Animal genetic flagship: CRP2 Planning meeting

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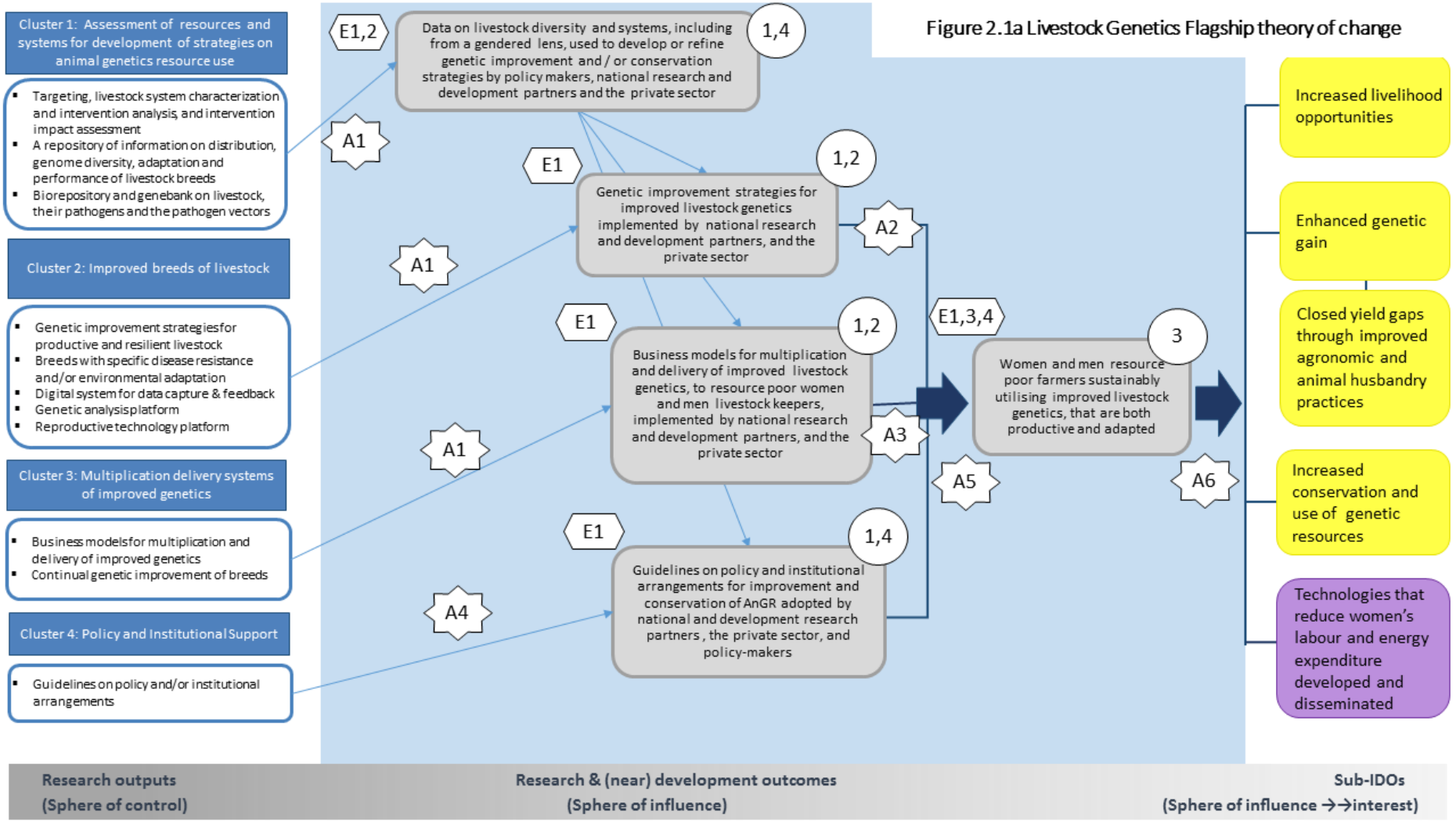
ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

CGIAR

Animal Genetic flagship objectives

- Identify and promote the most appropriate existing livestock breeds for systems and value chains (including promotion of breed substitution as relevant).
- Develop improved breeds, capitalizing on recent advances in genomic and reproductive technologies (within-breed improvement, cross-breeding etc).
- Develop effective delivery systems (public–private partnerships, community breeding schemes etc).

Flagship theory of changes



Improved productivity: Strategies

Breed substitutions

Cross-breeding

Within breed improvement

All options for all species !!

New breed-types (genome editing)

Our generic platforms ……

Sequencing (CTLGH, CAAS -= ILRI joint lab) and genotyping Platforms

Recording and feedback platform

Phenotypic platform (ILRI Farm, Kapiti, Addis)

Analytical platforms – combining genetic and phenotypic information to identify elite breeding animals

Reproductive technology platform – gene editing platform

Biorepository – livestock, pathogen, microbiomes – georeferenced information

Cluster of activities (CoA) 1

Assessment of resources and systems for development of strategies relating to the conservation and use of animal genetic resources

Better targeting of genetic interventions requires improved knowledge of the systems in which animal genetic resources are used, the phenotypic and genetic characteristics of the resources themselves, and of the broader economic, social and environmental contexts

Cluster of Activities (CoA) 1

Assessment of resources and systems for development of strategies relating to the conservation and use of animal genetics resources

2022 Outcome
Data on livestock diversity and systems, including from a gendered lens, **used to develop or refine** genetic improvement and / or conservation strategies by policymakers, national research and development partners, and the private sector, in 5 CRP priority countries and other locations.

CoA / Key Outputs 2017 (POWB)
(i) Availability of new datasets and/or knowledge on phenotypes, genotypes and agro-systems characteristics (chicken, small ruminants, cattle), including steps towards integration of these information in single database (DAGRIS)

Cluster 1 Funding 2017	**1,4 M. W1/W2, 2.4 M. Bilateral**

Cluster of Activities (CoA) 2
Improved breeds of livestock

Aims to promote or develop superior genetics that fit the needs and preferences of women and men livestock keepers and consumers. ***Approach tailored to the livestock species, system characteristics and stakeholder requirements of specific production systems***. *Options include within breed improvement programs, breeds substitution and the introduction of improved breeds (pure-breeds or crossed) for pilot testing and scaling up, creation of improved breed.*

Cluster of Activities (CoA) 2
Improved breeds of livestock

2022 Outcome
Genetic improvement strategies for improved livestock genetics **implemented** by national research and development partners, and the private sector in 6 CRP priority countries and other locations.

CoA / Key Outputs 2017 (POWB)
(ii) Improved breeding schemes (CBBP and chicken) (Gender/Youth Dimension) (iii). identification of adaptive signature of selection at genome level to environmental challenges (e.g. climate (heat) and infectious diseases selection pressures (e.g. cattle) (CapDev) and (iv). New technologies (phenotypic platform, optimised open-data kit (ODK) systems, genome editing protocols) (CapDEV)

Cluster 2 Funding 2017	**1,440,000 US$ W1/W2**

Cluster of Activities (CoA) 3
Continuous genetic gains, multiplication and delivery systems

Previous cluster (2), objective are to identify, develop and promote genetically superior livestock. **Here, the aim is to continually improve the performance of these livestock and link them to sustainable multiplication and delivery systems**. Including through the develop business models and creation of public–private research partnerships for breed improvement programs.

Cluster of Activities (CoA) 3
Continuous genetic gains, multiplication and delivery systems

2022 Outcome
Business models for multiplication and delivery of improved livestock genetics, to resource poor women and men livestock keepers, implemented by national research and development partners, and the private sector in five CRP priority countries and other locations.
Women and men resource poor livestock keepers sustainably utilising improved livestock genetics, both productive and adapted, in 3 priority countries and other locations.

CoA / Key Outputs 2017 (POWB)
(v) The assessment of institutional arrangements for delivery of improved genetics and guidelines on delivery options (dairy cattle) will be integrated in the business models for the multiplication and delivery of improved livestock genetics.

Cluster 3 Funding 2017	**185,000 US$ W1/W1**

Cluster of activities (CoA) 4
Policy and institutional support

Policies on animal genetic resource use, ownership, improvement and conservation are key to ensuring equitable benefits from livestock genetics, as well as sustainable genetic improvement. In this cluster the flagship will support national partners by ensuring sustainability of the genetic improvement strategy and delivery systems through appropriate policies and institutional arrangements .

Cluster 1 Funding 2017	**20,000 US$ W1/W2**

Cluster of activities (CoA) 4
Policy and institutional support

2022 Outcome
Guidelines on policy and institutional arrangements for improvement and conservation of animal genetic resources (AnGR) adopted by policymakers, national research and development partners, and the private sector, in 7 priority countries and other locations

CoA / Key Outputs 2017 (POWB)
(vi) The review on published baselines information on best practices and lessons on AnGR improvement in Africa will contribute to guidelines for improvement and conservation of AnGR to be adopted by countries. (Gender and Youth Dimension)

Animal Genetics Flagship – Crosscutting issues

CROSS-CUTTING ISSUES

Climate change
All research and development activities will build in resilience to climate shocks and a focus on adaptation to and mitigation of climate change. CGIAR is committed to devoting at least 60% of its research to those issues.

Gender and youth
Research is gender-sensitive and promotes gender equity – especially adapted to the needs of poor women. Prioritize food sector entrepreneurship along agri-food supply chains to provide opportunities for youth employment.

Policies and institutions
Research provides evidence for reforming agri-food policies and institutions to make them more conducive to pro-poor development, to improved nutrition and the sustainable management of natural resources.

Capacity development
Enhance innovation throughout the agri-food system, especially in new technologies, landscape analysis and climate-smart agriculture, for the research community, farmers and other groups along the value chain.

3

1. **Climate changes**: reduction of the emission of greenhouse gases per unit of animal product, through increased genetic-based productivity (e.g. lowering the number of heads required per unit of livestock commodity) and better management (especially of feed). This flagship will work closely with the **Livestock and the Environment** and the **Livestock Feeds and Forages** flagships.

1. Understanding **gender issues** in genetic resource use, and designing interventions based on this understanding are critical. Research on these issues will be done with the **Livestock Livelihoods and Agri-Food Systems flagship**.

2. The flagship has a strong **capacity development component** in its ToC. Capacity development is central for the flagship to take its research results to scale and ensure the sustainability of genetic interventions – **Link with Capacity development unit ILRI ????**

Total Flagship budget summary by sources of funding (USD)

	2017	2018	2019	2020	2021	2022	
Funding Needed	**Period 1**	**Period 2**	**Period 3**	**Period 4**	**Period 5**	**Period 6**	**Total**
W1+W2	3,793,723	3,983,410	4,182,580	4,391,709	4,611,295	4,841,859	25,804,579
W3	5,049,093	5,301,548	5,566,626	5,844,957	6,137,205	6,444,065	34,343,496
Bilateral	1,706,628	1,791,959	1,881,557	1,975,635	2,074,417	2,178,138	11,608,336
Other Sources	0	0	0	0	0	0	0
	10,549,444	11,076,917	11,630,763	12,212,301	12,822,917	13,464,062	71,756,404

Funding Gap	**Period 1**	**Period 2**	**Period 3**	**Period 4**	**Period 5**	**Period 6**	**Total**
W1+W2 (Required from SO)	0	0	0	0	0	0	0
W3 (Required from FC Members)	0	-168,662	-5,486,428	-5,764,759	-6,057,007	-6,363,867	-23,840,723
Bilateral (Fundraising)	67	-423,394	-672,557	-823,635	-2,074,417	-2,178,138	-6,172,074
Other Sources (Fundraising)	0	0	0	0	0	0	0
	67	-592,056	-6,158,985	-6,588,394	-8,131,424	-8,542,005	-30,012,797

Table 1: CRP planned budget by flagship for 2017

Flagship Name	Planned Budget 2017 (USD)			Proportion of bilateral
	W1/W2	W3/bilateral	Total	
FP1 Livestock Genetics	**3,749,402**	**8,030,625**	**11,780,027**	→ 68 %
FP2 Livestock Health	3,937,392	4,659,886	8,597,278	
FP4 Livestock & the Environment	2,225,805	6,178,150	8,403,955	
CRP Management & Support Cost	1,569,117	0	1,569,117	
CRP Management & Support Cost	1,569,117	0	1,569,117	
Strategic Investment Fund	2,533,000	0	2,533,000	
Total	14,014,716	34,774,534	48,789,250	→ 39 %

Figures not including CTLGH bilateral……

Budget Flagship ILRI. 40% cut

"Genetics flagship was funded in 2017 at the level of our originally proposed $20.2m W1/2 budget. That budget was cut to $14.0m because the two flagships were not approved. Now assuming the flagships are approved, we're being asked to include them, but with no additional funding to the $14.0m for 2018 ." (TR)

And and extra 20% cut (just in case)

(☺☺☺☺)

2018 Research budget cut 40% W1/W2

Items	Amount USD
Personnel -ILRI Staff	938,604
ICT (incl. co-financing)	69,223
Space (incl. co-financing)	74,432
R&C and Bench fee (incl. co-financing)	256,926
Other operational costs (workshop, publication, RMG, etc)	54,842
Travel	24,750
Total Direct Cost	**1,418,777**
Overhead (17%) -incl. co-financing	340,767
TOTAL	**1,759,543**
2018 -total Allocated budget	**1,704,319.00**
Over/Under budget	(55,224.43)

2017 Research Budget: **2.9 Millions**

In comparison to others……

3.49 millions in 2017

Flagship	Total W1/W2	Flagship Management		W1/W2 Research activities				
				Subtotal	ILRI	CIAT	ICARDA	SLU
Livestock Genetic	**2,255,105**	ILRI	93,228	2,161,877	1,704,319	-	427,734	29,824
Livestock Health	2,329,230	SLU	30,804	2,284,046	2,045,176	-	17,904	220,966
		ILRI	14,380					
Feeds and Forages	1,782,870	CIAT	-	-	-	-	-	-
Livestock Environment	1,323,087	ILRI	50,360	1,272,727	586,504	514,625	171,598	-
Livestock Livelihoods and Agri-Food Systems	1,379,708	ILRI	-	-	-	-	-	-
	9,070,000		188,772	5,718,650	4,335,998	514,625	617,236	250,790

Budget 2017: current expenditure….

PROJECTS EXPENDITURE BY NATURAL CLASSIFICATION - DETAILS BY ACTIVITY

Period: 01/01/2017 - 31/07/2017

International Livestock Research Institute

Executed on Aug 29 2017 1:01PM

Currency USD Budget version 1: AP* and Budget version 2: BA*

		PERSONNEL		SUPPLIES & SERVICES		OPERATIONAL TRAVEL		INDIRECT COSTS		TOTAL			
Activity	Activity Title	Budget	Actuals	Budget	Actuals	Budget	Actuals	Budget	Actuals	**Budget**	**Actuals**	Burn Rate	Comment
CRP001111	Livestock Landscape Genetics	210,530	30,480	428,350	31,670	46,680	6,790	141,660	15,330	**827,210**	**84,266**	10%	Low burn rate
CRP001112	BIOREPOSITORY: Sampling collection and genomes sequences analysis	83,150	29,240	56,720	7,570	-	250	41,760	6,300	**181,640**	**43,358**	24%	Low burn rate
CRP001113	Livestock Systems Characterization	252,980	32,320	140,740	31,610	-	-	66,930	10,870	**460,650**	**74,807**	16%	Low burn rate
CRP001121	Genomic Tools Development And Application	159,370	55,690	110,600	33,450	-	60	45,890	15,160	**315,860**	**104,357**	33%	Low burn rate
CRP001122	Breed Characterization	85,720	51,590	137,900	10,810	-	570	53,510	13,970	**277,130**	**76,931**	28%	Low burn rate
CRP001123	Breeding Schemes	-	72,980	-	15,390	-	30	-	15,030	**-**	**103,420**	#DIV/0!	No budget. Reverse expenses
CRP001124	Field Recording Tools Development	82,210	16,110	123,120	32,310	-	- 350	34,910	8,560	**240,230**	**56,635**	24%	Low burn rate
CRP001125	Reproductive Technology and Gene Editing	234,910	34,050	172,380	76,350	-	-	69,240	18,770	**476,530**	**129,165**	27%	Low burn rate
CRP001131	Business Model for Genetic Gains	116,450	32,810	28,520	7,660	-	-	24,640	6,880	**169,610**	**47,354**	28%	Low burn rate
CRP001141	Livestock Breed and Conservation Policy Guidelines	-	11,060	-	2,090	-	-	18,460	7,040	**18,460**	**20,193**	109%	Very high burn rate
CRP001236L	Development of improved vaccines against ASF	-	-	-	-	-	240	-	40	**-**	**276**	#DIV/0!	No budget. Reverse expenses
		1,225,320	**366,330**	**1,198,330**	**248,910**	**46,680**	**7,590**	**497,000**	**117,950**	**2,967,320**	**740,761**	**25%**	

- **New bilateral funding (CTLGH)**
- **Opportunities to carry-over….**

Recruitments

- Bioinformatic support: Jia Xinzheng CAAS – ILRI joint lab China (since August 2017), Samuel Oyala 25% (2018).
- Data visualization specialist Advertised – screening ….

Others

- Flagship Communication Officer (advertisement ready), communication strategy !
- Gender Post-doc (Nicoline…)
- Quantitative Geneticist(s) ! – Post Doc

Others, others…….

Figure 2.1b Livestock Genetics Flagship theory of change, assumptions, enabling actions and change domains

A1

Assumptions	
A1	▪That genetic improvement of livestock is recognized by stakeholders as providing potential for increased livestock productivity
	▪That stakeholders engage in dialogue around national or sub-national genetic improvement and delivery strategies
	▪That the needs and preferences of women and men livestock keepers, as well as other stakeholders along the livestock value chains including the youth, and present and future conditions of the production system, are adequately considered in development of the genetic improvement and delivery strategies
	▪That a vision for a national or sub-national genetic improvement and delivery strategy is agreed by all stakeholders, including national research and development partners, the private sector, women and men livestock keepers, and the youth
A2	▪That national research and development partners and the private sector agree on appropriate institutional arrangements to support the genetic improvement strategy
	▪That national research and development partners and the private sector invest in building capacity on genetic improvement strategies
	▪That national research and development partners and the private sector support the development of improved livestock genetics in a sustainable and cost-effective manner
	▪That national research and development partners and the private sector appropriately monitor the genetic improvement program, and adjust it as necessary
	▪That engagement in the development of improved livestock genetics is attractive to women and youth
	▪That there is an enabling policy environment
A3	▪That national research and development partners and the private sector agree on appropriate institutional arrangements to support the delivery of improved livestock genetics
	▪That national research and development partners and the private sector invest in building capacity on delivery of improved livestock genetics
	▪That national research and development partners and the private sector support the delivery of improved livestock genetics in a sustainable and cost-effective manner
	▪That national research and development partners and the private sector appropriately monitor the delivery program, and adjust it as necessary
	▪That engagement in the delivery of improved livestock genetics is attractive to women and youth
	▪That there is an enabling policy environment
A4	▪That policy makers are willing to adopt the guidelines on policy and institutional arrangements for improvement and conservation of animal genetic resources
	▪That policy makers are willing to resource the implementation of new policy arising from adoption of the guidelines
A5	▪That women and men livestock keepers, as well as others involved in the livestock value chains, invest in building capacity on the utilization of genetically improved livestock, including on appropriate livestock management practices
	▪That the keeping and use of improved livestock genetics is attractive to women and youth
	▪That policy makers and other stakeholders monitor implementation of the new policy, and make adjustments as necessary
A6	▪That women and men livestock keepers can access the necessary inputs - in relation to animal health-care, feed and animal housing - required for the improved livestock to express its genetic potential
	▪That appropriate market incentives exist for the use of improved livestock genetics
	▪That the improved livestock genetics continue to meet the needs and preferences of women and men livestock keepers, and other actors along the livestock value chains
	▪That the use of improved livestock genetics results in and lower environmental impact per unit of livestock product

E1

Enabling cross-cutting actions	
E1	"Next user" capacity development
E2	Consideration of gender & youth issues in strategy assessments
E3	Capacity development inclusive of resource poor men and women farmers
E4	Consideration of issues affecting use of the improved livestock genetics for different stakeholder groups, including women, men and

1

Domains of Change	
1	Changes in local, national and international research and development systems
2	Changes in markets, enterprises and consumer behaviour
3	Changes in producer systems (producers and communities)
4	Changes in policy and investment systems for scaling