



# CGIAR Research Program on Livestock and Fish 2016 Performance Monitoring Report

**Lead Center:** International Livestock Research Institute (ILRI)

**CGIAR Center partners:** CIAT, ICARDA, WorldFish,

**Non-CGIAR partners:** SLU

**Contact:** Tom Randolph (t.randolph@cgiar.org)

[www.livestockfish.cgiar.org](http://www.livestockfish.cgiar.org)

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CGIAR is a global partnership that unites organizations engaged in research for a food secure future. The CGIAR Research Program on Livestock and Fish aims to increase the productivity of small-scale livestock and fish systems in sustainable ways, making meat, milk and fish more available and affordable across the developing world. The Program brings together four CGIAR Centers: the International Livestock Research Institute (ILRI) with a mandate on livestock; WorldFish with a mandate on aquaculture; the International Center for Tropical Agriculture (CIAT), which works on forages; and the International Center for Research in the Dry Areas (ICARDA), which works on small ruminants. <http://livestockfish.cgiar.org>

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*Patron: Professor Peter C Doherty AC, FAA, FRS*

*Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996*

Box 30709, Nairobi 00100 Kenya  
Phone +254 20 422 3000  
Fax +254 20 422 3001  
Email [ilri-kenya@cgiar.org](mailto:ilri-kenya@cgiar.org)

[ilri.org](http://ilri.org)  
*better lives through livestock*

ILRI is a member of the CGIAR Consortium

Box 5689, Addis Ababa, Ethiopia  
Phone +251 11 617 2000  
Fax +251 11 667 6923  
Email [ilri-ethiopia@cgiar.org](mailto:ilri-ethiopia@cgiar.org)

*ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa*

# Contents

|   |    |
|---|----|
| Contents .....  | 0  |
| Acronyms .....  | 0  |
| A. Key messages.....  | 1  |
| A.1 Progress and challenges.....  | 1  |
| A.2 Two most significant achievements/success stories .....                         | 1  |
| A.3 Financial summary .....   | 2  |
| B. Impact pathways and intermediate development outcomes (IDOs).....                | 2  |
| C. Progress along the impact pathways.....  | 2  |
| C.1 Progress towards outputs.....   | 2  |
| C.2 Progress towards the achievement of research outcomes and IDOs .....            | 6  |
| C.3 Progress towards impact .....   | 7  |
| D. Gender research achievements.....  | 8  |
| E. Partnerships building achievements .....   | 8  |
| F. Capacity building achievements .....   | 9  |
| G. Risk management .....  | 10 |
| H. Lessons learned .....  | 10 |
| H.1 Confidence of indicators .....  | 10 |
| H.2 Changes in research direction.....  | 10 |
| H.3 Lessons learned from evaluation.....  | 10 |
| I. Financial report.....  | 10 |
| Annex 1. Program Indicators of Progress .....                                       | 11 |
| Annex 2. Performance indicators for gender mainstreaming with targets defined ..... | 42 |
| Annex 3. Financial reports .....  | 44 |

# Acronyms

|        |   |
|--------|---|
| A4NH   | CGIAR Research Program on Agriculture for Nutrition and Health              |
| AAS    | CGIAR Research Program on Aquatic Agricultural Systems                      |
| AFEX   | Ammonia fiber expansion   |
| AIN    | Aquaculture for Income and Nutrition project (Bangladesh)                   |
| AusAid | Australian Aid  |
| CATIE  | <i>Centro Agronómico Tropical de Investigación y Enseñanza</i> (Costa Rica) |
| CBPP   | Contagious bovine pleuropneumonia   |
| CCAFS  | CGIAR Research Program on Climate Change and Food Security                  |
| CCPP   | Contagious caprine pleuropneumonia  |
| CIAT   | International Center for Tropical Agriculture (Colombia)                    |
| CRP    | CGIAR Research Program  |
| CRISPR | Clustered regularly interspaced short palindromic repeats                   |
| CSIRO  | Commonwealth Scientific and Industrial Research Organization (Australia)    |
| CTL    | Cytotoxic T-cell  |
| DArT   | Diversity array technology  |
| ECF    | East Coast fever  |
| FAO    | United Nations Food and Agriculture Organization                            |
| FEAST  | Feed Assessment Tool  |
| GCARD3 | 3 <sup>rd</sup> Global Conference on Agricultural Research for Development  |
| GIFT   | Genetically Improved Farmed Tilapia   |
| GIZ    | <i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>              |
| ICARDA | International Center for Agricultural Research in the Dry Areas (Jordan)    |
| IDO    | Intermediate development outcome  |
| IFAD   | International Fund for Agricultural Development                             |
| ILRI   | International Livestock Research Institute (Kenya)                          |
| KIT    | Royal Tropical Institute (Netherlands)                                      |
| LiDeSA | Livestock Development Strategy for Africa                                   |
| M&E    | Monitoring and evaluation   |
| MHC    | Major histocompatibility complex  |
| NIRS   | Near-Infrared Spectroscopy  |
| PPR    | <i>Peste des petits ruminants</i>   |
| REDIB  | <i>Red Iberoamericana de Innovación y Conocimiento Científico</i>           |
| RTB    | CGIAR Research Program on Roots, Tubers and Bananas                         |
| SASI   | Systems Analysis for Sustainable Innovations flagship                       |

|              |  |
|--------------|--|
| SLU          | Swedish University of Agricultural Sciences (Sweden)         |
| TechFit      | A tool for feed technology prioritization                    |
| UK           | United Kingdom   |
| UPRA         | <i>Unidad de Planificación Rural Agropecuaria</i> (Colombia) |
| US           | United States of America                                     |
| USAID        | United States Agency for International Development           |
| USD          | United States dollars  |
| VCTS         | Value chain transformation and scaling flagship              |
| WSSV         | White spot syndrome virus                                    |
| Window 1/2/3 | CGIAR Funding Windows 1/2/3                                  |

## A. Key messages

### A.1 Progress and challenges

The CGIAR Research Program (CRP) on Livestock and Fish adopted a vision for the health, livelihoods and future prospects of the poor and vulnerable, especially women and children, to be transformed through two pathways: consumption of adequate amounts of meat, milk and fish, and benefits from improved incomes and livelihoods by participating in the associated animal-source food value chains. The program sought to achieve this vision by increasing the productivity of small-scale livestock and fish production systems and improving the inclusive and sustainable performance of their associated value chains.

The program proposed an ambitious new model to enhance the relevance, urgency and impact of its research. It was designed to bring together the collective capacity of CGIAR and other partners to develop and deliver appropriate integrated solutions for the pro-poor transformation of selected animal-source food value chains. As part of the model, the program began exploring how to work with development partners to translate these solutions into large development investments likely to achieve sustainable impact at scale. The process was also intended to influence longer-term research to prepare future breakthroughs that would ensure the continued viability and growth of these value chains. Implementing this model has become a change process to establish a new way of working for the CGIAR by reorienting capacity, testing novel approaches, mobilizing new resources and creating new types of partnerships to engage effectively in the selected value chains.

The model is showing its promise. This report highlights results achieved in the fifth and final year of the program which reflect a balanced portfolio of activities and outputs successfully making progress towards the outcomes envisaged for the original CRP 12-year lifespan. That balance included a steady output of research results from its technology platforms for animal health, genetics and feeds and forages to support sustainable livestock and aquaculture intensification, and visible momentum in bringing those results to bear in its targeted value chains. The balance is also reflected in a mix of both longer-term basic research and shorter-term adaptive work. Within several value chains, the research agenda has progressed from the initial characterization phase to testing best-bet solutions and preparing pilot trials of integrated packages. To take stock of the progress made, the program convened a series of events during the year within the research teams, which generated a series of [synthesis briefs](#), and with stakeholders (see, e.g. [Tropentag](#)). An internal workshop reviewed seven key [hypotheses](#) underlying the CRP's value chain-based agricultural research-for-development approach and concluded that CRP results to date served to validate four of the seven hypotheses, but were not sufficient yet to evaluate the other three. Key components of the agenda continue under the two new separate CRPs on Fish and Livestock, which were successfully approved as part of the 2<sup>nd</sup> phase CRP portfolio.

While substantial progress has been achieved, it has not been consistent across all areas of research or target countries. The nature of CRP funding arrangements continued to prove a constraint in managing such gaps, due both to unpredictability of Window 1/2 funding and to challenges in mobilizing sustained, uninterrupted bilateral funding for activities fully aligned with the program's priorities. This is important because inclusive value chain transformation for animal-source food is premised on a holistic approach that integrates technological and institutional innovation together with an enabling environment to achieve impact that requires a consistent, focused engagement in target value chains over a sufficiently long period of time.

### A.2 Two most significant achievements/success stories

#### **A new diagnostic tool for controlling a priority disease in sheep and goats**

Contagious caprine pleuro-pneumonia (CCPP) is a transboundary disease and considered the most important threat to sheep and goats in Africa and now in Asia. Attempts to control the disease have been hampered by the lack of rapid, inexpensive diagnostic tests for field use. In 2012 during an outbreak of the disease in Kenya, a new strain (ILRI181) was isolated by ILRI scientists. Based on the sequence of the strain, a rapid, specific and sensitive assay was developed which produces a fluorescent signal within 15-20 min and works well using pleural fluid obtained directly from CCPP-positive animals without prior DNA extraction. It relies on a simple

read-out device that can be powered by a car battery and diagnosis was achieved in less than 45 min in a simulated field setting (ILRI lab books). The next step will be commercial development.

### Reducing disease risk in shrimp culture in Bangladesh

The white spot syndrome virus (WSSV) is a major problem for shrimp culture in Bangladesh, an important cash income generator for smallholders farming multiple fish species: outbreaks can destroy entire populations of shrimp farms within a few days. To reduce the risk of this disease, WorldFish scientists working under the USAID-funded Feed the Future Aquaculture for Income and Nutrition (AIN) project have enabled hatcheries to increase their production of WSSV-free shrimp post-larvae tested using polymerase chain reaction (PCR). As the result, over 448 million disease-free post-larvae were distributed to farmers. This is important because a survey of farmers found that between 2011-12 and 2014-15, households using PCR-tested seed had a 26% increase in production yield on average (Aquaculture Journal *submitted*).

### A.3 Financial summary

The program executed USD 43.1 million of the total 2016 USD 50.1 million budget in 2016 (86% overall; 34% of W1/2 versus 66% of W3/bilateral/own funds). The original 2016 Plan of Work and Budget submitted in February 2016 was for a total USD 36.6 million, so over a quarter of the program's 2016 funding was new funding mobilized during the year. Gender research accounted for (tbc)% of expenditures.

## B. Impact pathways and intermediate development outcomes (IDOs)

The overall program impact pathway and theory of change is described in the program's **Results Strategy Framework and Intermediate Development Outcomes (IDOs) (v.3)** (<http://livestock-fish.wikispaces.com/IDO>) and summarized in the program's 2015–2016 extension proposal. Six IDOs were adopted by the program, and indicators for the IDOs and methodology for estimating their target and actual values are described in an **IDO Indicator Manual**. The original program IDOs have been maintained here for consistency; with the adoption of the new CGIAR Strategy and Results Framework 2016–2030, a revised, standard set of IDOs and sub-IDOs has been introduced, and the associated indicators and methodology for their estimation are being developed at System level. Work continued in 2016 to define how the monitoring and evaluation (M&E) framework will be operationalized in practice in preparation for Phase 2, including the appropriate use of benchmarking, baselines and dedicated data collection. To date, the program is relying on situation analyses for the selected value chain countries that describe a range of indicators of the current status of the target pro-poor value chain based largely on secondary data in the public domain. More detailed baseline information is being collected as bilateral projects are funded and implemented in each value chain.

### C. Progress along the impact pathways

The following summaries are derived from detailed annual reports by value chain and implementing partner, and synthesis reports by program flagship; these can be accessed at the CRP [wiki](#).

#### C.1 Progress towards outputs

For the extension period 2015–2016, the program was restructured from six themes to five flagships, three of which support the principal technology drivers of productivity and intensification in livestock and aquaculture systems, namely animal health, animal genetics, and feeds and forages. Two other flagships (systems analysis for sustainable innovation and value chain transformation and scaling) apply a combination of biological and social science to address key dimensions supporting inclusive value chain development and intensification and ensure more effective agricultural research-for-development that translates into impact.

**Flagship 1—Animal health:** This flagship generates data and materials for solutions to improve the pro-poor management of animal health and food safety in the selected value chains and more generally.

A first cluster of activities assesses productivity constraints imposed by disease to inform prioritization. After establishing internal capacity in 2015 to lead this work, it has quickly achieved momentum with a focus on

Uganda, Ethiopia and Tanzania, and investigations of new disease problems emerging in the Egypt and Bangladesh aquaculture systems. A systematic literature review of small ruminant diseases in Ethiopia provided detailed information on metacestodes, caprine contagious pleuro-pneumonia (CCPP), gastro-intestinal parasites and mange mite. A participatory epidemiological study yielded insights regarding differential veterinary knowledge of women and men in Ethiopian households keeping sheep and goats related to their gender roles, and the need to target interventions accordingly. In Uganda, collaboration with the A4NH CRP provided assessments of diseases with both production and public health impacts, indicating: brucellosis is not currently a major problem in pigs, but reporting for the first time *Yersinia enterocolitica* antibodies; cysticercosis remains present; and two-thirds of pigs were found infected with one or more gastro-intestinal parasite. In Bangladesh, the program informed the government of its discovery of acute hepatopancreatic necrosis disease, also called early mortality syndrome, for the first time in shrimp there, prompting a response.

The second cluster works to improve management of animal population health. In Uganda where the primary concern in pigs is African swine fever, risk factors in current smallholder systems were identified. A CSIRO-AusAID Initiative study found very low levels of awareness of biosecurity practices among pig keepers in the Uganda-Kenya border area. To protect Bangladesh shrimp culture, the impact of White Spot Disease and strategies for improving biosecurity at hatchery and farm level were described. The impact of rising use of chemical and biological products in aquaculture in Bangladesh was also documented.

The development of vaccines and diagnostics for priority neglected diseases that constrain the targeted animal source food value chains is the focus of the third cluster. *Peste des petits ruminants* (PPR) is one such disease for goats in Ethiopia; a study led by Pirbright Institute demonstrated successful immunization against PPR with a DIVA vaccine, critical in monitoring vaccination campaigns. East Coast fever (ECF) is a major disease constraint for Tanzania dairying. Collaborative work with University of Edinburgh identified the parasites comprising the existing live vaccine against ECF, important for investigating any vaccine failure. The results found an unexpectedly small amount of diversity within the vaccine parasites, so greater diversity may need to be introduced. An improved vaccine achieved protection for the first time against a LD95 sporozoite challenge dose, and three new schizont CTL antigens have been identified (ILRI lab books). Other advances in related bovine immunology included: staining techniques towards cellular activation markers; characterization of viruses contributing to the bovine respiratory disease complex responsible for pneumonia and major economic losses in cattle from intensive farming systems; and positive selection shown in indigenous cattle breeds for sequence diversity in class I MHC loci with implications for ECF infections. A reverse vaccinology approach was used to identify 66 *Mycoplasma mycoides* subsp. *mycoides* recombinant proteins to formulate a prototype vaccine against the other major cattle disease: contagious bovine pleuro-pneumonia (CBPP). One of the vaccine strains currently in use, T1/44, was sequenced to find ways to improve its safety, and two novel CBPP diagnostic tools were developed.

Under the final cluster on equitable delivery of animal health services and technologies, the manufacturing and testing protocol for the existing ECF vaccine, including the parasitological data for the reference stabilates used, was published. In Tanzania, a number of actions were successful in expanding capacity for greater ECF vaccination coverage, including recruiting additional private sector distributors, training vaccinators, and a certification system for trainers and vaccinators, contributing to cattle in 932 households being vaccinated.

**Flagship 2—Animal genetics:** This flagship aims to ensure that choices of improved and appropriate livestock breeds, breed combinations and strains are widely available, being sustainably used, and equitably providing income and nutritious, affordable food for the poor.

The first cluster of activities focuses on better assessment of opportunities for using animal genetic resources appropriately. To initiate work on indigenous poultry, village chicken breeding practices, objectives and farmers' trait preferences were characterized in Northern Ethiopia. Evidence regarding the value of indigenous chicken genetic resources was also established through genome-wide association studies of immune, disease and production traits in indigenous chicken ecotypes. For aquaculture, findings were reported from the first large-scale social interaction (competition) experiment for the improved strain of Nile tilapia (GIFT). The results show interesting trade-offs between harvest weight uniformity and harvest weight itself (article 1; 2), heritable



competitive interaction for harvest weight (3), and effects of competition on feed efficiency (4) – all of which may be influenced through selection criteria beyond the current focus on growth. A [tool](#) using diversity array technology (DArT) markers was developed enabling rapid genomic assessment in the Abbassa strain of Nile tilapia which will be key to managing inbreeding. To evaluate opportunities for better management of [indigenous pig](#) genetic resources, production systems in Vietnam and Sri Lanka were compared. Two studies offered novel insights into the genomic adaptations of domestic sheep to extreme environments: sequencing native [Chinese sheep](#) from varied environments revealed putative novel candidate genes and pathways for hypoxia responses at high altitudes, water reabsorption in arid environments, and energy metabolism and body size variations; and a novel mechanism for high-altitude adaptation in sheep identified through genomic comparison of high-altitude and lowland Asian breeds was reported in [Nature](#). The current knowledge of genetic diversity of domestic [goats in Africa](#) identified by microsatellite loci was reviewed, and their [genetic diversity](#) and structure within an early livestock dispersal area in Eastern North Africa characterized. For dairy cattle, a [review](#) described the status of dairy production systems and the adoption of genetic and breeding technologies across CRP sites in Tanzania, Kenya, India and Nicaragua. A chapter in mainstreaming the gender book highlighted the important but ignored role of women in managing breeding in dual-purpose cattle systems in Nicaragua.

The second cluster of research develops and promotes improved breeds and strains. Based on piloting of community-based sheep and goat breeding programs in Ethiopia, guidelines for their establishment were updated and a [national workshop](#) held on breeding strategies. The approach is being extended to [Kenya](#), including within a CCAFS site where the first step to characterize current [management practices](#) was completed. For dairy cattle, the feasibility of [genomic prediction](#) in small cross bred populations was demonstrated, and will be applied by national dairy performance recording centers in Tanzania and Ethiopia being established under the Bill and Melinda Gates Foundation-funded African Dairy Genetic Gains project. A two-year [study](#) in Senegal quantified key performance and financial differences associated with different local and Zebu-Bos Taurus crossbred dairy breed types to inform optimal cross-breeding strategies, and took care to understand [gendered responsibilities](#) in household cattle-keeping there. The aquaculture program maintained its steady progress, producing [generation 14](#) of the Abbassa tilapia line in Egypt and [generation 15](#) of the improved GIFT at WorldFish headquarters in Malaysia.

The third cluster aims at strengthening the delivery and use systems for improved animal genetic resources. Improving sheep reproduction performance has been identified as key to successful scaling out of community-based breeding programs; to this end, an [approach](#) to synchronization and artificial insemination adapted to field conditions in Ethiopia was developed and a [field-guide](#) produced for evaluating the soundness of breeding rams. Other support materials were developed for [cattle health-care](#) in Nicaragua and indigenous chicken [management](#) and [health-care](#) for Bangladesh, Pakistan, Vietnam and Sri Lanka.

Work under the fourth cluster targets ‘breakthrough technologies’ to support improved genetics in the smallholder context. A [protocol](#) on genome editing in bovine fibroblasts using CRISPR/Cas9 system was established, and the [embryo recovery rate](#) of in vitro produced bovine embryos after cryopreservation using solid surface vitrification and in straw dilution was assessed. The [capacity](#) of the ILRI biorepository was expanded to hold more open-source samples.

**Flagship 3—Feeds and forages:** This flagship develops superior feed and forage options that respond to current and evolving demands to increase meat, milk and fish production, while reducing the ecological footprint.

A first cluster of activities continued to strengthen a shared platform of tools and approaches it has established to support the feed research agenda. The Feed Assessment Tool (FEAST) [e-learning](#) website developed in collaboration with Sonata and the Humidtropics CRP was upgraded to integrate the TechFit tool as an Intervention Ranking Analysis so that [FEAST](#) now both assesses feed resources and proposes and prioritizes among 30 feed intervention options. More [equations](#) were added to the near infra-red reflectance spectroscopy (NIRS) platform, and training to use the platform was provided in [Ethiopia](#).

The second cluster seeks to ensure existing feed resources are used better. The contribution of *Pennistenum pedicellatum* to sheep fattening [diets](#) and factors affecting [farmer adoption](#) were described for Ethiopia. An

improved feeding regime was developed for dairy heifers in Rwanda. A basic step in using feed resources better resides in understanding feed price–quality relationships. Results of studies of these relationships in Niger and Nigeria were reported at the PanAfrican Grain and World Cowpea Conference, and for India showed that rational price-quality relationships do exist and offer the opportunity to design superior cost effective diets. Using crop residues for animal feed was investigated in East Africa and Ethiopia and shown to provide the best economic return to farmers, at least in the short to medium term.

Creating higher quality feed options is the focus of the third cluster. Steady incremental progress working with the crop CRPs in identifying and breeding superior food-feed cultivars for sorghum, rice and grain legumes, including chickpeas (4 papers) and the common bean was reported at two international crop improvement conferences. Evidence of gains to be achieved by selecting for faba bean straw quality was established. Findings showing low voluntary feed intake of short duration and water efficient sorghum and pearl millet varieties have informed breeding objectives in those programs. An approach was developed to facilitate research to exploit the game-changing property of apomixis in *Brachiaria decumbens*, and improved understanding of the root and fungal endophyte dynamics of *Brachiaria* with soil properties was reported. Significant progress was made in upgrading ligno-cellulose biomass for feed using Ammonia Fiber Expansion (AFEX), a spin-off-technology from second generation biofuel, which raised apparent digestibilities of straws and stover to the 70% range.

**Flagship 4—Systems Analysis for Sustainable Innovations (SASI):** This flagship acts at the interface between the technology generation flagships (Health, Genetics and Feeds & Forages) and the value chain transformation and scaling flagship (VCTS), to ensure integration of the various components through a whole-systems perspective looking at livestock and fish value chains as coupled socio-ecological systems that are operating in a wider regional and global context.

A first cluster of activities is dedicated to cross-cutting research that supports pro-poor value chain transformation, including gender dimensions (reported in a separate section). Two studies used life cycle analysis to quantify and compare the multi-dimensional environmental impacts of conventional and improved aquaculture in Egypt, and which provided evidence of the environmental benefits associated with best management practice and improved tilapia interventions through better resource use and feed utilization. Impact assessment of the aquaculture development project in Egypt that had scaled out these interventions was published and estimated they were contributing to USD 19 million annually in higher profits for the sector. A framework based on the concept of social wellbeing was described for understanding the effect of agrarian change in an area in Bangladesh where aquaculture is practiced. A collaborative effort with the CCAFS and Humidtropics CRPs applied a rapid household modelling approach to a large sample from sub-Saharan Africa and concluded that livestock development together with market access and off-farm opportunities are the best strategies to increase household food availability.

The second cluster under this flagship provides cross-cutting backstopping on the design and development of integrated intervention packages in the target value chains. The team continued the development of the value chain assessment tools and a completed version 1 of the tool kit is now publicly available. A systems dynamic model of the dual purpose cattle value chain in Nicaragua developed with value chain actors, provides a new tool for assessing the impact of improved feeding systems on milk productivity and producer incomes. The CRP contributed to a review of research on aquaculture value chains led by the AAS CRP. A study in Tanzania compared the benefits of three policy interventions proposed in the Tanzania Livestock Modernization Initiative. Using a partial equilibrium model, the *ex-ante* impact assessment concluded that all three interventions would address critical supply constraints in the smallholder dairy sector, though with differential benefits to milk producers and consumers. A second *ex-ante* impact assessment estimated the significant contribution improved forages could make to milk production in East Africa. A production function and financial analysis approach was used to confirm the financial viability of improving mola carplet production as an intervention in Bangladesh, though acknowledging that factors affecting production remain poorly understood.

A third cluster focuses on assessing progress and capturing lessons. Deployment of a novel M&E system grounded in the Theory of Change framework forms the major activity of this cluster. This Change Monitoring system was successfully piloted in Tanzania and Ethiopia.

**Flagship 5—Value chain transformation and scaling:** This flagship was redefined for the extension period to focus on using research to develop evidence-based interventions to promote inclusive, sustainable animal-source food value chains and stimulate processes to achieve transformative scale in the target value chains. The value chain research teams serve as the interface between cross-cutting research in the other flagships and integrated solutions for generating impact in a specific national or regional context.

A first set of activities focused on how best-bet interventions being developed by the other flagships could be combined and tested as integrated pilot interventions. Consistent with the original 12-year program horizon, research teams in the selected value chains targeted by the program were largely still validating best-bet interventions under the other flagships, as reported in the other flagship sections, while testing innovations for other components of the value chain. In Ethiopia, improving the quality and safety of [traditional processing](#) of dairy products including goat milk was studied and a [training manual](#) prepared. In Uganda with Irish Aid funding, components of a package for training various actors in the pig value chain on improved [practices and management](#) began to take shape. An analysis of the role of [governance structures](#) in the pig value chain highlighted the lack of mechanisms that promote benefits to smallholder farmers. The Vietnam pig value chain lacked bilateral funding for major activities, but based on an assessment of [adoption](#) of improved practices, created a functional classification to guide the intervention strategy for commercial pig producing households. The potential for ethnic minority households to develop markets for local pigs was assessed in the [Central Highlands](#) as a collaborative activity with Humidtropics and A4NH CRPs funded by the Livestock & Fish CRP. The Bangladesh aquaculture value chain work continued to be implemented closely with AAS and complementing the large USAID-funded AIN project that is strengthening the provision of inputs and services, including feed from small-scale mills and hatcheries providing WSSV-free shrimp seed and genetically improved tilapia. In Egypt, extensions of aquaculture development interventions implemented under an earlier Swiss Development Corporation funded project were pursued, including a fish processing component to target [youth](#). An assessment of the potential for [carbon insetting](#) schemes to improve profitability in Nicaragua dual-purpose cattle systems concluded that smallholder farmers may not be able to participate due to lack of organization and poor product quality, informing research priorities for next steps. In Tanzania, developing interventions for the dairy value chain focused on the appropriate organizational arrangements, with two tools for assessing sustainability adapted and applied in pilot sites: the [Producer Organization Assessment Tool](#) which considers various dimensions including financial health, access to dairy inputs and services, relationship with external environment, member loyalty, effective and transparent leadership and management and engagement with the output market; and a [Trader Assessment Tool](#) to assess how traders improved their businesses following training in business planning and mentoring on implementation of individual business plans. Another study examined farmers' preferences for [bundled input-output market arrangements](#) to guide intervention design.

The second cluster focuses on research to support implementation of innovations at scale, including improving assessment of capacity development needs and the role of innovation platforms. Of note were applications of capacity assessment tools, particularly regarding gender, in both [Ethiopia](#) and [Uganda](#). These enable development partners to address gaps that allow them to better support scaling out of CRP outputs. Similarly, in Nicaragua, a [toolbox](#) developed with the Humidtropics CRP and drawing on CRP outputs was provided to innovation platforms to aid their members in decision-making to increase productivity and resource integrity on their farms. The role of [multi-stakeholder processes](#) in fostering scaling out of inclusive dairy innovation was analysed in Tanzania, highlighting their contribution to the Livestock Development Strategy for Africa (LiDeSA). Benefits of the pig [multi-stakeholder platform](#) in Uganda originally initiated by the CRP, including stronger business linkages, were recorded by participants during reflection sessions.

## C.2 Progress towards the achievement of research outcomes and IDOs

The program devotes science to generating novel technologies and effective strategies that support inclusive livestock and fish value chain development and transformation. Several examples demonstrate that research from the program is being taken up by next users beyond the program's direct sphere of control.

- Based on a visit to the community-based sheep and goat breeding programs in Ethiopia, the African Goat Improvement Network decided to fund the [approach](#) in 12 sites in Malawi and Uganda.

- In Tanzania, three additional private sector [distributors](#) have begun to provide the live ECF vaccine, expanding the potential vaccine coverage among cattle keepers.
- Adopting the cassava peel processing technology developed in collaboration with the RTB and Humidtropics CRPs, two companies, Niji Foods Ltd (with matching funds from USAID) and Durante Fish Feeds Ltd, and the non-profit Synergos have established or started building six processing factories in [Nigeria](#) for two cassava peel products, CassaPeelMash® and CassaPeelBran® being used as an ingredient in monogastic, ruminant and aqua feed products.
- The 2<sup>nd</sup> phase crop agri-food systems CRPs have included a component to explore crop residue fodder traits as selection criteria in their breeding programs, demonstrating the momentum achieved by the dual purpose feed-food crop concept further developed under the Livestock & Fish CRP. Beyond including crop quantitative and qualitative fodder traits as additional selection criteria, this work is changing crop improvement paradigms based on whole plant optimization rather than for single traits.
- CIAT was invited to co-lead the [National Roundtable for Sustainable Cattle Production \(Mesa de Ganadería Sostenible\)](#) in Colombia. This platform consists of approximately 30 national public and private sector institutions and serves as a forum for planning and aligning research, development and policy efforts around livestock production. Through the Roundtable, CIAT participates in the cattle sector planning efforts of the Colombian Entity for Rural Agricultural Planning (UPRA).
- The International Fund for Agricultural Development (IFAD) awarded a [grant](#) to Heifer International to integrate the dairy hub model into its projects in Zanzibar and Rwanda. The dairy hub model has been a central feature of the Bill and Melinda Gates Foundation-funded East Africa Dairy Development project, in which ILRI has served as knowledge partner. The investment demonstrates uptake of the concept and commitment to scaling it out by a third-party organization.
- A major USAID-funded agricultural development project in Kenya (Accelerating Value Chain Development) led by ILRI adopted the CRP approach for dairy development in non-traditional marginal zones, using a similar [targeting](#) strategy as the CRP's Tanzania dairy value chain.
- The [Dairy Development Forum](#) in Tanzania has continued to increase its activities and to grow in membership, demonstrating its viability and sustainability as a national platform for coordinating inclusive dairy development. This is significant because the CRP played a key role in establishing the Forum, but is now limiting its support to strengthening the Forum's communication capacity as part of a planned exit strategy.
- The Online Journal Tropical Grasslands – Forrajes Tropicales supported by the CRP is now indexed in 4 science networks (Web of Science, Cabi, Agris, REDIB). It had 3 editions in 2016. The [website](#) was visited frequently in 2016 (Jan-Oct) with unique visitors over 58,000 and visits totalling 94,000. Over the same period, the journal had downloads of 4,291 abstracts and 5,920 full papers.
- The final project impact study found interventions implemented by the USAID-funded AIN project in Bangladesh were reaching 800,000 small- and medium-scale fish farmers and their families, and covering 150,000 ha in 2016. Small feed mills established under the project produced 955 tons.
- New initiatives in the private sector to support pig production in Uganda were developed in consultation with the CRP. [Devenish Nutrition](#) set up a feed mill and model farm to improve availability of quality feeds for pigs. Breeds, Feeds and Meats Ltd is a new company that will be providing pig breeding services and a feed mill for processing pig feeds.

### C.3 Progress towards impact

Evidence about impact of program research in 2016 came mainly from the [Tanzania](#) dairy value chain where a preliminary analysis of changes in milk revenues associated with the Irish Aid-funded MoreMilk project showed that dairy interventions increased average household daily revenue by 20% from USD 1.00 to USD 1.20. The preliminary results reported in 2015 regarding the impacts of the large aquaculture interventions in Egypt and Bangladesh were confirmed in project final [reports](#).

## D. Gender research achievements

Throughout 2016, the CRP continued to invest in building the capacity of biophysical and value chain scientists to integrate gender into their research projects as well as supporting interdisciplinary teams for the full research cycle, especially for the analysis and interpretation of gender disaggregated data. This was done in collaboration with the Royal Tropical Institute (KIT) which coached scientists throughout the research cycle. The result was a book that presents findings from 14 gender-integrated livestock and fish research studies, and reflections on the process. Methodological and data-related studies that were coached and written up as separate book chapters are described in this [overview chapter](#). The book was [pre-launched](#) during the CGIAR gender network annual meeting in Cali. It was written largely through [a writeshop process](#), which offered support in interpretation and analysis as well as writing of the gender aspects of the research. A follow-up webinar was held in July 2016 on 'Questions and challenges in gender data analysis and interpretation', for scientists working in the coached projects.

Highlights in 2016 as to gender tools include the development of a manual on gender responsive transformative approaches, which was included in the CRP's value chain toolkit. A team also finalized a gender module for [FEAST](#). In relation to animal genetics, a gender disaggregated [study](#) on milk production of 447 animals on 59 farms in Nicaragua showed gender disparities in milk production and adoption of Artificial Insemination. Gender-disaggregated data collection undertaken in a [forage](#) project in Tanzania unexpectedly showed that most forage collection is performed by men. In Ethiopia, the [gendered implications of small ruminant health](#) were studied, contributing to the sub-IDO on "improved capacity to participate in decision making".

Gender analysis in different aspects of value chains were explored in [Bangladesh](#) fish and [fish feed chains](#), dairy chains in [Tanzania, Kenya and Uganda](#), and [pig chains in Uganda](#) and are in preparation as peer reviewed publications, together with a synthesis paper with analyses of key gender issues across the CRP's priority livestock and fish value chains. These papers and book chapters contribute to all three of the sub-IDOs related to gender equality and inclusion. A second synthesis paper on gender in livestock and fish value chains explores issues of ownership in relation to gender and women's empowerment covering fish ponds in Bangladesh, cattle in Tanzania, and small ruminants in Ethiopia. This study contributes to the sub-IDO "gender equitable control over productive assets and resources". To address the significant barriers facing poor women fish retailers in Egypt, a new Swiss Development Corporation-funded project there permitted mixed methods applied research to be re-started with women retailer groups.

Comparative case studies on women's social and economic empowerment in aquaculture production systems in Asia were conducted with the FAO, with separate case study reports for [Bangladesh](#) and [Indonesia](#) forthcoming. These particularly contribute to the sub-IDO on "gender equitable control over productive assets and resources".

Based on the indicators for gender mainstreaming, the CRP met the requirements established by the former Consortium Office. An example for the performance indicators related to defining gender equality targets is that the sex-disaggregated data collected and analyzed across research projects in all flagships, and broader gender analysis influenced the definition of phase 2 research priorities in the LIVESTOCK CRP and FISH CRP proposals. An important accomplishment in relation to strengthening the institutional architecture for gender integration was the appointment of a new Senior Gender Scientist.

## E. Partnerships building achievements

The Swedish University of Agricultural Sciences (SLU), the CRP's first non-CGIAR partner, became fully engaged in the proposal process for the 2<sup>nd</sup> phase LIVESTOCK CRP proposal, taking leadership of the livestock health flagship.

New partnerships were established to address new research opportunities. As the CRP develops an agenda on fish health, it has initiated collaboration in this area with the Royal Veterinary College (UK), Mahidol University (Thailand), the Centre for Environment, Fisheries and Aquaculture Science (Cefas; UK) and Exeter and Stirling

Universities (UK). Similarly, to strengthen the work on the contribution of fish to human nutrition, the program involved Helen Keller International and the Bangladesh Fisheries Research Forum. In Nicaragua, new bilateral projects have allowed the CRP to begin working with Heifer International, CATIE and the Mixed Crop-livestock Learning Alliance. Interest in the program's gender capacity assessment activities in Ethiopia led to new collaboration with Livestock Market Development in the Ministry of Livestock and the National Network for Gender Equality in Agriculture. The program in Uganda was approached by Devenish Nutrition, a private company seeking guidance on its investment to support the pig value chain, leading to its involvement in the pig stakeholder platform.

The GCARD3 process provided an opportunity to evaluate the program's alignment with a wide range of stakeholders in its target countries, and consultations on the 2<sup>nd</sup> Phase CRP proposals continued as part of the CGIAR Site Integration initiative, particularly in Ethiopia. Other opportunities have allowed the program to validate its alignment with national priorities by contributing directly to national processes, including the invitation for CIAT to help host the National Roundtable for Sustainable Cattle Production in Colombia, and for the CRP to facilitate a series of regional consultations in Tanzania as part of the government's Livestock Modernization Initiative, a highlight of which was acknowledgement that the CRP's work on the dairy value chain is already implementing the African Union-InterAfrican Bureau for Animal Resources LiDeSA.

As the final year of the CRP and given funding uncertainty, no new major collaboration was initiated across CRPs, though a number of opportunities will be pursued in the 2<sup>nd</sup> Phase CRPs as described in the FISH CRP and LIVESTOCK CRP proposals.

Highlights of research outcomes cited in the preceding sections provide examples of partner use of CRP outputs, including the direct use of small ruminant value chain best bet technologies and strategies by various regional agricultural research centres within Ethiopia and supported by a number of short-term training events, the deployment by the African Goat Improvement Network of the community-based breeding model in development projects in Malawi and Uganda, and IFAD's adoption of the dairy hub model in development projects in Rwanda and Zanzibar.

## F. Capacity building achievements

Training activities are embedded throughout the program and a list of events is provided in the Performance Indicator Table in annex. Approximately 1,542 people, 36% of them women, were involved in short-term training events during the year. Of these, 30 were trained jointly in Uganda with RTB CRP on facilitation skills for the multi-stakeholder platforms they support, and 4 in Vietnam on diagnostics jointly with A4NH CRP. In Bangladesh, training targeted capacity among national partners to support fish feed and health requirements for aquaculture, as well as 'private sector facilitators' as local service providers under the AIN project. In Ethiopia, much of the effort focused on enabling partners in the regional agricultural research centers to support scaling out of CRP innovations for the small ruminant value chain. In Uganda and Tanzania, there was an emphasis on business management skills in addition to those related to animal husbandry. The program also hosted 66 graduate fellows as future leaders in research, nearly a third of whom (30%) were women.

The joint effort with the Humidtropics CRP to apply web-based instructional design and developing blended-learning materials to support better use of feed resources continued to refine and roll out the classroom and online modules for the [FEAST](#) tool. It was upgraded to incorporate the Techfit tool and has now been used for training in nearly all of the CRP's target value chains. Also, following the participatory gender capacity assessments conducted with partners in 2015 in Tanzania, Ethiopia, India and Uganda, [gender training modules](#) were developed with Transition International to address the capacity gaps identified, and used for training many of the same partners. In Ethiopia, the training prompted partners to establish a Gender Capacity Development Committee to mainstream the training in their organizations.

## G. Risk management

The Livestock & Fish CRP was designed to deliver results in terms of outputs and outcomes over a 12-year horizon. With the end of the program after five years, the program is mid-way in that process, so risks now relate primarily to continuity of key research activities within the 2<sup>nd</sup> Phase CRP portfolio and continued engagement within the impact pathways for key outputs and outcomes. The risk that the pipeline critical to delivering the CRP's outcomes is disrupted has largely been mitigated by the incorporation of the most promising research lines into the new FISH and LIVESTOCK CRPs. These research lines continue to contribute to priorities identified by the two new CRPs. Also, importantly, the two new CRPs have retained the selected value chains in the priority countries that were most active under the Livestock & Fish CRP, and so will maintain the engagement and momentum established for research outputs within the impact pathways for those value chains. But whereas programmatic integrity is largely being carried into the new CRPs, the value chain transformation focus of the Livestock & Fish CRP will now be only one component within the much broader mandates and research agendas of the new CRPs. Moreover, both of the new CRPs face funding challenges for their flagships largely responsible for the value chain impact pathways for which Window 1/2 funding was not approved for 2017. The funding embargo for these flagships, combined with the history of Window 1/2 funding instability and uncertainty, creates a high risk to the System's reputation in respecting commitments to key partners in the impact pathway and ensuring their continued collaboration. To mitigate this risk, the CRP encouraged efforts to mobilize bilateral resources for activities within the impact pathways, and to engage proactively in the CGIAR Site Integration initiative to strengthen the System's effectiveness at country level.

## H. Lessons learned

### H.1 Confidence of indicators

The indicators reported in Table 1 are derived from detailed data presented in the various background reports, which cite the supporting evidence. The data have been screened for duplications.

### H.2 Changes in research direction

The approach being tested in the Animal Genetics flagship to introduce trypanotolerance into cattle through gene-editing did not succeed and was attributed to bovine fibroblast senescence during prolonged culture of donor cell lines. Alternative protocols are now being examined.

### H.3 Lessons learned from evaluation

During this last year of the program, the program encouraged research teams to review the overall progress of each flagship, resulting in a series of [synthesis briefs](#). General conclusions emerging from the teams largely echoed the findings of the earlier external evaluations of the program, including consensus that there has been progress in aligning upstream research with the problem-solving focus of the components working more directly within the target value chains. A [consultation](#) held at Tropentag and an internal workshop reviewed the overall CRP approach and whether there was evidence that the value chain approach and focus on selected value chains was contributing to more relevant research that translates into impact. The discussion highlighted the continuing tension of defining the role of research versus development, with the consensus in general agreement with the CRP external evaluation that the results so far are showing promise, but with the approach needing to be more fully implemented. The CRP management committee also conducted a self-evaluation of the program's progress and the performance of its management and governance structure. The committee concluded that the CRP's value chain approach is on the right track, and highlighted a number of shortcomings that will need to be addressed in the 2<sup>nd</sup> Phase CRPs. Strengthening the role of the flagship leaders and mobilizing bilateral funding for the value chain teams were identified as priorities.

## I. Financial report

The financial reports are attached as Annex 3.

# Annex 1. Program Indicators of Progress

Detailed explanation for the source of the indicators can be found at [http://livestock-fish.wikispaces.com/2016\\_AnnualReports](http://livestock-fish.wikispaces.com/2016_AnnualReports) in the Source of Summary Indicators file and in the various Flagship, center and value chain reports posted there. Explanatory notes at the bottom of the table are provided for selected indicators.

| Indicator   | Deviation narrative (if actual is more than 10% away from target) | 2015    |        | 2016    |  |
|---|---|---------|--------|---------|--|
|   |   | Target  | Actual | Target  | Actual   |
| KNOWLEDGE, TOOLS, DATA  |   |         |        |         |  |
| 1. Number of flagship "products" produced by CRP  |   |         | None   | 5       | 1<br>Structure and governance of multi-stakeholder platforms for pig value chain development in Uganda<br><a href="http://bit.ly/2euolMW">http://bit.ly/2euolMW</a>  |
| 2. % of flagship products produced that have explicit target of women farmers/NRM managers        |   | Not set | N/A    | Not Set | N/A  |
| 3. % of flagship products produced that have been assessed for likely gender-disaggregated impact |   | Not set | N/A    | Not set | N/A  |
| 4. Number of tools produced by the CRP  |   |         | 70     | 40      | N=37 (* = 50% shared CCAFS; ** = 50% shared A4NH)<br>Traders assessment tool<br><a href="https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/">https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/</a><br>Tool for identification and selection criteria for weaners<br><a href="http://bit.ly/2fEWCbJ">http://bit.ly/2fEWCbJ</a> |



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|  |  |  |  | <p>Tool for assessment of knowledge on pig husbandry practices<br/> <a href="http://bit.ly/2fEZISG">http://bit.ly/2fEZISG</a></p> <p>Pig farmers training manual on biosecurity for control of African swine fever<br/> <a href="http://bit.ly/2eFTf2D">http://bit.ly/2eFTf2D</a></p> <p>Training manual for pork butchers<br/> <a href="http://bit.ly/2f7ukWp">http://bit.ly/2f7ukWp</a></p> <p>Producer Organization Assessment Tool<br/> <a href="https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/">https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/</a></p> <p>FEAST feed assessment tool<br/> <a href="https://cgspace.cgiar.org/handle/10568/76260">https://cgspace.cgiar.org/handle/10568/76260</a></p> <p>Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in Sub-Saharan East Africa<br/> <a href="https://cgspace.cgiar.org/handle/10568/77229">https://cgspace.cgiar.org/handle/10568/77229</a></p> <p>SPVCD Partner capacity assessment tool<br/> <a href="http://bit.ly/2fzyreQ">http://bit.ly/2fzyreQ</a></p> <p>Towards a sustainable dual-purpose cattle value chains in Nicaragua<br/> <a href="http://livestock-fish.wikispaces.com/file/view/Presentation+An+Notenbaert+Bristol+Jan+2016.pdf/572708703/Presentation%20An%20Notenbaert%20Bristol%20Jan%202016.pdf">http://livestock-fish.wikispaces.com/file/view/Presentation+An+Notenbaert+Bristol+Jan+2016.pdf/572708703/Presentation%20An%20Notenbaert%20Bristol%20Jan%202016.pdf</a></p> <p>Guidelines for Setting up Community-based Small Ruminants Breeding Programs in Ethiopia (2nd edition)<br/> <a href="http://livestock-fish.wikispaces.com/file/detail/Guidelines_CBBPS_secondEdition.pdf">http://livestock-fish.wikispaces.com/file/detail/Guidelines_CBBPS_secondEdition.pdf</a></p> <p>Field solution for the artificial insemination of Ethiopian sheep breeds: Reproductive package to effectively vehicle improved genetics from the communities to the communities<br/> <a href="http://hdl.handle.net/10568/77704">http://hdl.handle.net/10568/77704</a></p> <p>Rams' breeding soundness evaluation: Year-round management for rams that are fit for successful reproduction<br/> <a href="http://hdl.handle.net/10568/77701">http://hdl.handle.net/10568/77701</a></p> <p>Participatory training on Farm-Biosecurity<br/> <a href="http://bit.ly/2eFTf2D">http://bit.ly/2eFTf2D</a></p> |
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|  |  |  |  | <p>Tool for data capture on manure management of dual-purpose cattle in Nicaragua</p> <p><a href="https://ilri-angr.wikispaces.com/file/view/Manure%20management-ILRI-CCAFS-Nyando-20161103.pdf/600182770/Manure%20management-ILRI-CCAFS-Nyando-20161103.pdf">https://ilri-angr.wikispaces.com/file/view/Manure%20management-ILRI-CCAFS-Nyando-20161103.pdf/600182770/Manure%20management-ILRI-CCAFS-Nyando-20161103.pdf</a></p> <p>*Tool for data capture on market issues for sheep and goat production under climate smart villages in Kenya</p> <p><a href="https://ilri-angr.wikispaces.com/file/view/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf/564440801/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf">https://ilri-angr.wikispaces.com/file/view/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf/564440801/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf</a></p> <p>*Tool for data capture on small ruminant productivity under climate smart villages in Kenya</p> <p><a href="https://ilri-angr.wikispaces.com/CCAFS+Nyando+project+reports">https://ilri-angr.wikispaces.com/CCAFS+Nyando+project+reports</a></p> <p>Cost: benefit model for low-input dairy systems typical of developing countries</p> <p><a href="http://ilri-angr.wikispaces.com/file/detail/SDG%20cost_benefit%20model%20equations_cleank.docx">http://ilri-angr.wikispaces.com/file/detail/SDG%20cost_benefit%20model%20equations_cleank.docx</a></p> <p>Survey tool to determine willingness to pay for improved dairy genetics in Senegal</p> <p><a href="http://ilri-angr.wikispaces.com/Senegal+Dairy+Genetics">http://ilri-angr.wikispaces.com/Senegal+Dairy+Genetics</a></p> <p>Gender-sensitive data collection tool and manual for determining farmer-preferences and on-farm production of select chicken breeds in Ethiopia, Tanzania, and Nigeria</p> <p><a href="https://acgg.wikispaces.com/On-Farm+Testing">https://acgg.wikispaces.com/On-Farm+Testing</a></p> <p>A tool for identifying animal health challenges and presenting treatment options, for dual-purpose cattle in Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/detail/Manual%20salud%20animal%20bovina-2_20161125_FinalFormat.docx">http://livestock-fish.wikispaces.com/file/detail/Manual%20salud%20animal%20bovina-2_20161125_FinalFormat.docx</a></p> <p>Protocol on genome editing in bovine fibroblasts using CRISPR/Cas9 system and single colony of transfected cells isolation</p> <p><a href="http://ilri-angr.wikispaces.com/file/detail/Cryopreservation+of+bovine+in+vitro+produced+embryos+by+solid+surface+vitrification+-+Report.pdf">http://ilri-angr.wikispaces.com/file/detail/Cryopreservation+of+bovine+in+vitro+produced+embryos+by+solid+surface+vitrification+-+Report.pdf</a></p> <p>Manual on animal health</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Manual+de+Salud+Animal+Bovina.pdf/597973224/Manual+de+Salud+Animal+Bovina.pdf">http://livestock-fish.wikispaces.com/file/view/Manual+de+Salud+Animal+Bovina.pdf/597973224/Manual de Salud Animal Bovina.pdf</a></p> <p>Training modules to strengthen gender capacity of partner organizations</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20">http://livestock-fish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20</a></p> |
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|  |  |  |  | <p><a href="#">MODULO%201.docx/597979142/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx</a></p> <p>Productivity and Economic Performance of Indigenous Micro-organisms (IMO) Piggery Systems in Uganda</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/IMO%20poster%20Livestock%20Congress-1.pdf/598318412/IMO%20poster%20Livestock%20Congress-1.pdf">http://livestock-fish.wikispaces.com/file/view/IMO%20poster%20Livestock%20Congress-1.pdf/598318412/IMO%20poster%20Livestock%20Congress-1.pdf</a></p> <p>Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in Sub-Saharan East Africa</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/77229/Developing_tools_to_quantify_sustainability_of_intensive_and_extensive_ruminant_farming_systems_in_Sub-Saharan_East_Africa.pdf?sequence=1&amp;isAllowed=y">https://cgspace.cgiar.org/bitstream/handle/10568/77229/Developing_tools_to_quantify_sustainability_of_intensive_and_extensive_ruminant_farming_systems_in_Sub-Saharan_East_Africa.pdf?sequence=1&amp;isAllowed=y</a></p> <p>Modelling Household Level Small Ruminant Herd Size in Ethiopia</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Modelling+Household+level+Small+Ruminant+Herd+Size+-+Kassie+et+al+2016+presented.pdf/600597800/Modelling%20Household%20level%20Small%20Ruminant%20Herd%20Size%20-%20Kassie%20et%20al%202016%20presented.pdf">http://livestock-fish.wikispaces.com/file/view/Modelling+Household+level+Small+Ruminant+Herd+Size+-+Kassie+et+al+2016+presented.pdf/600597800/Modelling%20Household%20level%20Small%20Ruminant%20Herd%20Size%20-%20Kassie%20et%20al%202016%20presented.pdf</a></p> <p>Biorepository of livestock and livestock pathogen samples</p> <p><a href="http://azizi.ilri.cgiar.org/">http://azizi.ilri.cgiar.org/</a></p> <p>Whatsapp pig farmers! Uganda's innovation platforms connecting and sharing on smartphones</p> <p><a href="https://livestockfish.cgiar.org/2016/04/14/whatsapp-uganda/">https://livestockfish.cgiar.org/2016/04/14/whatsapp-uganda/</a></p> <p>Decision making toolbox for livestock production enabling smallholder farmers to make better decisions on their farms</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf</a></p> <p>and</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf</a></p> <p>and</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf</a></p> |
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| 5. % of tools that have an explicit target of women farmers |  |  | 26 | Not set | <p>N= 11 (31%) (* = 50% shared CCAFS)</p> <p>Traders assessment tool<br/> <a href="https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/">https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/</a></p> <p>Producer Organization Assessment Tool<br/> <a href="https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/">https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/</a></p> <p>FEAST feed assessment tool<br/> <a href="https://cgspace.cgiar.org/handle/10568/76260">https://cgspace.cgiar.org/handle/10568/76260</a></p> <p>Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in Sub-Saharan East Africa</p>  |

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|  |  |  |  | <p><a href="https://cgspace.cgiar.org/handle/10568/77229">https://cgspace.cgiar.org/handle/10568/77229</a></p> <p>Participatory training on Farm-Biosecurity</p> <p><a href="http://bit.ly/2eFTf2D">http://bit.ly/2eFTf2D</a></p> <p>Training manual butcher-Biosecurity</p> <p><a href="http://bit.ly/2f7ukWp">http://bit.ly/2f7ukWp</a></p> <p>*Tool for data capture on market issues for sheep and goat production under climate smart villages in Kenya</p> <p><a href="https://ilri-angr.wikispaces.com/file/view/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf/564440801/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf">https://ilri-angr.wikispaces.com/file/view/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf/564440801/CCAFS%20Nyando_Traders%20Survey%20Tool.pdf</a></p> <p>*Tool for data capture on small ruminant productivity under climate smart villages in Kenya</p> <p><a href="https://ilri-angr.wikispaces.com/CCAFS+Nyando+project+reports">https://ilri-angr.wikispaces.com/CCAFS+Nyando+project+reports</a></p> <p>Gender-sensitive data collection tool and manual for determining farmer-preferences and on-farm production of select chicken breeds in Ethiopia, Tanzania, and Nigeria</p> <p><a href="https://acgg.wikispaces.com/On-Farm+Testing">https://acgg.wikispaces.com/On-Farm+Testing</a></p> <p>Training modules to strengthen gender capacity of partner organizations</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx/597979142/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx">http://livestock-fish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx/597979142/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx</a></p> <p>Decision making toolbox for livestock production enabling smallholder farmers to make better decisions on their farms</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf</a></p> <p>and</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf</a></p> <p>and</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf">http://livestock-fish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf</a></p> |
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|   |  |  | 21 | Not set |  |
| 6. % of tools assessed for likely gender-disaggregated impact |  |  |    |         | <p>N= 8 (22%)</p> <p>Traders assessment tool<br/> <a href="https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/">https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/</a></p> <p>Producer Organization Assessment Tool<br/> <a href="https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/">https://livestockfish.cgiar.org/2016/11/03/moremilkit-producer-groups/</a></p> <p>FEAST feed assessment tool<br/> <a href="https://cgspace.cgiar.org/handle/10568/76260">https://cgspace.cgiar.org/handle/10568/76260</a></p> <p>Developing tools to quantify sustainability of intensive and extensive ruminant farming systems in Sub-Saharan East Africa<br/> <a href="https://cgspace.cgiar.org/handle/10568/77229">https://cgspace.cgiar.org/handle/10568/77229</a></p> <p>Participatory training on Farm-Biosecurity<br/> <a href="http://bit.ly/2eFTf2D">http://bit.ly/2eFTf2D</a></p> <p>Training manual butcher-Biosecurity<br/> <a href="http://bit.ly/2f7ukWp">http://bit.ly/2f7ukWp</a></p> <p>Decision making toolbox for livestock production enabling smallholder farmers to make better decisions on their farms<br/> <a href="http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf">http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+1+Ganader%C3%ADa.pdf/610751237/Cuaderno%20de%20trabajo%201%20Ganader%C3%ADa.pdf</a></p> <p>and<br/> <a href="http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf">http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+2+Ganader%C3%ADa.pdf/610751239/Cuaderno%20de%20trabajo%202%20Ganader%C3%ADa.pdf</a></p> <p>and<br/> <a href="http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf">http://livestockfish.wikispaces.com/file/view/Cuaderno+de+trabajo+3+Ganader%C3%ADa.pdf/610751243/Cuaderno%20de%20trabajo%203%20Ganader%C3%ADa.pdf</a></p> <p>Training modules to strengthen gender capacity of partner organizations<br/> <a href="http://livestockfish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20">http://livestockfish.wikispaces.com/file/view/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20</a></p> |

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|  |  |   |   |    | <a href="#">MODULO%201.docx/597979142/2.09.2016%20TI%20Gender%20CD%20guidelines%20TRADUCIDO%20MODULO%201.docx</a>   |
| 7. Number of open access databases maintained by CRP |  | 7 | 6 | 24 | <p>N = 18</p> <p>GIS layers MoreMilkiT scenarios: Spatial practicalities and implications for Tanzania dairy value chain:<br/><a href="http://ilri-cleaned.wikispaces.com/file/view/GeoPortalPGISlayers.zip">http://ilri-cleaned.wikispaces.com/file/view/GeoPortalPGISlayers.zip</a></p> <p>Animal Feeds Analysis Application: <a href="http://afawa.icarda.org/">http://afawa.icarda.org/</a></p> <p>DAGRIS (origin, distribution, diversity, present use and status of indigenous farm animal genetic resources). <a href="http://dagris.info">http://dagris.info</a></p> <p>AZIZI Bio-repository:<br/><a href="http://azizi.ilri.cgiar.org">http://azizi.ilri.cgiar.org</a></p> <p>Animal Genetic Training Resources<br/><a href="http://agtr.ilri.cgiar.org">http://agtr.ilri.cgiar.org</a></p> <p>Baseline on improved breeds in Nicaragua (ADA-financed project):<br/><a href="http://data.ilri.org/portal/dataset/adanicbaseline">http://data.ilri.org/portal/dataset/adanicbaseline</a></p> <p>Baseline FSP-Solidaridad project:<br/><a href="http://livestock-fish.wikispaces.com/file/detail/Informe+LB+Proyecto+Carne+y+L%C3%A1cteos+competitivos+FINAL28OCT.docx">http://livestock-fish.wikispaces.com/file/detail/Informe LB Proyecto Carne y Lácteos competitivos FINAL28OCT.docx</a></p> <p>Raw feed material nutrient values (Aquaculture Bangladesh):<br/><a href="http://hdl.handle.net/10568/65130">http://hdl.handle.net/10568/65130</a><br/><a href="http://hdl.handle.net/10568/65132">http://hdl.handle.net/10568/65132</a><br/><a href="http://hdl.handle.net/10568/6513">http://hdl.handle.net/10568/6513</a></p> <p>Tropical Grasslands - Forrajes Tropicales Journal: <a href="http://www.tropicalgrasslands.info/index.php/tgft">http://www.tropicalgrasslands.info/index.php/tgft</a></p> <p>Food Demand, Role of Pork in the Diets and Nutritional Security in Pig Value Chains in Uganda:<br/><a href="http://data.ilri.org/portal/dataset/moreporkug">http://data.ilri.org/portal/dataset/moreporkug</a></p> <p>MoreMilkiT Baseline Household Survey in Tanzania: <a href="http://data.ilri.org/portal/dataset/moremilkit-hh-tz">http://data.ilri.org/portal/dataset/moremilkit-hh-tz</a></p> <p>Database on Nicaragua dual-purpose cattle: <a href="http://data.ilri.org/portal/dataset?q=nicaragua">http://data.ilri.org/portal/dataset?q=nicaragua</a></p> <p>Database on Senegal dairy cattle:<br/><a href="http://data.ilri.org/portal/dataset?q=SDG&amp;vocab+ILRI+voccountries=SENEGAL">http://data.ilri.org/portal/dataset?q=SDG&amp;vocab ILRI voccountries=SENEGAL</a></p> |

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|   |  |         |         |         | <p>Database on Red Maasai, Dorper and Red Maasai x Dorper sheep breeding program in Kenya<br/> <a href="http://data.ilri.org/portal/dataset/ilri-kapiti-sheep">http://data.ilri.org/portal/dataset/ilri-kapiti-sheep</a></p> <p>Dairy Genetics East Africa 1 of baseline and longitudinal monitoring data related to animal performance:<br/> <a href="https://data.ilri.org/portal/dataset/dgea1-baseline-survey-kenya-and-uganda">https://data.ilri.org/portal/dataset/dgea1-baseline-survey-kenya-and-uganda</a><br/> <a href="https://data.ilri.org/portal/dataset/dgea-long">https://data.ilri.org/portal/dataset/dgea-long</a></p> <p>MoreMilkIT project evaluation of Innovation Platforms:<br/> <a href="https://data.ilri.org/portal/dataset">https://data.ilri.org/portal/dataset</a></p> <p>ImGoats Mozambique dataset used for gender analysis:<br/> <a href="https://data.ilri.org/portal/dataset/imgoats-mozambique">https://data.ilri.org/portal/dataset/imgoats-mozambique</a></p> <p>Longitudinal monitoring dual purpose cattle Nicaragua<br/> <a href="http://data.ilri.org/portal/dataset/adaniclong">http://data.ilri.org/portal/dataset/adaniclong</a></p> |
| 8. Total number of users of these open access databases   |  | 244,268 | 341,050 | Not set | N = 341,060  |
| 9. Number of publications in ISI journals produced by CRP |  | 48      | 70      | 67      | N = 45 (see Annex 3)   |
| 10. Number of strategic value chains analyzed by CRP      |  | 14      | 11      | 0       | <p>N= 18 (** = 50% shared A4NH)</p> <p>Value chain actor's practices associated with the spread of African swine fever disease in smallholder pig systems in Uganda<br/> <a href="https://livestockfish.cgiar.org/2016/09/07/asf-dione-uganda/">https://livestockfish.cgiar.org/2016/09/07/asf-dione-uganda/</a></p> <p>The occurrence of porcine <i>Toxoplasma gondii</i> infections in smallholder production systems in Central and Eastern Uganda<br/> <a href="https://cgspace.cgiar.org/handle/10568/77110">https://cgspace.cgiar.org/handle/10568/77110</a></p> <p>Participatory value chain risk assessment to guide interventions in disease control for smallholder pig systems in Uganda<br/> <a href="https://cgspace.cgiar.org/handle/10568/73401">https://cgspace.cgiar.org/handle/10568/73401</a></p> <p>Reflections workshop report on drug management and challenges facing livestock drug industry and stockists in Mukono district</p>  |



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|  |  |  |  | <p><a href="http://bit.ly/2eFVC5k">http://bit.ly/2eFVC5k</a></p> <p>Status of established forages for livestock feeding in Hoima district</p> <p><a href="http://bit.ly/2ekwFM5">http://bit.ly/2ekwFM5</a></p> <p>Status of established forages for livestock feeding in Lira district</p> <p><a href="http://bit.ly/2f7z1PK">http://bit.ly/2f7z1PK</a></p> <p>Knowledge on the current pig feeding practices</p> <p><a href="http://bit.ly/2ekAXDb">http://bit.ly/2ekAXDb</a></p> <p>Developing smallholder pig value chains in Uganda to increase rural incomes and adapt to climate change</p> <p><a href="http://bit.ly/2flp56f">http://bit.ly/2flp56f</a></p> <p>Governance structures and constraints along the Ugandan smallholder pig value chains</p> <p><a href="http://www.slideshare.net/ILRI/iaae-ouma-sep2016">http://www.slideshare.net/ILRI/iaae-ouma-sep2016</a></p> <p>Partner capacity assessment methodology</p> <p><a href="http://bit.ly/2eAjabf">http://bit.ly/2eAjabf</a></p> <p>Towards a sustainable dual purpose cattle value chain in Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Presentation+An+Notenbaert+Bristol+Jan+2016.pdf/572708703/Presentation%20An%20Notenbaert%20Bristol%20Jan%202016.pdf">http://livestock-fish.wikispaces.com/file/view/Presentation+An+Notenbaert+Bristol+Jan+2016.pdf/572708703/Presentation%20An%20Notenbaert%20Bristol%20Jan%202016.pdf</a></p> <p>Smallholder pig value chains development in Uganda: Catalysing the emerging smallholder pig value chains to increase rural incomes and assets</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Evaluation%20of%20business%20and%20enterprise%20development%20capacity%20dev%20report- Revised.pdf/598025928/Evaluation%20of%20business%20and%20enterprise%20development%20capacity%20dev%20report- Revised.pdf">http://livestock-fish.wikispaces.com/file/view/Evaluation%20of%20business%20and%20enterprise%20development%20capacity%20dev%20report- Revised.pdf/598025928/Evaluation%20of%20business%20and%20enterprise%20development%20capacity%20dev%20report- Revised.pdf</a></p> <p>Farmers preference for bundled input-output markets: Implications for adapting dairy market hubs in the Tanzania dairy value chain</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/77312/aaee_rao_2016.pdf?sequence=1&amp;isAllowed=y">https://cgspace.cgiar.org/bitstream/handle/10568/77312/aaee_rao_2016.pdf?sequence=1&amp;isAllowed=y</a></p> <p>Piloting innovation and market linkages to transform smallholder dairy value chains in Tanzania</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/75986/tanzania_dairy_poster_jun2016.pdf?sequence=1&amp;isAllowed=y">https://cgspace.cgiar.org/bitstream/handle/10568/75986/tanzania_dairy_poster_jun2016.pdf?sequence=1&amp;isAllowed=y</a></p> |
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|   |  |       |        |      | <p>Presentation EAAP Belfast on ex-ante environmental impact assessment</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/EAAP_Van+der+Hoek_23937.pptx/597972984/EAAP_Van+der+Hoek_23937.pptx">http://livestock-fish.wikispaces.com/file/view/EAAP_Van+der+Hoek_23937.pptx/597972984/EAAP_Van+der+Hoek_23937.pptx</a></p> <p>**Prevalence of trichinellosis and cysticercosis in indigenous pigs from ethnic minorities for selected communes in the Central Highlands of (Dak Lak)</p> <p><a href="https://cgspace.cgiar.org/handle/10568/80712">https://cgspace.cgiar.org/handle/10568/80712</a></p> <p>Insects for Animal Feeding</p> <p><a href="http://ilrihyd.wikispaces.com/24.Insects">http://ilrihyd.wikispaces.com/24.Insects</a></p> <p>Value chain analysis of Lake Nasser fisheries in Aswan, Upper Egypt. Penang, Malaysia</p> <p><a href="http://www.worldfishcenter.org/content/value-chain-analysis-lake-nasser-fisheries-aswan-upper-egypt">http://www.worldfishcenter.org/content/value-chain-analysis-lake-nasser-fisheries-aswan-upper-egypt</a></p>  |
| CAPACITY ENHANCEMENT AND INNOVATION PLATFORMS                           |  |       |        |      |   |
| 13. Number of trainees in short-term programs facilitated by CRP (male) |  | 5,339 | 66,230 | 2880 | <p>N=1,059 (**50% A4NH) (***)50% Roots Tubers and Bananas)</p> <p>11 Scientific writing course, Entebbe, Uganda</p> <p><a href="http://bit.ly/2f0GskF">http://bit.ly/2f0GskF</a></p> <p>3 Gender capacity assessment feedback and validation with partners, Kampala, Uganda</p> <p><a href="http://bit.ly/2e7Kpyl">http://bit.ly/2e7Kpyl</a></p> <p>11 Capacity building of Mukono district extension staff to support pig beneficiary farmers on appropriate husbandry practices, Mukono, Uganda</p> <p><a href="http://bit.ly/2eugSNZ">http://bit.ly/2eugSNZ</a></p> <p>***23 Capacity building of pig MSP leaders on facilitation skills for managing platform meetings, Kampala, Uganda</p> <p><a href="http://bit.ly/2fkjEk2">http://bit.ly/2fkjEk2</a></p> <p>19 Business opportunity seminar, Morogoro, Tanzania</p> <p><a href="https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/">https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/</a></p> <p>21 Evaluation of business and enterprise development capacity development intervention</p> <p><a href="http://bit.ly/2fnSeME">http://bit.ly/2fnSeME</a></p> <p>21 Training of Masaka district pig farmer groups and cooperatives on business development, Masaka, Uganda</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/80378/ResearchBrief_76.pdf?sequence=1">https://cgspace.cgiar.org/bitstream/handle/10568/80378/ResearchBrief_76.pdf?sequence=1</a></p> |

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|  |  |  |  | <p>6 Use of Point of Care Technology to Enhance Disease Diagnosis in the Smallholder Pig Value Chain in Uganda, Masaka &amp; Lira, Uganda<br/> <a href="http://bit.ly/2eTZfFa">http://bit.ly/2eTZfFa</a></p> <p>20 Training of livestock researchers on breeding data collection entry and analysis, Debre Birhan, Ethiopia<br/> <a href="http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf">http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf</a></p> <p>26 Three on-the-job training of NARS veterinarians and animal production specialists on reproductive technologies, Debre Birhan, Bonga, Doyogena; Ethiopia<br/> <a href="https://cgspace.cgiar.org/handle/10568/77710">https://cgspace.cgiar.org/handle/10568/77710</a></p> <p>250 Training of small ruminant keepers on forming collective marketing groups, Menz area, North Shewa zone, Ethiopia<br/> <a href="https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/">https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/</a></p> <p>9 Training of district level agricultural officers on generation and management of market information, Menz area, North Shewa zone, Ethiopia<br/> <a href="https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/">https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/</a></p> <p>19 Training on Gender Capacity Development in Gendered Value Chain Analysis, Addis Ababa, Ethiopia<br/> <a href="http://livestockfish.wikispaces.com/file/detail/Gendered%20Value%20Chain%20Analysis%20Module_Training%20Report_Ethiopia_12042016.pdf">http://livestockfish.wikispaces.com/file/detail/Gendered%20Value%20Chain%20Analysis%20Module_Training%20Report_Ethiopia_12042016.pdf</a></p> <p>44 Gender capacity assessment feedback and validation with partners, Horro, Doyogena, Yabello; Ethiopia<br/> <a href="https://cgspace.cgiar.org/bitstream/handle/10568/76264/LF_gender_capdev_may2016.pdf">https://cgspace.cgiar.org/bitstream/handle/10568/76264/LF_gender_capdev_may2016.pdf</a></p> <p>19 Analysis and interpretation of data collected in participatory survey, 'Addis Ababa<br/> <a href="https://livestockfish.cgiar.org/2016/08/31/peg-ethiopia/">https://livestockfish.cgiar.org/2016/08/31/peg-ethiopia/</a></p> <p>12 Coenurosis diagnostics, Addis Ababa University<br/> <a href="https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/">https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/</a></p> <p>50 Coenurosis training for farmers, Borana Ethiopia<br/> <a href="https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/">https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/</a></p> <p>12 ECF epidemiology and diagnostics, NAHDIC Sebeta, Addis Ababa</p> |
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|  |  |  |  | <p><a href="http://livestock-fish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf">http://livestock-fish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf</a></p> <p>105 Fish feed quality analysis and control, Nationwide</p> <p><a href="http://agrilife24.com/index.php/2016-04-11-06-34-16/745-fish-feed-nutrition-formulation">http://agrilife24.com/index.php/2016-04-11-06-34-16/745-fish-feed-nutrition-formulation</a></p> <p>22 Fundamentals of Data Analysis and Mixed Linear Models in Animal Breeding Addis Ababa, Ethiopia</p> <p><a href="https://acgg.wikispaces.com/Advanced+Course+on+Fundamentals+of+Data+Analysis%2C+Addis+Ababa%2C+Ethiopia%2C+29th+February-4th+March%2C+2016">https://acgg.wikispaces.com/Advanced+Course+on+Fundamentals+of+Data+Analysis%2C+Addis+Ababa%2C+Ethiopia%2C+29th+February-4th+March%2C+2016</a></p> <p>22 On-station chicken performance monitoring, Morogogo, Tanzania; Debre Zeit, Ethiopia; Ile-ife, Nigeria.'</p> <p><a href="https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_STATION_TRAINING%20REPORT.docx">https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_STATION_TRAINING%20REPORT.docx</a></p> <p>67 On-farm chicken performance monitoring, Morogogo, Tanzania; Holetta, Ethiopia; Ile-ife, Nigeria.'</p> <p><a href="https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_FARM%20TRAINING%20REPORT.docx">https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_FARM%20TRAINING%20REPORT.docx</a></p> <p>5 Genomic data analysis, Beijing, China</p> <p><a href="http://ilri-angr.wikispaces.com/file/detail/Training%20for%20livestock%20molecular%20genetics%20and%20genomic%20data%20analysis%20organized%20by%20the%20CAAS-ILRI%20joint%20lab.docx">http://ilri-angr.wikispaces.com/file/detail/Training%20for%20livestock%20molecular%20genetics%20and%20genomic%20data%20analysis%20organized%20by%20the%20CAAS-ILRI%20joint%20lab.docx</a></p> <p>27 Synchronization and artificial insemination in cattle, to artificial insemination service providers, Ugenya, Gem, Alego, Kuria West, Rongo and Awendo, Kenya</p> <p><a href="http://avcd.wikispaces.com/file/view/AVCD+Dairy+component+FTAI+report.pdf">http://avcd.wikispaces.com/file/view/AVCD+Dairy+component+FTAI+report.pdf</a></p> <p>25 Open data Kit tools for cattle performance data capture, Arusha Tanzania</p> <p><a href="http://adgg.wikispaces.com/file/view/Trip+Report-1-ADGG+Arusha-20160602.pdf">http://adgg.wikispaces.com/file/view/Trip+Report-1-ADGG+Arusha-20160602.pdf</a></p> <p>51 Training in reproductive management of cattle, Camoapa, Matiguas, Nicaragua.</p> <p><a href="http://livestock-fish.wikispaces.com/file/detail/Overall%20Report%20-%20Workshops%20Reproductive%20Management.docx">http://livestock-fish.wikispaces.com/file/detail/Overall%20Report%20-%20Workshops%20Reproductive%20Management.docx</a></p> <p>88 Training in animal health management in cattle, Piedra Sembrada, Las Lajas, Coyanchigue, La Calamidad Panamerica, Los Pochote, Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Report+of+trainig-Animla+Health-20160801.pdf">http://livestock-fish.wikispaces.com/file/view/Report+of+trainig-Animla+Health-20160801.pdf</a></p> <p>12 Practical methods and software in animal quantitative genetics and genomics, Nairobi, Kenya</p> |
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|   |  |  |        |       | <p><a href="http://hpc.ilri.cgiar.org/beca/training/AQGG_2016/index.html">http://hpc.ilri.cgiar.org/beca/training/AQGG_2016/index.html'</a></p> <p>50 Livestock recording and monitoring of performance, reproductive management of cattle, Camoapa/Matiguás - Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Overall+Report+-+Workshops+Reproductive+Management.docx/597973338/Overall+Report+-+Workshops+Reproductive+Management.docx">http://livestock-fish.wikispaces.com/file/view/Overall+Report+-+Workshops+Reproductive+Management.docx/597973338/Overall Report - Workshops Reproductive Management.docx</a></p> <p>6 Training of partners and staff on Use of Point of Care Technology to Enhance Disease Diagnosis in the Smallholder Pig Value Chain in Uganda, Lira Uganda.</p> <p><a href="http://bit.ly/2eTZfFa">http://bit.ly/2eTZfFa</a></p> <p>**3 Training of WASI staff on blood collection in native pigs</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/80712/CysTrich%20Dak%20report.pdf?sequence=1&amp;isAllowed=y">https://cgspace.cgiar.org/bitstream/handle/10568/80712/CysTrich%20Dak%20report.pdf?sequence=1&amp;isAllowed=y</a></p>   |
| 14. Number of trainees in short-term programs facilitated by CRP (female) |  |  | 73,636 | 1,440 | <p>N= 583 (**50% A4NH) (**50% Roots Tubers and Bananas)</p> <p>6 Scientific writing course Entebbe, Uganda</p> <p><a href="http://bit.ly/2f0GskF">http://bit.ly/2f0GskF</a></p> <p>8 Gender capacity assessment feedback and validation with partners, Kampala, Uganda</p> <p><a href="http://bit.ly/2e7Kpyl">http://bit.ly/2e7Kpyl</a></p> <p>3 Capacity building of Mukono district extension staff to support pig beneficiary farmers on appropriate husbandry practices, Mukono, Uganda</p> <p><a href="http://bit.ly/2eugSNZ">http://bit.ly/2eugSNZ</a></p> <p>***7 Capacity building of pig MSP leaders on facilitation skills for managing platform meetings, Kampala, Uganda</p> <p><a href="http://bit.ly/2fkjEk2">http://bit.ly/2fkjEk2</a></p> <p>6 Business opportunity seminar, Morogoro, Tanzania</p> <p><a href="https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/">https://livestockfish.cgiar.org/2016/07/22/tanzania-milk-business/</a></p> <p>80 Evaluation of business and enterprise development capacity development intervention</p> <p><a href="http://bit.ly/2fnSeME">http://bit.ly/2fnSeME</a></p> <p>80 Training of Masaka district pig farmer groups and cooperatives on business development, Masaka, Uganda</p> <p><a href="https://cgspace.cgiar.org/bitstream/handle/10568/80378/ResearchBrief_76.pdf?sequence=1">https://cgspace.cgiar.org/bitstream/handle/10568/80378/ResearchBrief_76.pdf?sequence=1</a></p> |

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|  |  |  |  | <p>2 Use of Point of Care Technology to Enhance Disease Diagnosis in the Smallholder Pig Value Chain in Uganda, Masaka &amp; Lira, Uganda<br/> <a href="http://bit.ly/2eTZfFa">http://bit.ly/2eTZfFa</a></p> <p>1 Training of livestock researchers on breeding data collection entry and analysis, Debre Birhan, Ethiopia<br/> <a href="http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf">http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf</a></p> <p>4 Three on-the-job training of NARS veterinarians and animal production specialists on reproductive technologies, Debre Birhan, Bonga, Doyogena; Ethiopia<br/> <a href="https://cgspace.cgiar.org/handle/10568/77710">https://cgspace.cgiar.org/handle/10568/77710</a></p> <p>150 Training of small ruminant keepers on forming collective marketing groups, Menz area, North Shewa zone, Ethiopia<br/> <a href="https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/">https://livestockfish.cgiar.org/2016/12/26/ethiopia-smart-marketing/</a></p> <p>6 Training on Gender Capacity Development in Gendered Value Chain Analysis, Addis Ababa, Ethiopia<br/> <a href="http://livestockfish.wikispaces.com/file/detail/Gendered%20Value%20Chain%20Analysis%20Module_Training%20Report_Ethiopia_12042016.pdf">http://livestockfish.wikispaces.com/file/detail/Gendered%20Value%20Chain%20Analysis%20Module_Training%20Report_Ethiopia_12042016.pdf</a></p> <p>11 Gender capacity assessment feedback and validation with partners, Horro, Doyogena, Yabello; Ethiopia<br/> <a href="https://cgspace.cgiar.org/bitstream/handle/10568/76264/LF_gender_capdev_may2016.pdf">https://cgspace.cgiar.org/bitstream/handle/10568/76264/LF_gender_capdev_may2016.pdf</a></p> <p>1 Analysis and interpretation of data collected in participatory survey<br/> <a href="https://livestockfish.cgiar.org/2016/08/31/peg-ethiopia">https://livestockfish.cgiar.org/2016/08/31/peg-ethiopia</a></p> <p>50 Coenurosis training for farmers, Borana, Ethiopia<br/> <a href="https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/">https://livestockfish.cgiar.org/2016/11/11/towards-coenurosis-control/</a></p> <p>5 ECF epidemiology and diagnostics, NAHDIC Sebeta, Addis Ababa<br/> <a href="http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf">http://livestockfish.wikispaces.com/file/detail/Training%20report_Breeders%20skills_march2016.pdf</a></p> <p>3 Fundamentals of Data Analysis and Mixed Linear Models in Animal Breeding, Addis Ababa, Ethiopia<br/> <a href="https://acgg.wikispaces.com/Advanced+Course+on+Fundamentals+of+Data+Analysis%2C+Addis+Ababa%2C+Ethiopia%2C+29th+February-4th+March%2C+2016">https://acgg.wikispaces.com/Advanced+Course+on+Fundamentals+of+Data+Analysis%2C+Addis+Ababa%2C+Ethiopia%2C+29th+February-4th+March%2C+2016</a></p> <p>17 On-station chicken performance monitoring, Morogogo, Tanzania; Debre Zeit, Ethiopia; Ile-ife, Nigeria.'</p> |
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|  |  |  |  | <p><a href="https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_STATION_TRAINING%20REPORT.docx">https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_STATION_TRAINING%20REPORT.docx</a></p> <p>55 On-farm chicken performance monitoring, Morogogo, Tanzania; Holetta, Ethiopia; Ile-ife, Nigeria.'</p> <p><a href="https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_FARM%20TRAINING%20REPORT.docx">https://acgg.wikispaces.com/file/detail/AFRICAN%20CHICKEN%20GENETIC%20GAINS_ON_FARM%20TRAINING%20REPORT.docx</a></p> <p>3 Genomic data analysis, Beijing, China</p> <p><a href="http://ilri-anagr.wikispaces.com/file/detail/Training%20for%20livestock%20molecular%20genetics%20and%20genomic%20data%20analysis%20organized%20by%20the%20CAAS-ILRI%20joint%20lab.docx">http://ilri-anagr.wikispaces.com/file/detail/Training%20for%20livestock%20molecular%20genetics%20and%20genomic%20data%20analysis%20organized%20by%20the%20CAAS-ILRI%20joint%20lab.docx</a></p> <p>5 Synchronization and artificial insemination in cattle, to artificial insemination service providers, Ugenya, Gem, Alego, Kuria West, Rongo and Awendo, Kenya</p> <p><a href="http://avcd.wikispaces.com/file/view/AVCD+Dairy+component+FTAI+report.pdf">http://avcd.wikispaces.com/file/view/AVCD+Dairy+component+FTAI+report.pdf</a></p> <p>3 Open data Kit tools for cattle performance data capture, Arusha, Tanzania</p> <p><a href="http://adgg.wikispaces.com/file/view/Trip+Report-1-ADGG+Arusha-20160602.pdf">http://adgg.wikispaces.com/file/view/Trip+Report-1-ADGG+Arusha-20160602.pdf</a></p> <p>10 Training in reproductive management of cattle, Camoapa, Matiguas, Nicaragua.</p> <p><a href="http://livestock-fish.wikispaces.com/file/detail/Overall%20Report%20-%20Workshops%20Reproductive%20Management.docx">http://livestock-fish.wikispaces.com/file/detail/Overall%20Report%20-%20Workshops%20Reproductive%20Management.docx</a></p> <p>37 Training in animal health management in cattle, Piedra Sembrada, Las Lajas, Coyanchigue, La Calamidad Panamerica, Los Pochote, Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Report+of+trainig-Animla+Health-20160801.pdf">http://livestock-fish.wikispaces.com/file/view/Report+of+trainig-Animla+Health-20160801.pdf</a></p> <p>7 Practical methods and software in animal quantitative genetics and genomics, Nairobi, Kenya</p> <p><a href="http://hpc.ilri.cgiar.org/beca/training/AQGG_2016/index.html">http://hpc.ilri.cgiar.org/beca/training/AQGG_2016/index.html</a></p> <p>20 Livestock recording and monitoring of performance, reproductive management of cattle, Camoapa/Matiguás – Nicaragua</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/Overall+Report+-+Workshops+Reproductive+Management.docx/597973338/Overall+Report+-+Workshops+Reproductive+Management.docx">http://livestock-fish.wikispaces.com/file/view/Overall+Report+-+Workshops+Reproductive+Management.docx/597973338/Overall+Report+-+Workshops+Reproductive+Management.docx</a></p> <p>2 Training of partners and staff on Use of Point of Care Technology to Enhance Disease Diagnosis in the Smallholder Pig Value Chain in Uganda, Lira Uganda.</p> <p><a href="http://bit.ly/2eTZfFa">http://bit.ly/2eTZfFa</a></p> <p>**1 Training of WASI staff on blood collection in native pigs</p> |
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|  |  |  |    |         | <a href="https://cgspace.cgiar.org/bitstream/handle/10568/80712/CysTrich%20Dak%20report.pdf?sequence=1&amp;isAllowed=y">https://cgspace.cgiar.org/bitstream/handle/10568/80712/CysTrich%20Dak%20report.pdf?sequence=1&amp;isAllowed=y</a>   |
| 15. Number of trainees in long-term programs facilitated by CRP (male)       |  |  | 63 | Not set | N = 46 (75%***Roots, tubers and bananas) (50%****Dryland Systems)<br>1 -Bachelors<br>19- Masters (2***)(1****)<br>25 – PhD (1***)(1****)<br>1 – other (1***)  |
| 16.Number of trainees in long-term programs facilitated by CRP (female)      |  |  | 54 | Not set | N = 20<br>3 – Bachelors<br>5 – Masters<br>11 – PhD<br>1 - Other   |
| TECHNOLOGIES/PRACTICES IN VARIOUS STAGES OF DEVELOPMENT                      |  |  |    |         |   |
| 18. Number of technologies/NRM practices under research in the CRP (Phase I) |  |  | 27 | 29      | N = 6<br><i>Biological</i><br>Field solutions for synchronization and artificial Insemination with fresh semen in sheep<br><a href="https://cgspace.cgiar.org/handle/10568/77710">https://cgspace.cgiar.org/handle/10568/77710</a><br>Goat milk processing techniques to improve diary product safety<br><a href="http://livestock-fish.wikispaces.com/file/detail/Goat%20Milk%20Intervention%20study%20Abergelle.pdf">http://livestock-fish.wikispaces.com/file/detail/Goat%20Milk%20Intervention%20study%20Abergelle.pdf</a><br>new / improved germplasm for chicken in Ethiopia, Tanzania and Nigeria.<br><a href="https://africacgg.net/">https://africacgg.net/</a><br>WorldFish feed experiments to increase nutritional value of tilapia<br><a href="https://livestockfish.cgiar.org/2016/06/09/worldfish-feed-tilapia/">https://livestockfish.cgiar.org/2016/06/09/worldfish-feed-tilapia/</a><br><i>Management/Cultural Practices</i><br>Improved sheep fattening systems<br><a href="http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf">http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf</a> |



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|   |  |  |    |         | Gill nets<br><a href="http://www.worldfishcenter.org/pages/gill-net/">www.worldfishcenter.org/pages/gill-net/</a>   |
| 19. % of technologies under research that have an explicit target of women farmers                  |  |  | 6  | Not set | N = 4 (67%)<br><i>Biological</i><br>Goat milk processing techniques to improve diary product safety<br><a href="http://livestock-fish.wikispaces.com/file/detail/Goat%20Milk%20Intervention%20study%20Abergelle.pdf">http://livestock-fish.wikispaces.com/file/detail/Goat%20Milk%20Intervention%20study%20Abergelle.pdf</a><br>New / improved germplasm for chicken<br><a href="https://africacgg.net/">https://africacgg.net/</a><br><i>Management/Cultural Practices</i><br>Improved sheep fattening systems<br><a href="http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf">http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf</a><br>Gill nets<br><a href="http://www.worldfishcenter.org/pages/gill-net/">www.worldfishcenter.org/pages/gill-net/</a> |
| 20. % of technologies under research that have been assessed for likely gender-disaggregated impact |  |  | 2  | Not set | N=2 (34%)<br>Improved sheep fattening systems<br><a href="http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf">http://livestock-fish.wikispaces.com/file/detail/Sheep%20Fattening%20Project%20Report_Phase%20I.pdf</a><br>New / improved germplasm for chicken<br><a href="https://africacgg.net/">https://africacgg.net/</a>   |
| 23. Number of technologies /NRM practices field tested (phase II)                                   |  |  | 17 | 5       | N= (15) (**50%Roots Tubers and Bananas)<br><i>Biological</i><br>***Sweet Potato Vines Silage: A Feed Resource for Improved Smallholder Pig Production in Masaka, Uganda<br><a href="http://bit.ly/2fKlykq">http://bit.ly/2fKlykq</a><br>***Sweet potato silage-based diets for growing pigs, Masaka, Uganda<br><a href="http://bit.ly/2ekAyk7">http://bit.ly/2ekAyk7</a>  |

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|  |  |  |  | <p>***Effect of feeding supplemented sweet potato silage on pig performance in smallholder production systems in Kamuli and Masaka, Uganda<br/> <a href="http://bit.ly/2ev1kcP">http://bit.ly/2ev1kcP</a></p> <p>Waste management at the pig slaughter node, Kampala, Uganda<br/> <a href="http://bit.ly/2fnPE95">http://bit.ly/2fnPE95</a></p> <p>Economic performance of indigenous micro-organisms (IMO) piggery systems in Mukono , Uganda<br/> <a href="http://bit.ly/2fnT5fZ">http://bit.ly/2fnT5fZ</a></p> <p>***Changes in pig performance because of feeding on supplemented sweet potato silage – IDO 1 (improved pig productivity)<br/> <a href="http://bit.ly/2fKlykq">http://bit.ly/2fKlykq</a></p> <p>Coenurosis control, Borana, Tigray, Horro<br/> <a href="http://livestock-fish.wikispaces.com/file/detail/Animal%20Health%20Intervention%20Project%20Protocol%20-%20for%20coenurosis.docx">http://livestock-fish.wikispaces.com/file/detail/Animal%20Health%20Intervention%20Project%20Protocol%20-%20for%20coenurosis.docx</a></p> <p>Respiratory disease control; Oromia, Tigray, Amhara, SNNPR<br/> <a href="http://livestock-fish.wikispaces.com/file/detail/Animal%20Health%20Intervention%20project%20Protocol%20-%20Respiratory%20diseases%20Edited.docx">http://livestock-fish.wikispaces.com/file/detail/Animal%20Health%20Intervention%20project%20Protocol%20-%20Respiratory%20diseases%20Edited.docx</a></p> <p>Reproductive disease control, Oromia, Tigray, Amhara, SNNPR<br/> <a href="http://livestock-fish.wikispaces.com/file/detail/Animal%20health%20intervention%20project%20on%20Reproductive%20disease%20of%20SR%20edited.docx">http://livestock-fish.wikispaces.com/file/detail/Animal%20health%20intervention%20project%20on%20Reproductive%20disease%20of%20SR%20edited.docx</a></p> <p>Gastro-intestinal parasite control, Oromia, Tigray, Amhara, SNNPR<br/> <a href="http://livestock-fish.wikispaces.com/file/detail/Animal%20health%20intervention%20project%20protocol%20on%20Internal%20parasite.docx">http://livestock-fish.wikispaces.com/file/detail/Animal%20health%20intervention%20project%20protocol%20on%20Internal%20parasite.docx</a></p> <p><i>Management/Cultural Practices</i></p> <p>Reflections on pig value chain interventions – multi-stakeholder platforms, and capacity building of pork butchers and farmers, Masaka, Uganda<br/> <a href="https://cgspace.cgiar.org/handle/10568/80380">https://cgspace.cgiar.org/handle/10568/80380</a></p> <p>Changes in knowledge, attitudes and practices of pig farmers in control of ASF through biosecurity capacity development interventions– IDO 1 (improved pig productivity), Masaka, Uganda<br/> <a href="http://bit.ly/2fnR6bV">http://bit.ly/2fnR6bV</a></p> |
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|  |  |  |    |   | <p>Changes in knowledge, attitudes and practices of pork butchers in pig slaughter and appropriate pork handling through capacity building interventions – IDO 2 (improved quality and quantity of pork supplied in the marketing systems). Masaka, Uganda</p> <p><a href="http://bit.ly/2fnR6bV">http://bit.ly/2fnR6bV</a></p> <p>Community-based sheep breeding programs, Atsbi, Doyogena</p> <p><a href="http://livestock-fish.wikispaces.com/file/detail/bestbet_CBBP_implementation.docx">http://livestock-fish.wikispaces.com/file/detail/bestbet_CBBP_implementation.docx</a></p> <p>Revised business plan for centralized pig slaughter facility - Public Private Partnership between the Masaka Municipality and the Greater Masaka Pig Farmers Cooperative Union, Masaka area, Uganda</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/PigAbattoir_Bplan_revised_08042016%20_final.pdf/598054078/PigAbattoir_Bplan_revised_08042016%20_final.pdf">http://livestock-fish.wikispaces.com/file/view/PigAbattoir_Bplan_revised_08042016%20_final.pdf/598054078/PigAbattoir_Bplan_revised_08042016%20_final.pdf</a></p> |
| 27. Number of technologies/NRM practices released by public and private sector partners globally (phase III)                         |  |  | 4  | 6 | <p>N = 3</p> <p>Using biogas to manage pig slaughter waste in Kampala, Uganda</p> <p><a href="http://livestock-fish.wikispaces.com/file/view/uganda_pp_wambizzi.pdf/584951455/uganda_pp_wambizzi.pdf">http://livestock-fish.wikispaces.com/file/view/uganda_pp_wambizzi.pdf/584951455/uganda_pp_wambizzi.pdf</a></p> <p>CBPP cocktail ELISA</p> <p><a href="http://jcm.asm.org/content/54/6/1557">http://jcm.asm.org/content/54/6/1557</a></p> <p>CBPP lateral flow, Tanzania and Sub Saharan Africa</p> <p><a href="http://jcm.asm.org/content/54/6/1557">http://jcm.asm.org/content/54/6/1557</a></p>  |
| <b>POLICIES IN VARIOUS STAGES OF DEVELOPMENT</b>   |  |  |    |   |  |
| 28. Numbers of Policies/ Regulations/ Administrative Procedures Analyzed (Stage 1)   |  |  | 19 | 4 | N=0  |
| 29. Number of policies / regulations / administrative procedures drafted and presented for public/stakeholder consultation (Stage 2) |  |  | 18 | 0 | N=0  |
| 30. Number of policies / regulations / administrative  |  |  | 0  | 0 | N = 0  |

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| procedures presented for legislation (Stage 3)   |  |  |   |      |  |
| 31. Number of policies / regulations / administrative procedures prepared passed/approved (Stage 4)                    |  |  | 0   | 0    | N = 1<br>Nagaland pig breeding policy, Nagaland, India<br>NO. PLAN-59/PBP/2015-16/AHV/ Dated 04.08.2016<br><a href="https://cgspace.cgiar.org/handle/10568/76530">https://cgspace.cgiar.org/handle/10568/76530</a>   |
| 32. Number of policies / regulations / administrative procedures passed for which implementation has begun (Stage 5)   |  |  | 0   | 0    | N=0  |
| OUTCOMES ON THE GROUND   |  |  |   |      |  |
| 33. Number of hectares under improved technologies or management practices as a result of CRP research                 |  |  | N = 5,968 (new hectares) + 17,500 (continuing hectares) | 600  | N = 42,263 (new hectares) + 146,772 (continuing hectares) ***** (50% AAS -Aquatic Agricultural Systems)<br>*****Improved fish husbandry practices and technology uptake, South West Bangladesh, S.Asia.<br><a href="https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160908_Hamel_TrackingPromises_Web.pdf">https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160908_Hamel_TrackingPromises_Web.pdf</a> |
| 34. Number of farmers and others who have applied new technologies or management practices as a result of CRP research |  |  | N = 31,770 male farmers + 84 female farmers             | 5900 | N = 792,333 male farmers + 792,333 female farmers ***** (50% AAS -Aquatic Agricultural Systems)<br>*****Improved fish husbandry practices and technology uptake, South West Bangladesh, S.Asia.<br><a href="https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160908_Hamel_TrackingPromises_Web.pdf">https://csis-prod.s3.amazonaws.com/s3fs-public/publication/160908_Hamel_TrackingPromises_Web.pdf</a>         |

Annex Table 1A: List of publications in ISI journals, supplement to Indicator 9.

| Publication Title   | Year | Citation  | Journal Name<br>Or Book Title  | Impact<br>Factor<br>2015 | Item<br>type    | cgspace handle  | DOI   |
|---|------|---|--|--------------------------|-----------------|---|---|
| With trust and a little help from our friends: How the Nicaragua learning alliance scaled-up training in agribusiness                               | 2016 | Landmann, D.H. and Cadilhon, J.J. 2016. With trust and a little help from our friends: How the Nicaragua learning alliance scaled-up training in agribusiness. IN: Dror, I., Cadilhon, J.-J., Schut, M., Misiko, M. and Maheshwari, S. (Eds). 2016. Innovation platforms for agricultural development: Evaluating the mature innovation platforms landscape. UK: Routledge.                                   | Innovation platforms for agricultural development: Evaluating the mature innovation platforms landscape. |                          | Book chapter    | <a href="http://hdl.handle.net/10568/68758">http://hdl.handle.net/10568/68758</a> . |   |
| MilkIT innovation platform: Changing women's lives - One cow and one litre of milk at a time - Deep in the foothills of India's Himalayan Mountains | 2016 | Ravichandran, T., Teufel, N. and Duncan, A.J. 2016. MilkIT innovation platform: Changing women's lives - One cow and one litre of milk at a time - Deep in the foothills of India's Himalayan Mountains. IN: Dror, I., Cadilhon, J.J., Schut, M., Misiko, M. and Maheshwari, S. 2016. Innovation platforms for agricultural development: Evaluating the mature innovation platforms landscape. UK: Routledge. | Innovation platforms for agricultural development: Evaluating the mature innovation platforms landscape. |                          | Book chapter    | <a href="http://hdl.handle.net/10568/68759">http://hdl.handle.net/10568/68759</a>   |   |
| Analysis of the Cellular Immune Responses to Vaccines.  | 2016 | Svitek, N., Taracha, E.L.N., Saya, R., Awino, E., Nene, V. and Steinaa, L. 2016. Analysis of the cellular immune responses to vaccines. Vaccine Technologies for Veterinary Viral Diseases 1349: 247-262  | Vaccine Technologies for Veterinary Viral Diseases   |                          | Book chapter    |   | <a href="http://dx.doi.org/10.1007/978-1-4939-3008-1_16">http://dx.doi.org/10.1007/978-1-4939-3008-1_16</a> |
| Cloning of the African indigenous cattle breed Kenyan Boran   | 2016 | Mingyan Yu, Muteti, C., Ogugo, M., Ritchie, W.A., Raper, J., and Kemp, S.J. 2016. Cloning of the African indigenous cattle breed Kenyan Boran. Animal Genetics  | Animal Genetics  | 1.779                    | Journal article | <a href="http://hdl.handle.net/10568/74293">http://hdl.handle.net/10568/74293</a>   | <a href="http://dx.doi.org/10.1111/age.12441">http://dx.doi.org/10.1111/age.12441</a> .                     |

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|--|------|--|---|-------|-----------------|---|---|
| An assessment of chemical and biological product use in aquaculture in Bangladesh                                    | 2016 | Ali, H., Rico, A., Murshed-e-Jahan, K., Ben Belton. 2016. An assessment of chemical and biological product use in aquaculture in Bangladesh. <i>Aquaculture</i> 454: 199–209   | Aquaculture                             | 1.878 | Journal article |   | <a href="http://dx.doi.org/10.1016/j.aquaculture.2015.12.025">http://dx.doi.org/10.1016/j.aquaculture.2015.12.025</a>                               |
| Evaluation of desho grass ( <i>Pennisetum pedicellatum</i> ) hay as a basal diet for growing local sheep in Ethiopia | 2016 | Asmare, B., Demeke, S., Tolemariam, T., Tegegne, F., Wamatu, J., Rischkowsky, B. 2016. Evaluation of desho grass ( <i>Pennisetum pedicellatum</i> ) hay as a basal diet for growing local sheep in Ethiopia. <i>Trop Anim Health Prod</i> , 48(4): 801-806.                | Tropical Animal Health and Production   | 0.817 | Journal article |   | <a href="https://www.ncbi.nlm.nih.gov/pubmed/26970971">https://www.ncbi.nlm.nih.gov/pubmed/26970971</a>   |
| Determinants of the utilization of desho grass ( <i>Pennisetum pedicellatum</i> ) by farmers in Ethiopia             | 2016 | Asmare, B., Solomon Demeke, S., Tolemariam, T., Tegegne, F., Wamatu, J., Rischkowsky, B. 2016. Determinants of the utilization of desho grass ( <i>Pennisetum pedicellatum</i> ) by farmers in Ethiopia. <i>Tropical Grasslands-Forrajes Tropicales</i> , 4(2):112–121.    | Tropical Grasslands-Forrajes Tropicales |       | Journal article |   | <a href="http://www.tropicalgrasslands.info/index.php/tgft/article/view/273">http://www.tropicalgrasslands.info/index.php/tgft/article/view/273</a> |
| A meta-analysis of Contagious Caprine Pleuropneumonia (CCPP) in Ethiopia   | 2016 | Asmare, K., Abayneh, T., Mekuria, S., Ayelet, G., Sibhat, B., Skjerve, E., Szonyi, B. and Wieland, B. 2016. A meta-analysis of Contagious Caprine Pleuropneumonia (CCPP) in Ethiopia. <i>Acta Tropica</i>  | Acta Tropica                            | 2.27  | Journal article | <a href="http://hdl.handle.net/10568/72552">http://hdl.handle.net/10568/72552</a> | <a href="http://dx.doi.org/10.1016/j.actatropica.2016.02.023">http://dx.doi.org/10.1016/j.actatropica.2016.02.023</a>                               |
| Mange mite infestation in small ruminants in Ethiopia: Systematic review and meta-analysis                           | 2016 | Asmare, K., Abebe, R., Sheferaw, D., Krontveit, R.I. and Wieland, B. 2016. Mange-mite infestation in small ruminants in Ethiopia: Systematic review and meta-analysis. <i>Veterinary Parasitology</i>  | Veterinary Parasitology                 | 2.46  | Journal article | <a href="http://hdl.handle.net/10568/70166">http://hdl.handle.net/10568/70166</a> | <a href="http://dx.doi.org/10.1016/j.vetpar.2016.01.017">http://dx.doi.org/10.1016/j.vetpar.2016.01.017</a>   |
| Gastrointestinal nematode infection in small ruminants in Ethiopia: A systematic review and meta-analysis            | 2016 | Asmare, K., Sheferaw, D., Aragaw, K., Abera, M., Sibhat, B., Haile, A., Kiara, H., Szonyi, B., Skjerve, E. and Wieland, B. 2016. Gastrointestinal nematode infection in small ruminants in Ethiopia: A systematic review and meta-analysis. <i>Acta Tropica</i> 160:68–77. | Acta Tropica                            | 2.27  | Journal article | <a href="http://hdl.handle.net/10568/75608">http://hdl.handle.net/10568/75608</a> | <a href="http://dx.doi.org/10.1016/j.actatropica.2016.04.016">http://dx.doi.org/10.1016/j.actatropica.2016.04.016</a>                               |

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|---|------|---|---------------------------------------|-------|-----------------|---|---|
| Systematic review and meta-analysis of metacestode prevalence in small ruminants in Ethiopia  | 2016 | Asmare, K., Sibhat, B., Abera, M., Haile, A., Degefu, H., Fentie, T, Bekele, J., Terefe, G., Szonyi, B., Robertson, L.J. and Wieland, B. 2016. Systematic review and meta-analysis of metacestode prevalence in small ruminants in Ethiopia. Preventive Veterinary Medicine                           | Preventive Veterinary Medicine        | 2.167 | Journal article | <a href="http://hdl.handle.net/10568/73679">http://hdl.handle.net/10568/73679</a> | <a href="http://dx.doi.org/10.1016/j.prevetmed.2016.05.006">http://dx.doi.org/10.1016/j.prevetmed.2016.05.006</a> . |
| A mathematical model that simulates control options for African swine fever virus (ASFV)  | 2016 | Barongo, M.B., Bishop, R.P., Fèvre, E.M., Knobel, D.L. and Ssematimba, A. 2016. A mathematical model that simulates control options for African swine fever virus (ASFV). PLOS ONE 11(7): e0158658.   | PLOS One                              | 3.324 | Journal article | <a href="http://hdl.handle.net/10568/76234">http://hdl.handle.net/10568/76234</a> | <a href="http://dx.doi.org/10.1371/journal.pone.0158658">http://dx.doi.org/10.1371/journal.pone.0158658</a> .       |
| Shrimp, prawn and the political economy of social wellbeing in rural Bangladesh   | 2016 | Belton, B. 2016. Shrimp, prawn and the political economy of social wellbeing in rural Bangladesh. Journal of Rural Studies 45:230–242.  | Journal of Rural Studies              | 2.206 | Journal article | <a href="http://hdl.handle.net/10568/75816">http://hdl.handle.net/10568/75816</a> | <a href="http://dx.doi.org/10.1016/j.jrurstud.2016.03.014">http://dx.doi.org/10.1016/j.jrurstud.2016.03.014</a> .   |
| Meat and milk production scenarios and the associated land footprint in Kenya   | 2016 | Bosire, C.K., Krol, M.S., Mekonnen, M.M., Ogutu, J.O., Leeuw, J. de, Lannerstad, M. and Hoekstra, A.Y. 2016. Meat and milk production scenarios and the associated land footprint in Kenya. Agricultural Systems 145:64–75.   | Agricultural Systems                  | 2.867 | Journal article | <a href="http://hdl.handle.net/10568/72745">http://hdl.handle.net/10568/72745</a> | <a href="http://dx.doi.org/10.1016/j.agsy.2016.03.003">http://dx.doi.org/10.1016/j.agsy.2016.03.003</a> .           |
| Nutrient requirements and low-cost balanced diets, based on seasonally available local feedstuffs, for local pigs on smallholder farms in western Kenya | 2016 | Carter, N.A., Dewey, C.E., Thomas, L.F., Lukuyu, B., Grace, D. and Lange, C. de. 2016. Nutrient requirements and low-cost balanced diets, based on seasonally available local feedstuffs, for local pigs on smallholder farms in western Kenya. Tropical Animal Health and Production 48(2): 337-347. | Tropical Animal Health and Production | 0.817 | Journal article |   | <a href="http://dx.doi.org/10.1007/s11250-015-0957-6">http://dx.doi.org/10.1007/s11250-015-0957-6</a>               |
| Effects of white spot disease and bio-security on shrimp farming in Bangladesh  | 2016 | Debnath, P.P., Karim, M., Keus, H.J., Mohan, C.V. and Belton, B. 2016. Effects of white spot disease and bio-security on shrimp farming in Bangladesh. Fish Pathology 51:S60-S65.   | Fish Pathology                        |       | Journal article | <a href="http://hdl.handle.net/10568/74308">http://hdl.handle.net/10568/74308</a> | <a href="http://dx.doi.org/10.3147/jsfp.51.s60">http://dx.doi.org/10.3147/jsfp.51.s60</a> .                         |

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|--|------|---|---|-------|-----------------|---|---|
| Crop residue allocation to livestock feed, soil improvement and other uses along a productivity gradient in Eastern Africa                     | 2016 | Duncan, A.J., Bachewe, F., Mekonnen, K., Valbuena, D., Rachier, G., Lule, D., Bahta, M. and Erenstein, O. 2016. Crop residue allocation to livestock feed, soil improvement and other uses along a productivity gradient in Eastern Africa. <i>Agriculture, Ecosystems and Environment</i> 228:101–110.   | Agriculture, Ecosystems and Environment | 3.564 | Journal article | <a href="http://hdl.handle.net/10568/75245">http://hdl.handle.net/10568/75245</a> | <a href="http://dx.doi.org/10.1016/j.agee.2016.05.011">http://dx.doi.org/10.1016/j.agee.2016.05.011</a> .             |
| Drivers of household food availability in sub-Saharan Africa based on big data from small farms  | 2016 | Frelat, Romain; Lopez-Ridaura, Santiago; Giller, Ken E.; Herrero, Mario; Douxchamps, Sabine; Djurfeldt, Agnes Andersson; Erenstein, Olaf; Henderson, Ben; Kassie, Menale; Paul, Birthe; Rigolot, Cyrille; Ritzema, Randall S.; Rodriguez, Daniel; Van Asten, Piet J. A.; Van Wijk, Mark T. 2016. Drivers of household food availability in sub-Saharan Africa based on big data from small farms. <i>Proceedings of the National Academy of Sciences of the United States of America (PNAS)</i> 113(2): 458-463.; <a href="http://hdl.handle.net/10568/70134">http://hdl.handle.net/10568/70134</a> ; | PNAS                                    | 9.674 | Journal article | <a href="http://hdl.handle.net/10568/70134">http://hdl.handle.net/10568/70134</a> | <a href="http://dx.doi.org/10.1073/pnas.1518384112">http://dx.doi.org/10.1073/pnas.1518384112</a>                     |
| East Coast fever caused by <i>Theileria parva</i> is characterized by macrophage activation associated with vasculitis and respiratory failure | 2016 | Fry, L.M., Schneider, D.A., Frevert, C.W., Nelson, D.D., Morrison, W.I. and Knowles, D.P. 2016. East Coast fever caused by <i>Theileria parva</i> is characterized by macrophage activation associated with vasculitis and respiratory failure. <i>PLoS One</i> 11(5):e0156004.   | PLOS One                                | 3.324 | Journal article | <a href="http://hdl.handle.net/10568/74287">http://hdl.handle.net/10568/74287</a> | <a href="http://dx.doi.org/10.1371/journal.pone.0156004">http://dx.doi.org/10.1371/journal.pone.0156004</a> .         |
| Assessment of reproductive performance of Begait cattle in in-situ and ex-situ sites and in different production systems in northern Ethiopia  | 2016 | Gebrekidan, B., Tegegne, A. and Regassa, F. 2016. Assessment of reproductive performance of Begait cattle in in-situ and ex-situ sites and in different production systems in northern Ethiopia. <i>Animal Reproduction Science</i>   | Animal Reproduction Science             | 1.511 | Journal article | <a href="http://hdl.handle.net/10568/69517">http://hdl.handle.net/10568/69517</a> | <a href="http://dx.doi.org/10.1016/j.anireprosci.2015.12.005">http://dx.doi.org/10.1016/j.anireprosci.2015.12.005</a> |



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|---|------|--|--|-------|-----------------|---|---|
| Empirical evaluation of sustainability of divergent farms in the dryland farming systems of India   | 2016 | Haileslassie, A., Craufurd, P., Thiagarajah, R., Kumar, S., Whitbread, A., Rathor, A., Blummel, M., Ericsson, P. and Kakumanu, K.R. 2016. Empirical evaluation of sustainability of divergent farms in the dryland farming systems of India. <i>Ecological Indicators</i> 60:710-723.  | Ecological Indicators  | 3.444 | Journal article | <a href="http://hdl.handle.net/10568/68432">http://hdl.handle.net/10568/68432</a> | <a href="http://dx.doi.org/10.1016/j.ecolind.2015.08.014">http://dx.doi.org/10.1016/j.ecolind.2015.08.014</a>         |
| The Rural Household Multi-Indicator Survey (RHoMIS) for rapid characterisation of households to inform climate smart agriculture interventions: Description and applications in East Africa and Central America | 2016 | Hammond, J., Fraval, S., Etten, J. van, Suchini, J.G., Mercado, L., Pagella, T., Frelat, R., Lannerstad, M., Douxchamps, S., Teufel, N., Valbuena, D. and Wijk, M.T. van. 2016. The Rural Household Multi-Indicator Survey (RHoMIS) for rapid characterisation of households to inform climate smart agriculture interventions: Description and applications in East Africa and Central America. <i>Agricultural Systems</i> | Agricultural Systems   | 2.867 | Journal article | <a href="http://hdl.handle.net/10568/75249">http://hdl.handle.net/10568/75249</a> | <a href="http://dx.doi.org/10.1016/j.agsy.2016.05.003">http://dx.doi.org/10.1016/j.agsy.2016.05.003</a>               |
| Limited genetic and antigenic diversity within parasite isolates used in a live vaccine against <i>Theileria parva</i>  | 2016 | Hemmink, J.D., Weir, W., MacHugh, N.D., Graham, S.P., Patel, E., Paxton, E., Shiels, B., Toye, P.G., Morrison, W.I. and Pelle, R. 2016. Limited genetic and antigenic diversity within parasite isolates used in a live vaccine against <i>Theileria parva</i> . <i>International Journal for Parasitology</i>   | International Journal for Parasitology: Parasites and Wildlife |       | Journal article | <a href="http://hdl.handle.net/10568/73303">http://hdl.handle.net/10568/73303</a> | <a href="http://dx.doi.org/10.1016/j.ijpara.2016.02.007">http://dx.doi.org/10.1016/j.ijpara.2016.02.007</a>           |
| Determination of the minimum fully protective dose of adenovirus-based DIVA vaccine against <i>peste des petits ruminant's</i> virus challenge in East African goats  | 2016 | Holzer, B., Taylor, G., Rajko-Nenow, P., Hodgson, S., Okoth, E., Herbert, R., Toye, P. and Baron, M.D. 2016. Determination of the minimum fully protective dose of adenovirus-based DIVA vaccine against <i>peste des petits ruminant's</i> virus challenge in East African goats. <i>Veterinary Research</i> 47:20.   | Veterinary Research  | 2.815 | Journal article |   | <a href="http://dx.doi.org/10.1186/s13567-016-0306-4">http://dx.doi.org/10.1186/s13567-016-0306-4</a>                 |
| Genetic variance for uniformity of harvest weight in Nile tilapia ( <i>Oreochromis niloticus</i> )  | 2016 | Hooi Ling Khaw, Ponzoni, R.W., Hoong Yip Yee, Aziz, M.A. bin, Mulder, H.A., Marjanovic, J. and Bijma, P. 2016. Genetic variance for uniformity of harvest weight in Nile tilapia ( <i>Oreochromis niloticus</i> ). <i>Aquaculture</i> 451:113–120.   | Aquaculture  | 1.878 | Journal article |   | <a href="http://dx.doi.org/10.1016/j.aquaculture.2015.09.003">http://dx.doi.org/10.1016/j.aquaculture.2015.09.003</a> |

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|---|------|---|---------------------------------------|-------|-----------------|---|---|
| Multi-locus genotyping reveals absence of genetic structure in field populations of the brown ear tick ( <i>Rhipicephalus appendiculatus</i> ) in Kenya | 2016 | Kanduma, E.G., Mwacharo, J. M., Mwaura, S., Njuguna, J.N., Nzuki, I., Kinyanjui, P.W., Githaka, N., Heyne, H., Hanotte, O., Skilton, R.A. and Bishop, R.P. 2016. Multi-locus genotyping reveals absence of genetic structure in field populations of the brown ear tick ( <i>Rhipicephalus appendiculatus</i> ) in Kenya. <i>Ticks and Tick-borne Diseases</i> 7(1): 26-35. | Ticks and Tick-borne Diseases         | 2.718 | Journal article |   | <a href="http://dx.doi.org/10.1016/j.ttbdis.2015.08.001">http://dx.doi.org/10.1016/j.ttbdis.2015.08.001</a>           |
| Multiple genomic signatures of selection in goats and sheep indigenous to a hot arid environment.   | 2016 | Kim, E-S., Elbeltagy, A.R., Aboul-Naga A.M., Rischkowsky, B., Sayre, B., Mwacharo, J.M., Rothschild, M.F. 2016. Multiple genomic signatures of selection in goats and sheep indigenous to a hot arid environment. <i>Heredity</i> . 116(3): 255-264.  | Heredity                              | 3.805 | Journal article |   | <a href="http://dx.doi.org/10.1038/hdy.2015.94">http://dx.doi.org/10.1038/hdy.2015.94</a>                             |
| Participatory definition of breeding objectives for sheep breeds under pastoral systems—the case of Red Maasai and Dorper sheep in Kenya                | 2016 | König, E.Z., Mirkena, T., Strandberg, E., Audho, J., Ojango, J., Malmfors, B., Okeyo, A.W, and Philipsson, J. 2016. Participatory definition of breeding objectives for sheep breeds under pastoral systems—the case of Red Maasai and Dorper sheep in Kenya. <i>Tropical Animal Health and Production</i> . 48(1): 9-20.   | Tropical Animal Health and Production | 0.817 | Journal article |   | <a href="http://dx.doi.org/10.1007/s11250-015-0911-7">http://dx.doi.org/10.1007/s11250-015-0911-7</a>                 |
| Sero-prevalence of <i>Taenia solium</i> cysticercosis in rural and urban smallholder pig production settings in Uganda                                  | 2016 | Kungu, J.M., Dione, M.M., Ejobi, F., Leslie J.S., Harrison, E., Poole, J., Pezo, D. and Grace, D. 2016. Sero-prevalence of <i>Taenia solium</i> cysticercosis in rural and urban smallholder pig production settings in Uganda. <i>Acta Tropica</i> .   | Acta Tropica                          | 2.27  | Journal article |   | <a href="http://dx.doi.org/10.1016/j.actatropica.2016.01.016">http://dx.doi.org/10.1016/j.actatropica.2016.01.016</a> |
| Social network analysis provides insights into African swine fever epidemiology   | 2016 | Lichoti, J.K., Davies, J., Kitala, P.M., Githigia, S.M., Okoth, E., Maru, Y., Bukachi, S.A. and Bishop, R.P. 2016. Social network analysis provides insights into African swine fever epidemiology. <i>Preventive Veterinary Medicine</i>   | Preventive Veterinary Medicine        | 2.167 | Journal article | <a href="http://hdl.handle.net/10568/70222">http://hdl.handle.net/10568/70222</a> | <a href="http://dx.doi.org/10.1016/j.prevetmed.2016.01.019">http://dx.doi.org/10.1016/j.prevetmed.2016.01.019</a>     |

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|---|------|---|---|-------|-----------------|---|---|
| Do Texas Angora bucks improve mohair weight and quality traits of Tajik Angora goats?   | 2016 | Mueller J.P., Kosimov, M.A., Kosimov F.F., Brent, L., Nishanov, N., Rischkowsky, B. 2016. Do Texas Angora bucks improve mohair weight and quality traits of Tajik Angora goats? Short communication. <i>Small Ruminant Research</i> , 134: 74-78.   | Small Ruminant Research                   |       | Journal article |   | <a href="http://dx.doi.org/10.1016/j.smallrumres.2015.12.031">http://dx.doi.org/10.1016/j.smallrumres.2015.12.031</a> |
| Experimental evaluation of inactivated and live attenuated vaccines against <i>Mycoplasma mycoides</i> subsp. <i>Mycoides</i>   | 2016 | Mwirigi, M., Nkando, I., Aye, R., Soi, R., Ochanda, H., Berberov, E., Potter, A., Gerdt, V., Perez-Casal, J., Naessens, J. and Wesonga, H. 2016. Experimental evaluation of inactivated and live attenuated vaccines against <i>Mycoplasma mycoides</i> subsp. <i>Mycoides</i> . <i>Veterinary Immunology and Immunopathology</i> 169:63–67.                                | Veterinary Immunology and Immunopathology | 1.535 | Journal article | <a href="http://hdl.handle.net/10568/69443">http://hdl.handle.net/10568/69443</a> | <a href="http://dx.doi.org/10.1016/j.vetimm.2015.12.006">http://dx.doi.org/10.1016/j.vetimm.2015.12.006</a>           |
| Capsular polysaccharide from <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> shows potential for protection against Contagious Bovine Pleuropneumonia                     | 2016 | Mwirigi, M., Nkando, I., Olum, M., Attah-Poku, S., Ochanda, H., Berberov, E., Potter, A., Gerdt, V., Perez-Casal, J., Wesonga, H., Soi, R. and Naessens, J. 2016. Capsular polysaccharide from <i>Mycoplasma mycoides</i> subsp. <i>mycoides</i> shows potential for protection against Contagious Bovine Pleuropneumonia. <i>Veterinary Immunology and Immunopathology</i> | Veterinary Immunology and Immunopathology | 1.535 | Journal article | <a href="http://hdl.handle.net/10568/76131">http://hdl.handle.net/10568/76131</a> | <a href="http://dx.doi.org/10.1016/j.vetimm.2016.07.002">http://dx.doi.org/10.1016/j.vetimm.2016.07.002</a>           |
| Enhancing knowledge and awareness of biosecurity practices for control of African swine fever among smallholder pig farmers in four districts along the Kenya–Uganda border | 2016 | Nantima, N., Davies, J., Dione, M., Ocaido, M., Okoth, E., Mugisha, A. and Bishop, R. 2016. Enhancing knowledge and awareness of biosecurity practices for control of African swine fever among smallholder pig farmers in four districts along the Kenya–Uganda border. <i>Tropical Animal Health and Production</i>   | Tropical Animal Health and Production     | 0.817 | Journal article | <a href="http://hdl.handle.net/10568/72548">http://hdl.handle.net/10568/72548</a> | <a href="http://dx.doi.org/10.1007/s11250-016-1015-8">http://dx.doi.org/10.1007/s11250-016-1015-8</a>                 |
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## Annex 2. Performance indicators for gender mainstreaming with targets defined

| Performance Indicator  | CRP performance approaches requirements   | CRP performance meets requirements   | CRP performance exceeds requirements  |
|--|---|--|---|
| 1. Gender inequality targets defined                             | Sex-disaggregated social data is being collected and used to diagnose important gender-related constraints in at least one of the CRP's main target populations   | <p>Many L&amp;F projects collect and analyze sex-disaggregated data in order to identify gender-related constraints. For example, data collected through 16 gender-integrated projects in 2015 were analyzed and used as inputs to defining phase 2 research priorities in the genetics, health and, feeds and forages flagships.</p> <p>AND</p> <p>The CRP has defined and collected baseline data on the main dimensions of gender inequality in the CRP's main target populations relevant to its expected outcomes (IDOs)</p> <p>AND</p> <p>A synthesis paper is being finalized drawing out key constraints to gender quality in livestock and fish value chains covering, Bangladesh, Egypt, Ethiopia, Tanzania and Uganda.</p>  | CRP targets changes in levels of gender inequality to which the CRP is contributing or plans to contribute, with related numbers of men and women beneficiaries in main target populations. |
| Performance Indicator  | CRP performance approaches requirements   | CRP performance meets requirements   | CRP performance exceeds requirements  |
| Institutional architecture for integration of gender is in place | <p>CRP scientists and managers with responsibility for gender in the CRP's outputs are appointed, have written TORs and funds allocated to support their interaction.</p> <p>Procedures defined to routinely report use of available diagnostic or baseline knowledge on gender for assessment of the gender equality implications of the CRP's flagship research products as per the Gender Strategy</p> <p>CRP M&amp;E system has protocol for tracking progress on integration of gender in research</p> | <p>Since mid-2014 CRP L&amp;F (ILRI) has been recruiting for a Senior Gender Scientist. In the interim period (2015/16) a team from the Royal Tropical Institute lead by Rhiannon Pyburn have been contracted to lead the Gender Initiative as well as leading gender integration efforts across the program. After a long search, in 2016 ILRI was successful in recruiting a new Senior Gender Scientist- Nicoline de Haan - who began in her post in February 2017.</p> <p>The L&amp;F Program Management Unit monitors gender work across the portfolio by collecting indicators of progress in the annual activity progress reports, using the guidelines as to appropriate percentages developed by the Consortium Office, which KIT developed into a decision tree. The new MARLO M&amp;E tool may be an opportunity to further quantify gender mainstreaming through more systematic gender budgeting.</p> | The CRP uses feedback provided by its M&E system to improve its integration of gender into research   |

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|  | A CRP plan approved for capacity development in gender analysis | L&F has invested significantly in 2016 to build capacity on gender analysis through coaching biophysical and value chain scientists on the analysis, interpretation and write-up of gender data collected in gender-integrated research projects. This is a continuation of coaching on research design and implementation of 16 projects in 2015. In April 2016 a writing workshop was convened to draft book chapters for each gender-integrated project. And selected gender-integrated projects were also supported in preparing papers for peer-reviewed publication. |  |
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## Annex 3. Financial reports

Pending