute to achieving the FP2 2022 outcome of reduced poverty through improved management. The second output also represents advances in knowledge of gender barriers and opportunities, but focuses on new understanding of structural (policy) barriers and opportunities for increasing gender equality in the fisheries sector. The third output represents an area of innovation in relation to assets and livelihoods in fisheries contexts: gender transformative models for strengthening livelihoods. The second and third outputs are key foundational work towards 2022 outcomes.

B.2.3 Contribution of W1-2 Funds

No W1-2 funds will be used for Flagship 2 and all research will be funded by W3-Bilateral funds. Table 3 provides a breakdown of W3/bilateral funding by 2022 Outcomes.

FLAGSHIP LEVEL TABLES CONSOLIDATED

Table 2: Flagship contributions to sub-IDs with relevant indicators and targets

FP No.	Mapped and contributing to Sub-IDO	Relevant CRP sub-IDO indicators*	2017 Target**
FP1	Sub-IDO 1.3.1: Diversified enterprise opportunities	# of micro, small and medium enterprises improved and/or diversified in aquaculture value chains as a result of FISH research	Baselines established in FISH focal countries, refined indicator and identify interventions
	Sub-IDO 1.3.2: Increased livelihood opportunities	# increased income in women and men farmers and value chain actors (disaggregated by age and wealth group)	Analyze survey data in Bangladesh and Egypt. Develop methodologies
	Sub-IDO 1.3.4: More efficient use of inputs	Feed conversion, water and nutrient use efficiency	Baseline and methodologies established in 2 countries
	Sub-IDO 1.4.2/2.1.2: Closed yield gaps through improved agronomic and animal husbandry practices	Increase in yield (kg/ha/yr) in target aquaculture systems from adoption of better management practices as a result of FISH research	Performance assessment completed in 2 countries to determine baseline
	Sub-IDO 1.4.3/2.1.3: Enhanced genetic gain	Estimated breeding value gain per generation for target traits in tilapias and carp breeding programs (%)	5% genetic gain documented in tilapia and rohu breeding programs in Malaysia and Egypt (tilapia) and Bangladesh (rohu)
	Sub-IDO 2.1.2: Increased access to nutrient-rich foods	# of new smallholders adopting nutrient rich food (including fish), technology packages and management practices resulting from FISH research	5,000 smallholders in 1 focal country
	Sub-IDO 2.3.2: Reduced livestock and fish disease risks associated with intensification and climate change	% reduction in fish disease prevalence in target aquaculture systems associated with improved breeds and FISH technologies	Defining baselines of tilapia disease status in 2 focal countries
	Sub-IDO 3.3.1: Increased resilience of agro-ecosystems and communities, especially those including smallholders	# of ha of aquatic and coastal marine habitat restored and under more productive and equitable management as a result of FISH research	None for 2017
	Sub-IDO 3.3.3: Reduced net greenhouse gas emissions from agriculture, forests and other forms of	GHG emissions per kg fish produced in target aquaculture systems	Establish baselines and intervention points for GHG reduction in aquaculture production systems.

	land use		
	Sub-IDO XC 1.1.4: Enhanced capacity to deal with climatic risks and extremes	# households with increased capacity to deal with climate risks and extremes	Develop indicators and methodologies for assessing future improvements
	Sub-IDO XC 2.1.1: Gender equitable control of productive assets and resources	# women with increased control of productive assets and resources (disaggregated by age and wealth)	Develop indicators and methodologies for assessing future improvements
	XC 2.1.3 Improved capacity of women and young people to participate in decision-making	# women and young people with increased influence in aquaculture and small-scale fisheries-related decision making (disaggregated by age and wealth)	Develop indicators and methodologies for assessing future improvements
	XC 3.1.1 Increased capacity of beneficiaries to adopt research outputs ³	# innovation platforms, learning alliances and other multi-stakeholder platforms operating with FISH engagement	Innovation platforms for aquaculture research established in Bangladesh, Egypt, Myanmar and Nigeria
	XC 3.1.3 Conducive agricultural policy environment	\$ investment that incorporates FISH research (through public policy, development agencies, private sector)	US\$25 million of development investments informed by CRP Phase 1 fish-related research (including FP1 and FP2 research)
	XC 4.1.2 Enhanced capacity in partner research organizations through training and exchange	Number of research partner staff trained (disaggregated by age and wealth; gender, job/role, location and literacy)	Capacity assessments of FP1 research partners completed
FP2	Sub-IDO 1.3.1: Diversified enterprise opportunities	# of micro, small and medium enterprises improved and/or diversified in aquaculture value chains as a result of FISH research	No FP2 work on this in 2017 (due to lack of W1-2 funding)
	Sub-IDO 1.3.2: Increased livelihood opportunities	# increased income in women and men farmers and value chain actors (disaggregated by age and wealth group)	SSF assessments during 2017 will inform the indicator and methodologies for future monitoring
	Sub-IDO 2.1.2: Increased access to nutrient-rich foods	# of new smallholders adopting nutrient rich food (including fish), technology packages and management practices resulting from FISH research	2,500 smallholders in 1 focal country
	Sub-IDO 3.2.1: More productive and equitable management of natural resources	% increase in yield from better natural fisheries management practices as a result of FISH research.	No FP2 work on this in 2017 (due to lack of W1-2 funding)
	Sub-IDO 3.3.1:	# of ha of aquatic and coastal	No FP2 work on this in 2017

³ Indicators for XC 3.1.1 and XC 3.1.3 were not included in the FISH proposal; new indicators have been incorporated for 2017

	Increased resilience of agro-ecosystems and communities, especially those including smallholders	marine habitat restored and under more productive and equitable management as a result of FISH research	(due to lack of W1-2 funding)
	Sub-IDO XC 1.1.4: Enhanced capacity to deal with climatic risks and extremes	# households with increased capacity to deal with climate risks and extremes	Develop indicators and methodologies for assessing future improvements
	Sub-IDO XC 2.1.1: Gender equitable control of productive assets and resources	# women with increased control of productive assets and resources (disaggregated by age and wealth)	Develop indicators and methodologies for assessing future improvements
	XC 2.1.3 Improved capacity of women and young people to participate in decision-making	# women and young people with increased influence in aquaculture and small-scale fisheries-related decision making (disaggregated by age and wealth)	Develop indicators and methodologies for assessing future improvements

Disclaimer

- 2.1 Keep in mind that the indicators for sub-IDs are still work in progress.
2.2 Relevant CRP Sub-IDO indicators as provided to SMO in Nov. 2016 for SC3-03 item)
2.3 **Whenever available please provide targets.

Table 3: Expected Annual Milestones (progress markers) towards Outcomes 2022

FP No.	FP Outcome 2022	Milestone 2017 Max. of 3 milestones per FP outcome 2022	Mapped budget request for 2017	
			W1/ W2 USD	W3/ bilateral USD
FP1	Outcome 1.1: 1.5 million households have access to and are using our selectively improved, faster growing and more resilient strains of tilapia and carp seed	Milestone 1.1.1: Genomic selection strategy for improved tilapia prepared with partners and integrated in 2018 FISH research plans.	1,385,445	2,304,068
		Milestone 1.1.2: Impact assessments of prior dissemination activities completed in Bangladesh, Egypt and dissemination of existing improved tilapia strains continued in Bangladesh, Egypt and India.		
		Milestone 1.1.3: Gender-integrated end user preference review completed and research capacity and methods in place to conduct user preference research.		
	Outcome 1.2: 2.5 million households	Milestone 1.2.1: Diseases of tilapia strains assessed and biosecurity measures	1,038,084	1,088,072

	<p>have adopted disease detection and control strategies, cost-effective and sustainable aqua-feeds and/or improved aquaculture management practices</p>	<p>designed and implemented in tilapia breeding programs in Bangladesh, Egypt and Malaysia.</p> <p>Milestone 1.2.2: Priority ingredients identified for tilapia and carp aqua-feed research via focal country assessments, cross-CRP dialogue (RICE, RTB, LIVESTOCK) and dialogue with other partners and results integrated in 2018 FISH research plans.</p> <p>Milestone 1.2.3: Best practice guidelines for health and feed management packaged and disseminated via extension networks to fish farmers in Bangladesh, Egypt, Myanmar, India.</p>		
	<p>Outcome 1.3: 4.8 million mt of annual farmed fish production with reduced environmental impact and increased resource-use efficiency (measured by 20% reduction in GHG emissions and 10% increase in water and nutrient-use efficiency)</p>	<p>Milestone 1.3.1: Baseline assessments of GHG emissions and water and nutrient use efficiency in tilapia and carp farming completed and used to identify interventions in Bangladesh, Egypt, Myanmar.</p>	132,152	25,210
	<p>Outcome 1.4: 2.3 million poor men, women and youth access improved livelihood opportunities resulting from increased aquaculture production and associated value chains and enterprise development (of which 50% are women)</p>	<p>Milestone 1.4.1: Multi-stakeholder partnership platforms for sustainable aquaculture R&D convened in Egypt, Nigeria, Bangladesh, Myanmar.</p> <p>Milestone 1.4.2: A gender-integrated set of methods, tools and capacity available within FISH focal countries for assessing aquaculture systems, value chains and entrepreneurial opportunities for women and youth</p> <p>Milestone 1.4.3: Fish-supply demand modelling completed and used to inform future targeting of FISH aquaculture technologies in Africa. Results integrated into FISH 2018 research plans.</p>	788,181	4,485,758

FP2	Outcome 2.1: 1 million fishery-dependent households have reduced poverty as a result of adopting improved fisheries management	Milestones 2.1.1: Assessments of adaptive management and livelihood interventions in small-scale marine and inland fisheries in Bangladesh, Cambodia, Myanmar, Philippines, Timor Leste and Solomon Islands	0	5,523,651
		Milestones 2.1.2: Assessments have informed design of adaptive management and livelihood interventions in inland areas in 3 countries [Bangladesh, Cambodia, Myanmar]		
	Outcome 2.2: 1.2 million people, of which 50% are women, assisted to exit poverty through livelihood improvements	Milestone 2.2.1: Barriers and opportunities for gender-equitable governance and assets in fishery-dependent communities identified	0	1,203,169
		Milestones 2.2.2: Assessments completed of rice-field systems in South and SEAsia and identification of options in farming practices and policies that increase gender-equitable development outcomes for women and men small-scale farmers and fishers assessed.		
		Milestones 2.2.3: Conceptual framework for small-scale fisheries in fish food systems developed and used to convene policy engagement, align investment in fisheries and re-invigorate global dialogue and strategies concerning the role of small-scale fisheries in poverty reduction		
	Outcome 2.3: 2.1 million hectares of inland aquatic and coastal marine habitat restored and under more productive and equitable management	Milestone 2.3.1: Evidence collated and research designed to determine ecosystem productivity and equity outcomes from management interventions in Bangladesh, Cambodia and Solomon Islands	0	82,063

Disclaimer:

- 3.1 Milestones could be outputs or outcomes as appropriate to the scale and maturity of the work. **In this table 3 please focus as much as possible on milestones towards outcomes to avoid overlaps and duplication with table 4.**
- 3.2 Budget amounts are mapped to outcomes from costing outputs and activities that are required to enable changes that we expect to happen.
- 3.3 It is important to acknowledge that the budget amounts are likely not directly correlated to the work proposed for this year, but build on investment and outputs from the past.

Table 4: Expected Key Output 2017 towards Outcomes 2022

FP No.	FP Outcome 2022	CoA Output	Tagging of expected outputs 2017		
			G	Y	CD
FP1	Outcome 1.1: 1.5 million households have access to and are using our selectively improved, faster growing and more resilient strains of tilapia and carp seed	CoA output 1.1.1: Faster growing and resilient carp and tilapia strains <ul style="list-style-type: none"> • Base populations established for new breeding program of Catla and Silver carps established (Bangladesh) • Genetic assessment of juvenile rearing methods of Rohu carp (2 Journal articles⁴) • Impact assessments completed of previously disseminated improved tilapia strains (Egypt and Bangladesh) (Journal articles) • Dissemination plans for improved tilapia dissemination prepared with national partners in Cambodia and Myanmar (Practice notes, Working papers) 	0	0	1
		<ul style="list-style-type: none"> • Base populations established for new breeding program of Catla and Silver carps established (Bangladesh) • Genetic assessment of juvenile rearing methods of Rohu carp (2 Journal articles⁴) • Impact assessments completed of previously disseminated improved tilapia strains (Egypt and Bangladesh) (Journal articles) • Dissemination plans for improved tilapia dissemination prepared with national partners in Cambodia and Myanmar (Practice notes, Working papers) 	0	0	0
		<ul style="list-style-type: none"> • Impact assessments completed of previously disseminated improved tilapia strains (Egypt and Bangladesh) (Journal articles) • Dissemination plans for improved tilapia dissemination prepared with national partners in Cambodia and Myanmar (Practice notes, Working papers) 	1	0	0
		CoA output 1.1.2: New productivity and resilience traits identified and incorporated into fish breeding programs <ul style="list-style-type: none"> • Strategy for genetic improvement of tilapias to include genomic selection and new traits (Global, Egypt, Malaysia) (Working paper or workshop proceedings) • Genetic assessment of reproductive performance of Abbassa strain (Egypt) (journal article). • New knowledge on sex determining genes, feed efficiency and resilience in tilapia (journal articles) 	1	1	2
		CoA output 1.1.2: New productivity and resilience traits identified and incorporated into fish breeding programs <ul style="list-style-type: none"> • Strategy for genetic improvement of tilapias to include genomic selection and new traits (Global, Egypt, Malaysia) (Working paper or workshop proceedings) • Genetic assessment of reproductive performance of Abbassa strain (Egypt) (journal article). • New knowledge on sex determining genes, feed efficiency and resilience in tilapia (journal articles) 	0	0	1
		<ul style="list-style-type: none"> • Strategy for genetic improvement of tilapias to include genomic selection and new traits (Global, Egypt, Malaysia) (Working paper or workshop proceedings) • Genetic assessment of reproductive performance of Abbassa strain (Egypt) (journal article). • New knowledge on sex determining genes, feed efficiency and resilience in tilapia (journal articles) 	0	0	1
		<ul style="list-style-type: none"> • New knowledge on sex determining genes, feed efficiency and resilience in tilapia (journal articles) 	0	0	1
		CoA output 1.1.3: Knowledge on genomic tools and methods to accelerate genetic gain and incorporate new traits in fish breeding programs <ul style="list-style-type: none"> • Genomic databases for rohu, catla and silver carps Bangladesh) • Genetic characterization of mola carp (Bangladesh) (Journal article) • Genomic assessment (SNP panel) of adoption of GIFT tilapia (Bangladesh and Philippines) (SPIA project, journal article) 	0	0	1
		<ul style="list-style-type: none"> • Genomic databases for rohu, catla and silver carps Bangladesh) • Genetic characterization of mola carp (Bangladesh) (Journal article) • Genomic assessment (SNP panel) of adoption of GIFT tilapia (Bangladesh and Philippines) (SPIA project, journal article) 	1	0	1
		<ul style="list-style-type: none"> • Genetic characterization of mola carp (Bangladesh) (Journal article) • Genomic assessment (SNP panel) of adoption of GIFT tilapia (Bangladesh and Philippines) (SPIA project, journal article) 	0	0	0

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“Journal articles” refers to peer reviewed articles that are planned for submission or publication during 2017

		<p>CoA output 1.1.4: Knowledge on end-user preferences of poor men and women for improved fish</p> <ul style="list-style-type: none"> Literature reviews on gendered consumer and producer preferences in relation to fish characteristics (Journal article) Innovative gender-integrated end-user assessment package of tools for use across FISH focal and scaling countries (manual, practice note, mobile tools) Concept Note for cross-CRP Gender & Breeding Initiative 	2	1	0
			2	1	1
			2	1	2
Outcome 1.2: 2.5 million households have adopted disease detection and control strategies, cost-effective and sustainable aqua-feeds and/or improved aquaculture management practices		<p>CoA output 1.2.1: Fish disease surveillance and diagnostic tools</p> <ul style="list-style-type: none"> Biosecurity assessment and plans for tilapia breeding and dissemination programs in Bangladesh, Egypt and Malaysia (program brief, user friendly manual/practice brief) Epidemiological and economic assessment of a newly emerging disease in tilapia (TiLV) conducted with partners (working paper, journal article) Field diagnostic tools for syndromic surveillance of key tilapia diseases (user friendly factsheet, manual, mobile tools) National strategies for aquatic animal health management developed with national partners in Bangladesh and Egypt (2 policy briefs) 	0	0	1
			0	0	0
			0	0	1
			1	1	2
		<p>CoA output 1.2.2: Sustainable fish feed resources</p> <ul style="list-style-type: none"> Inventory of nutritional information and gap analysis of locally available ingredients from focal countries, contributing to future research priorities for FISH in 2018 (working paper) Results from testing of three potential novel tilapia fish feed ingredients and/or feeding systems (Bangladesh, Malaysia, Egypt) (journal articles) Analysis of nutrient use efficiency in carp mono-and polyculture systems in Bangladesh completed (journal article) 	0	0	1
			0	0	1
			0	0	1
		<p>CoA output 1.2.3: Integrated fish feed and health management packages for improved fish strains</p> <ul style="list-style-type: none"> Integrated better management practices (BMPs) for tilapia breeding programs, multiplication centres and farming systems packaged and delivered through training courses (manuals, user friendly tools, videos, web site) Knowledge on chemicals and prophylactic health products used in tilapia farming in Bangladesh (journal article) 	1	1	2
			0	0	0

		<ul style="list-style-type: none"> BMP training for tilapia farmers in Bangladesh and Egypt 	1	1	2
Outcome 1.3: 4.8 million mt of annual farmed fish production with reduced environmental impact and increased resource-use efficiency (measured by 20% reduction in GHG emissions and 10% increase in water and nutrient-use efficiency)	CoA output 1.3.1: Scalable aquaculture system models, technology packages and best practices for sustainable intensification and enhanced adaptive capacity to climate risk <ul style="list-style-type: none"> Reducing GHG emissions and improving resource use of aquaculture systems based on Life Cycle Analysis (journal papers on carp systems in Bangladesh; cross-country synthesis in Bangladesh, Myanmar, Egypt; and Indonesian aquaculture futures). Exploratory meta-analysis of LCA results and human dietary requirements. Working paper on water efficiencies in aquaculture systems in Egypt. Nutritious pond papers from Bangladesh and Vietnam (journal articles, program briefs/tools) 		1	0	1
Outcome 1.4: 2.3 million poor men, women and youth access improved livelihood opportunities resulting from increased aquaculture production and associated value chains and enterprise development (of which 50% are	CoA output 1.3.1: Scalable aquaculture system models, technology packages and best practices for sustainable intensification and enhanced adaptive capacity to climate risk <ul style="list-style-type: none"> Strategy for R&D and Scaling Partnerships and Platforms in the focal countries and guidelines for assessing partnership/platform performance New empirical knowledge of women's empowerment in aquaculture (FAO brief and Bangladesh case study) 		1	1	2
	CoA output 1.3.2: Inclusive, gender-sensitive and sustainable approaches to delivery and use of improved fish seed, health, feeds and aquaculture technology packages <ul style="list-style-type: none"> Empirical findings from piloted gender-inclusive and gender-transformative extension in household pond farming in Bangladesh (Journal article) Assessment of "Local Service Provider"/private sector extension strategies for poor farmers in Bangladesh (Working paper, Program brief) 		2	1	1
			1	1	1

	women)	<ul style="list-style-type: none"> Assessment of youth in aquaculture completed and research/partnership strategy developed for FISH focal countries (working paper, FISH focal country research strategies for 2018) 	1	2	2
		<p>CoA output 1.3.3: Inclusive and gender sensitive business and entrepreneurial models for smallholder farmers and poor value chain actors</p> <ul style="list-style-type: none"> Literature review assessing existing knowledge and gaps regarding gender and aquaculture value chains (journal article) New empirical knowledge on gender norms and assets in aquaculture systems (Bangladesh, program brief) 	2	0	0
		<p>CoA 1.3.4: Tools, models, data and analytical capacity to assess sustainable performance and adoption of aquaculture technology innovations</p> <ul style="list-style-type: none"> Integrated framework (tools and methods) for assessing performance of aquaculture systems in FISH focal countries IMPACT fish model applied to Africa and a manuscript "Fisheries and aquaculture in African fish-supply trends" completed. Fish supply demand model projections for Bangladesh and Zambia submitted (journal article, program brief) FISH CRP Gender Strategy Mixed method tools for assessing gender and women's empowerment (tools ready to apply in FISH focal countries; CGIAR Webinar on Measuring Gender Transformative Change) 	1	1	1
			0	0	1
			2	1	1
			2	1	1
FP2	Outcome 2.1: 1 million fishery-dependent households have reduced poverty as a result of adopting improved fisheries	<p>CoA 2.1.1: Co-management models tested and refined for inclusive governance, food security and sustainability</p> <ul style="list-style-type: none"> A framework for improving adaptive capacity of fishing communities published: collaborative research conducted with JCU research partners (journal articles; policy brief/practice guidance) Assessments of adaptive management systems in Myanmar (a working paper 	1	0	2

	management	<p>providing a baseline for assessing future changes) and Cambodia (journal article)</p> <ul style="list-style-type: none"> • Fisheries management plans a) implemented or b) revised based on participatory adaptive management principles (in Cambodia, Solomon Islands, Timor Leste) • Community-based management processes critically analyzed across at least three countries of engagement (journal article examining success of gender equity, power and fisheries principles in processes, and lessons shared to refine FISH and partner approaches to community-based management) 	1	0	1
			1	1	1
			1	1	0
		<p>CoA 2.2.1: Assess and refine governance and production models for integrated aquaculture and agriculture</p> <ul style="list-style-type: none"> • Assessment of rice-fish systems in Myanmar, South and Southeast Asia co-complemented with RICE and research priorities identified (journal article and refined impact pathways) • Rice field micro-habitat technology and management practices assessed and packaged for dissemination via partners in Bangladesh (with CCAFS) and Cambodia • New knowledge on the role of gender in the Myanmar fisheries sector (program brief) 	1	1	0
			1	1	2
			2	2	1
	Outcome 2.2: 1.2 million people, of which 50% are women, assisted to exit poverty through livelihood improvements	<p>CoA 2.1.3: Alternative livelihood strategies assessed</p> <ul style="list-style-type: none"> • Gender integrated livelihood diagnosis tool developed and applied in three countries (updated tool, journal article) • Empirical knowledge regarding an innovative model of gender transformative micro-finance (journal article) 	1	1	2
			2	1	2
		<p>CoA 2.3.1: Regional and global analysis of the current state and potential of SSF for food security and well-being.</p> <ul style="list-style-type: none"> • Key synthesis papers on small-scale fisheries, including multi-case/partner journal publications on enhancing the development impacts of SSF through research-in-development, and "Securing a just space for small-scale fisheries amidst the shifts in Ocean Governance" • Methodologies and a proposal developed to understand and quantify participation, food security functions and economic contributions of SSF globally using a fish food 	1	0	1

		<p>systems approach - conducted in partnership with FAO</p> <ul style="list-style-type: none"> • A publicly available dataset contributed to the FAO-hosted nutrition database on nutritional value of marine fish, concentrating on those harvested through SSF • Barriers and opportunities in policy/structural environments published and informing governance interventions across scales (including gender) - case studies from at least two FISH countries (journal article) and in-country strategies in 2 FISH focal countries updated to maximize impact • Fisheries and aquaculture: current status and future directions conducted in Myanmar and Solomon Islands (journal article and refined country-level impact pathways and adapted strategies based on new knowledge). • Compelling, evidence-supported revised program of research on SSF submitted to the key donors, drawing on outputs above 	1	1	0
			0	0	1
			1	1	1
			1	0	0
			1	1	1
	Outcome 2.3: 2.1 million hectares of inland aquatic and coastal marine habitat restored and under more productive and equitable management	<p>CoA 2.1.1: Co-management models tested and refined for inclusive governance, food security and sustainability</p> <ul style="list-style-type: none"> • Evidence from co-management assessments • Coastal habitat maps and training tools in Solomon Islands 	1	0	2
			1	0	2

Disclaimer

4.1) Please see explanations in the instructions and guidance below to complete the tagging columns for the cross-cutting topics.

4.2) G = Gender, Y = Youth, CD = Capacity Development;

4.3) Markers: 0 = not targeted, 1 = significant, 2 = principal

4.4) CoA (Cluster of Activity) Outputs or Key Outputs reported in the POWB are expected to be key products, new knowledge and services produced through a variable number of deliverables reported at the project level (and not necessarily at the program level); for output's definition, see glossary.

LIST OF ACRONYMS

A4NH	Agriculture for Nutrition and Health CRP
AAS	Aquatic Agricultural Systems CRP
ANU	Australian National University
ARC	Agricultural Research Center
ARIs	Advanced Research Institutes
BFRI	Bangladesh Fisheries Research Institute
BMP	Better or best management practices
BoP	Bottom of the Pyramid
CCAFS	Climate Change, Agriculture and Food Security CRP
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CGIAR	Consultative Group for International Agricultural Research
CIRAD	French Agricultural Research Centre for International Development
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CLAR	Central Laboratory for Aquaculture Research
CoA	cluster of activities
CRP	CGIAR research program
DOF	Department of Fisheries
FAO	Food and Agriculture Organization of the United Nations
FISH	CGIAR research program on fish agri-food systems
FP	flagship project
GHG	greenhouse gas
GIFT	Genetically Improved Farmed Tilapia
ha	hectare
IDO	intermediate development outcome
IDS	Institute of Development Studies
IFAD	International Fund for Agriculture Development
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IPG	international public good
ISC	Independent Steering Committee
IWMI	International Water Management Institute
JCU	James Cook University
kg	kilogram
KIT	Royal Tropical Institute (Netherlands)
L&F	Livestock and Fish CRP
LCA	lifecycle assessment
MARLO	Managing Agricultural Research for Learning & Outcomes
MC	management committee (FISH CRP)
MEL	monitoring, evaluation and learning
MMF	Myanmar Fisheries Federation

MSD	MSD Merck Sharp & Dohme AG (pharmaceutical company)
N	nitrogen
NARS	National Agricultural Research Systems
NARES	National Agricultural Research and Extension Systems
NDC	nationally determined contributions
NEPAD	New Partnership for Africa's Development
NGOs	nongovernmental organizations
NRI	Natural Resources Institute
P	phosphorous
PDF	post-doc fellow
PIM	Policies, Institutions and Markets CRP
&&D	research and development
RICE	Rice agri-food systems CRP
RTB	Roots, Tubers and Bananas CRP
SDG	Sustainable Development Goal
SLO	system-level outcome
SMB	System Management Board
SLU	Swedish Agricultural University
SMO	System Management Office
SNP	single nucleotide polymorphism
SPIA	Standing Panel on Impact Assessment (of the CGIAR)
SRC	Stockholm Resilience Center
SRF	Strategy and Results Framework (of the CGIAR)
SSF	small-scale fisheries
SRUC	Scotland's Rural College
TiLV	Tilapia Lake Virus
ToC	theory of change
UCC	University College Cork
UNFCCC	United Nations Framework Convention on Climate Change
UoL	University of Lancaster
UoS	University of Stirling
USD	United States dollars
W1-2	windows 1 and 2 (funding windows)
W3	window 3 (funding window)
WLE	Water, Land and Ecosystems CRP
WRI	World Resources Institute
WUR	Wageningen University Research
yr	year



Lead Center:

