

CGIAR RESEARCH PROJECT LIVESTOCK AND FISH PHASE 2

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Livestock and Fish CGIAR Research Project, Phase Two

“More meat, milk and fish by and for the poor”

Rationale

The vision of the CGIAR Research Program on Livestock and Fish continues to be that the health, livelihoods and future prospects of the poor and vulnerable, especially women and children, can be transformed through consumption of nutritious meat, milk and fish and through shared benefits from income and job opportunities by their greater participation in animal-source food value chains. Phase Two of the Program seeks to realize this vision by increasing the productivity of small commercial livestock and fish production systems and improving the performance of their associated value chains.

The Program proposes a model to strengthen the relevance and impact of its research to these ends. First, the process also defines longer-term research to prepare the future breakthroughs that will be needed to ensure the continued viability and sustainable growth of these animal-source food value chains. It is designed to join capacity within the CGIAR and its many partners to develop solutions for pro-poor transformation of value chains and for their implementation at a large scale. Over the period 2015-2023, the Phase 2 program proposes to continue these efforts with sharper focus on linking Flagship research to the Program’s development objectives and on using the lessons learned during Phase 1.

Strategic Objectives

The Livestock and Fish (L&F-2) CGIAR Research Program, Phase 2, will contribute to achieving the four SLOs. It will sustainably increase the productivity of smallholder livestock and fish production to increase the supply and affordability of animal-source foods from poor producers and for poor consumers. The output and cost effects for animal source foods will improve incomes, employment, nutrition, and food security and reduce poverty along nine major value chains. Phase 2 proposes to deliver results to over several million households in the period 2015-2023 through research / development work in the value chains and through global research on several flagship projects.

Results Framework

The Program has defined intermediate development outcomes (IDOs) that target productivity, accessible food supplies, employment and incomes (especially for women), nutrition and favorable policies, while mitigating environmental impacts. Table 1 proposes slightly revised IDOs for Phase 2. IDOs #1 through #6 are very similar to those of Phase 1¹.

¹ IDOs#1 through #3 are identical. IDO#4 makes a small clarification. IDO#5 is revised to eliminate redundancies with IDOs #1 and #3. IDO#6 is revised to drop an objective that is very difficult to measure and impossible to attribute to this CRP.

The new IDO#7 recognizes the need for increased supplies of livestock and fish feed to support the productivity gains in animal agriculture. The IDOs identify the key links in the value chains that research for development will enhance: increased productivity of livestock and fish enterprises, more and better quality animal-source foods (ASFs), a more gender-equitable distribution of income and environmental benefits for poor agents, a reduction in the nutrient gaps of poor consumers, lower environmental costs and better policy incentives.

Theory of Change and Impact Pathways

The L&F Phase 2 Theory of Change is like that of L&F Phase 1 – local and global research will generate knowledge embodied in new technologies and new institutions. Research for development partnerships will reduce the costs of technical and organizational changes to smallholders, allowing them to increase their productivity and incomes. Targeting and gender-analytic tools will give a strong focus on poor and marginalized groups who have often been excluded from technology transfer programs.

Specific assumptions in this theory of change are:

- Many pre-commercial smallholders in high potential value chains can become commercial if new technologies, better institutions and better incentives are available;
- Many pre-commercial smallholders will respond to technologies and policies to invest in new technologies and in sustainable intensification;
- Targeting high potential value chains will increase the rate and scale of adoption of new technologies and the rate and scale of response to incentives;
- Addressing the value chain from production inputs to consumption and vice versa will increase the rate and scale of adoption of new technologies;
- Women and marginalized groups will receive special priority in research for development because they have often been excluded from access to assets, to markets and technologies;
- The poor rely more on animal-source food (ASF) produced by smallholders and sold in informal value chains, so that the poor tend to benefit more from technical and policy changes in smallholder value chains;
- The poor will consume more ASF if those products are cheaper and of better quality;
- Increased consumption of ASF among poor people will improve their nutrition and health; and
- Capable partners are available and motivated to develop interventions at scale.

Table 1: Livestock and Fish CRP Phase Two Results Framework

Intermediate Development Outcomes (IDOs) and Indicator Classes, 2015-2023

Current IDO	Change from Phase One?	Indicator Classes
<p>#1 Increased livestock and fish productivity in small-scale production systems for the target commodities (SLO1 and SLO2)</p>	<p>No change</p>	<p>Uganda and Vietnam – yields / animal of pig meat; percentage pig mortality;</p> <p>Ethiopia and Mali – yields of small ruminant meat; flock mortality; kidding rate;</p> <p>Tanzania and India – dairy yields per animal;</p> <p>Egypt and Bangladesh – fish yields per hectare;</p> <p>Nicaragua – beef and dairy yields per animal and per hectare</p>
<p>#2 Increased quantity and improved quality of the target commodity supplied from the target small-scale production and marketing systems (SLO1 and SLO2)</p>	<p>No change</p>	<p>Quantity, by commodity yields per animal and per unit of land or time, stratified by target systems.</p> <p>Quality by real unit prices</p>
<p>#3 Increased employment and income for low income actors in the target value chains, with an increased share of employment for and income controlled by low-income women (SLO1 and SLO3)</p>	<p>No change</p>	<p>Increased income among poor people, disaggregated by sex and age.</p> <p>Higher share of women reporting greater control of income from value chain participation.</p> <p>Increased employment in the target value chains, disaggregated by sex, age and poverty status.</p>
<p>#4 The target commodity responsible for filling a larger share of the nutrient gap for the poor, particularly for nutritionally vulnerable populations (women of reproductive age and young children) (SLO3)</p>	<p><i>“Increased consumption of the target commodity ...”</i></p>	<p>Higher Individual Dietary Diversity Index (IDDI); higher Household Dietary Diversity Index (HDDI);</p> <p>Better health and nutrition status of children under five years: Wasting: % of children under 5 years falling under -2 standards deviations of weight for age (%).</p>

Current IDO	Change from Phase One?	Indicator Classes
		Stunting: % of children under 5 less than -2 standard deviations of mean height for age.
<p>#5 Lower environment impacts and higher benefits per unit of commodity produced in the target value chains (SLO4)</p>	<p>#5 Lower environment impacts and higher benefits per unit of commodity produced in the target value chains (SLO4)</p> <p>“Higher benefits” are already covered by “higher productivity” in IDO 1 and by “higher income” in IDO3</p> <p>“per unit of commodity produced” to be covered in Indicators</p>	<p>Quantities of greenhouse gases (methane, carbon dioxide, and nitrous oxide) in each value chain; solid wastes in swine and dairy; per animal and cumulative by link in the value chain (farm, first processing, final processing, consumer)</p>
<p>#6 Policies (including investments) and development actors recognize and support the development of the small-scale production and marketing systems, and seek to increase the participation of women within these (SLO2 and SLO4)</p>	<p>#6 Policies (including investments) and development actors recognize and support the development of the small-scale production and marketing systems, and seek to increase the participation of women and poor agents within these (SLO2)</p> <p>There is no way of measuring the “recognition of development actors”; policies and investments can be measured</p>	<p>Public spending on value chains, as shares of national public spending; quality of spending on public goods in value chains, as share of spending on all goods in the value chains;</p> <p>Private investment in the value chains;</p> <p>Number of prominent policy reforms (e.g. change in tax structure to allow freer trade, to reduce post-harvest losses, to eliminate bias in favor of large enterprises, or to eliminate gender bias in asset ownership or management)</p>
<p>#7 None</p>	<p>#7 <i>Improve yield potential of major feeds and forages (SLO1, SLO2, SLO4)</i></p>	<p>Yield potential per unit of land in environments representative of the given value chains</p> <p>Uses and yields of improved materials in environments representative of the given value chains</p>

Target Indicators

Achievement of each IDO will be measured by specific targets (belonging to the classes in Table 1) defined in each value chain, e.g. a 50 percent increase in milk produced per cow in 150,000 poor households in Tanzania over 9 years, or a 75 percent increase in fish yield per hectare in Egypt over 9 years.

The detailed indicators will be derived from the situational analyses for the nine value chains that are underway in L&F-Phase 1 and that will be completed by November 2013. Generation of the targets draws on existing models and analyses to estimate potential productivity gains and reduced environmental impacts from feed, health and genetics interventions and to estimate the potential beneficiary population, together with benchmarking based on past and present development interventions. This analysis is generating an evidence base to support the level of scaling out and changes that the program is proposing as reasonable to achieve within the 9-12 year IDO time horizon.

IMPLEMENTATION AND PARTNERS

We will implement the research component of L&F-2 through several Flagship Projects that are designed to produce Global Public Goods and broadly applicable global knowledge. The Projects will be integrated into value chain development, and are designed to deliver more outputs, more employment, greater equity and fewer local environmental costs. Projects will also produce local knowledge that is applied to the development problems of income, jobs, inequalities, and environmental costs.

We will implement the development component of the L&F-2 through local partners from national governments to the private and NGO sectors. The development component will finance interventions that translate research results from the Flagship Projects and from the national sites, into more productive livestock and fish value chains. In the Phase 2 Project Paper, we will propose a method to select development partners on a competitive basis. Development partners selected on that basis would then be evaluated, in part, using results-based performance methods.

Flagship Projects

The Flagship Projects (Annex 1) are research efforts across the principal crop, fish, and livestock systems in the tropics. The knowledge and innovation created to find solutions to the constraints in the program's value chains will the scientifically driven development process more generally. Improving international access to and use of program outputs will eventually, over the 10-year horizon and beyond, contribute to the desired system changes in income, food security, nutrition, and natural resources management. Each Flagship Project will contribute to the Intermediate Development Outcomes (IDOs) in varying proportions.

Building a Livestock and Fish Genetics Platform. The objective of this Flagship Project is to build an integrated animal genetic improvement and innovative delivery program, and a platform to support this at global scale is urgently needed for priority livestock and fish species with the ultimate outcome of significant and sustained animal systems productivity improvement in developing countries. This will contribute mainly to IDO#1, IDO#2 and IDO#3.

Improving Animal Health for Increased Productivity. The objective of this Flagship Project is to develop a pro-poor, sustainable animal health diagnostic and vaccines platform speeding up the development of solutions for existing and emerging diseases of livestock. This will comprise a diagnostic assay platform, Delivery of animal health interventions, and innovative work on herd health, to be implanted through partnerships with ARIs and national scientific programs.

Reducing the environmental costs of animal production. The objective of this project is to contribute to a pro-poor, environmentally responsible livestock and aquaculture sector in developing countries. This will contribute mainly to IDO#5.

Developing new biotechnologies for animal nutrition. This Project has a sequence of objectives over time. The first is to assess ligno-cellulolytic biomass availability, competition, utilization and costs and in potential value chains for meat milk and fish (Year 1). The second is to Analyze and synthesize findings to the hydrolysis of plant cell walls for enhanced sugar release and utilization for use in animal feeding (Year 1 – 2). Subsequent objectives are to: (i) design and test appropriate biomass processors and fermenters as intermediary steps in developing of expandable technologies (Years 3-6); and (ii) extend technologies that can be used along feed value chains with partners from farmers' organizations, cooperatives, NGOs and the private sector (Years 6-9).

Sustaining feed-based intensification of animal production. The Project's objective is to achieve an overall 50 percent increase in total factor productivity in at least half of the value chains where the L&F CRP works, through better feeds and more efficient feed and fodder value chains, while avoiding unacceptable environmental costs on land, water and atmospheric resources.

Reducing gender disparities. The proposed Flagship Project has four objectives: (i) Increase gender analytic capacity within CG Centers, partner organizations, and value chain actors to diagnose and resolve gender constraints in value chains; (ii) develop and implement research and development approaches through which women and marginalized groups capture more value-added from animal production; (iii) develop and implement approaches through which women and marginalized groups achieve more access to assets -- markets, land, animals, technologies, power; and (iv) develop and implement approaches to increase level and equity of ASF consumption in poor households.

Value Chains

Nine value chains (Annex 2) were selected based on a number of conditions that maximize the program's likelihood of achieving broader impact at scale. Target value chains were also chosen to have high potential for welfare gains from producers to consumers. The selection criterion included: existence of value chain growth and market opportunities, pro-poor potential, a body of researchable constraints to sustain various research agendas in the value chains, existence of enabling environments, and existence of considerable CGIAR legacy activities. The target value chains also comprise pairs of similar value chains located in different regions of the world, for instance smallholder dairy in Tanzania and India, to allow cross-value chain comparisons and learning.

The target value chains are:

- Aquaculture in Egypt and Bangladesh² (leadership by WorldFish)
- Small ruminants in Ethiopia and Mali (leadership by ILRI, ICARDA and national programs)
- Smallholder dairy in India (four selected states), Tanzania and Nicaragua (leadership by ILRI, CIAT and national programs)
- Smallholder pigs in Vietnam and Uganda (leadership by ILRI and national programs)

These value chains are the settings for delivering innovations derived from the Flagship work and existing knowledge on the technical and organizational themes. This close linkage between research and development will ensure focuses on opportunities for increasing productivity and provides a mechanism to extend research outputs broadly.

In developing the value chain-specific theories of change and the impact pathways, the program is relying on the Participatory Impact Pathways Analysis (PIPA) approach in stakeholder workshops which allow participants to explicitly reveal their assumptions and hypotheses about how the program will bring about impact. PIPA is quite similar to the outcome mapping philosophy although the PIPA approach differs in two ways: 1) it incorporates both the achievement of outcomes and the key actors responsible for delivering those changes and 2) it also applies network map analysis to understand how different stakeholders in the value chain interact to achieve the desired overall program goals. The workshops engage value chain stakeholders in walking through a predicted process of turning program outputs into research outcomes, to development outcomes, and finally into impacts. These workshops will be held in each of the 9 program target value chains/countries. Participants will be drawn from a wide range of stakeholders including: target value chain staff, scientists directly involved in the value chains, government officials who are directly linked to developing the target value chain, and

² Bangladesh fish replaces Uganda fish from Phase 1.

representatives of farmer forums, implementing partner organizations, national agricultural research institutions, and the private sector.

This will be achieved through targeted dissemination of results through publications, social and mass media, etc. to provide sufficient supporting evidence and platforms for widespread promotion (at the global scale) of the technologies. In addition, the program will seek to build the capacity of “next users” such as the NARES, NGOs, Civil Society Organizations and public and private service providers in countries outside of the selected value chains, and so accelerate downstream testing and adaptation of research outputs. L&F-2 will specifically engage with key partners in disseminating its research for development outputs and ensuring they are widely accessible and used. The program will also develop a strategy for targeting specific messages and channels to influence policy makers, especially those who determine development investments, to promote wider deployment of the program’s proven interventions. Monitoring and evaluation of the impacts of technical and organization changes along the value chains will show how component outputs contribute to each IDO.

Lessons Learned to Date

Lessons from the initial implementation of L&F-1, and from collaboration with other CRPs, have prompted adjustments in the second phase. The first lesson is the need to link the main research outputs – in Phase 2, the Flagship Projects – to propose technical and organization solutions in the value chains. This has been done explicitly in this Phase 2 document. The second is the imperative to use experience from the value chains to inform work in the Flagship Projects and other research efforts. A third lesson is the urgent need to reduce environmental costs associated with agricultural intensification value, to understand how animal-source foods can better deliver nutrition, and to identify policy reforms that create a better investment environment and implement mechanisms to increase private sector investment. The Flagship Projects proposed here, notably the one on “Reducing the Environmental Costs of Animal Production”, have incorporated this lesson. A fourth is to link the work of other CRPs to that of Livestock and Fish; this is being done, for example, in the proposed new collaboration with A4NH-2 in the area of zoonoses and with CCAFS-2 and Dryland Systems-2 in the area of carbon sequestration in African rangelands. A final lesson is the need to understand incentive policies in the value chain countries as they affect smallholders’ incentives to adopt new technologies. Lessons learned about incentives will be disseminated as Policy Notes to influence the policy and research environments governing livestock, feed and fish development.

Principal Risks

Various external conditions could put at risk the predicted results from the Flagship Projects and the value chains. The chief risks to achieving the IDOs are as follows.

Failure to achieve global research results in the Flagship Projects. The Flagship Projects will focus on broad scientific problems – building an animal genetic platform for the tropics; reducing the environmental costs of animal production; developing new biotechnologies

for animal nutrition; sustaining feed-based intensification; reducing gender-based disparities in animal production systems. Failure to achieve productive and sustainable solutions to these problems is the greatest scientific risk to the objectives of L&F-2. We will manage this risk by deepening collaboration with advanced research institutes, by the use of innovative research methods, and by testing research ideas in the value chain sites.

Adverse trends in production systems, notably intensification in marginal areas.

Continued population growth and commercial crop expansion in the tropics threaten the program objectives because they would negate research results. That is, research can generate more productive technologies for market and environment goods, but its net impact might even be negative if population growth and commercial farming in the tropics grow more quickly than research impacts do. We will manage this risk by collaborating with partner research institutions in the marginal and environmentally-sensitive regions on both development and policy interventions.

Focusing on a few value chains might reduce the numbers of beneficiaries, among producers and consumers. We have managed this risk by choosing large value chains – dairying in India, dairying in East Africa, small ruminants in Mali and Ethiopia, swine in Vietnam, fish in Bangladesh and Egypt – where there are many beneficiaries and where the expected gains from technical change are high;

Bias prevents women and other marginalized groups from innovating or intensifying, reducing potential numbers of beneficiaries. We will manage this risk by doing careful situational analyses in each value chain³, and as part of each Flagship Project, to identify potential sources of such bias and policy measures to reduce their effects;

Income and gender inequalities are exacerbated by program implementation. We will define interventions based on the situational analyses to avoid introducing new inequalities or exacerbating old ones; and

New partnerships incur high transaction costs. We will manage these costs by structuring the L&F - Phase 2 contracts with downstream development partners to create incentives for results-based performance.

³ The situational analyses for the 9 value chains are underway in LaF, Phase 1 and will be completed by November 2013.

Table 2: Livestock and Fish CRP, Phase 2, Indicative Budget, 2015-2023

	Indicative Budgets, US\$ thousands		
	2015-2017	2018-2020	2021-2023
Flagship Projects			
Building a Genetics Platform	12,732	12,732	12,732
Improving Animal Health	17,000	17,000	17,000
Reducing Environmental Costs	17,250	17,250	17,250
Developing New Biotechnologies	7,000	7,000	7,000
Sustaining Feed-Based Intensification	13,100	14,410	15,851
Reducing Gender Disparities	7,200	5,400	5,400
Total	74,282	73,792	75,233
Value Chains			
Bangladesh Fish	12,000	12,000	12,000
Egypt Fish	5,000	5,000	5,000
Ethiopia Small Ruminants	8,400	7,800	7,800
India dairying	6,000	12,000	12,000
Mali Small Ruminants	2,800	5,200	2,600
Nicaragua Cattle	2,800	5,200	2,600
Tanzania Dairying	3,000	6,000	8,000
Uganda Swine	6,130	6,130	6,130
Vietnam Swine	4,500	6,750	6,750
Total	50,630	66,080	62,880
Associated capital investments	5,000	5,000	5,000
Grand totals	129,912	144,872	143,113

ANNEX 1: FLAGSHIP PROJECTS

ANNEX 2: VALUE CHAINS