identified in the Project Results Framework (Appendix 1), AWP/B and M&E Plan. Each semester the NPC will prepare a draft PPR, and will collect and consolidate any comments from the FAO PTF. The NPC will submit the final PPRs to the FAO Representative in Uruguay every six months, prior to 10 June (covering the period between January and June) and before 10 December (covering the period between July and December). The July-December report should be accompanied by the updated AWP/B for the following Project Year (PY) for review and no-objection by the FAO PTF. The Budget Holder has the responsibility to coordinate the preparation and finalization of the PPR, in consultation with the PT and LTO. After LTO and BH clearance, the FLO will ensure that project progress reports are uploaded in FPMIS in a timely manner.

261. **Annual Project Implementation Review (PIR)**. The NPC, under the supervision of the LTO and BH and in coordination with the national project partners, will prepare a draft annual PIR report[71] covering the period July (the previous year) through June (current year) no later than July 1st every year. The LTO will finalize the PIR and will submit it to the FAO-GEF Coordination Unit for review by July 10th. The FAO-GEF Coordination Unit, the LTO, and the BH will discuss the PIR and the ratings[72]. The LTO is responsible for conducting the final review and providing the technical clearance to the PIR(s). The LTO will submit the final version of the PIR to the FAO-GEF Coordination Unit for final approval. The FAO-GEF Coordination Unit will then submit the PIR(s) to the GEF Secretariat and the GEF Independent Evaluation Office as part of the Annual Monitoring Review of the FAO-GEF portfolio. The PIR will be uploaded to FPMIS by the FAO-GEF Coordination Unit.

262. **Technical reports**. The technical reports will be prepared as part of the project outputs and will document and disseminate lessons learned. Drafts of all technical reports must be submitted by the NPC to the PSC and FAO Representation in Uruguay, which in turn will be shared with the LTO for review and approval and to the FAO-GEF Coordination Unit for information and comments before finalization and publication. Copies of the technical reports will be distributed to the PSC and other project stakeholders, as appropriate. These reports will be uploaded in FAO FPMIS by the BH.

263. **Co-financing reports**. The NPC will be responsible for collecting the required information and reporting on in-kind and cash co-financing provided by all the project cofinanciers and eventual other new partners not foreseen in the Project Document. Every year, the NPC will submit the report to the FAO Representation in Uruguay before July 1th covering the period July (the previous year) through June (current year). This information will be used in the PIRs.

264. **GEF Climate Change Mitigation and Land Degradation Tracking Tools**. In compliance with GEF policies and procedures, tracking tools on the climate change mitigation and land degradation focal areas will be sent to the GEF Secretariat in three stages: (i) with the project approval document by the GEF CEO; (ii) with the mid-term review of the project; and (iii) with the final evaluation of the project.

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[71] Prior to the preparation of the PIR report, the FAO-GEF Coordination Unit will provide the updated format as every year some new requirements may come from the GEF.

[72] The NPC, the BH, the LTO and the FAO/GEF Coordination Unit should assign ratings to the PIR every year. The ratings can or cannot coincide among the project managers.

265. **Final Report**. Within two months prior to the project's completion date, the Project Coordinator will submit to the PSC and FAO Representation in Uruguay a draft final report. The main purpose of the final report is to give guidance to authorities (ministerial or senior government level) on the policy decisions required for the follow-up of the Project, and to provide the donor with information on how the funds were utilized. Therefore, the terminal report is a concise account of the main **outputs, outcomes, conclusions and recommendations** of the Project, without unnecessary background, narrative or technical details. The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for ensuring sustainability of project results. Work is assessed, lessons learned are summarized, and recommendations are expressed in terms of their application to the integrated landscape management in the three microregions in the context of the development priorities at national and departmental levels, as well as in practical execution terms. This report will specifically include the findings of the final evaluation as described in section 3.6 below. A project evaluation meeting will be held to discuss the draft final report with the PSC before completion by the NPC and approval by the BH, LTO, and FAO-GEF Coordination Unit.

3.5.4 Monitoring and Evaluation summary

266. Table 3.4 summarizes the main monitoring and evaluation reports, parties responsible for their publication and time frames.

Table 3.4. Summary of main monitoring and evaluation activities

M&E Activity	Responsible parties	Time frame/ Periodicity	Budget
Inception workshop	NPC; FAO Uruguay (with support from the LTO, and FAO-GEF Coordination Unit)	Within two months of project start up	USD 1,000
Project Inception report	NPC, M&E expert and FAO Uruguay with clearance by the LTO, BH and FAO-GEF Coordination Unit	Immediately after the workshop	-
Project level impact monitoring	NPC; project partners, local organizations	Continuous	USD 53,007 (5% project coordinator+25% Assistant coordinator)
Field level impact monitoring	Field coordinator, technicians	Continuous	USD 36,125 (3% Field Coordinator, 3% Technicians, 5% Farm-level monitoring system)
Supervision visits and rating of progress in PPRs and PIRs	PC; FAO (FAO Uruguay, LTO). FAO-GEF Coordination Unit	Annual, or as needed	FAO visits will be borne by GEF agency fees

	may participate in the visits if needed.		Project Coordination visits shall be borne by the project's travel budget
Project Progress Reports (PPRs)	PC, with stakeholder contributions and other participating institutions	Six-monthly	USD 8628 (3.5% of the Project Coordinator's time)
Project Implementation Review (PIR)	Drafted by the NPC, with the supervision of the LTO and BH. Approved and submitted to GEF by the FAO-GEF Coordination Unit	Annual	FAO staff time financed though GEF agency fees. PCU time covered by the project budget.
Co-financing reports	PC with input from other co-financiers	Annual	USD 2465 (1% of the Coordinator's time)
Technical reports	PC, FAO (LTO, FAO Uruguay)	As needed	
Mid-term review	FAO Uruguay, External consultant, in consultation with the project team, including the FAO-GEF Coordination Unit and others	Midway through the project implementation period	USD 20,000
Final evaluation	External consultant, FAO Office of Evaluation (OED) in consultation with the project team, including the FAO-GEF Coordination Unit and others	At the end of the project (to start at least 6 months before the completion date)	USD 50,000 FAO staff time and travel costs will be financed by GEF agency fees.
Terminal Report	PC; FAO (FAO Uruguay, LTO, FAO-GEF Coordination Unit, TCS Reporting Unit)	Two months prior to the end of the project.	USD 6,550
Total budget			**USD 177,776**

3.6 EVALUATION PROVISIONS

267. At the end of the first 24 months of the project, the BH will arrange a **Mid-Term Review (MTR)** in consultation with the PSC, the PT, the LTO and the FAO-GEF Coordination Unit. The MTR will be conducted to review progress and effectiveness of implementation in terms of achieving project objective, outcomes and outputs. The MTR will allow mid-course corrective actions, if needed. The MTR will provide a systematic analysis of the information provided under the M&E Plan (see above) with emphasis on the progress in the achievement of expected outcome and output targets against budget expenditures. The MTR will refer to the Project Budget (see Appendix 3) and the approved AWP/Bs for Project Year (PY) 1 and PY2. The MTR will contribute to highlight replicable good practices and main problems faced during project implementation and will suggest mitigation actions to be discussed by the PSC, the LTO and FAO-GEF Coordination Unit.

268. An independent Final Evaluation (FE) will be carried out six months prior to the terminal report meeting. The FE will be led by the Office of Evaluation (OED) in consultation

with project stakeholders. The FE will aim to identify the project impacts, sustainability of project outcomes and the degree of achievement of long-term results. The FE will also have the purpose of indicating future actions needed to expand on the existing Project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to management authorities and institutions with responsibilities in food security, conservation and sustainable use of natural resources, small-scale farmer agricultural production and ecosystem conservation to assure continuity of the processes initiated by the Project. Both the MTR and FE will pay special attention to outcome indicators and will be aligned with the GEF Tracking tool (CCM and LD focal areas).

3.7 COMMUNICATION AND VISIBILITY

269. A communication strategy will be developed and implemented to ensure fluid information flow with farmers, extensionists and institutional partners, in support to the activities under Component 1 (strategy and NAMA development processes) and Component 2 (implementation of farm-level strategies, field days). The strategy will ensure that information on project results and lessons are disseminated to a wide audience through appropriate communication channels. Activities include the preparation of communications materials such as posters and leaflets, presence in local media (TV, AM radio, newspapers), as well as the set-up and maintenance of a project website and dedicated social media accounts over the whole project period. FAO through the Representation in Uruguay which will fund a communications specialist to support implementation of the communications and outreach strategy

270. At regional and global levels, the project will support publication of at least three journal articles on project results, particularly with regard to novel approaches to on-farm GHG monitoring and implementation of CSLM strategies. Project results will be presented at two international conferences related to Climate-Smart Agriculture. Furthermore, the project will facilitate the participation of project staff in three events of international research and practictioners' networks. A webinar series on CSLM through a regional partnership of the networks to connect with peers from other countries in the region. FAO through its Livestock Unit will work to disseminate project results and lessons through GLEAM, LEAP, and other CSA livestock related initiatives. Dissemination at global level will also be ensured through co-operation with the Climate and Clean Air Coalition, a co-financing partner.

SECTION 4 – SUSTAINABILITY OF RESULTS

4.1 SOCIAL SUSTAINABILITY

271. The project intervenes in four pilot regions selected based on the importance of family farms in sustaining the livelihood of the local population. At farm level, social sustainablility of the project will be achieved through application of the co-innovation ensures which ensures that the development of farm-level strategies are based on the capacities, goals and aspirations of the farmers and their families (see section 1.4. lessons learned). At territorial level, the project supports social cohesion through the strengthening of local producers' organizations. These provide important forums for mutual learning among local farmers and articulation of their problems and concerns, and facilitation of technical and financial assistance with public sector institutions at higher levels.

272. At national level, social sustainablility will be strengthened by including farmer's concerns into the national CSLM strategy. This will be ensured through the involvement of farmer's associations in the development and validation strategy, and through targeted capacity building measures.

4.2 ENVIRONMENTAL SUSTAINABILITY

273. The intervention strategy is focused on improving environmental performance on small and medium livestock farmers who manage an important part of Uruguay's fragile rangelands. Halting and reversing land degradation on this land will not only yield the targeted global environmental benefits of climate change and improvement of soil resources, but also have a positive impact on other environmental goods and services such as biodiversity conservation (Uruguay's natural grasslands are particularly rich in species), landscape integrity, and water regulation capacity of the soil.

274. Through the project, impacts of transition of the production systems to CSLM on different environmental factors (soils, vegetation, water) will be systematically monitored, enhancing the understanding of these transition processes. This in turn will provide the opportunity for the project, associated initiatives, and farmers to learn from the experience, and optimize their strategies to maximize environmental benefits, while improving productivity (see section 4.3).

275. At national level, the project will contribute to the environmental sustainability of the livestock sector through the development of the national CSLM strategy, and a NAMA for the beef sector, as well as through the improvement of institutional capacities of key public and private sector institutions as well as farmers' associations, to implement the strategy.

276. Due to the profitability of the CSLM practices, a rebound effect may occur in the long term, where the specific gains in GHG emissions are overcompensated by a rise in production in the livestock sector, leading to an actual increase of emissions. This scenario must be evaluated against a baseline scenario where the sector will grow anyway, on a high emission pathway, based on global demand forecasts. (See appendix 4 for a discussion of this risk).

4.3 FINANCIAL AND ECONOMIC SUSTAINABILITY

277. The project adopts a multi-level approach to capacity building to ensure financial and economic sustainablitiy of project interventions. Farm strategies are developed based on the actual economic situation on each farm, as well as on the goals and aspirations of the farmers

and their families. The time invested by the farmer is very likely amply compensated by the increased income. Any additional investment costs identified in the farm strategy, if any, for example for improving water availability or reforestation activities, will be covered by the DACC-2 project. Most technological options supported by the project require no or very low investment on the part of the farmer. In this way, the project works with the farmers to overcome wide-spread scepticism about possible improvements of the production systems.

278. At the national level, the project will provide public and private sector institutions with options to improve economic opportunities associated with the transition to a climate smart livestock production. In particular, the NAMA and associated MRV system will enable institutions to identify and and access funding sources to continue support the implementation of the national CSLM strategy, which will in turn boost the economic returns from CSLM development.

4.4 SUSTAINABILITY OF CAPACITY DEVELOPMENT

279. The project's capacity development strategy targets all key stakeholders at local, regional and national levels.

280. At the local level, sustainability is ensured through the application of the co-innovation approach. Under this approach, the extensionist and farmer develop a strategy based on a thorough assessment of the situation on the productive system on each farm, as well as the farmer's goals and aspirations. The extensionist takes the role of facilitator rather than purely a technical advisor. This approach has been shown to be very effective in triggering long-term improvements (see lessons learned, section 1.4). This approached is enhanced by farmer-to-farmer learning during workshops and field days, which has also proven very effective in Uruguay.

281. At the regional and national levels, sustainability of capacity development is achieved by systematically including farmers' associations in the activities of the project. These associations have a great potential to disseminate the messages of the project. At the national level, capacities of relevant actors will be strengthened to implement the national CSLM strategy through a dedicated workshop programme carefully tailored to the needs and situation of each institution. In particular, capacities will be installed at the key units of MGAP which have a mandate to implement programmes for sustainable livestock development: DGDR and UGP.

4.5 APPROPRIATENESS OF TECHNOLOGIES INTRODUCED and COST/EFFECTIVENESS

282. The technological options promoted under the project have been shown to be adopted to the context of family livestock farmers in Uruguay, and have been successfully applied in previous programs. In the development of the farm-level strategy, technological options are carefully analyzed by farmers and producers to ensure that only those technologies are applied which correspond to the situation of the farm and the capacity of the farmer.

283. The technological options have been shown to be very cost-effective. Most options require no or minor investments that can easily be assumed by the farmers. On the other hand

productivity, net income of farms labor efficiency can increase considerably with the adoption of improved practices, making the approach very attractive to family farmers.[73]

4.6 INNOVATIVENESS, REPLICATION and SCALE-UP

284. **Innovativeness:** At the global level, the approach of climate smart agriculture (including livestock), covering the nexus of food security, climate change and sustainable resource management, emerged quite recently. Recognizing this, the GEF has made climate smart agriculture (including livestock management) central to its strategies for natural resource management under GEF 6. This applies in both the climate change and land degradation focal areas. This will be one of the first GEF projects to implement these new GEF strategies.

285. Over the last 15 years, Uruguayan research institutions have developed a technological approach to livestock raising based on rangelands ecology, animal behaviour during grazing, ecosystem services (including carbon sequestration) and rural extension techniques. This holistic, farm level approach to management goes far beyond managing the herd animals. This Project will help fine tune, testing and disseminating this innovative approach.

286. Specifically, this is the first project in Uruguay that explicitly focuses on the climate change mitigation potential of the livestock sector. It will make an important contribution to help Uruguay meet the ambitious target to curb specific GHG emissions from livestock. Given the trends in global meat consumption, it is a project that it is of global relevance.

287. **Replication and up-scaling:** The Project has great potential for replication and upscaling. In Uruguay, the area of rangelands managed by farmers amounts to 10,518 million ha. The Project intervenes directly on 35,000 hectares. It is estimated that the project can, indirectly, have an impact on 400,000 hectares through close alignment with other ongoing initiatives, notably the DACC-2 project (see section 1.2) as well as a close collaboration with farmers' associations.

288. Further upscaling will be sought through a series of add-on measures. One possibility is to seek climate change mitigation related funding through the UNFCCC's National Appropriate Mitigation Actions (NAMA) mechanism. The project uses the 60 farms as the flagships of a much more ambitious strategy to produce more beef without any significant increase in emissions. The GEF project is the cornerstone of the sectoral policy designed for a technical revolution in Uruguayan beef production. As the profitability of the beef business improves with the technical change and net income is more stable as the farms builds resilience, it is expected that spill over be high.

289. Finally, the project will contribute important inputs to the National Program of Technology Transfer and Diffusion (NPTTD) currently under development by MGAP and expected to start in the implementation of the project. This GEF project will be a key source

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[73] See Andrea Ruggia, Santiago Scarlato, Gerónimo Cardozo, Verónica Aguerre, Santiago Dogliotti, Walter Rossing, Pablo Tittonell. 2015. Managing pasture-herd interactions in livestock family farm systems based on natural grasslands. In Uruguay. 5th International Symposium for Farming Systems Design, Montpellier, France (http://fsd5.european-agronomy.org/documents/proceedings.pdf) for a discussion of a recent experience with co-innovation in Eastern Uruguay.

of knowledge, lessons learned and tools to better design and implement the scaling-up activities with support of the NPTTD.

APPENDICES

APPENDIX 1: RESULTS FRAMEWORK

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
Project Objective: To mitigate climate change and to restore degraded lands through the promotion of climate-smart practices in the livestock sector, with focus in family farming.							
Component 1: Strengthening the institutional framework and national capacities to implement the climate smart livestock management (CSLM)							
Outcome 1.1 Policy and planning frameworks have been strengthened to support CSLM implementation and national communication on livestock emissions.	**Indicator 3 (CC)**: One MRV system for emission reduction in place and reporting verified data (for the large ruminant livestock sub-sector, as part of the NAMA development)	4		8	MRV documentation; reports of national information system on GHG emissions		*M+E Expert*
	Indicator 5 (CC): Degree of support for low GHG development in the policy planning and regulatory framework.	3		6	Strategy document; policies and work plans of key institutions	Adequate budget allocation by government	*M+E Expert*

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
Output 1.1.1: A national climate-smart livestock management (CSLM) strategy, designed and validated with key stakeholders.	**Indicator 1.1.1a**: A CSLM strategy document;	Lack of CSLM strategy	1 draft strategy elaborated and validated	1 finalized CSLM strategy presented to the Government and disseminated at regional and local level	CSLM strategy document	Willingness and capacities of the institutions to participate and contribute to the preparation and validation of the CSLM strategy; Agreement on common criteria for CSLM can be reached among stakeholders	*M+E Expert*
	Indicator 1.1.1b: Number of institutions involved in the preparation and validation process		10 institutions involved in the preparation and validation process	10 institutions involved in the prepration and validation process	Documentation of validation workshops	Willingness and capacities of the institutions to participate and contribute to the preparation and validation of the CSLM strategy	*M+E Expert*
Output 1.1.2: A Nationally Appropriate Mitigation Action (NAMA), including a national measuring, reporting and validation (MRV) system for the livestock ruminant sector.	**Indicator 1.1.2a**: A validated NAMA document and MRV system	Lack of NAMA and MRV system	1 MRV system proposed	1 validated NAMA and 1 MRV system presented to the Government	NAMA document and MRV system;		*M+E Expert*
	Indicator 1.1.2b: Number of institutions involved in the validation of the NAMA			10 institutions involved in the validation of the NAMA	Documentation of validation workshops	Willingness and capacities of the institutions to participate and contribute to validation of the NAMA	*M+E Expert*

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
Outcome 1.2: National capacities have been strengthened to support CSLM implementation.	**Indicator 1.2:** No. of institutions that commit to supporting the implementation of CSLM;	0 organizations		6 national organizations with confirmed commitment to CSLM implementation	Action plans or institutional programs for mainstreaming CSLM at instituional level; budget allocation for CSLM	Willingness of the institutions to mainstream CSLM at institutional level and allocate budget	M+E Expert
Output 1.2.1: Capacities developed to effectively support the implementation of CSLM with a gender-sensitive perspective.	**Indicator 1.2.1**: Number of staff in national institutions with enhanced capacities for mainstreaming CSLM at institutional level	0 staff members		30 staff members from 6 institutions with enhanced capacities for mainstreaming CSLM at institutional level	Workshop documentation and participants' evaluation	Willingness of the institutions to assign staff to participate in capacity building measures	*M+E Expert*
Output 1.2.2: A training program in place, to supporting the rolling out of improved and climate- smart approaches to livestock management.	**Indicator 1.2.2**: Number of extensionists with enhanced knowledge and capacities on CSLM	0 extensionists	75 extensionists with improved knowledge and capacities on CSLM	75 extensionists with improved knowledge and capacities on CSLM	Final evaluation of the CSLM training courses	Willingness and availability of the extensionists to participate in the training courses	*M+E Expert*
Component 2: Development and deployment of CSLM technologies and practices at field level.							

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
Outcome 2.1 Sustainable climate-smart livestock management (CSLM) has been implemented in degraded/degrading lands.	**Indicator LD 1.1:** Land area under effective rangeland management practices and/or supporting climate-smart agriculture.	35,000 ha under CSLM	15,000 ha under CSLM	35,000 ha under CSLM.	GIS established in the on-farm monitoring system; documentation of farming practices of farmers and extensionists.	Willingness of farmers to participate and share correct information on farming practices; no occurence of extreme climatic events during the implementation phase of the project; stability of economic framework conditions for the farmers.	Component 2 coordinator
	Indicator 1 (CC): Tons of CO2eq of GHG reduced or avoided directly and indirectly.			379,000 t CO2eq of GHG reduced or avoided directly and indirectly.	Analysis of GHG emissions in the farm-level monitoring system.	Willingness of farmers to participate and share correct information on farming practices; no occurence of extreme climatic events during the implementation phase of the project; stability of economic framework conditions for the farmers.	Implementing institution of the monitoring system

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
	Participating farms with increased farm-level incomes.[1]			At least 80% of participating farms achieve a minium of 10 % increase of farm-level incomes.	Financial reports of participating farms.		Component 2 coordinator
	Indicator 4 (CC): Area under low GHG technologies and practices.			Additional 35,000 has under low GHG (CSLM) management practices.	GIS established in the on-farm monitoring system; documentation of farming practices of farmers and extensionists.	Willingness of farmers to participate and share correct information on farming practices; no occurence of extreme climatic events during the implementation phase of the project; stability of economic framework conditions for the farmers.	Component 2 coordinator
Output 2.1.1: Short and medium-term farm level strategies implemented on project farms with a gender perspective.	**Indicator 2.1.1**: Number of CSLM strategies implemented with a co-innovation process on farm level.		60 focus farms selected and co-innovation process for the implementation of CSLM strategies	60 farms implemented CSLM strategies and apply improved practices and technologies.	Documentation of CLSM farming practices of farmers and extensionists.	Willingness of farmers to participate and share correct information on farming practices; no occurence of extreme climatic events during the implementation	Component 2 coordinator

[1] Target will be quantified at inception

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
			initiated, at least 20% women-headed.			phase of the project; stability of economic framework conditions for the farmers.	
Output 2.1.2: A capacity development program focused on the application of the CSLM technologies and practices.	**Indicator 2.1.2**: Number of farmers with enhanced knowledge and capacities on CSLM.		120 farmers and farm employees, trained at least 30% female participants.	120 farmers and farm employees, trained at least 30% female participants.	Final evaluation of the workshops and field days.	Willingness and availability of the farmers to participate in the workshops and field days.	Component 2 coordinator
Output 2.1.3: On-farm monitoring system, in place to monitor GHG emissions, adaptation strategies, financing, land degradation and biodiversity.	**Indicator 2.1.3**: Number of farms that are integrated into the monitoring system.		GIS established and monitoring of 60 farms in progress.	Monitoring of 60 farms over 4 years;	GIS for focus farms; protocols for sampling and analysis in the monitoring system; reports on the monitoring system.	Available capacity of laboratories to analyse samples and process data; willingness of farmers to share correct information.	Implementing institution of the monitoring system
Component 3: 3. Monitoring, evaluation and knowledge-sharing							
Outcome 3.1: Project implementation based on RBM and lessons learned/good practices	M&E system ensuring timely delivery of project benefits and adaptive		up-to-date monitoring on outcomes, outputs and activities.	up-to-date monitoring on	Project progress and evaluation reports.		M&E Expert

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
documented and disseminated	results-based management.			outcomes, outputs and activities.			
Output 3.1.1: A set of manuals and media products that describe the improved CSLM practices, measures and technologies, for use by extension workers and farmers.	**Indicator 3.1.1:** Number of information products and number of distributed copies.		To be determined at project inception.	To be determined at project inception.	Types information material produced; records of the distribution of copies; number of views in social media.		M&E Expert
Output 3.1.2: Project Monitoring & Evaluation Plan and system, in place.	**Indicator 3.1.2**: Number of meetings and workshops.		Regular meetings of the coordinating bodies; regular reporting on the progress and results of the project.	Regular meetings of the coordinating bodies; regular reporting on the progress and results of the project.	Documentation of regular meetings; project reports.		M&E Expert
Output 3.1.3: Knowledge-sharing with other countries and dissemination of verifiable data and tested methodologies	**Indicator 3.1.3a**: Number of publications.		To be determined at project inception.	Publication of 3 journal articles.	Journal articles		M&E Expert
	Indicator 3.1.3b: Number of presentations at conferences.		To be determined at project inception.	Presentation of the project at 2 conferences.	Conference proceedings.		M&E Expert

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Responsible for data collection
	Indicator 3.1.3c: Participation in networking events.		To be determined at project inception.	To be determined at project inception.			M&E Expert
Output 3.1.4: Project Mid-term review and Final Evaluation.	**Indicator 3.1.4**: Number of evaluations conducted		Mid-term review	Final evaluation	Evaluation reports		M&E Expert
Output 3.1.5: A Communication Strategy, implemented.	**Indicator 3.1.5**: Number of appearence in local media; number of visitors of website and social media accounts		To be determined at project inception	To be determined at project inception	Articles in local media; number of TV appearances; statistics of webiste and social media		M&E Expert

APPENDIX 2: WORK PLAN

Example of acronyms: FAO Rep: FAO Representative in Uruguay; PT: Project Team; NPC: National Project Coordinator; PSC: Project Steering Committee

PROJECT CODE: GCP/URU/035/GFF

Work Plan

Output	Activities	Responsible	Year 1				Year 2				Year 3				Year 4			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1: Strengthening the institutional framework and national capacities to implement the climate smart livestock management (CSLM)																		
Outcome 1.1: Policy and planning frameworks have been strengthened to support CSLM implementation and national communication on livestock emissions.																		
Output 1.1.1: A national climate-smart livestock management (CSLM) strategy, designed and validated with key stakeholders.	Initial outline of the working methodology for the elaboration of the strategy document and the working groups: (1) CSLM practices for GHG mitigation and restoration of degraded rangelands; (2) Ecosystem services, resilience and other co-benefits; (3) market entry, certification and value chains; (4) communication and dissemination.	1 Strategy Coordinator, 4 Technical Facilitators																
	Validation workshop for the working methodology of the MGCN	Strategy Coordinator																
	Prepare inputs to guide the group work	Facilitators																
	5 working sessions of the groups	Facilitators																

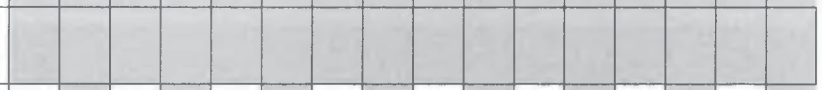
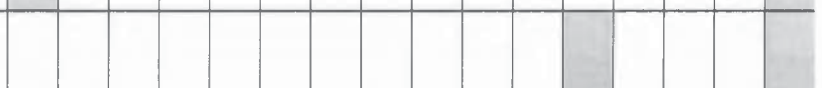
	Elaboration of draft strategy components basded on working group results	Facilitators																		
	Elaboration of draft strategy document based on components	Strategy Coordinator																		
	Validation of the strategy document (1 meeting, extended MGCN)	Strategy Coordinator																		
	Validation and dissemination of the strategy at regional and local scale (1 meeting per ecoregion, convened through Mesas de Desarrollo Rural - MDR)	Strategy Coordinator																		
	Finalization of the strategy document and presentation to the executive committee	Strategy Coordinator																		
	Presentation of the strategy document to the government	PSC																		
Output 1.1.2: A Nationally Appropriate Mitigation Action (NAMA), including a national measuring, reporting and validation (MRV) system for the livestock ruminant sector.	Preparation of the NAMA guidelines	MGAP / UASCC and MVOTMA / DCC																		
	Development of draft NAMA document	NAMA Specialist																		
	Analysis of financing opportunities and finance access mechanisms for the NAMA at national and international levels	NAMA Specialist																		
	Meetings with key stakeholders	NAMA Specialist																		
	Proposal of the MRV system	MRV Specialist																		

	Estimation of the impact of NAMA activities on GHG emissions	MRV Specialist																	
	1 NAMA validation workshop (extended MGCN)	NAMA Specialist / MRV Specialist																	
	Finalization of the NAMA document and presentation to the executive committee	NAMA Specialist / MRV Specialist																	
	Presentation of the NAMA document to the government	PSC																	
Outcome 1.2: National capacities have been strengthened to support CSLM implementation.																			
Output 1.2.1: Capacities developed to effectively support the implementation of CSLM with a gender-sensitive perspective.	6 institutional workshops to align institutional concepts with the CSLM strategy and NAMA	Strategy Coordinator / NAMA Specialist																	
	6 training workshops with a needs assessment to mainstream the CSLM strategy into institutional policies and programs	Strategy coordinator / NAMA Specialist																	
	6 institutional training workshops to identify opportunities and and institutional action plan to mainstream the CSLM strategy into policies and programs	Strategy coordinator / NAMA Specialist																	

Output 1.2.2: A training program in place, to supporting the rolling out of improved and climate-smart approaches to livestock management.	4 training courses on CSLM practices for extensionists who work on farms of indirect intervention (1 course for at least 15 technicians per ecoregion)	Technicians / Specialists for animal production, Participative work, ecosystem services, farm management																			
Component 2: Development and deployment of CSLM technologies and practices at field level.																					
Outcome 2.1: Sustainable climate-smart livestock management (CSLM) has been implemented in degraded/degrading lands.																					
Output 2.1.1: Short and medium term farm level strategies implemented on project farms with a gender perspective.	Validate selection criteria and processes with farmer organizations	MGAP																			
	Selection of the farms with participation of local farmer organizations	MGAP / Specialists / Farmer Organizations																			
	Selection of technicians	MGAP / Specialists / Farmer Organizations																			
	Training of technicians who work on the GEF project farms with monitoring and verification	Specialists for animal production, participative work, ecosystem services, farm management																			

	Implementation of the participatory working process in three steps: (1) Training and diagnosis; (2) Formulation of a farm plan; (3) Implementation of the farm plan	Technicians / Specialists																	
	Annual planning and evaluation workshops	Technicians / Specialists																	
Output 2.1.2: A capacity development program focused on the application of the CSLM technologies and practices.	Training workshop of farmers and rural workers	Technicians / Specialists																	
	42 Field days and visits to innovative farms	Technicians / Specialists																	
Output 2.1.3: On-farm monitoring system, in place (to monitor GHG emissions, adaptation strategies, financing, land degradation and biodiversity).	Establishment of a GIS through SNIA covering the 60 pilot farms and control farms	DGRN / Research Institute																	
	Definition of protocols for sampling and analysis	Research Institute																	
	Monitoring of variables by remote sensing	Research Institute																	
	Sampling and analysis of stool	Research Institute																	
	Sampling and analysis of soils	Research Institute																	
	Sampling and analysis of vegetation	Research Institute																	
	Analysis of indicators for CC mitigation and soil restoration	Research Institute																	
	Monitoring of socio-economic and gender variables	Research Institute																	
	Scholarship for a postgraduate student for research that provides input for the MRV system	Research Institute																	

	Development and validation of an online tool for the characterization and monitoring of the farms, processing of information and farm-level calculation of GHG emissions	Research Institute																		
Component 3: Monitoring, evaluation and knowledge-sharing																				
Outcome 3.1: Project implementation based on RBM and lessons learned/good practices documented and disseminated																				
Output 3.1.1: A set of manuals and media products that describe the improved CSL practices, measures and technologies, for use by extension workers and producers.	Production of explanatory material (brochure or leaflet)	Communications Specialist	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Production of a complementary video	Communications Specialist	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Explanatory field manual that targets rural farmers and extension workers, second edition at the end of the project	Communications Specialist, Graphic Designer, Editor, Print	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Video storytelling with practitioners' experience	Communications Specialist, MGAP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Output 3.1.2: Project Monitoring & Evaluation Plan and system, in place.	Design of grievance mechanism, designation of focal point and communication to stakeholders	NPC, MGAP																		

	Development and maintenance of an M&E tool	Monitoring and Evaluation Specialist, based on UGP system	
	Monthly meetings of the project team	NPC	
	Meetings of the executive committee every four months	MGAP / FAO	
	Annual meeting of the advisory committee (extended MGCN)	MGAP / DGRN	
	Preparation of annual workplan	NPC	
	Preparation of six-monthly progress reports	NPC	
	Inception workshop	NPC	
	Final workshop	NPC	
	Preparation of inception and final reports	NPC	
Output 3.1.3: Knowledge-sharing with other countries and dissemination of verifiable data and tested methodologies	Publication of thesis and journal articles	Specialists, Postgraduate Students	
	Presentation at an international conferences and seminars	Specialists, Postgraduate Students	
	Organization of a webinar series on CSLM at regional level	Communications Specialist	

	Disseminate information in international networks on Climate Smart Livestock, including GASL	Communications Specialist, Experts, MGAP, FAO															
Output 3.1.4: Project Mid-term review and Final Evaluation.	Mid-term review	FAO BH															
	Final evaluation	FAO OED															
Output 3.1.5: A Communication Strategy, implemented.	Development of a communication strategy for the institutional communication	Communications Specialist															
	Establishment and maintenance of a project website and social media accounts	Communications Specialist															
	Development of a communication strategy for the communication with farmers	Communications Specialist															

APPENDIX 3: PROJECT BUDGET

Copy of GCP URU
034 URU Full Budge

APPENDIX 4: RISK MATRIX[1]

	Description of risk	Impact[2]	Probability of occurance[1]	Degree of incidence	Mitigation actions	Responsible party
1	Extreme events related to climate change and climate variability	Should the Project target areas experience extreme events such as drought during the Project intervention, the uptake of measures may be slower than anticipated due to changing priorities of the participating farmers. Benefits to the farmer may not be visible.	M	M	The selection of sites across the country, in different agro-ecological zones will ensure that at least a good proportion of the farmers are able to introduce and test the technologies and practices, even if drought is experienced in one area. The Co-innovation approach allows adopting the CSLM strategy to unforeseen climatic situations. Investments to cope with unforeseen drought conditions may be covered by the DACC-2 project. The Project management will monitor the situation closely and take remedial action if necessary.	PSC, NPC
2	Animal disease epidemic in the project area	Should one or more of the Project target areas experience a disease epidemic, it will make it very difficult to test and develop new	L	MH	The selection of sites across the country, in different agro-ecological zones will ensure that at least a good proportion of the farmers are able to introduce and	PSC, NPC

[1] Please consult available corporate guidelines and training for information on how to complete the risk log on the ERM website.

[2] H: High; MH: Moderately High; ML: Moderately Low; L: Low

	Description of risk	Impact[2]	Probability of occurance[1]	Degree of incidence	Mitigation actions	Responsible party
		technologies and practices. It may also make the farmers more risk averse, and less willing to participate in the Project.			test the technologies and practices, even if an epedemic is experienced in one area. The only epidemic that could affect the project is Foot and Mouth disease. However, the likelihood of an outbreak is low, as Uruguay has adequate prevention for this disease (i.e. vaccination, border controls). The Project management will monitor the situation closely and take remedial action if necessary.	
3	Lack of interest and motivation by farmers to participate	If there is a lack of interest, development and implementation of the CSLM strategies may be slower than anticipated. In consequence, targets on global environmental benefits may only be partially reached.	ML	H	In the selection process, care will be taken that participating farmers have a genuine interest and motivation. Furthermore, the selection process is articulated with local farmers' associations which will support the roll-out of field activities. The Project will implement proven measures and approaches that ultimately make good economic and financial sense to farmers. This should ensure that over time most farmers wish to participate.	PSC
	Lack of interest of stakeholders to participate in the CSLM strategy elaboration and	The CSLM strategy is not adopted by the institutions.	ML	H	Most potential stakeholders were involved in the preparation phase and support the Project's approach.	PSC, PAC

	Description of risk	Impact[2]	Probability of occurance[1]	Degree of incidence	Mitigation actions	Responsible party
	validation process and capacity building activities.				The Project will be advised by the National Livestock Rangelands Board (MGCN), where all key actors from public, private, academic sectors and civil society participate. This will ensure a fluid information flow an feedback mechanism with all stakeholders.	
	Carbon sequestered in soils is uncertain.	Carbon sequestration targets can only partially be achieved.	L	M	The estimations of carbon sequestration on natural rangelands is based on best available and up-to date information. Furthermore, a conservative approach was adopted to estimating soil carbon balance. The on-farm monitoring system will monitor trends in soil and vegetation carbon. On farms where levels deviate from the target, farm-level CSLM strategies will be adjusted. However, confidence is high as the prject will eliminate overgrazing which is the main driver of soil degradation and carbon loss.	NPC
	Rebound effect: It is likely that the project will contribute to increasing the volume of production, given the financial	GHG emission reduction targets can not be met by the project.	L	M	Overall emissions from the livestock sector can be expressed as the production volume times the average	PSC

	Description of risk	Impact[2]	Probability of occurance[1]	Degree of incidence	Mitigation actions	Responsible party
	profitability of CSLM practices. This raises the risk of a potential increase of overall GHG emissions, rather than the expected decrease.				emission per unit of product (Emission intensity – Ei). Within the project area (35,000 ha). production is estimated to grow by 53% through productivity gains (from 3,100 ton live weight to 4,800), while emission intensity will decrease by 38% considering gross emissions by livestock only, and by 71% considering carbon sequestration. This results in a net mitigation effect of livestock production. There will thus be no increase in absolute emissions within the project area. At national level, it may be envisaged that because CSLM practices are more profitable than current practices, the project will contribute to accelerating the growth of the national beef sector, leading to more animals in production. This could result in a rebound effect whereby the decrease in emission intensity is offset by the overall growth in production. However, this scenario must be compared against a baseline in which the beef sector is likely to grow anyway, driven by national and international demand. Global meat consumption is expected to nearly	

	Description of risk	Impact[2]	Probability of occurance[1]	Degree of incidence	Mitigation actions	Responsible party
					double between 2005 and 2050. Without the project, the sector's growth would take place emission intensity levels close to current ones. It is thus unlikely that any possible rebound effect causes greater absolute emission increases than the "no project" scenario.	
2	Low technical capacity of experts and institutions at national and local level halting the project's progress	The lack of technical capacities may slow down the identification of qualified experts and institutions to implement project activities. It may also slow down progress of project execution.	L	ML	The assessment conducted during the PPG phase shows that this risk is low and suitable national experts can be identified. In terms of institutional capacity, the risk will be mitigated through the project's capacity building activities.	Project Steering Committee (PSC) Project team

APPENDIX 5: ENVIRONMENTAL AND SOCIAL ASSESSMENT

PROJECT ENVIRONMENTAL AND SOCIAL SCREENING (ESS) CHECKLIST -For Risk Classification use during Project Identification

For each question only 1 of 4 boxes must be checked: Not Applicable (N/A), No, Yes or Unknown[1].

Would the project, if implemented?	Not Applicable	No	Yes	Unknown
I. FAO VISION/STRATEGIC OBJECTIVES				
Be in line with FAO's vision?			X	
Be supportive of FAO's strategic objectives?			X	
II. FAO KEY PRINCIPLES FOR SUSTAINABILITY IN FOOD AND AGRICULTURE				
Improve efficiency in the use of resources?			X	
Conserve, protect and enhance natural resources?			X	
Protect and improve rural livelihoods and social well-being?			X	
Enhance resilience of people, communities and ecosystems?			X	
Include responsible and effective governance mechanisms?			X	
ESS 1 NATURAL RESOURCES MANAGEMENT				
Management of water resources and small dams				
Include an irrigation scheme that is more than 20 hectares or withdraws more than 1000 m3/day	X			
Include an irrigation scheme that is more than 100 hectares or withdraws more than 5000 m3/day of	X			
Include an existing irrigation scheme?	X			
Include an area known or expected to have water quality problems?	X			
Include usage of non-conventional sources of water (i.e. wastewater)?	X			
Include a dam that is more than 5 m. in height?	X			

Include a dam that is more than 15 m. in height?[77]	X			
Include measures that build resilience to climate change?			X	

Tenure				
Negatively affect the legitimate tenure rights of individuals, communities or others[2]?		X		
ESS 2 BIODIVERSITY, ECOSYSTEMS AND NATURAL HABITATS				
Make reasonable and feasible effort to avoid practices that could have a negative impact on biodiversity,				X
Have biosafety provisions in place?	X			
Respect access and benefit-sharing measures in force?	X			
Safeguard the relationships between biological and cultural diversity?				X
Protected areas, buffer zones and natural habitats				
Be located such that it poses no risk or impact to protected areas, critical habitats and ecosystem				X
ESS 3 PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE				
Planted forests				
Have a credible forest certification scheme, national forest programmes or equivalent or use the	X			
ESS 4 ANIMAL - LIVESTOCK AND AQUATIC- GENETIC RESOURCES FOR FOOD AND AGRICULTURE				
Aquatic genetic resources				
Adhere (Aligned) to the FAO Code of Conduct for Responsible Fisheries (CCRF) and its related	X			

[77] "Show stopper" questions are marked in red colour. If any issues are identified in answering these questions then the project is no longer a low risk project and needs to be brought to he attention of relevant technical divisions and the ESM unit.

Be aligned, where applicable, with FAO's strategic policies established in the FAO Technical Guidelines for Responsible Fisheries (including aquaculture)?	X		
Livestock genetic resources			
Be aligned with the Livestock Sector Strategy including the animal disease, public health and land			X
ESS 5 PEST AND PESTICIDES MANAGEMENT			
Involve the procurement or provision of pesticides?		X	
Result in increased use of pesticides through expansion or intensification of production systems?		X	
Require the disposal of pesticides or pesticide contaminated materials?		X	

[2] In accordance with Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT) http://www.fao.org/docrep/016/i2801e/i2801e.pdf

ESS 6 INVOLUNTARY RESETTLEMENT AND DISPLACEMENT				
Avoid the physical and economic displacement of people?	X			
ESS 7 DECENT WORK				
Adhere to FAO's guidance on decent rural employment, promoting more and better employment			X	
Respect the fundamental principles and rights at work and support the effective implementation of other international labour standards, in particular those that are relevant to the agri-food sector?			X	
ESS 8 GENDER EQUALITY				
Have the needs, priorities and constraints of both women and men been taken into consideration?			X	
Promote women's and men's equitable access to and control over productive resources and services?			X	
Foster their equal participation in institutions and decision-making processes?			X	
ESS 9 INDIGENOUS PEOPLES AND CULTURAL HERITAGE				
Are there any indigenous communities in the project area?		X		
Are project activities likely to have adverse effects on indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and	X			
Are indigenous communities outside the project area likely to be affected by the project?	X			
Designed to be sensitive to cultural heritage issues?	X			

Pierre Gerber, 19 July, 2017

Risk Classification Certification Form

After completing the Environmental and Social (E&S) Screening Checklist, the Lead Technical Officer (LTO) completes and certifies this Certification Form and attached the E&S Screening Checklist to this form.

Project symbol: GCP/URU/034/GFF Project title: Climate- smart livestock production and land restoration in the Uruguayan rangelands

A. RISK CLASSIFICATION

[√] Low [ ] Moderate [ ] High

1. Record key risk impacts from the E&S Screening Checklist
   - A. Decrease in GHG emissions
   - B. Recovery of degraded lands and rangelands
   - C. Increase resilience of rangelands ecosystems to variability and climatic change.
   - D. Increase environmental, economic and social sustainability

2. Has the project site and surrounding area been visited by the compiler of this form?

[√] Yes [ ] No

B. STAKEHOLDER CONSULTATION/ENGAGEMENT

Identification of Stakeholder(s)	Date	Participants	Location
Meeting with FUCREA	Aug/2014	7	Montevideo
Meeting with CNFR	Aug/2014	10	Montevideo
Initial Workshop	Aug/2016	50	Montevideo
Final Workshop	July/2017	45	Montevideo

1. Summarize key risks and impacts identified from the stakeholder engagement
   - A. Increase the resilience of ecosystem rangelands
   - B. Increase environmental, economic and social sustainability of livestock production
   - C. _____
   - D. _____

2. Have any of the stakeholders raised concerns about the project?

No_____

_____

The LTO confirms the information above

Date 20 July 2017

Signature 

Stakeholder EngagementMatrix

1. Stakeholder Engagement/Consultuation

Stakeholder Name	Stakeholder Type	Stakeholder profile	Consultation Methodology	Consultation Findings	Expected timing (for Stakeholder Engagement Plans Only)	Comments
MGAP	Main counterpart – Implementation partner	Government - Minister of Agriculture	Consultations, Validation Workshop	Very positive about the project, active collaboration		
UASCC/OPYPA - MGAP	Main counterpart - Beneficiary	Government – Technical department	Continuous consultation during PIF and PPG phases	Active and positive collaboration		Very active engagement
DGRN – MGAP	Beneficiary / Partner	Government – Technical department	Continuous consultation during PIF and PPG phases, workshops	Active and positive collaboration		
DGDR – MGAP	Beneficiary / Partner	Government – Technical department	Continuous consultation during PIF and PPG phases, workshops	Positive collaboration,		
UGP – MGAP	Partner	Government – Technical department	Continuous consultation during PIF and PPG phases, workshops	Positive collaboration, defined joint implementation with DACC-2 project		
DINAMA – MVOTMA	Partner	Government – Technical department	Inception, Mid-term and validation workshops	Positive collaboration, identified baseline projects, pledges cofinancing		

Stakeholder Name	Stakeholder Type	Stakeholder profile	Consultation Methodology	Consultation Findings	Expected timing (for Stakeholder Engagement Plans Only)	Comments
Climate Change Unite – MVOTMA	Partner	Government – Technical department	Inception, Mid-term and validation workshops	Active support for NAMA/MRV development		
INIA	Partner / Beneficiary	Public/private research institution	Inception, Mid-term and validation workshops	Active support through baseline projects, pledges cofinancing		
INAC	Partner / Beneficiary	Public/private research institution	Inception, Mid-term and validation workshops	Active collaboration for the national CSLM strategy		
IPA	Partner / Beneficiary	Public/private research institution	Inception, Mid-term and validation workshops	Active collaboration for the national CSLM strategy, pledges cofinancing		
FAGRO / UdelaR	Partner / Beneficiary	Public university	Continuous consultation during PIF and PPG phases, workshops	Active collaboration in prodoc development, pledges cofinancing		
FUCREA	Partner / Beneficiary	Farmers' association	Inception, Mid-term and validation workshops	Offers dissemination of project through its of network; would like to be involved in selection process of farms and extensionists		Selection process of farms and technicians will include representatives of farmers'associations

Stakeholder Name	Stakeholder Type	Stakeholder profile	Consultation Methodology	Consultation Findings	Expected timing (for Stakeholder Engagement Plans Only)	Comments
CNFR	Partner / Beneficiary	Farmers' association	Inception, Mid-term and validation workshops	Offers dissemination of project through its of network; would like to be involved in selection process of farms and extensionists		Selection process of farms and technicians will include representatives of farmers'associations
AUGAP	Partner / Beneficiary	Farmers' association	Inception, Mid-term and validation workshops	Offers dissemination of project through its of network; would like to be involved in selection process of farms and extensionists		Selection process of farms and technicians will include representatives of farmers'associations
Farmers	Direct Beneficiaries		PPG Phase: Indirect through participation of farmers'associations Implementation phase: Direct consultation		Traning and evaluation activities at local level, continuous engagement with technicians	

2. Grievance MechanismFocal Point Information	To be determined at inception
Contact Details	To be determined at inception

Explain how the grievance mechanism has been communicated to stakeholders	To be determined at inception

APPENDIX 6. TERMS OF REFERENCE
Draft[78]

A) Terms of Reference for Project Staff

A.1) Core project Team

The project team will coordinate the implementation of the project over the whole project duration. It consists of the National Project Coordinator, an Assistant Coordinator / M+E Specialist (Component 3) the CSLM Strategy Coordinator (Component 1), the Co-Innovation Specialist (Component 2), a Communications specialist funded by FAO (Component 3), as well as a Monitoring Specialist. A budget and operations officer will provide operational support. A PhD student funded out of the LoA (cf. ToRs below) will be based in the project office and will work directly with the Project Team.

Title	National Project Coordinator (NPC)
Timing/Duration	47 months, full time
Background	Responsible for overall coordination of the project, reporting, monitoring and evaluation, and outreach activities (component 3). The NPC reports to the Project Steering Committee. S/he works under administrative supervision of FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Supervision of project staff and activities; • Monitoring of the progress of the project; • Close coordination with component coordinators; • Coordination of monthly team meetings; • Preparation of six-monthly progress reports, inception and terminal reports; • Maintain working relations and communication with Executive Committee, Advisory Committee, counterparts and project partners; • Communication of project results.
Key competencies / qualifications	• Advanced university degree in agronomy, natural resource management, economics, or similar; • More than 10 years of relevant work experience; • Experienced team leader and good track record of project management and coordination skills; • Expertise in natural resource management; • Demonstrated ability to communicate, including advocating to government agencies; • Strong ability to work under pressure and against tight deadlines;

[78] Consultants' Terms of Reference will be revised and validated during the project's inception.

	• Strong drafting and interpersonal skills, honesty, orientation on achievements. • Spanish and English language skills

Title	**Budget and Operations Officer**
Timing/Duration	47 months, full time
Background	Under the overall supervision of the FAO Representative in Uruguay and in close cooperation with other FAO staff, the incumbent will provide operational support to the implementation, monitoring and evaluation of the project for timely delivery of its outcomes and outputs.
Main tasks	• Ensure smooth and timely implementation of project activities in support of the results-based work plan, through operational and administrative procedures according to FAO rules and standards; • Coordinate the project operational arrangements through contractual agreements with key project partners; • Arrange the operations needed for signing and executing Letters of Agreement (LoA) with relevant project partners; • Undertake day-to-day management of the project budget, including the monitoring of cash availability, budget preparation and budget revisions to be reviewed by the National Project Coordinator; • Ensure the accurate recording of all data relevant for operational, financial and results-based monitoring; • Ensure that relevant reports on expenditures, forecasts, progress against work plans, project closure, are prepared and submitted in accordance with FAO and GEF defined procedures and reporting formats, schedules and communications channels, as required; • Execute accurate and timely actions on all operational requirements for personnel-related matters, equipment and material procurement, and field disbursements; • Participate and represent the project in collaborative meetings with project partners and the Project Steering Committee, as required; • Be responsible for results achieved within her/his area of work and ensure issues affecting project delivery and success are brought to the attention of higher level authorities through the BH in a timely manner, • In consultation with the FAO Evaluation Office, the LTO and the FAO-GEF Coordination Unit, support the organization of the mid-term review and final evaluation, and provide inputs regarding project budgetary matters;
Key competencies / qualifications	• University Degree in Economics, Business Administration, or related fields. • Five years of experience in project experience in planning, project implementation and management/administration of development programmes including the preparation, monitoring and evaluation of development projects and operations procedures • Knowledge of FAO's project management systems, and national systems. • Working knowleddge of Spanish and limited working knowledge of Spanish.

Title	CSLM Strategy Coordinator (Component 1)
Timing/Duration	47 months (dedication 30 hrs)
Background	The Strategy Coordinator oversees the development of a national CSLM strategy and institutional capacity building programme. S/he reports directly to the National Project Coordinator. S/he works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Coordination of the CSLM strategy development process; • Coordination of the institutional capacity building programme on CSLM strategy • Organization of the CSLM training programme • Preparation of working methodology; • Preparation of draft and final CSLM strategy document • Coordination of institutional workshops; • Preparation of training material; • Documentation and facilitation of workshops.
Key competencies / qualifications	• University degree in agronomy, natural resource management, economics, or similar; • More than 8 years of relevant work experience; • Experienced team leader and good track record of project management and coordination skills; • Expertise in in the livestock sector is an advantage; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements. • Working knowledge of Spanish and limited working knowledge of English.

Title	Senior Co-Innovation Specialist / Field Coordinator
Timing/Duration	47 months (full time)
Background	The Senior Co-Innovation Specialist coordinates the field activites of the project (component 2) and provides technical inputs on the co-innovation approach. The Specialist reports directly to the National Project Coordinator. He / She works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Coordination of thework of the technical specialists on animal production, Farm Management and Ecosystem Services with technicians and farmers • Coaching of extensionists during the implementation phase on application of the co-innovation approach; • Participate in 4 training courses for extensionists • Participation in the selection of farms;

	• Training of extensionists for project farms; • Revision of annual farm plans; • Participation in planning and evaluation workshops; • Participate in training workshops and field days for farmers and farm workers with a gender perspective; • Support organization of workshops and field days; • Design and supervise monitoring of social indicators and data analysis; • Preparation of training material and revision of existing material; • Prepare section on participatory methodologies of the field manual. • Participation in technical working groups on the national CSLM strategy and provides technical inputs as requested; •
Key competencies / qualifications	• University degree in Agronomy or related field • More than 8 years of relevant work experience in the application of the co-innovation approach; • Experienced team leader and good track record of project management and coordination skills; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements. • Working knowledge of Spanish and limited working knowledge of English

Title	**Assistant Coordinator / M&E Expert**
Timing/Duration	45 months (Asesor Level 1, full time)
Background	The Assistant Coordinator/M&E Expert supports the coordinator as well as the Strategy and Field Coordinators in organizational matters and reporting. S/he is responsible for the development and maintenance of the project's M+E system. Is responsible foreports directly to the National Project Coordinator and works under administrative supervision of the FAO Representative and under technical supervision of the Lead Technical Officer.
Main tasks	• Development and maintenance of M&E tool in coordination with UGP of MGAP; • Assisting in coordination of monthly staff meetings; • Preparation of project reports; • General: Support communication with counterparts and project partners, support organization of workshops and events.
Key competencies / qualifications	• Degree in business administration, public administration, finance, economics or related field; • Familiarity with FAO or other donors' Monitoring and Evaluation procedures;

	• More than 5 years of experience related to M&E of projects; • Full competency and fluency in Spanish and limited working knowledge of English; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements. • Working knowledge of Spanish and limited working knowledge of English

Title	**Communications Specialist (Component 3)** **This position will be funded by FAO**
Timing/Duration	45 months (Asesor Level II, half-time)
Background	The Communication Specialist is responsible for the development and implementation of the project's communication strategy. S/hereports directly to the National Project Coordinator. S/he works under administrative supervision of the FAO Representative in Uruguay.
Main tasks	• Design of communication strategy for institutions and target groups; • Prepare project brochure; • Coordinate production of audiovisual products (4 videos); • Adapt field manuals for farmers and extensionists; • Assist in the organization of a webinar series and preparation of presentations in conferences and networking events; • Produce contents for website and social media accounts (facebook, twitter, whatsapp); • Coordinate appearances in local media.
Key competencies / qualifications	• Higher degree in communications or related fields; • More than 5 years of relevant work experience in communications or media relations with a national government agency or international private sector organization; • Demonstrated ability to develop communication tools – written, verbal, electronic, etc.; • Perfect English and Spanish language skills

Title	**Monitoring Specialist – Ph.D. Candidate**
Timing/Duration	45 months (full time) This position will be funded through a Ph.D. grant included in the Letter of Agreement for the On-farm monitoring system
Background	The Monitoring Specialist will assist the project team in the analysis of environmental and socio-economic data, and including them into the project's M+E system, as well as the MRV system at national level. S/he will carry out analysis and modelling tasks for the NAMA development. He works in close

	cooperation with the Assistant Coordinator / M+E Specialist, Field Coordinator, as well as the NAMA and MRV specialists.
Main tasks	• Assist in the analysis of data and calculation of GHG emissions and land degradation based on field observation and remote sensing data. • Preparation of socio-economic data from field observations and environmental data from on-farm monitoring system into project M+E system; • Perform data analysis and modelling tasks for NAMA and MRV development • Co-author scientific papers on the design and results of the on-farm monitoring programme
Key competencies / qualifications	• University degree in Agronomy, Environmental Sciences or related field • Knowledge of GHG accounting an advantage • Good knowledge of statistics and statistical software packages eg. SPSS • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements. • Working knowledge of Soanish and limited working knowledge of English

A.2) Terms of Reference for Specialists

The project will fund 6 part-time specialists to provide technical input to Components 1, 2 and 3. For component 1, they provide background analyses and facilitate the work of the technical working groups on the CSLM strategy, develop the NAMA and MRV proposals, and provide inputs to the capacity building programme as trainers. For component 2, they provide guidance to technicians and farmers in the implementation of the CSLM strategies. For component 3, they provide inputs to training materials and field guides. Furthermore, the project will fund up to 2,360 days of technicians who will work with farmers in the development and implementation of the CSLM strategies.

Title	**Animal Production and CSLM Specialist (Components 1 and 2)**
Timing/Duration	42 months (dedication 8 days/month)
Background	The Animal Production / CSLM Specialist contributes to the development of the national CSLM strategy and leads a working group on CSLM practices for GHG mitigation and restoration of degraded grasslands. He guides the work of the technicians in regarding animal production, participates in training activities and gives input to training materials. The Specialist reports directly to the National Project Coordinator, in close coordination with the CSLM strategy coordinator and the field coordinator. He works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare background document for the working group sessions in the development process of the CSLM strategy;

	• Organize and facilitate working groups; • Consolidate working group results; • Revision of draft and final CSLM strategy document. • Preparation of training material and revision of existing material; • Participate in 4 training courses for extensionists; • Training of extensionists for project farms; • Coaching of extensionists during the implementation phase; • Participation in planning and evaluation workshops; • Participate in training workshops and field days for farmers and farm workers with a gender perspective; • Design and supervise monitoring of production-related indicators and data analysis; • Prepare section on animal production of the field manual.
Key competencies / qualifications	• University degree in agronomy or related fields; • Very good conceptual understanding and knowledge of CSLM; • Experience in the region an advantage; • More than 8 years of relevant work experience; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements.

Title	**Agronomist / Ecosystem Services Specialist (Components 1 and 2)**
Timing/Duration	42 months (dedication 8 days/month)
Background	The Agronomist / Ecosystem Services Specialist contributes to the development of the national CSLM strategy and leads a working group on ecosystem services, resilience and other co-benefits of CSLM. He guides the work of the technicians in regarding sustainable grassland management and soil conservation, participates in training activities and gives input to training materials. The Specialist reports directly to the National Project Coordinator, in close coordination with the CSLM strategy coordinator and the field coordinator. He works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare background document for the working group sessions in the development process of the CSLM strategy; • Organize and facilitate working groups; • Consolidate working group results; • Revision of draft and final CSLM strategy document. • Preparation of training material and revision of existing material on grasslands management and soil conservation; • Participate in 4 training courses for extensionists;

	• Training of extensionists for project farms; • Coaching of extensionists during the implementation phase; • Participation in planning and evaluation workshops; • Participate in training workshops and field days for farmers and farm workers with a gender perspective; • Design and supervise monitoring of ecological indicators and data analysis; • Prepare section on grasslands management and ecosystem services of the field manual.
Key competencies / qualifications	• University degree in agronomy or ecology; • Very good conceptual understanding and knowledge of ecosystem services; • More than 8 years of relevant work experience; • Experience in the region an advantage; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements.

Title	**Farm Management and Extension Specialist (Components 1 and 2)**
Timing/Duration	42 months (dedication 8 days/month)
Background	The Farm Management and Extension Specialist contributes to the development of a CSLM strategy and leads a working group on extension, capacity building, communication and dissemination. He guides the work of the technicians in regarding farm management, participates in training activities and gives input to training materials. The Specialist reports directly to the National Project Coordinator, in close coordination with the CSLM strategy coordinator and the field coordinator. He works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare background document for the working group sessions in the development process of the CSLM strategy; • Organize and facilitate working groups; • Consolidate working group results; • Revision of draft and final CSLM strategy document. • Preparation of training material and revision of existing material on farm management approaches; • Participate in 4 training courses for extensionists; • Training of extensionists for project farms; • Coaching of extensionists during the implementation phase; • Participation in planning and evaluation workshops; • Participate in training workshops and field days for farmers and farm workers with a gender perspective;

	• Design and supervise monitoring of production-related indicators and data analysis; • Prepare section on farm management of the field manual.
Key competencies / qualifications	• University degree in agronomy or agricultural economis; • Very good conceptual understanding and knowledge of extension services and farm management, particularly of livestock family farms ; • More than 8 years of relevant work experience; • Experience in the region an advantage; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements.

Title	**Agricultural Economist / Market and Value Chains Specialist (Component 1)**
Timing/Duration	6 months (dedication 30 hrs)
Background	The Agricultural Economist / Market and Value Chains Specialist contributes to the development of a CSLM strategy and leads a working group on market entry, certification and value chains. The Specialist reports directly to the Strategy Coordinator and works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare background document for the working group sessions in the development process of the CSLM strategy; • Organize and facilitate working group sessions; • Consolidate working group results; • Revision of draft and final CSLM strategy document. • Prepares a background study on market insertion of CSLM products at national and international level:
Key competencies / qualifications	• University degree in economics or related fields; • More than 8 years of relevant work experience; • Very good understanding and knowledge of national and international markets and value chains related to the livestock sector in Uruguay; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements.

Title	**NAMA Specialist (Component 1)**

Timing/Duration	12 months (dedication 30 hrs)
Background	The NAMA Specialist oversees the development of a NAMA, in close coordination with the MRV Specialist and reporting directly to National Project Coordinator. He / She works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare outline of NAMA document; • Conduct consultations with key institutions and actors; • Compile background documentation; • Analysis of financing opportunities at national and international level; • Consolidate NAMA and MRV documents; • Present draft document for validation by MGCN; • Prepare final document based on comments and present to Project Steering Committee; • Participate in 6 institutional workshops. • Review CSLM strategy document and prepare inputs as necessary.
Key competencies / qualifications	• University degree in areas related to environment, climate change or national and international policy; • Very good understanding and knowledge of global and national climate change issues; • More than 8 years of relevant work experience; • Familiarity with the livestock sector is an advantage; • Strong ability to work under pressure and against tight deadlines.

Title	**Monioring Reporting and Verification systems Specialist (Component 1)**
Timing/Duration	9 months (dedication 30 hrs)
Background	The MRV Specialist oversees the development of a MRV system for the livestock and ruminant sector, in close coordination with the NAMA Specialist and reporting directly to the National Project Coordinator. He / She works under administrative supervision of the FAO Representative in Uruguay and under technical supervision of the FAO Lead Technical Officer.
Main tasks	• Prepare outline of a MRV system document; • Conduct consultations with key institutions and actors, • Compile background documentation; • Estimate mitigation potential of NAMA actions; • Consolidate NAMA and MRV document; • Present draft document for validation by MGCN; • Prepare final document based on comments and present to Project Steering Committee.

Key competencies / qualifications	• University degree in relevant field such as agronomy, environment, natural resources management; • Knowledge of UNFCCC guidelines on MRV systems; • At least 5 years of experience in assessment of GHG emissions and reporting, preferably in the livestock sector; • Familiarity with the livestock sector is an advantage; • Full working knowledge of Spanish and limited working capacity in English; • Strong ability to work under pressure and against tight deadlines; • Strong drafting and interpersonal skills, honesty, orientation on achievements.

Title	**Technicians for Co-Innovation**
Timing/Duration	10 technicians, total dedication 2360 field days
Background	The technicians are responsible for developing and accompanying the implementation of the CSLM strategies on the 60 pilot farms. Furthermore, they will facilitate farmer-to-farmer extension activities during field days and workshops, and participate in farm-level monitoring of socio-economic and environmental data. report directly to the Field Coordinator.
Main tasks	• Participate in 4 training courses for extensionists; • Participation in training for project extensionists; • Preparation and revision of annual farm plans; • Participation in planning and evaluation workshops; • Participate in training workshops and field days for farmers and farm workers with a gender perspective; • Support organization of workshops and field days; • Training and supervision of farmers in data collection; • Participate in monitoring and data analysis; • Monitoring of socioeconomic variables and gender aspects, based on field journals (*carpeta verde*). • Revise training manual with the farmers.
Key competencies / qualifications	• At least 8 years professional experience related to extension in the livestock sector; • Affiliation with a local farmers association a plus • Preferably with experience regarding co-innovation • Experience in the private sector and familiarity with local conditions of the respective ecoregion;

B) Terms of Reference for Letters of Agreement

The project will fund a letter of agreement with a research institution to set up and implement the on farm monitoring system for GHG emissions and environmental impacts of CSLM practices. As part of the agreement, a PhD grant will be funded for a student who will assist the project team in the analysis of data and integrtation into the project's M+E system.

Title	**On farm monitoring system for GHG emissions and environmental impacts of CSLM practices**
Timing/Duration	**4 years**
Objective:	Implementation of the on-farm monitoring system to measure GHG emissions and soil conservation in livestock farming systems
Main products/activities	• Scholarship for one PhD student who will be based in the project office and will work directly with the Project Team. Research topic to be finalyse but will be focussed on ensuring the quality of monitoring data, modelling to support the development of CSL strategy and NAMA, and dissemination and outreach activities. • Establishment of a GIS covering the 60 pilot farms and control farms, compatible with MGAP and MVOTMA information systems • Definition of protocols for sampling and analysis in the monitoring system; • Monitoring of variables by remote sensing (vegetation cover, net primary productivity, albedo), • Sampling and analysis of animal feces, soils and above-ground and below-ground vegetation, • Training of farmers and extensionists to perform field monitoring activities, as necessary • Analysis of GHG emissions and carbon sequestration based on sampling data, • Modeling of GHG emissions • Development of a database and a web-based module for data input • Annual reports on results of the monitoring, based on FAO and MVOTMA reporting requirements • Preparation of 2 journal articles on the methodology and results of the monitoring system
Key competencies/qualifications	• Institution with proven track record on research regarding GHG emissions monitoring and modelling of agricultural and livestock production systems • Access to laboratory services with documented quality control • Working methodology aligned with criteria of the IPCC guidelines • Proven logistical capacity to implement projects of similar size and complexity

APPENDIX 7: SELECTION CRITERIA FOR PILOT FARMS AND EXTENSIONISTS

The following criteria will be used to select the pilot farms. They will be finalized and validated by the PAC and formally adopted by the PSC at project inception.

(A) Membership of networks and links with producer organizations

The membership or links of pilot sites with networks and local producer organizations facilitate the dissemination of the results of the project and its scaling-up to a larger number of producers in each area. The pilot farm will serve as training and dissemination center for CSLM practices, and the farmer and his/her network play a key role in this task. It is thus imperative that the farms have a good network to other producers, or social capital.

B) Representativeness

It is imperative that pilot farms be a representative sample of the livestock production systems of each ecoregion, ensuring that the CSLM practices that are adapted, applied and validated under this project are scalable to the vast majority of livestock producers in each ecoregion. Family farms and mid-size farms represent more than 80% of the total. Representativeness will be determined based on the MGAP typology constructed from a recent survey, data from the General Agricultural Census of 2011 and expert knowledge of the specialists participating in the selection.

C) Technological gap and Potential for improvement

Within the farms identified based on the previous criteria in each ecoregion, those with the greatest technological "gap" and potential possibility of improving the economic, productive and environmental results, in line with the objectives of the project, will be prioritized. However, some farms with a considerable level of adoption of CSLM practices may be selected as they can serve as an example in the field days in the initial stages of the project.

D) Gender equity and inclusion of rural youth

According to the latest statistics available, on more than 90% of cattle farms men make make most management decisions . Farms where women take an active role in the management are likely tobe more open to innovation and technological change. Priority will be given in the selection of pilot lands to those directed by women and younger farmers, or where women have a relevant role in decision making and land management. At least 20% of the pilot farms will be female-headed.

Selection criteria for the extensionists will include 1. Association with the farmers' groups or organizations and 2. Experience in the pilot region.

APPENDIX 8: The production system shift proposed by the project and related benefits.

1. Current situation and historical trends

The project targets the dominant production system of mixed cattle and sheep raised on natural grasslands or rangelands in particularly on small and medium family farms. The animals are kept on grasslands year-round. In this system, shortage of feed, mostly in winter, and in several years also on summer and autumn, typically leads negative effects as loss of weight and body condition of the cows, low fertility rate, late first mating age of heifers.

Until recently (2000´s), high inflation coupled with low land prices provided an incentive for rangeland farmers to keep large herds and to invest little in technologies and practices for pasture improvement or improved animal husbandry. Typically, on an ad-hoc basis, the farmers sell some livestock in order to purchase additional land, and so ultimately expand the herd. Despite the fact that inflation has been under control in more recent years, and the fact that land prices have increased very rapidly[79], the mind-set to have 'as large a herd as possible' still prevails.

Low productivity

Cattle ranching in Uruguay is thus characterised by low meat productivity (kg beef produced per ha per year) – particularly among the small and medium sized family farms. The pastures and rangelands are poorly exploited and overgrazed: high stocking rates combined with low grass heights and low leaf area index lead to poor forage availability and also poor forage quality in the intake. This triggers low productivity at animal and herd level, especially related to reproductive performance and daily weight gain. For example, poor feed availability, results in sub-optimal animal conditions, that causes low pregnancy and birth rates (the weaning rate per mated cow is only 63%, on average[80]). Low levels of pregnancy mean there is always a large number of economically unproductive cattle on the pastures – the 'breeding overhead'.

Furthermore, the poor grazing and feeding conditions negatively affect animal growth rates – growing an animal takes time and is not efficient. Hence, despite the overall gains in productivity in the past decade and success with export markets, there is still ample room for improving productivity, especially among small and medium-sized farms.

High GHG emissions and emission intensities

Uruguay has a unique greenhouse gas (GHG) emissions profile; the agriculture sector contributes about 75% to the country's total GHG emissions. Methane (CH_4) from enteric fermentation contributes more than half of the total agriculture sector emissions. The

[79] Due mostly to the opportunity to convert land to soya bean production
[80] For the period 1999-2010 (DIEA-MGAP, 2014 Yearbook, 2014)

National GHG Inventory (2012) found that the beef cattle sector in Uruguay emitted 15.9 million tonnes carbon dioxide equivalent (CO_2 eq.). Within this, enteric methane represents about 64% of the total GHG emissions from beef production. Emissions associated with deposition of manure on pasture contributes an additional 7.1 million tonnes CO_2 eq., 36% of the total GHG emissions.

The results indicate that the emission intensity of beef in Uruguay is on average 18.7 Kg CO_2 eq./kg LW produced. The cow-calf system, most common among small and medium-size farms was found to have the highest emission intensities.

A few key management factors influence emission intensity (i.e. emissions per unit of product) from beef production:

- *Inadequate supply of quantity and quality feed* results in high enteric methane emissions per unit of metabolizable energy, low daily weight gains, high mortality of young stock, longer parturition intervals, and low animal weights.
- *Animal health* affects emission intensity as mortality and morbidity cause losses of animal and productivity, wich result in "unproductive emissions".
- *Reproductive efficiency and herd management* affects emission intensity by influencing the portion of the herd that is in production, i.e. the breeding overhead described above.

These three production parameters are encapsulated in meat yield. As a result, we observe a strong, exponentially declining relationship between the emission intensity and the average meat offtake rate of the herd (kg of beef / herd population, over one year).

The poor management of pasture has also lead to long term land degradation and loss of soil organic matter. A major proportion of the carbon lost from soil is released into the atmosphere, which results in a baseline of CO_2 emission from the soil, where degradation is still ongoing. At best, degradation is stabilized and no further carbon is being lost to the atmosphere.

Low economic profitability

Overall economic productivity per hectare in small farms is low, with average annual net income per hectare in the range USD-7 to +36[81]. The factors causing low productivity are most notable on small and medium size family farms, which typically have lower rates of adopting new technologies. This is partly a result of changes in the scale and cost of production over the past years in Uruguay. Increasing production costs have squeezed margins and farm profitability, therefore making the management of small farms more economically challenging. In this context of economic stress, most small farmers have responded by

81 Adaptation Fund Project "Building resilience to climate change in vulnerable smallholders"2011, page 16.

attempting to further expand the herd size without concomitant efficiency gains. This ultimately further reduces productivity per livestock unit (or per hectare).

Definitions

Grasslands (i.e. any land cover dominated by grasses) can be used for livestock production under the following broad land use types:

- Rangelands: natural vegetation, managed through grazing only – generally low animal densities.
- Pasture: natural or planted vegetation, managed through grazing, fertilization, irrigation, etc.
- Fodder crop: natural or planted vegetation, managed through grazing, fertilization, irrigation, etc. and essentially harvested.

2. Principles of good grazing management and related environmental benefits

Here we lay out the basic elements of good grassland management in temperate climate, and the related environmental benefits.

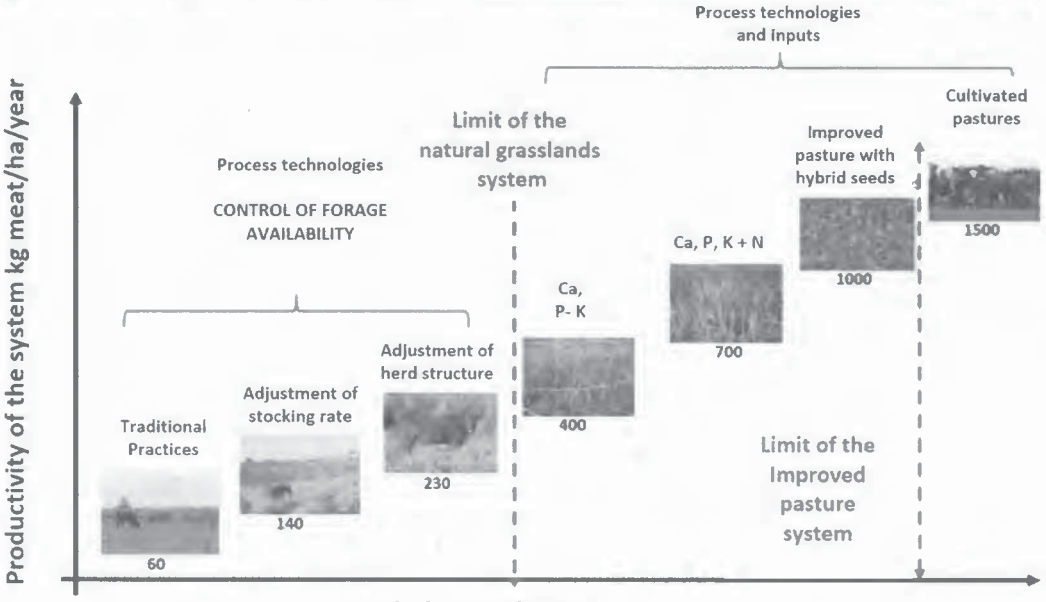
Principles

The proposed system change is based on the following principles:

- *Maintenance of minimal pasture height* (autumn 8 cm, winter 5cm, spring/summer 8 to 12 cm) through control of grazing intensity over time to match livestock demand with vegetation supply, for example through paddocks or strategic supplementation;
- *Improved uptake of nutrients:* Allocation of forage as function of corporal condition to improve uptake of nutrients;
- *Improved fertility of cows* through control of mating period and early weaning to improve fertility of cows;
- *Improved herd management*: Maintenance of a greater productive/unproductive animal ratio through, for example, improving reproductive management, decreasing age at first calving, controlling mating +calving season, and strategic supplementation.
- Establishment of shade/protective forests;
- Improvement of water sources.

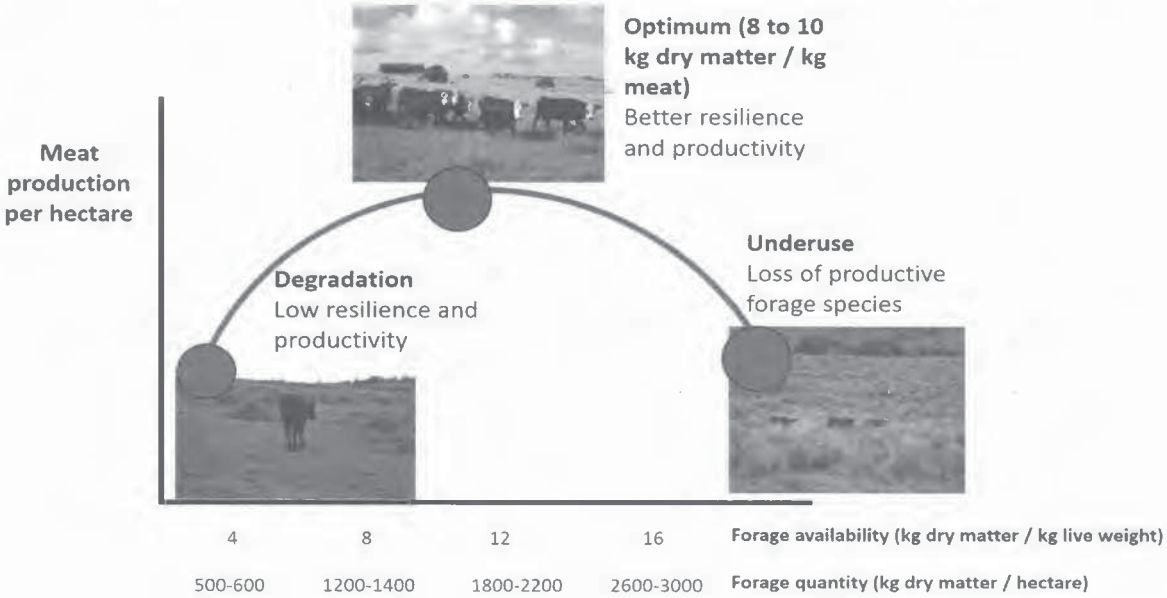
The two figures below introduce the sustainable intensification pathway (project interventions will stay within the limit of the natural grassland system) - above - and the theoretical relationship between meet productivity per ha and forage productivity per ha – below.

Sustainable intensification pathways



Faccio, 2013

Meat production and forage availability



GHG net emissions and land conservation benefits

The practices advocated under the project have strong benefits in terms of climate change mitigation and land conservation.

	CH4 emissions	**N2O emissions**	**C sequestration**	**Land degradation**
Control of grazing intensity and maintenance of minimal pasture height (autumn 8 cm, winter 5cm, spring/summer 8 to 12 cm), for example through paddocks	Reduction of emission intensity: more efficient fodder uptake and improved digestibility.	Reduction of emission intensity: more efficient fodder uptake and improved digestibility.	Positive effect: more inputs to the soil to build organic matter, less pressure on land, development of deeper root system, recuperation periods.	Positive effect: less pressure on land, development of deeper root system, recuperation periods, disturbance and selective grazing increasing plant species richness and productivity
Allocation of forage as function of corporal condition to improve uptake of nutrients	Reduction of emission intensity: more efficient feed conversion.	Reduction of emission intensity: more efficient feed conversion.	No effect	No effect
Control of mating period and weaning to improve fertility of cows	Reduction of emissions: Less emissions due to less non-productive animals.	Reduction of emissions: Less emissions due to less non-productive animals.	No effect	No effect
Herd management: Maintenance of fertile animals only	Reduction of emission: Less emissions due to less non-productive animals.	Reduction of emission: Less emissions due to less non-productive animals.	Positive effect: reduction in herd size, less pressure on land.	Positive effect: reduction in herd size, less pressure on land.
Establishment of shade/protective forests	tbd Reduction of emission intensity: better feed conversion, less thermic stress.	tbd Reduction of emission intensity: better feed conversion, less thermic stress.	Positive effect: C uptake in woody biomass	Positive effect: prevention of erosion
Improvement of water sources	Reduction of emissions: animals need less energy to get to water sources.	Reduction of emissions: animals need less energy to get to water sources.	Positive effect: less erosion and soil compaction around waterways.	Positive effect: less erosion and soil compaction around waterways.

Adaptation benefits

The Project interventions will also increase the adaptive capacity of small farmers and improve ecosystem resilience over the concerned grasslands, thereby contributing to adaptation to climate change. This is due to the combined effects on soil health, water storage capacity, biodiversity and animal body score, as well as on better decisions and risk management.

Biodiversity conservation benefits

Uruguay's grasslands are in general rich in biodiversity and are considered unique by many experts. Uruguay contains remnants of the original Argentine Mesopotamian Grasslands. Habitats in Uruguay are varied and interspersed, with series of localized geographic features, each including rocks, hills, small ravines and rivers which provide a variety of ecological niches to a diversity of species. There are also rich and diverse soil types with high activity clays, which is important to build carbon in the mineral associated fraction of the soil organic matter (MaOM). These mosaic patterns underlie and define the uniqueness and importance of the grasslands biodiversity. From a botanical perspective, Uruguay has over 2,500 species of which the great majority are herbaceous species or shrubs corresponding to the grasslands savanna ecosystems. The Uruguayan grasslands have undergone systematic deterioration and decline in biodiversity, mostly due to the unsustainable grazing practices (overgrazing) on grasslands. However, monitoring and experiments show that well managed grazed plots usually have higher plant species richness than exclosures, mainly because grazing reduces the dominance of superior competitors and introduces an intermediate level of disturbance benefiting biodiversity. Higher species richness in grazed plots results in higher biomass productivity; moreover grazing increases absorption efficiency of radiation by limiting the amount of standing dead biomass. This Project aims stop the loss of biodiversity and recover it through better grazing management. Higher plant biodiversity in grasslands leads to a biomass productivity that is higher and more resilient to climate change.

3. Production practices promoted under the project scenario and ex-ante financial analysis

Through the co-innovation approach, practices and technology mixes will be tailored to the specific socioeconomic and ecological conditions and goals of each farmer and household. In this section, we describe some of the main practices that will be potentially considered in this process. Interventions can be grouped in strategic technologies, decision support technologies and tactical technologies.

Further to these practices, complementary investments such as water infrastructure: small reservoirs, fences or tree seedlings for protective forests will be covered by the DACC project (see Annex 10).

Table 1. Strategic practices for rangeland-based livestock system

Practice	Implication for the production system
Year-round control of the forage supply of mating cows ([1, 2 y 7])	Control of grazing intensity, to improve the energy consumption of animals. Definition and allocation of forage of the different pastures according to the physiological state and corporal condition of the cows. Forage heights in autumn of 8 cm, winter 5cm, spring summer 8 to 12 cm.
Control of period and duration of mating ([2, 6 y 7])	Mating during spring and summer for a period of no more than 90 days. In areas of superficial soils and during summers with water deficit to achieve a higher number of pregnant cows in December
Definitive weaning ([2, 6])	Definitive weaning should be in early autumn (March). This reduces the energy requirement of the cows and grazing in pastures of 8 cm of natural field it is possible to increase the corporal condition of the cows (1 point to 1,5)
Mating age of heifers ([3])	The calves should not lose weight during the first winter, after the definitive weaning. Adequate supply of natural grass fodder and / or energy supplementation or adequate supply of forage from improved pasture is necessary. After the first winter, with a suitable supply of natural pasture forage the heifers arrive in weight and body condition suitable for the mating.
Improved feeding of primiparous cows at birth and second mating ([2, 3, 6])	Primparous cows that at the time of delivery have a body condition of 4.5 points and that recover that body condition after the birth are more likely to be pregnant in the second mating. Improvement of body condition in primiparous cows can occur with adequate natural field fodder or improved pasture to improve the energy balance during calving and the onset of the second mating.

Table 2. Decision support practices for rangeland-based livestock production systems

Practice	Implication for the production system
Observation of the body condition and grazing management based on the observation ([2, 4 y 6])	The proposed scale for Cow Breeding in Uruguay has eight categories of body condition (CC) where 1 identifies a very skinny cow and 8 the opposite extreme. In Uruguayan herds of breeding the classes that abound most are 3, 4 and 5. Within the range 2 to 6 a unit corresponds, on average, to 25-34 kg of live weight. CC is a variable that can be controlled through the supply of forage. Based on the classification of cows by CC at weaning, winter calving and lactation, decisions are made on fodder supply, flushing and control of suckling.
Control of bullsprior to mating ([11]).	A physical and semen study of the bull has been recommended prior to the mating in order to detect problems that limit the pregnancy of breeding cows.
Observation and estimation of the	Grass height is an indicator of dry matter (DM) availability per unit area and is an objective way of knowing the availability of fodder. It has been suggested that 1 cm of grass is equivalent to 300 kg of DM of forage per hectare. On the other hand, there is information that relates the height of grass with the evolution of the

availability of pasture in critical moments ([2 y 4])	CC. Therefore, knowing the height of the grass, it is possible to estimate the amount of forage available. In a given situation can be projected if the animals are losing, maintaining or gaining CC, always relating it to the endowment and the physiological state of the cows, ie the demand for energy.
Diagnosis of the ovaric activity during mating period ([5])	The diagnosis of ovarian activity, recommended to be implemented midway through the mating period, allows the determination of the structures present in the ovaries of the cows. It identifies pregnant cows, cows normally cycling, cows in superficial anestrus and cows in deep anestrus. This specific information is relevant to define the particular management to be performed on each cow or batch of cows in order to impregnate the most animals in a given period of time.
Gestation diagnosis after mating period ([5]).	The pregnancy diagnosis of cows, carried out one to two months after the removal of the bull from the herd, determines the number of pregnant cows and non-pregnant cows. It is a good moment to estimate CC and to define the differential allocation of forage prioritizing pregnant cows. It also allows the farmer to define the strategy to follow with non-pregnant cows: sale, wintering, selling off or maintenance on farm with less nutritional requirements until the next harvest season.

Table 3. Tactical practices for rangeland-based livestock production systems

Practice	Implications for the production system
Temporary weaning ([8 y 9])	Temporary weaning consists of placing a nasal tablet to the calf, over 45 days old and a minimum of 60 kg live weight, for 11 to 14 days. Temporary weaning reduces milk production and hence energy requirements, increasing glucose and insulin levels and improving the cow's energy balance. The response of cows to temporary weaning is affected by CC of the cow at the time of intervention. Cows with CC of 3.5 to 4 at the beginning of the mating period respond best to temporary weaning.
Temporary weaning and flushing. ([8])	When the possibility of increasing the supply of forage to the cows during the fall period is reduced, forage may be supplemented for 21 to 25 days, at a rate of 2 kg of rice paddy per cow. This increases energy consumption, further enhancing energy balance and increasing the level of metabolic hormones involved in reproductive enhancements.
Early weaning ([10]).	Early weaning consists of weaning definitively the calves when they are between 60 and 90 days old. The application of early weaning can be a suitable technique to improve nutrition of cows during the fall and consequently their reproductive efficiency, since it eliminates the nutrient requirements for milk production for maintenance and gain of weight. However, It implies higher costs for the rearing of the weaned calf weaned. The effect of early weaning is greater in cows with low CC, less than 3.5.

Effects on productivity and farm economics

This section summarizes the results of an ex-ante economic evaluation of the proposed practices at the farming system, through a cost benefit analysis (CBA). This analysis was prepared in the context of the preparation of Uruguayan NDC (Rosas 2017). It assesses the incremental variation of income and cost derived from the new practices compared to the baseline.

The analysis is constructed from the producer point of view, assessing the cost effectiveness of the introduction of practices for an average farmer in its future cash flow. The majority of the practices promoted are process based and do not require large investments. Instead, the farmers will receive thorough technical support and training. Nevertheless, in some cases limited investments may be required and will be covered by the DACC project (see Annex 10)

This analysis does not consider environmental co-benefits. It also excludes the impacts the intervention will have on adaptation to climate change, although it is widely accepted that they will result in increased resilience (GFCC). This analysis can thus be considered as conservative.

All results are shown per hectare of land for an average farm of 585 hectares. The model assumes a real annual discount rate of 5.3% in US dollars (USD), resulting form the subtraction of the US annual inflation as of June 2017 to nominal rate of 7% (2017 current rate in the financial market).

The cost-benefit analysis was calculated for two scenarios. The first one includes the incremental benefits and costs of implementing all strategic, tactical and decision support interventions proposed under this project (Section 3 of this annex). The combination of these various interventions is called "improved natural pasture and animal management". The underlying assumption for the farm deployment of these practices is that they require thorough technical assistance and training. These cost are included in the analysis.

In the second scenario, farmers are assumed to adopt additional changes (on top of what is deployed in the first scenario), that have higher investment costs. This scenario is presented to illustrate a less favorable situation in terms of investment needed. This present a more conservative situation in terms of cost-benefit analysis. Additional cost include: improvement in farm subdivision (fences), improvement of water sources, strategic supplement feeding for female calves, tree plantations for shade and shield and supplementary labor.

Scenario 1

The incremental income of these changes are attributed to an increase in productivity of 7,6 kg of meat per hectare, which corresponds approximately to a 10% increase in productivity per *ha* (MGAP 2017). This is a conservative assumption considering the increase found in pilot

farm research (Ruggia et al. 2015). This increase is assumed to progressively take place, starting form the second year of the project (2019), until it fully materializes on year 5 (2022).

The scenario uses the current national average price of calves on foot of 2.36 USD/kg. The costs counted are all those related to the technical assistance, as budgeted in the project (including advisory services and sanitary technical assistance): eleven workdays of extension workers (@200 USD) per farm per year during the first two years, and 9 workdays per farm per year for subsequent years. Additionally, one training session per year is included for every 8 farmers throughout the period of the project. Regarding sanitary technical assistance, the analysis assumes the following costs: 28 USD / bull for annual veterinary inspection; 1.5 USD / cow for diagnosis of ovarian activity; and 1.5 USD / cow for pregnancy diagnosis. The analysis also assumes an allocation of 0.355 breeding cows per ha and a one bull per 25 cows.

Scenario 2

In addition to the above, the following actions are evaluated in scenario 2.

The set of possible additional actions has an incremental impact in incomes and in costs. Some of them could be isolated but others need to be considered as a package, particularly those related to productivity increases. For example, in order to fully get the benefits of strategic supplementation, the practice is combined with improved natural pasture and animal management and the introduction of shade trees and water sources.

The introduction of these packages requires labor, to be hired in addition to family labor. According to data published by the Ministry of Labor, the annual cost of a farm employee is 10,381 USD. The analysis assumes the need for a half-time employee in the case of family farms and a full-time employee in the case of medium-sized farms. It is considered that 30% of the farms area under study is composed of family farms.

Based on the representative survey of beneficiaries of the Family Farming and Climate Change Project of the MGAP (GFCC-MGAP, 2015), average farms would require an investment of 7.78 meters of fences per hectare to improve its subdivision system. The cost of wire fences is USD 4.7 per meter (GFCC-MGAP, 2015). Costs of operation and maintenance are estimated at 5% of the initial investment per year. It is important to note that, these expenditures could be considered near the maximum value of the cost of improving subdivision, since using electric fences would be a cheaper option.

Regarding strategic provision of supplement feeding, the analysis assumes the supplementation of female calves only, during their first winter (90 days). The stocking rate of female calves is 0.09 heads per hectare. On average, the animal consumes 148 kg of supplement during the period considered, at a market price of 360 USD / ton. Investment in feed bunks for self-consumption is also included, at a cost of USD 800 per unit, which allows to feed 11 calves. Feed bunks are replaced at their seventh year of use.

The investment cost of planting trees for shade and shelter and of improving water sources (construction of small dams plus tubes and water bunks), is estimated at USD 6,200 for an average farm of 500 hectares. Their annual cost of operation and maintenance is 5% of the initial investment.

Results

According to the CBA, the adoption of CSL management practices is profitable for farmers in both scenarios. Scenario 1 shows a high NPV and IIR resulting from the fact that the deployment of improved practices generates an increase in productivity with a low investment requirement. The NPV is 86.6 USD/ha expressed in USD of 2018. The IRR of the project is 39.9%. The details of these results are shown in Table 4.

Table 4. Cost-benefit analysis of scenario 1: Summary of results

Concept	**Units**	**2018**	**2019**	**2020**	**2021**	**2022**	**...**	**2037**
Net income flow	**USD/ha**	**-9.0**	**-4.5**	**1.3**	**5.8**	**10.3**		**10.3**
1) Increase in productivity	USD/ha	0.0	4.5	9.0	13.5	18.0		18
Increase in productivity	*Kg/ha*	*0.0*	*1.9*	*3.8*	*5.7*	*7.6*		*7.6*
Price	*USD/live kg*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*		*2.4*
2) Technical assistance	USD/ha	-9.0	-9.0	-7.6	-7.6	-7.6		-7.6
NPV	**2018 USD/ha**	**86.6**						
IRR	**%**	**39.9**						

Results are also positive for scenario 2. The NPV of evaluating the deployment of a broader set of technologies (strategic technologies, decision support technologies, and tactical technologies) is computed at USD 134.6 expressed in USD of 2018. The lower IRR, calculated at 19.3%, is caused by the range of additional investments required (fences, shade, water, feed bunks), while the NPV is higher. Results are shown in Table 5. It should be highlighted that the parameters chosen to compute this scenario are very conservative, and therefore, these results could be considered as the lower bound of the financial viability estimate.

Table 5. Cost-benefit analysis of scenario 2: Summary of results

Concept	Units	2018	2019	2020	2021	2022	...	2037
Net income flow	**USD/ha**	**-68.3**	**-4.7**	**5.3**	**13.9**	**22.5**		**22.5**
1) Increase in productivity	USD/ha	0.0	4.5	9.0	13.5	18.0		18
Increase in productivity	*Kg/ha*	*0.0*	*1.9*	*3.8*	*5.7*	*7.6*		*7.6*
Price	*USD/live kg*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*		*2.4*
2) Technical assistance	USD/ha	-9.0	-9.0	-7.6	-7.6	-7.6		-7.6
3) Hired labor	USD/ha	-17.0	-17.0	-17.0	-17.0	-17.0		-17.0
4) Improved farm subdivisions	USD/ha	-36.58	-1.83	-1.83	-1.83	-1.83		-1.83
5) Supplement feed female calves	USD/ha	6.7	15.2	15.2	15.2	15.2		15.2
6) Shade, shelter and water	USD/ha	-12.4	3.5	7.6	11.8	15.9		15.9
NPV	**2018 USD/ha**	**134.6**						
IRR	**%**	**19.3**						

Note. Between 2022 and 2037 there are some years that the net income flow is lower due to the replacement of the feed bunks. In these cases, the net income flow is 14.1 USD/ha, with net income from supplementing female calves is 6.7 USD/ha instead of 15.2 USD/ha.

Barriers to adoption

A number of barriers stop small farmers and many medium sized farmers from adopting climate smart practices and technologies. These are:

(1) ***Lack of awareness of low-cost sustainable alternatives to current management practices.*** Although national government officials and experts understand that the current situation is a "triple lose", local extension workers and farmers are not aware that low-cost alternatives exist and that the benefits of these alternatives are high, especially for small and middle size farms.

(2) ***High perceived risk of new technologies and practices on part of the farmers.*** The small farmers predominantly believe that the best way to minimize risk is to maximize the number of livestock. Further, small farmers are generally risk averse – hence, they are slow and reluctant to adopt new technologies or practices. This perceived risk is in part based on past issues with the adoption of novel practices. In the 1980s and 90s, the substitution of natural rangelands by improved pasture was advocated as an option to increase productivity on livestock farms. Many farmers took up loans to invest in improvement of pasture, but due to the economic situation (high inflation and low prices for land) had problems re-paying their debt.

(3) ***Inadequate incentives and technical assistance to guide the transition to CSLM.*** One reason for the lack of awareness and high perceived risk is the insufficient system of extension and technical assistance, especially for small and medium farmers. No programme offers long-term technical assistance to farmers to accompany the transition to sustainable production systems farmers based on the individual

characteristics of the farm. There are little training and supervision opportunities for extensionists to update their knowledge.

(4) ***Lack of an interinstitutional strategy on CSLM.*** Despite high-level knowledge and understanding of the current productivity and climate change issues, in the public sector, academia and farmers' organization, there are no national programs, plans or regulations to coordinate and promote the introduction and dissemination of CSLM. There is no agreement among the key actors on common criteria to define CSLM in the Uruguayan context, as well as a strategy to promote the adoption of climate-smart approaches of livestock management on natural rangelands. Likewise, there are no significant national budget allocations to these issues.

(5) ***Lack of scientific knowledge and data on CSLM practices and its impacts on GHG emissions, soil conservation, and biodiversity.*** Although the general processes linking livestock management, GHG emissions and land degradation are understood, the details of the interactions are not well known, neither quantified. There is no primary data on (i) how different livestock management systems affect GHG emissions nor (ii) how different livestock management systems affect soil fertility, erosion and biodiversity. This lack of detailed data is a barrier to improving CSLM approaches and securing private or donor funding to new technologies and practices.

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APPENDIX 9: COOPERATION ARRANGEMENTS BETWEEN THE GEF AND DACC PROJECTS

The project will be implemented in close coordination with the Project "Natural Resources and Adaptation to Climate Change" (DACC-2 BIRF-8099-UY) which is implemented by MGAP with funding from a World Bank loan. The projects are mutually reinforcing, as the DACC project focuses on adaptation to climate change and improvement of natural resources management, while the GEF project focuses on climate change mitigation. Both intervene in the same areas. Cooperation with the DACC project at territorial level provides a unique window of opportunity for the GEF project in two respects: 1. Due to the coordinated implementation arrangement, farms of the DACC project will benefit from the capacity building activities, tools and methodologies developed by the GEF project. Consequently, the area of the farms can be considered indirect coverage. 2. The DACC project will finance small infrastructure investments, such as water management or reforestation, on the farms participating in the GEF project, if necessary.

The coordination arrangement between GEF and DACC-2 project will be organized along the following lines:

A) During the selection phase:

1- In the four pilot regions, the DACC-2 Project will issue a call for Local Farmers' Organizations and / or Groups to receive technical assistance and investments for the implementation of CSLM practices. For registration, organizations will be required to present the basic caracteristics of farms of the group, as well as one or more extension technicians responsible for the technical advice. DACC-AD will provide funds through the respective organization for each farm of the group for technical advisory services for the first stage of adoption of CSLM in (i) characterization of the facility, (ii) redefinition of the CSLM strategy, and (iii) implementation of the CSLM strategy, during one year. In addition, up to USD 8,000 will be financed per farm for the necessary infrastructure investments. This call will be made at the national level, which will cover the 4 ecoregions where the GEF project will be implemented. The regional technicians of the Directorate General of Rural Development (DGDR) of the MGAP, located in the departments of the ecoregions, will play a key role in disseminating this information.

2- Once the selection of the farmers' groups under the DACC call has been finalized, the selection criteria for the pilot farms and extensionists will be determined based on the directions developed in the preparation phase of the GEF project (see Annex 7). This will be done in a consultative process led by MGAP and the Project Coordinator, together with the extended institutional framework (INIA, IPA and others), farmers' organizations (including those selected under the DACC project DACC), technical specialists of the GEF project and the territorial experts of the MGAP.

3- Once the selection of the farmers' groups under the call has been finalized, MGAP together with PC and other relevant actors (INIA, IPA, etc.), will convene meetings at territorial level with the management of the farmer's organizations. It will explain the synergies that will be established between DACC and GEF projects, and how to proceed methodologically for their

achievement. Within the scope of this meeting, a field day or workshop will also be scheduled to motivate the producers of the groups or groups that are registered as potential beneficiaries for the selection of the monitoring sites of the GCP / URU / 035 / GFF project.

4- In each sub-area where nuclei and / or groups of each ecoregion were selected, a field day and workshop will be held to explain the GEF project and generate interest and motivation in the producers to become potential beneficiaries . The territorial technicians of the DGDR, the CNFR, AUGAP, FUCREA and CREA farmers' group will play a key role in organizing and announcing these activities. Announcements will be spread by word of mouth as well as through local media (radio, SMS lists, WhatsApp groups, etc.)

5 - Subsequently to the field day, a registration period is opened to receive the applications of the interested farmers to become beneficiaries of the GEF project. The registration will be carried out in a simple way, requesting the essential information only, and made by means very accessible to the producer, such as a telephone or radio call to the local organization or local MGAP representation.

6- After the end of the enrollment period, all potential beneficiaries will be visited by project staff to gather the essential information for the selection process, explain the commitments that are required by the farmer and to know the main motivations of the farmer to be part of the project.

7- The MGAP together with the project specialists, INIA, IPA and the farmers'organizations, make the selection of the monitoring properties applying the pre-defined criteria;

8- The results of this process of selection of monitoring sites are communicated to both the selected producers and the local organizations to which they belong.

As far as possible, the 60 GF will be distributed equitably among the 4 agroecological regions, so each region will ideally have 15 GF, with an average of 583 hectares per farm.

B) During the implementation phase

Farms participating in the GEF project will be called GEF farms (GF) and farms participation in the DACC be called indirect intervention farms (IIF).

1 - Each farmers' group selected by the DACC will be composed of 10 or maximum 15 producers. Organizations may apply with more than one group.

2 - The GF will be selected within the groups selected under the DACC / DACC-AD, therefore, each MP will be linked to a group of producers and a local producer organization, such as AUGAP or CREA.

3- The extensionists of the GF - as long as they have the necessary experience to carry out the work of co-innovation - will be the same ones that were presented in the application to the DACC call, therefore, each technician will advise GF and IIF. Each technician will advise from 2

GF to a maximum of 3 GF. For technical assistance to GF farms, extensionists will be remunerated by the GEF project, for activities on IFF, by the DACC project.

4- At the beginning of the activities the extensionists will participate in the training programme on CSLM practices and co-innovation (output 1.2.2).

5 - For the organization of activities at the territorial level, the project will be supported by local farmers' organizations, and the Regional Technicians of the DGDR / MGAP, technicians of the IPA and the Territorial Development Boards (MDR).

6- The National Coordinator of the Project and the Component Coordinator 2 will play a key role in articulating activities at the territorial level and coordinate the PSC and the Advisory Committee.

7- The IIF which are in the same area as the GF will be invited to participate in all extension activities (field days, workshops etc.) organized by the GEF project.

8- The DACC project will facilitate funding for necessary investments on GF farms for te implementation of the CSLM strategy, such as paddocks and water management.

APPENDIX 10. METHODOLOGY FOR ESTIMATION OF GHG EMISSIONS AND CARBON SEQUESTRATION

The following annex explains assumptions and methods to estimate (a) CH_4 and N_2O emissions from livestock, (b) changes in soil organic carbon stocks in rangelands, and (c) carbon sequestration in woody biomass. For further detail please refer to the Excel sheet included at the end of the annex.

A) Estimation of CH_4 and N_2O emissions

The ex-ante calculations of the emissions of were done using 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The sources included were:

- CH_4 emissions from Enteric Fermentation, following Section 10.3 of Chapter 10 (Emissions from Livestock and Manure Management).
- CH_4 emissions from Manure Management, following Section 10.4 of Chapter 10.
- N_2O emissions from Manure Management (direct and indirect), following Section 10.5 of Chapter 10.
- N_2O emissions from Managed Soils (direct and indirect) Following Chapter 11, Section 11.2.

The activity data (AD) were estimated using the Tier 2 livestock characterization, that includes definition of cattle subcategories, population by subcategory and feed intake for typical animals in each category. The source of information was the National System of Livestock Information (SNIA for its acronym in Spanish) of the MGAP.

For the feed intake estimates were obtained for the following variables using information from the MGAP (OPYPA; Survey 2014 to cattle farmers), the National Institute for Agricultural Research (INIA) and the Faculty of Agronomy, and consultations of experts in the process of calibration of the FAO GLEAM Model for the conditions of Uruguay. The variables considered were: Weight, average weight gain, feeding situation, mean winter temperature, milk production, fat content in milk, pregnancy, and feed digestibility.

With these variables, the gross energy intake was calculated using the different 2006 IPCC equations. Tier 2 emissions factors (EF) were obtained for enteric fermentation, including the use of country-specific methane conversion factor (Y_m) developed by INIA and published in a peer reviewed publication (Dini, Y. *et al.* 2017. Animal Production, CSIRO).

The T2 EFs estimated for enteric fermentation are presented in Table 10.1.

Sub-category	EF
Bulls	74.1
Cows	90.9
Fattening cows	92.7
Steers + 3 yr.	81.8
Steers 2-3 yr.	78.9
Steers 1-2 yr	66.8

Heifers 2-3 yr	64.6
Heifers 1-2	61.7
Calves (males)	39.9
Calves (females)	37.8

Table 10.1: Tier 2 EFs for enteric fermentation by subcategory of cattle

To estimate the emissions of CH_4 from manure management, it was considered that 100% of the manure is deposited on pastures by the grazing animals (no feed-lots or confinement of animals will be used), The AD are Tier 2, the same used for enteric fermentation, and the EFs are T1.

The N_2O produced (direct and indirect), was estimated using again the same Tier 2 AD for animal population and T1 EFs. Direct N_2O emissions correspond to nitrification and denitrification of nitrogen.

The methodology estimates direct N_2O emissions due to the deposition of manure on the grasslands using the Tier 2 AD and the 2006 IPCC Tier 1 EFs. Synthetic or organic fertilisers, crop residues or sewage sludge is not to be used. Indirect emissions due to volatile nitrogen losses (as ammonia and NOx) were accounted using 2006 IPCC Tier 1 EFs

Finally, the two indirect sources of emissions of N_2O were included in the estimates: a) the volatilisation of N as NH_3 and oxides of N (NO_x), and the deposition of these gases and their products NH_4+ and NO_3 - onto soils and the surface of lakes and other waters; and b) the leaching and runoff from land of N from urine and dung deposition from grazing animals

B) Estimation of changes in soil organic carbon stocks in rangelands

Managing both, C and N cycles is considered key to succeed in sequestering C in soils. By improving vegetation cover and stopping overgrazing on degraded pastures, the project will directly result in increased ecosystem services, such as soil water retention, soil fertility and forage production over 35,000 hectares. A recent metanalysis by Conant R. (2016)[82] report that "*These new data largely confirm our earlier conclusions: improved grazing management, fertilization, sowing legumes and improved grass species, irrigation, and conversion from cultivation all tend to lead to increased soil C, at rates ranging from 0.105 to more than 1 Mg C·ha−1·yr−1[...]. The main area in which the new data are contrary to our previous synthesis is in conversion from native vegetation to grassland, where we find that across the studies the average rate of soil carbon stock change is low and not significant. The data in this synthesis confirm that improving grassland management practices and conversion from cropland to grassland improve soil carbon stocks...Reversing practices that have led to grazing land degradation can prompt increases in ecosystem carbon stocks, sequestering atmospheric CO2 in grazing land soils.* "

A previous paper by Piñeiro G. *et al.* (2010)[83] provides scientific background for the goal of the project related to restoration of degraded land through soil organic matter rebuilding. This paper reports that the proposed mechanisms of grazing control over SOC operate into three

[82] Grassland management impacts on soil carbon stocks: a new synthesis. *Ecological Applications*, 0(0), 2016, pp. 1–7 © 2016 by the Ecological Society of America.

[83] Piñeiro, G. et al. Pathways of Grazing Effects on Soil Organic Carbon and Nitrogen. RANGELAND ECOLOGY & MANAGEMENT 63(1) January 2010.

major simultaneous pathways: 1) changes in net primary production (NPP pathway), 2) changes in nitrogen stocks (nitrogen pathway), and 3) changes in organic matter decomposition (decomposition pathway). The relative importance of the three pathways may generate variable responses of SOC to grazing. Our conceptual model suggests that rangeland productivity and soil carbon sequestration can be simultaneously increased by management practices aimed at increasing N retention at the landscape level. Figure X shows the main pathways that influence soil carbon related to soil nitrogen.

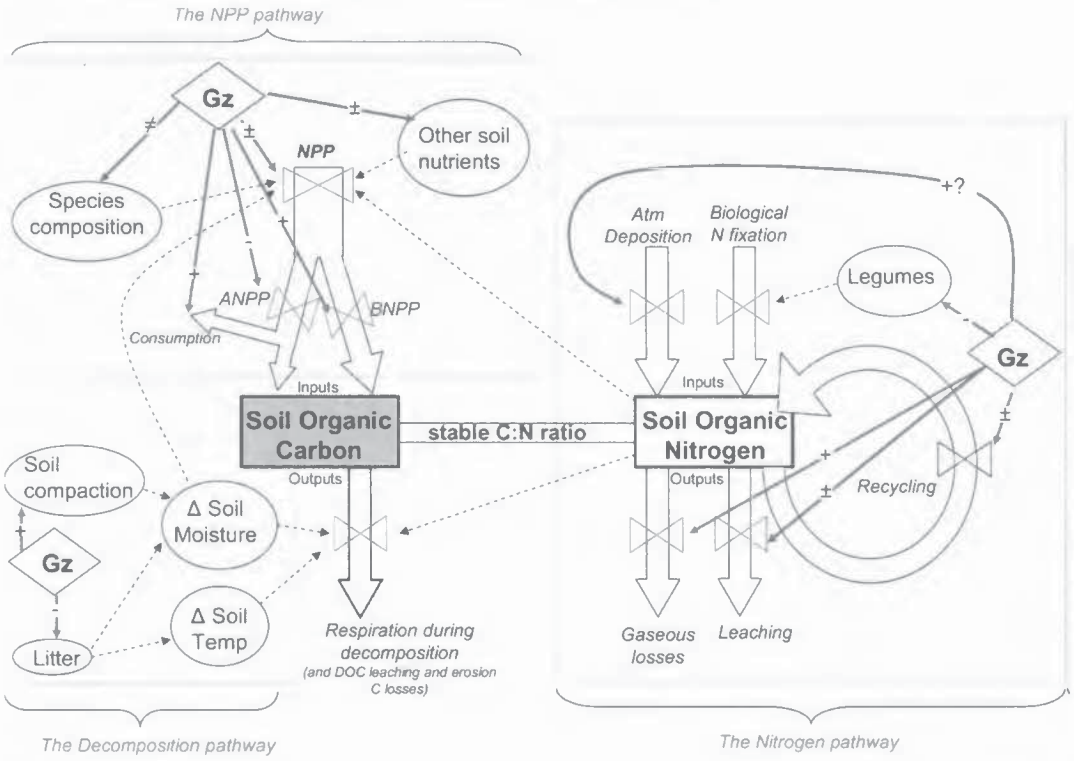

Figure X. Grazing effects on soil organic carbon stocks through different pathways. We separated three main pathways by which grazing modifies soil organic carbon stocks in rangelands: via affecting net primary production, by changing nitrogen stocks and cycling, or by altering soil organic carbon decomposition. Gz indicates grazing; NPP, net primary production; ANPP, aboveground NPP; BNPP, belowground NPP; C:N, carbon to nitrogen ratio; and DOC, dissolved organic carbon.

C) Estimation of carbon sequestration in woody biomass

As the project foresees to increase the areas of small forest dedicated to provide shadow and shelter in paddocks that lack these services and new paddocks created to improve pasture management, there will be carbon sequestration in both, aboveground and below ground biomass. To estimate the removals, the AD (area) should be multiplied by the corresponding removal factors. The methodology used for this is the one included in the 2006 IPCC Guidelines for AFOLU: method gains-losses. Gains are estimated using Equation 2.10 presented in Chapter 2 of the AFOLU Volume. Variables implied are: mean annual increment (m3), density, biomass expansion factor (BEF), factor 1+R to estimate belowground biomass, carbon fraction and C-CO2 factor. The increment was obtained from national inventory plots and corresponds to fast growing species, the density in country-specific, and the other parameters are Tier 1. Dead organic matter and soil organic carbon were not included in this first ex-ante estimation,

and it is assumed that changes in these pools are going to be not significant. Planting will be done with minimum disturbance of soils. Losses are expected to be zero as no commercial harvest is foreseen and the risk of fires is very low in small patches of forests.

The complete calculation of carbon benefits is available in the attached excel workbook:

GEF URU Livestock Carbon Calculation re

APPENDIX 11. INSTITUTIONS IN THE LIVESTOCK SECTOR IN URUGUAY

Public sector institutions

290. **Ministry of Agriculture, Livestock and Fisheries (Ministerio de Ganadería, Agricultura y Pesca - MGAP)** MGAP has as strategic objective to contribute to the permanent development of the agricultural, agroindustrial and fishing sectors, promoting their insertion in international markets, based on the management and sustainable use of natural resources. In 2010, the Ministry outlined the following strategic guidelines for public policies in the agricultural sector:

- To strengthen agricultural, agroindustrial and fisheries competitiveness by achieving sustainable development from the point of view of social integration and preservation of the environment;
- To join efforts of the public and private organizations; and
- Perform decentralized actions with greater work in the territory and together with rural organizations and producers.

291. In terms of technological processes, MGAP has the responsibility to promote the transfer and diffusion of agricultural, agroindustrial and fishing technology as well as technology related to sustainable use and management of natural resources to the respective sectors. MGAP presides the Coordinating Council of Agricultural Technology, which is the coordinating body of the Technology Policy for the sector. It carries out some research activities in the Veterinary Laboratory Division (DILAVE) and in the Soils and Waters Division (Soil Microbiology Laboratory).

292. MGAP runs extension services supported by different programs such as the Agricultural Services Program (PSA), the National Program for the Development of Small and Medium Livestock Farmers (PRONADEGA), the National Support Program for Small Agricultural Farmers (PRONAOPPA), the Climate Change and Development Project (DACC) and the project "Building Resilience to Climate Change and Vulnerability in Vulnerable Small Producers".

293. In Uruguay, the extension system consists of 100 field technicians under the MGAP and many private technicians. In order to provide support to small farmers, the MGAP technicians work with the private technicians, who, in turn, work with the small scale farmers. In some cases the private technicians are paid by the farmers directly, or through farmers' associations, more often they are paid through a national programme or internationally supported projects.

294. Extension services are typically short duration with long periods in between (for example, 1 day every 6 months). Due to the short time available, technical assistance typically is limited to demonstration of a technology or supervision of infrastructure. Extensionists have no time to develop a strategy with the farmers based on an assessment of the individual farm and taking into account different technological and process tools to achieve economic, environmental and social goals.

295. The following departments and units of the MGAP are relevant for the proposed project:

296. **Office of Programming and Agricultural Policy (Oficina de Programación y Política Agropecuaria – OPYPA)** The Office of Agricultural Programming and Planning (OPYPA) has an advisory role in the formulation of public policies for the agricultural, agro-industrial and fishing sector as well as the support of the executive units. In this, OPYPA is monitoring the agro-industrial chains and the economic situation. It is further conducting studies on cross-cutting and sectoral issues with a focus on technical change, economy of natural resources, coordination of productive chains and competitiveness..

297. **Agricultural Sustainability and Climate Change Unit (Unidad Agropecuaria de Sostenibilidad y Cambio Climático - UASCC)** In 2000 the MGAP created within OPYPA the Climate Change Unit, which was renamed the Agricultural Sustainability and Climate Change Unit (UASCC) in 2016. UASCC coordinates the programs related to climate change mitigation and adaptation and the MGAP's contribution to the fulfilment of the national commitments to the UNFCCC. The unit prepares estimates for the reports of the contribution of the agricultural sector to the emission and removals of greenhouse gases. With the incorporation of sustainability as a field of work, the UASCC is also responsible for the statistics for the monitoring of production through the environmental accounts. It coordinates implementation of the National Plan for Adaptation to Climate Change and Variability for the Agricultural Sector (PNA-Agro).

298. **Directorate for Natural Resources (Dirección General de Recursos Naturales – DGRN)** DGRN is responsible for the development of public polices related to the use and management of natural resources, especially soil and water, in all agricultural sectors of Uruguay. Among the responsibilities of the DGRN is the continuous update of the Uruguayan soil productivity index (CONEAT) It is also responsible for the approval of the soil use and management plans, which are mandatory for farmers who manage more than 50 ha of arable land (see regulatory framework below). DGRN also includes the recently created Rangeland Division.

299. **Directorate for Rural Development (Dirección General de Desarrollo Rural – DGDR)** Since its creation in 2005, the DGDR designs and promotes agricultural policies within the MGAP that contribute to a sustainable rural development and participation of the rural population. The DGDR plays an important actor in the decentralization of the MGAP and is strongly linked to the 42 Rural Development Committees (Mesas de Desarrollo Rural – MDR) established in 2007 (Law 18.126)[84]. Thus, the DGDR has an extensive outreach to rural communities and serves as a local contact of the MGAP in rural areas.

300. **Unit for Project Management (Unidad de Gestion de Proyectos – UGP)** The UGP was created in 2012 to implement the project on sustainable management of natural resources and climate change (Desarrollo y Adaptación al Cambio Climático – DACC). Since 2016 the UGP is institutionalized within the MGAP in order to coordinate and manage internationally financed projects and to advise the MGAP.

301. **MGAP decentralized structures.** In 2007, MGAP initiated a process of decentralization and coordination of agricultural policies with departmental basis, creating the following governance units:

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[84] http://www.iica.int/sites/default/files/publications/files/2016/b3701e_0.pdf

- The **National Agricultural Council** contributes, to the development of a decentralisation policy for the MGAP management and the harmonisation of national and departmental policies.
- **Departmental Agricultural Councils** (CDA), which disseminate in their region the policies of the MGAP and public non-state public entities related to the agricultural work and spread information about the various projects in order to reach out to the target groups. CDAs operate in all 19 departments.
- **Rural Development Committees** (MDR) whose purpose is to promote greater involvement and participation of the agricultural society in the implementation of the policies of the sector, detecting the demands and concerns of the rural producers of the department and channeling the different development projects. Currently there are 42 MDR.

302. **Ministry of Housing, Territorial Planning and Environment (Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente – MVOTMA)** The MVOTMA, created by the Law nº 16.112 in 1990, designs and implements public policies related to housing, environment, land use and water, in order to promote an equitable and sustainable development, contributing to the improvement the citizens' quality of life. According to the General Law of Environmental Protection (Law 17.283), the MVOTMA is the national competent authority of climate change and Uruguay's focal point of the United Nations Framework Convention on Climate Change (UNFCCC). The climate change division of the MVOTMA is also the competent authority for NAMAs in the country.

303. **National Directorate of Environment (Dirección Nacional de Medio Ambiente – DINAMA)** The DINAMA is responsable for policies related to the protection of ecosystems and biodiversity and oversees environmental assessments. Within the DINAMA is a division for the national system of protected areas (Sistema Nacional de Areas Protegidas – SNAP). The SNAP contributes to the conservation of biodiversity, the maintenance of ecosystem services and a sustainable use of natural resources (Law 17.234). It establishes conservation strategies and management plans, involving different national and local actors in order to increase acceptance and compliance.

304. **National Response System to Climate Change and Variability (Sistema Nacional de Respuesta al Cambio Climático y Variabilidad - SNRCC)** The SNRCC, created in 2009 by Executive Decree 238/09, has been consolidated and strengthened as a space for coordination and planning of public and private actions that are necessary for risk prevention, mitigation and adaptation to climate change. Its management is based on a Coordination Group and an Advisory Commission. The Coordination Group is chaired by MVOTMA and vice-chairs are held by MGAP and the Office of Planning and Budget (OPP). The remaining members of the Coordination Group are from various other Ministries and institutions. The Advisory Commission, consisting of technicians representing public institutions, academic, technical and research entities, has deepened the analysis of climate change related problems through different working groups based on thematic areas. One of the main milestones of the SNRCC was the participatory elaboration of the National Policy on Climate Change (PNCC) (see regulatory framework)

305. **Faculty of Agronomy (FAGRO) of the University of the Republic (UdelaR)** The Faculty of Agronomy is a public institution with national leadership and regional recognition in tertiary and higher education in agricultural sciences. Its mission is to contribute to the sustainable

development of the country by training professionals in agricultural sciences and thus develop the fields of research, innovation and extension. FAGRO is structured in 10 departments (Plant Biology; Biometrics, Statistics and Computing; Social Sciences; Animal Production and Pastures; Forest Production and Wood Technology; Plant Production; Plant Protection; Soils and Water; Environmental Systems; Food Technology Unit). The FAGRO has three experimental stations and a regional center in addition to its headquarter in Montevideo.

Public Private Institutions

306. **National Institute for Agricultural Research (Instituto Nacional de Investigación Agropecuaria – INIA).** INIA is a non-state public institution established in 1989. INIA's mission is to generate and adapt knowledge and technologies to contribute to the sustainable development of the agricultural sector and the country, taking into account State policies, social inclusion and the demands of markets and consumers. INIA has the following objectives: i) Formulate and implement agricultural research programs aimed at generating and adapting technologies that meet the country's needs and are adequate for the socio-economic conditions of the agricultural production; ii) Participate in the development of a national scientific and technological knowledge in the agricultural area through its own activity or efficient coordination with other research and technology transfer programs that are carried out at public or private levels; and iii) Establish an effective transfer of the generated technologies with the technical assistance and extension organizations operating at the public and private levels.

307. INIA organises its activities into 11 major programs, four of which are directly related to this project: Family Farm Production, Meat and Wool Production, Pastures and Forages, and Production and Environmental Sustainability. INIA collaborates with other institutions through the FPTA (Fund for the Promotion of Agricultural Technology)[85]. There are also strategic Projects of the Agricultural Services Program (MGAP), which promote the formation of strategic alliances for the execution of projects between INIA and other specialized public or private, national or international entities. INIA reaches out to farmers with consulting, support and advisory services through CARs (Regional Advisory Councils), which are set up with people linked to the agricultural sector in the regions of INIA's five experimental stations. They collaborate in the elaboration of plans and programs of investigation, as well as the search of additional resources. Given its importance in the process of linking users with the generation and diffusion of transfer, INIA has strengthened the action of each CAR with the formation of Working Groups that bring together, for each of the main productive activities of the region, representatives of producer associations, credit technical assistance, marketing and industrialization. INIA establishes agreements with organizations of the agricultural sector for specific demands, usually based on proposals of the organizations.

308. The **Institute of Livestock Technology Transfer (IPA)** is a non-state public institution for the diffusion of agricultural technology. Its directive board consists of delegates from ARU, FRU, CNFR, CAF and MGAP. Its objectives are: a) To carry out activities of extension, technology transfer and training related to the agricultural production; b) Support of zonal

[85] The FPTA was created in Law 16,065. It is intended to finance technological research projects related to the agricultural sector, executed by other institutions or individuals outside the Institute, mainly in response to issues demanded by the National Programs of INIA and according to the needs of complementing their own plans.

promotion plans, as well as the implementation of specific actions to demonstrate the adoption of technology; c) Prepare development plans and projects at the site, regional or national level; d) To establish collaboration agreements and to carry out specific tasks with other institutions. IPA carries out a broad variety of activities related to technology transfer and the dissemination of knowledge among different target groups and using various formats. Among its strategic guidelines is the objective to implement projects with donor financing and / or in the framework of agreements with national and international institutions of the fields of science, innovation and technology.

309. The **National Meat Institute (INAC)** is a non-state public institution created by Decree Law 15.605 in 1984. According to Art.1 of this law, INAC has the role of proposing, advising and implementing the National Meat Policy. Its mission is to develop collective actions that promote activities and policy formulations that add value and contribute to the sustainable development of the meat sector. Its vision is to place the Uruguayan meat sector as a supplier of high added value, increasing its participation in the international market.

The **Uruguayan Wool Secretariat (SUL)**, a private non-profit research and dissemination institution created by Law No. 13.602, and financed by the wool producers of Uruguay through the retention of a percentage of the FOB value of wool exports. It is managed by a directive board that comprises representatives of producer organizations, the MGAP, the Ministry of Economy and Finance and the BROU. Its tasks include: "improving the quality of wool and expanding production, promoting scientific research, organize activities to promote and disseminate technology to improve production, shearing and wool production systems and to collaborate with the Government, producers, manufacturers and traders in matters affecting wool production." The SUL carries out applied research activities linked to technology transfer. It provides advice and training to producers.

Farmers' organizations

310. **Uruguayan Federation of Regional Centres of Agricultural Experimentation (Federación Uruguaya de los Grupos CREA - FUCREA)** FUCREA is the assemlbly of all CREA groups in Uruguay. It is a long-standing institution in the agricultural sector and is widely recognized at national and international level since 1966. The facilitation of work tools and innovations to each CREA group is FUCREA's strategy to ensure its future advancement.

311. The CREA method is based on group work of farmers. Through the mutual exchange and the discussion on concrete problems of each farm, the farmers are able to develop individual approaches for the development of their businesses and families. In this way, FUCREA's members can draw conclusions and get inspiration about the productive systems and the techniques that are applied by their peers.

312. FUCREA serves as a reference for group dynamics, integral management of agricultural companies, preparation and implementation of projects as well as consultancy and extension services. The Federation is funded mainly by the contributions of each of the groups as well as their sponsors. Thus, the mission of the institution is to "provide methodological and technical support to CREA groups as well as presence in the rural areas, contribute that their members' personal and business development that increases the competitiveness in their activities." At the moment FUCREA assembles 10 mixed agricultural-livestock CREA groups, 19 livestock groups, 3 groups of fruit- and wine-growers and 12 dairy farming groups.

313. **National Commission for Rural Development (Comisión Nacional de Fomento Rural – CNFR)** was founded in 1915 by several Rural Development Societies with the aim to improve the quality of life in rural areas. At present, it is composed of 98 first-degree entities - Rural Development Societies, Agrarian Cooperatives and other basic organizations - which in turn group and radiate their action on some 15,000 family producers from all over Uruguay, dedicated to a broad variety of agricultural sectors. The CNFR is considered the main representative organization of small and medium farmers of the rural environment due to its constituent organizations that are dispersed throughout the country.

314. **Uruguayan Association of Rangeland Farmers (Asociación Uruguaya de Ganaderos del Pastizal - AUGAP)** is the Uruguayan branch of the Southern Cone Rangeland Alliance (Alianza del Pastizal – AP) and was constituted on December 7, 2014, and is currently counting 120 members. The creation of AP was initiated by BirdLife International and its American partners in order to protect hábitats of migratory birds in the North American prairies and the pampas of the Southern Cone. In 2005, a joint project started with the BirdLife International partners in South America as well as North American public and private institutions in order to launch the idea of a South American rangeland conservation initiative.

315. Other farmers' organizations include the Uruguayan Rural Federation (FRU), the Rural Association of Uruguay (ARU) and the Federated Agrarian Cooperatives (CAF).

316. The **National Livestock Rangeland Board (MGCN)** created by MGAP in 2012 with the purpose of harmonising cattle ranching with the conservation of resources, thus encouraging livestock management practices that promote both the conservation and efficient use of natural rangelands. The MGCN seeks to assemble relevant institutions and promote joint efforts to recognize and value rangeland ecosystem services - not only in productive terms but also its resilience against climate change and variability. The objectives of the MGCN are to:

- provide technical advice to projects related to natural rangelands;
- promote sustainable production systems that are less vulnerable to climate variability;
- coordinate with research-extension institutions in areas of livestock in the natural rangelands;
- promote the development of technological innovations, their transfer and adoption in order to increase the output and/or the value of rangeland-based livestock production conserving the natural resources;
- give recommendations for plans and research programs in the field of livestock farming on natural rangelands of public and private agricultural research institutions.

317. The MGCN's Executive Board consists of representatives of MGAP, IPA; INIA; FAGRO; Faculty of Science; and SUL. There is also an Extended Board which, in addition to the Executive Board's institutions, assembles CNFR; CAF; ARU; FUCREA; FRU; MVOTMA (SNAP); INAC and AUGAP. The extended MGCN has been designated by MGAP as Advisory Committee to the project