Climate Smart Agriculture Research and Innovation Support for Dairy Value Chains in Eritrea (CSARIDE)

(Contract Reference Number: FOOD/2019/411-806)

Second Interim Narrative Report

3 February 2021-2 February 2022

DeSIRA
PARTNERSHIPS FOR INNOVATION

Climate Smart Dairy
ERITREA

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List of acronyms used in the report

AI	Artificial Insemination
AKIS	Agricultural Knowledge Innovation System
BDS	Business Development Service
CA	Contracting Authority
CAg	Consortium Agreement/ Collaboration Agreement
CSA	Climate Smart Agriculture
CSARIDE	Climate Smart Agriculture Research and Innovation Support for Dairy Value Chains in Eritrea'
DoA	Description of Action
EC	European Commission
EDF	European Development Fund
EFA	Economic and Financial Assessment
EIA	Environmental Impact Assessment
EIDP	Eritrea-Ireland Development Partnership Office, Asmara
EUDE	European Commission, Delegation of the European Union to the State of Eritrea
FAO	Food and Agriculture Organization of the UN
GC	Grant Contract
GoSE/SoE	Government of the State of Eritrea
HAC	Hamelmalo Agricultural College, Eritrea
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
IPR	Intellectual Property Rights
IT	International Team
LUKE	Natural Resources Institute Finland

M&E	Monitoring and Evaluation
MIHAP	Minimum Integrated Household Agricultural Package
MoA	Ministry of Agriculture, State of Eritrea
AED	Agriculture Extension Department of MoA
MoLWE	Ministry of Land, Water and Environment, Eritrea
MoU	Memorandum of Understanding
NARI	National Agriculture Research Institute, Eritrea
NGO	Non-governmental Organization
NSC	National Project Steering Committee
NUEW	National Union of Eritrean Women
OM	Outcome Mapping
PC	Project Coordinator
PF	Performance Framework
PIP	Project Implementation Plan
PM	Project Manager
PMC	Project Management Committee
PMF	Performance Measurement Framework
RC	Results Chain
RPIC/ZT	Regional Project Implementation Committees/Zoba Team
SDGs	Sustainable Development Goals
SHA	Self Help Africa
SLM	Sustainable Land Management
TL	Task Leaders
ToT	Training of Trainers
UCC	University College Cork, Ireland
UCD	University College Dublin, Ireland
UNDP	United Nations Development Programme

WP/WPL	Work Package/ Leader

1. Description

1.1. Name of coordinator of the grant contract: **Dr Lance O'Brien**

1.2. Name and title of the contact person: **Dr Lance O'Brien, Project Coordinator**

1.3. Name of beneficiaries and affiliated entity(ies) in the action:

Teagasc -The Agriculture and Food Development Authority- is the lead applicant. University College Dublin (**UCD**), University College Cork (**UCC**), National Resources Institute Finland **(LUKE**), **Vita** and Self Help Africa (**SHA**), are co-applicants to the grant contract.

1.4. Title of the action: **Climate Smart Agriculture Research and Innovation Support for Dairy Value Chains in Eritrea (CSARIDE)**

1.5. Contract number: **FOOD/2019/411-806**

1.6. Start date and end date of the reporting period: **3 February, 2021 – 2 February, 2022**

1.7. Target country(ies), regions, municipalities or towns: **State of Eritrea: Zobas Debub, Maekel, and Anseba**

1.8. Final beneficiaries&/or target groups (if different) (including numbers of women and men):

Target Groups

- Resource-poor livestock farmers;
- Private and cooperative input and output market agents and service suppliers, including milk collection and processing entities, as well as AI and veterinary services;
- Small -scale entrepreneurs (e.g. National Union of Eritrean Women); and
- Public sector bodies, including the National Agriculture Research Institute (NARI), Hamelmalo Agricultural College (HAC), MoA, and regional governments (Zobas);
- Unemployed youth and women who will benefit from additional employment opportunities flowing from a more productive farming sector and stronger overall value chain.

Final Beneficiaries

- Consumers of the new high-value dairy products who will enjoy greater availability of more cost-effective, quality products;
- National economy, which will benefit from increased employment, additional food exports and reduced food imports.

1.9. Country(ies) in which the activities take place (if different from 1.7):

2. Assessment of implementation of action activities and its results

2.1. Executive summary of the action

Notwithstanding the effects of the global COVID-19 pandemic, the project has made modest progress in executing critical activities and delivering corresponding outputs. During the span of the reporting period, the project focused on capacity building and putting critical infrastructure/equipment in place to strengthen the research capacity of public actors along the value chain, particularly NARI and HAC. The project team prioritised capacity building as an essential entry point to bolster knowledge transfer systems and facilitate strategic partnerships. These are the essential pillars in the chain of results for the attainment of the overall project objective and outcomes. The team was unable to provide the planned level of support for the private sector value chain actors mainly due to COVID-19 restrictions. However, team members did extend targeted support to some private sector actors along the value chain, mainly in the form of investment support for milk collection centres and provision of business development services (advisory services) to small dairy processors.

The following are among the critical milestones which were realised during the reporting period: the establishment of the Genetic Resource Centre at Aklelet, which will assist in improving breed quality; the establishment of a model demonstration farm at NARI, serving both as a research resource and as a demo for farmers; support for NARI and HAC through the provision of Holstein and Barka breeds for research and educational purposes; administration of AI to more than 800 cattle, which will improve breed capacity at farm level; educational support to HAC, which will improve knowledge and skills transfer; support from the international team on collaborative research, which will improve capacity on problem-oriented research in NARI and HAC.

Another important milestone during the period relates to strengthening of project management and M&E tools. With the completion of the baseline survey in November 2021, it was essential to revise the log frame to reflect the findings of the BLS and update baseline indicators and revisit mid and end-line project targets. The team further revised the log-frame to ensure greater consistency with the monitoring and evaluation framework being developed to monitor progress of the DeSIRA initiative at the global level.

The key challenge for the reporting period was the nationwide lockdown imposed to control the spread of COVID-19, which constrained the execution of activities, particularly those related to private sector value chain actors. Delays were also experienced in recruiting specialists for the both the national and international teams. These delays, in turn, slowed progress at **Outcome (Oc)** level, even though it is too early to assess progress objectively at this level, even in the absence of COVID-19 effects. Moreover, the assumptions and risks defined in the project proposal, particularly the operational risks, still remain valid.

2.2. Results and activities

A. RESULTS

Assessment of the results of the action so far

In the course of the current reporting period, the team focused on putting in place key implementation and project management structures; building the capacity of value chain actors, with a focus on the public sector; and completing recruitment to the project team. The key impact to be reported is the strengthening of awareness of value chain actors of the importance of embracing CSA for the future interventions. Further impacts to be noted include the adoption and incorporation by the partners of the project concepts and principles, as well as the organizational and institutional arrangements at the different hierarchical levels to facilitate knowledge transfer and undertake CSA research. In particular, we can acknowledge acceptance of the project approach, especially the idea of a dairy commodity platform as a viable mechanism to strengthen the dairy value chain; improved institutional capacity of value chain actors (especially. HAC and NARI) enabling them to plan more CSA-focused interventions in discussions with other partners, including as part of the recently-signed Cooperation Agreement between the UN and the GoSE.

Systematic development of Eritrea's dairy value chain is just beginning. Under the circumstances, it is inevitable that more prolonged efforts would be required to create consensus on approaches and create synergy between international experiences and the national context. This was further complicated with the onset of COVID-19, which constrained project implementation, especially up to the second half of 2021. Hence, it is quite unrealistic to report on the status of project Outcomes (Oc) or Impact at this very early stage. The Eritrean experience is such that projects take a little longer at take-off with slow adoption of new approaches by institutions; while international experience has shown that considerable time and effort is required until project approaches are institutionalized and key structures/procedures are put in place.

Despite these challenges, the project continued to build on the deliverables reported in year-1, largely around the delivery of prioritized outputs that are critical to the attainment of the project objectives and outcomes. These key outputs were identified as priority areas in the PIP. The status of these outputs is presented in Table-1 (see below).

In general, the team is confident that the project will meet the planned results. The commitment and enthusiasm shown in the implementation of activities, and the level of ownership of outputs attest that the chain of results will be met as planned. The continued relevance of the project and the high level of coordination between the partners are additional indicators pointing to the high likelihood of attaining projected outcomes and achieving robust impact.

Mainstreaming of cross-cutting issues

This project accords gender a priority, both from the perspective of the EU's pledge for gender inclusivity as well as the Government of Eritrea's policy to promote gender equality. A core project objective is to empower women to participate more fully in all aspects of the

dairy value chain and thereby contribute in a meaningful way to the attainment of project outcomes and outputs.

The project has solicited the services of Vita's 'gender specialist' to ensure that gender sensitive inclusivity are considered at all stages of the project. Accordingly, the gender specialist continues to engage at all levels of the project, ensuring the climate smart agriculture and dairy value chain approaches are evaluated on their capacity to promote gender equality.

Environmental sustainability

The project itself is environmentally benign and focuses on climatic conditions affecting agriculture productivity. Integral to achieving the project Outcomes and Outputs is the strategy to ensure that its activities are institutionally and environmentally sustainable and are climate smart.

In designing the project, the team included a strong commitment to ensuring the conservation of the natural resources base and initiate SLM programmes. While these programmes will be implemented over the coming years, a few environmentally benign initiatives have been executed in the interim. These include measures to institute a climate friendly energy supply (solar) for the model dairy farm at HAC and the installation of solar power for the milk cooling and processing centres.

A critical action early in the life of CSARIDE is the need to undertake an environmental impact assessment (EIA) to provide information on the likely environmental impacts of the proposed project interventions and to provide a baseline against which to measure progress. The project is in the process of recruiting a competent expert for the task.

Youth

The project will target young women and men to acquire entrepreneurship and technical skills, as well as training programmes in environmental protection and water conservation agriculture. In addition to new jobs that will arise as a result of improvements in the value chain, CSARIDE will also establish a job creation seed fund of €100,000, which will be applied in the form of grants and technical support for projects which fulfil grant support criteria and will help create extra jobs for young people and women in particular. Opportunities will be created at input, production, processing, storage, packaging, marketing, and in value addition areas. The fund will build on a long and still prevailing

tradition in Eritrea of commercial agriculture and agri-business entrepreneurship. The overall target is 300 new jobs.

Table 1: Level of achievement of Outputs in the reporting period

Outputs (Value chain development)	Indicator	Target	Achievement in the reporting period
1.1 Value chains, target areas, actors and service/input providers identified.	#. of livestock value chains selected, mapped and opportunities identified	Three dairy value chains identified and mapped, and constraints and opportunities identified	• Three target areas identified, VC mapping commenced, and analysis of constraints/opportunities proceeding. • Different menus of interventions options under review. • International value chain consultants (SENSE consultants) made initial field visit together with the project team to define each value chain characteristics as well as validate and/ or provide practical intervention options.
1.2 Gender-sensitive and environmentally sustainable production, input/service supply, processing and marketing interventions identified and reviewed annually	#. of intervention options identified for use along the dairy value chain.	Five menus of intervention options developed	• Awaits results of the different work groups (WPs) as well as further analyses and report from consultant
	# of intervention options applied along the dairy value chain	At least four menus of intervention options applied	• Awaits results of the different work groups (WPs) as well as further analyses and report from consultant
	# of demonstration materials for VC interventions provided	# of demo materials provided	• Awaits results of the different work groups(WPs) as well as further analyses and report from consultant
	Business plan developed and modality for small entrepreneurship fund developed	At least one business plan developed annually	

	Increased availability of environmentally sustainable input/service suppliers	20 suppliers of inputs/services trained in environmentally sustainable input/service supply systems	
	# of new jobs created	300 new jobs	
	# of facilitators identified to champion the development of value chains and their components	Three facilitators identified to champion the development of the selected value chains. % increase on access	
	# credit schemes provided	% increase in financial instruments and services (30%)	
2.1 Gaps in skills and knowledge of VC actors and service/input providers in gender sensitive VC development identified	Gaps analysis report on skills of VC actors and service/input providers in gender sensitive VC produced	At least 1 gap analysis report for VCA produced	• Preliminary assessment by consultant has identified list of gaps and knowledge needs along the VC. • MoA Agri-Business expert developed draft proposal for GA on agri-business gaps • Consultations completed for further in-depth study and hands- on skill transfer.
2.2 Various knowledge capturing, sharing and learning events (field days, study tours, platform meetings) for VC actors and input/service providers completed	# of field days, study tours, platform meetings and other such knowledge-capturing and learning events organized # of training materials and references translated, updated made accessible	# of field days(2 /yr/Zoba), study tours(6), platform meetings and other such knowledge-capturing and learning events organized(2 per yr/Zoba) 200 training material items and references translated, updated made accessible	• Several dairy commodity platform meetings organized in the Debub region • MoA extension expert (seconded to the project) facilitating similar platform meetings in other areas; • A manual on general feeding practices of calf starter prepared for use by the extension agents.

	# of VC actors participating in all such knowledge- capturing, sharing and learning events	50% of VC actors participating in all such knowledge- capturing, sharing and learning events	
2.3 Training/mentoring other VC actors in improving product quality and food safety completed	# of training/mentoring sessions organized for other VC actors on improving product quality and food safety completed # of value chain actors trained on product quality and food safety	Training/mentoring sessions organized for other VC actors on improving product quality and food safety completed (2 per yr/Zoba) 50% of value chain actors trained on product quality and food safety	• 21 farmers trained on grain-based calf starter
2.4 Establish/ rehabilitate milk collection and processing facilities	# of milk collection centres established /rehabilitated # of milk processing facilities established /rehabilitated	Three fully functioning milk collection centres established in three different Zobas Three milk processing facilities established /rehabilitated	• One milk collection centre at Encode, Zoba Anseba, rehabilitated and handed over to cooperative management • Milk collection centers in Akurdet and Debub regions assessed for their capacity and gaps • Commenced analysis of needs and capacities of processors to define intervention requirements
2.5 Enhanced service delivery and support of institutional actors on climate smart innovation and knowledge management	# of bull studs established # of upgraded AI facilities # of private AI service providers establish	One bull stud established at site of Animal & Plant Diagnostic Centre. Four AI service facilities upgraded. One private AI service provider established	• One AI centre rehabilitated in the previous reporting period • An assessment underway to pilot private AI service provider in Debub

	# of AI straws distributed from cattle improvement centre	10,000 AI straws distributed	• 800 cattle administered through AI
	# of trained AI lab staff and facilities' operatives.	10 staff trained	• 3 (1female) staff trained on sexed semen management and administration • 7 experts and 6 farmers training on AI administration
	# of pilot cattle databases established	One pilot cattle database established	
	# of local cattle breed improvement programmes developed	One fully-fledged cattle improvement centre established with a number of sub-stations	• Shed house constructed, 10 cattle supplied (5 Holstein and 5 Barka) to the cattle breed improvement centre.
	No. of improved and fully functional National Analytical Laboratories	One improved and fully functional National Analytical Laboratory established/improved.	• Lab equipment for NAPHL under procurement
3.1 Gaps in skills and knowledge of State institutions in support of gender- sensitive and environmentally sustainable VC development identified.	Gaps analysis report on knowledge in support of gender-sensitive and environmentally sustainable VC development produced	At least 1 gap analysis report for institutions produced	• Participatory- based detailed gap analysis is being planned by national team supported by SENSE.
3.2 TOT and specialist trainings/mentoring for extension staff in VC approaches and dairy VC interventions completed.	# of trainings materials and guidelines made accessible	Training materials and guidelines made accessible (~200)	
	# of trainers from public and private organisations selected (ToT) for delivery of required training programmes	10 key personnel from public &private sector trained to deliver training (ToT) programmes for the selected value chains	• 23 (6 females)experts from MoA were trained on livestock feed analysis and ration formulation for dairy and beef • 22 experts (4 female) were trained on livestock forage

			production and conservation techniques. • 20 extension staff from Debub and Anseba were trained on silage making and forage conservation strategies, calf starter feeding, as well as practicals on prevalence of sub- clinical mastitis
	# of farmers provided with improved technology and % successfully adopting/using them	800 hub farmers and 40,000 small scale farmers, 70% success rate, Y4	
	# of client days of ToT on CSA provided to strengthen institutional capacity for supporting the selected value chains	1200 client days of training provided by Y4	
	# of participating farmers and other VC actors who received training and extension services	50% of participating farmers and other VC actors who received training and extension services	
3.3 Improved knowledge among public sector staff on market- led CSA value chain development	Curriculum at HAC reviewed based on market- led CSA value chain development	20 courses reviewed and changed to revised curriculum	• Selected educational resource materials for four courses on Dairy Value Chain (DVC), Climate Smart Agriculture (CSA) and Knowledge Management (KM) were provided for final review to HAC. • Work in progress for a further eight courses as part of capacity support for undergraduate module development at HAC. • Teaching and office

		200 graduates completed education with revised curriculum	equipment under procurement for HAC • Laboratory equipment under procurement for NARI and HAC
3.4 Knowledge centres and extension system provided with IT and audio equipment, materials (video, radio programs, documents, posters…)	# of knowledge and skills centres established # of protocols developed for disseminating knowledge and information to stakeholders One Knowledge Management System developed at national level in support of agri-food industry # of publications, posters, audio and video documentaries produced and accessed by type of user (VC actor)	At least one knowledge centre is established at national level At least one protocol developed for disseminating knowledge and information to stakeholders Pilot knowledge management system developed and knowledge accessed readily by institutions and value chain members. Education materials produced and made available in different formats (at least for 13 course modules and 200 for extension)	
3.5 Various knowledge capturing, sharing and learning events (field days, study tours, platform meetings) for VC actors and input/service providers completed	Report on gender sensitive and environmentally sustainable knowledge interventions produced and reviewed # of training courses organised for educational institutions in gender-sensitive VC approaches and interventions	At least one report on gender sensitive and environmentally sustainable knowledge interventions produced and reviewed Two training courses organised for educational institutions in gender-sensitive VC approaches and interventions 70% of staff from	

	# of staff from educational institutions trained in gender-sensitive VC approaches and dairy value chain interventions	educational institutions trained in gender-sensitive VC approaches and dairy value chain interventions	
	No. of students trained in problem-oriented research to support technical, institutional and organizational innovations given to MSc students.	Training in problem-oriented research to support technical, institutional and organizational innovations given to ~20 MSc students and five PhD candidates. Focus will also be on innovation, job creation and CSA	• Eight candidates (2 females) commenced MSc studies in University of Nairobi and three PhD candidates selected by HAC to commence studies in Year 3. • Access to Teagasc websites provided to HAC and NARI researchers • ILRI agreed to facilitate access by NARI to its CGSPACE database
3.6 Promotion (research) interventions developed and reviewed annually	# of research priorities on VC approaches/interventions identified and reviewed annually	Research priorities on VC approaches identified (At least 8 priority research topics agreed and being implemented by end of project)	• Four collaborative research proposals agreed and being delivered jointly by HAC and NARI with support from the international team
	# of research partners signing MOU and partnership with NARI, HAC	MOU and research partnership between NARI, HAC, ILRI & Irish institutions	• Irish and Finish institutions supporting new research projects. Discussions underway with ILRI to secure additional support.
	Development and implementation of a new research plan for NARI and HAC	Applied adaptive research programme implemented on station at NARI and on-farm in the three selected dairy value chain areas.	
	# and type of applied adaptive research programs implemented on- station at NARI and on-farm in the three selected dairy value chain areas	Climate smart research activities embedded into NARI projects.	• Research facilities at HAC and Aklelet research station rehabilitated • Farm development plan prepared by HAC to

	# of climate smart dairy production 'blueprints' developed, available and incorporated in dairy farming systems # of technical publications prepared which underpin the development of MAC for Eritrea.	Three climate smart dairy production 'blueprints' developed, available and incorporated in dairy farming systems Ten technical publications prepared which underpin the development of MAC for Eritrea.	underpin new curriculum and research activities • Solar powered submersible pump and irrigation infrastructure installed at HAC
3.7 Promotional interventions and distribution of materials for(education institutes)completed	New curriculum and teaching material for agriculture graduate students at HAC with a focus on meeting needs of market value chains, innovation support, farm enterprise and CSA implemented # of graduates with improved knowledge on CSA value chain(market led CSA) No. of HAC staff upgraded from BSc to MSc level	New curriculum in place at HAC Y4 200 graduates with understanding of market-led CSA value chains Y5. Six teaching staff upgraded from BSc to MSc level and three to PhD level	• 4 courses supported with books, reference materials and relevant educational materials • Three staff from HAC selected to pursue PhD

4.1 Gender sensitive and environmentally sustainable knowledge interventions identified and reviewed annually.	Report on gender sensitive and environmentally sustainable knowledge interventions produced and reviewed	At least one report on gender sensitive and environmentally sustainable knowledge interventions produced and reviewed	

4.2 Priority gender-sensitive and environmentally sustainable diagnostic studies and lessons learned completed/synthesized.	Knowledge Management System developed at national level in support of agri-food industry # of training materials, publications, posters, audio and video documentaries produced and accessed by type of user (VC actor)	Pilot knowledge management system developed so that knowledge can be accessed readily by institutions and value chain members. # of education materials produced and accessed	
4.3 Priority gender- sensitive and environmentally sustainable action studies and lessons learned completed/synthesized	# of gender- sensitive and environmentally sustainable action studies and lessons learned completed/synthesized.	At least two action studies	
4.4 Commodity specific gender-sensitive and environmentally sustainable impact studies completed	# Commodity specific gender- sensitive and environmentally sustainable impact studies completed.	Two impact studies completed	
4.5 Increased access to project-generated gender- sensitive and environmentally sustainable knowledge	Video, radio programs on interventions, VC approaches and lessons learned prepared and broadcast. Project visits and professional consultation events, project website and social media created and made operational # of publications produced # Conferences /meetings held	# of video, radio programs broadcast (30) # of learning platforms, policy taskforces and professional association events organised (8); Internet-based tools (~3); # of visits made to the project websites and social media # of important comments and suggestions collected and utilised for planning review and improving performance Publications (~20); Use of mass media (periodically ~2times per year);	

		Three conferences/workshops held and four professional association events held.	
Project RBM gender-sensitive and environmentally sustainable impact and outcome M&E completed.	RBM gender-sensitive and environmentally sustainable impact and outcome M&E in place	RBM in place	Project M&E under development with draft M&E plan prepared and training to MoA, Zoba and project staff on project Planning and M&E agreed to commence first quarter of current year

B. ACTIVITIES

We outline full details of activities completed, with links to corresponding outputs, in respect of each of the project's six work packages in the following pages.

Work package 1: Design, implementation, management and co-ordination

During the current reporting period, the team adopted various steps to strengthen project coordination and management, local and international staffing, communications and monitoring.

Coordination and management

With a view to strengthening the project coordination and management and overall quality control, the project initiated a number of initiatives during 2021, the principal one being the fortnightly meetings for all team members. The team held 14 such meetings during the reporting period. During these meetings, WP leaders reported on progress, identified problems arising and proposed solutions. We also examined risks arising that could influence the delivery of activities.

The leaders of WP4 and WP5 also organised regular meetings to discuss progress on research and education activities. The team also put in place a Research Oversight Committee (ROC), comprising team members and external experts, to provide advice and guidance to the Director-General of NARI and the Dean of HAC on the development and management of the joint national Dairy Value Chain Research Programme, including the implementation of a postgraduate research training programme. The ROC will also support the national research team in the identification of future priorities and opportunities, the ongoing training and mentoring of research staff, and the development of clear plans of action to address priorities, integrating activity across research, data, skills and partnerships.

At governance level, the Project Steering Committee, chaired by HE Minister Arefaine, met on two occasions and the Project Management Committee met twice. These regular meetings helped bring greater focus to project activities by reviewing actions undertaken in the previous period and planning for future actions. The meetings also assisted in improving communications and enabling all team members to raise and discuss issues of concern.

Unreliable internet connectivity in Eritrea continues to constrain smooth communication. To overcome this, the project supported MoA's IT center with more bandwidth, which has helped in some respects. At times, the team in Asmara uses internet facilities of some international organizations. Since the ease of COVID-19 restrictions, communication barriers have been mitigated, with staffers of the international team able to visit Eritrea twice within the span of the reporting period.

The project also strengthened its management & implementation capacity by recruiting two international consultants and the secondment of five experts from the MoA to fill critical staffing needs. The team also took steps to bolster project coordination and communication through the introduction of fortnightly meetings for all team members. The team submitted the draft Project Implementation Plan (PIP) during the first reporting period, but following the completion of the Baseline study in August 2021, they submitted a revised version in September 2021.

Project staffing

Project management filled a number of vacancies in the local project team with the support of the Minister for Agriculture, who seconded four staff members on a half-time basis. Posts in the areas of environment and human nutrition remain to be filled. In addition, we were able to replace the expertise on value chain analysis and livestock production through the recruitment of consultants (SENSE).

Communication

The team launched the project website in July (https://www.teagasc.ie/about/international-food-security/current-projects/eritrea/csaride/), and further work is underway to migrate the existing webpages to a new standalone website; to provide for an easy- to- use content management system; and to transfer hosting to its own domain https://csaride.org. The team will be in a position in year 3 to step up the project communication function, resulting from the recruitment of a part-time Communications Officer through secondment from the MoA.

Administration/financial control

The project team will implement the recommendations made in the systems audit and expenditure review undertaken by an external consultant during the reporting period. These recommendations will help strengthen financial control and reporting for the remainder of the project. In addition, the team will undertake regular quarterly financial reporting in year 3 and will introduce six-monthly technical progress reporting.

Work package 2: Project Implementation Plan (PIP)

The project team submitted the initial PIP draft during the first reporting period. Following the completion of the Baseline Study in August 2021, the team revised the PIP and submitted a new draft in September 2021. During this period, we also identified the three target study areas and commenced preparations for the detailed mapping of the dairy value chains in those areas. This work will be completed early in year 3. (**Op 1.1**).

Work package 3: Improved climate smart dairy farming production and productivity

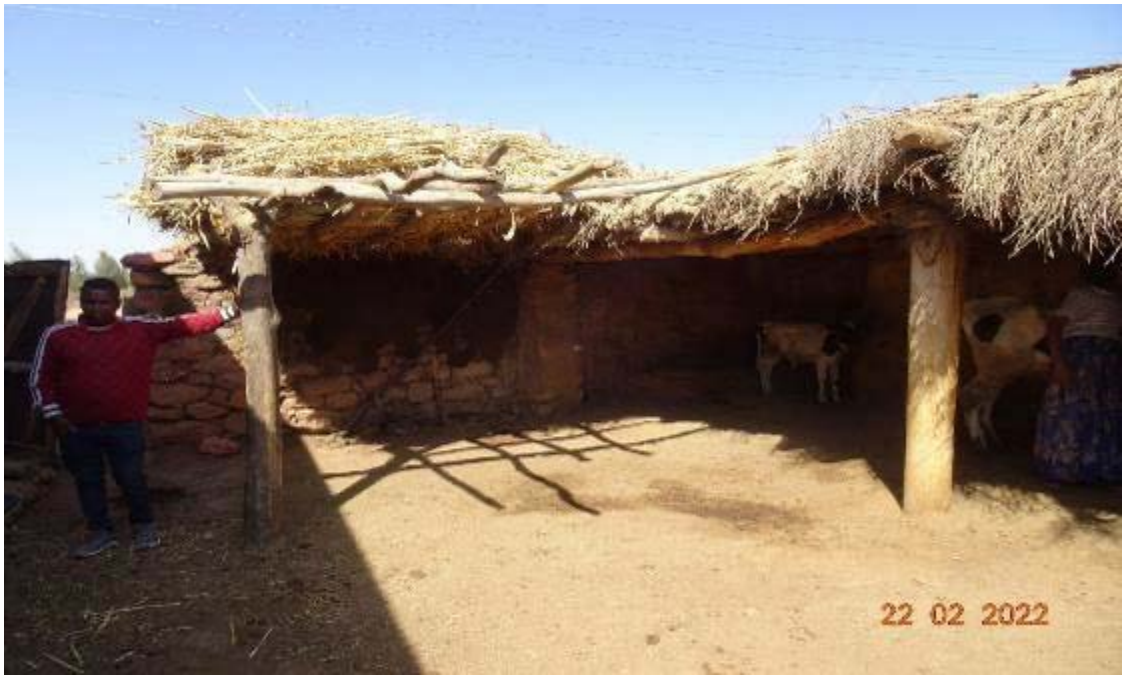
The focus of the work in the reporting period was on the establishment of dairy commodity platforms in the three Zobas. The team also began the process of identifying potential beneficiaries who could be supported through business development services (**Op 1.2**).

The newly appointed consultancy team (SENSE) made a preliminary visit to Eritrea on a fact-finding mission to gather a first-hand understanding of the dairy value chain, to meet the project team, partners and stakeholders in Eritrea and formulate a plan for further research and proposed project interventions for 2022 (**Op 1.2**).

WP3 stresses the need to avail of opportunities for strategic partnerships with other related projects and organisations at work in Eritrea. In this way, and through its multi-level management structure, the project will ensure that the investment in the project leverages resources from these other programmes and projects, strengthens their collective and individual returns and ensure real impact in terms of increased output, added value, better farmer incomes and additional employment opportunities.

In this regard, we are in close communication with IFAD, who plan to implement a large integrated rural development project in Eritrea. There are considerable overlaps between the two projects-at a high level in terms of goals and objectives, and at an operational level in terms of geographic focus, intended beneficiaries and planned activities. As such, there is a strong rationale for the project teams to work together to avoid duplication of effort and to maximise the impact of available resources (**Op 3.6**).

Progress on VC development has been slow due to the constraints identified above, chiefly the COVID-19 pandemic, and delays in getting project partners, staff and experts on board. The project has addressed these constraints and the team is now in place to begin addressing VC challenges directly.



Work package 4: Enhanced organizational capacity and enterprise skills of dairy value chain actors with capacity to adopt/promote new technologies

CSARIDE capacity development focuses on producers and other VC actors, including private/cooperative input/service suppliers and the public sector actors. Preliminary investigations (**Op 2.1**) as well as the recent FAO assessment[1] indicate that these actors have limited capacity to engage in participatory action and research, multi-stakeholder processes

[1] Haile, A. (2021), ***Assessment of Agricultural Innovation System in Eritrea Report,*** FAO.

and market-oriented agriculture, and therefore need specific capacity building. Women's participation in production is also very low, and a particular focus needs to be directed towards meeting their specific needs to enable them participate effectively in new value chains.

In the reporting period, the project has completed different capacity support measures targeting milk processing, AI services, research and teaching facilities, as well as the cattle improvement centre. Accordingly, renovation works were undertaken at Encode milk cooling and collection centre (MCC) comprising renovation of solar power heater, water pipeline and building maintenance (**Op 2.4**). The Ministry of Agriculture (MoA) branch office of Anseba region reached agreement with Keren and Sutur Dairy Cooperatives on the management and operation of the milk collection centre and eight member farmers were selected for the committee to run the centre.

In order to improve the overall DVC and magnify the project impact, the project management has developed a good synergy with ongoing projects funded by IFAD and AFDB. For instance, through the ongoing IFAD project MoA is in the process of procuring a large liquid nitrogen plants (LNP); relieving the CSARIDE from making such investment. Similarly, CSARIDE project has initiated the procurement of mini LNP having a 5.5 litres capacity, which will be installed in Anseba region (**Op 2.5**).

In the reporting period, AI staff inseminated 850 dairy cattle from 4000 doses of Holstein Friesian and Jersey semen, which was procured in the previous reporting period (**Op 2.5**). This output was strengthened further through a series of training events, including training of seven experts from the different Zobas and six farmers in AI administration (. In order to improve capacity in the overall management of sexed semen, three (One female) AI technicians received training on semen collection, processing, storage, and artificial insemination at the National Animal Genetic Improvement Institute of the Ministry of Agriculture, Ethiopia (**Op 2.5**).

Twenty-three (six females) MoA experts received training on livestock feed analysis and ration formulation for dairy and beef and another 22 experts (4 female) were trained on livestock forage production and conservation techniques (**Op 3.2**). IAEA experts delivered this training following a local initiative to synergies different investments. Project management plans to expand this relationship with IAEA.

Work package 5: Enhanced service delivery and support of institutional actors on climate smart innovation, and knowledge management along the dairy value chain

During the reporting period, NARI and HAC agreed to undertake jointly four priority research projects (**Op 3.6**) as part of a national research programme. The management of the two institutions have agreed on joint research teams for each project and the teams have drafted detailed research proposals. The international team members reviewed these proposals, which the individual research teams are now finalising. The research proposals will address:

1. The development of calf starter ration
2. The evaluation of a range of forage crops to meet nutritional needs of dairy cattle

3. The conservation of forages for use during the dry season period
4. Understanding the prevalence and risk factors of sub-clinical mastitis and its control measures.

The MSc candidates in the UoN will address components of these proposals in their research theses (**Op 3.5**).

The international review of the research proposals undertaken by IT members supports the capacity development process for HAC and NARI. The international organisations are further supporting the research function by providing access to digital libraries and international bibliographic databases (**Op 3.6**).

A key element of the research capacity building is the training of 28 MSc students and 3 PhDs during the course of the project. To date, ten staff members from NARI and MoA have registered for Masters' degrees in the University of Nairobi and a further seven have been accepted for registration by the University (**Op 3.5**). Four of the candidates have completed their course work and are now planning their research theses. IT members are supporting this process by acting as part of the thesis supervisory teams (**Op 3.5**).

The Research Oversight Committee (ROC) is instrumental in supporting the identification of research priorities and the ongoing training and mentoring of research staff (**Op 3.6**).

The IT identified 12 HAC undergraduate courses for curriculum review and provision of educational resource materials. In the reporting period, the team provided selected educational resource materials for four courses on Dairy Value Chain (DVC), Climate Smart Agriculture (CSA) and Knowledge Management (KM) (**Op 3.3**).

To enhance the teaching and research capacity of HAC, a purchase request for teaching and office equipment, including overhead projectors, desktop and laptop computers, is in the process of procurement. UCD is also supporting HAC to develop a College farm plan for teaching and research (**Op 3.3**).

In order to strengthen the research and teaching capacity of HAC, the College authorities completed some renovation works on the farm, including the installation of a solar powered submersible water pump while they renovated the sprinkler irrigation infrastructure to secure a sustainable supply of animal feed (**Op 3.6**).

HAC has made the field- level preparations for the joint research initiative, including renovation of the cattle barns, and it has reserved 3 ha of land for forage production to grow alfalfa by irrigation. In the reporting period, the College planted 11 hectares of land with groundnuts (1 ha), sorghum (3 ha) and pearl millet (7ha) and the biomass will be used as animal feed. They have also made available 5 ha of land as grassland to be cut and used for hay and 1 ha of land is currently planted with maize to be used for silage (**Op 3.7**).

The National team is undertaking a preliminary study to install a solar powered submersible pump & irrigation infrastructure for forage -based dairying at the Begait cattle improvement centre (Aklelet research site). The centre team has constructed a simple animal shade house and procured 5 Holstein and 5 Barka cows of predetermined phenotypic characteristics (**Op 2.5**).

A research team at NARI conducted an observational trial on one type of calf starter, which was developed during the pilot project on calves born from the NARI dairy herd. The team demonstrated the results to some farmers residing around Dubarwa area (**Op 3.5**). Another kind of calf starter was also formulated using different feed ingredients and is being tested on NARI neonatal calves. Moreover, the team also completed a manual on general feeding practices of calf starter for use by the extension agents as a guidance (**Op 3.5**).

In addition, NARI has maintained 1.3 hectare of established forage in the model farm for grain-based calf starter observations (**Op 3.4**). Biomass production is being recorded on daily basis. Furthermore, as part of the ongoing research on evaluation of a range of forages for meeting nutritional needs of dairy cattle, data of biomass and plant height of sweet potato varieties have been collected for five harvesting cycles.

Twenty extension staff from Debub and Anseba were trained on silage making and they provided a demonstration on the conservation strategies and calf starter feeding, (**Op 3.2**). Likewise, about 20 dairy farmers from Maekel and Debub regions have been trained to produce silage from corn fodder and a mixture of 50% corn fodder and 50% alfalfa using plastic drums (**Op 3.5**). Twenty-one farmers participated on the demonstration on grain-based calf starter held at AdiGheda, Sub Zoba Dubarwa (**Op 3.5**).

Figure Renovated Solar powered irrigation infrastructure and Maize crop plant at HAC farm

Work package 6: Increased access to information and knowledge on CSA practices, tools and approaches for the wider public

The overall objective of WP6 is to facilitate the promotion and dissemination of principles and good practices for the development of dairy value chains beyond the study areas in Eritrea. In the reporting period, CB and KM (communication) experts seconded for the project have prepared their proposal, which is under review by the WP leader and relevant team. Further, a proposal for capacity needs assessment submitted by the CB expert is under review and consideration for synergising the study with efforts of the VC consultants recruited is being discussed.

Cows at NARI Research Centre

Explain any problems (e.g. delay, cancellation, postponement of activities) which have arisen and how they have been addressed (if applicable)

As we have already indicated, the biggest unforeseen problem encountered was the outbreak of Covid-19 in mid-March 2020 and the mitigation measures adopted by governments globally and in Eritrea.

In addressing this problem, the PC wrote to the EUDE on 28 April requesting a one-month extension to the PIP, which was granted on 30 April. While work on the ground came to a halt in March, the project partners continued to work on the PIP documentation and submitted a draft PIP in June.

In the absence of international travel and in-country movement, the project used Zoom and other virtual media to communicate and to agree on the various activities that we described earlier in this report.

The Covid epidemic continued to impact on our capacity to implement key VC actions in the early months of the current reporting period. As reported in the first interim report, progress was also hampered by the death of the project livestock expert (Dr Azage Tegegne) and the departure of the dairy value chain expert (Dr Seamus Crosse). Both experts have now been replaced.

List any risks that might have jeopardised the realisation of some activities and explain how they have been tackled

The project team included a Risk Register in Annex 1 of the original grant application form: the team updated the Register in the draft PIP documentation, which they submitted to EUDE in June 2020. The revised Register identified Covid-19 as a new operational risk for the future and listed the following mitigation measures:

- Maintain ongoing communication with EU Delegation Office
- Build strong communication network with teams in Eritrea
- Agree revised implementation plans with EU Delegation and partners/associates
- Prioritise projects that can be implemented by national/Zoba teams with less international inputs.

The Register also listed risks relating to inability to recruit local project staff and staff turnover as further operational risks. We have referred to problems arising from staff turnover in the previous section. We have already had to deal with risks associated with lack of expertise in Eritrea and are dealing with those in the short term through international recruitment. In the longer term, these risks are being addressed through capacity development of local staff.

2.3. Log-frame matrix updated

The updated log-frame has been loaded on the OPSYS system.

2.4. Updated action plan

Please provide an updated action plan for the future activities of the project[2]

The Year 3 Action Plan is attached herewith.

[2] This plan will cover the financial period between the interim report and the next report**.**

3. Beneficiaries/affiliated entities, trainees and other cooperation

3.1 Assessment of the relationship between the beneficiaries/affiliated entities of this grant contract

There are no beneficiaries/affiliated entities of this grant contract.

3.2 Assess the relationship between your organisation and State authorities in the action countries? How has this relationship affected the action?

The relationships between Teagasc and the Eritrean State authorities are excellent. Teagasc has a particularly strong and trusting relationship with all of the key State authorities, including the MoA, NARI, Extension Service and HAC, having worked on various projects in the country for over a decade. In that period, as well as directly working on the ground, Teagasc has provided five postgraduate fellowships to Eritrean students to enable them complete postgraduate degrees in Ireland (One PhD and four MSc). In addition, Teagasc has provided short-term training for a further four Eritrean researchers in Ireland. The organisation has also invited staff from Eritrean State bodies and the private sector to Ireland for short-term training and welcomed the Minister for Agriculture to Ireland on an educational visit in 2018. The relationship with the MoA is further strengthened in that the PM is on secondment from the Ministry.

These relationships continue to have a very positive impact on the implementation of the action, as they mean that the actions will be built on existing strong foundations, including deep knowledge of the country, of its agriculture and of the key decision makers in both the public and private sectors. In addition, they mean that we will be working directly with some key people whom we have supported for postgraduate and short-term training in Ireland and in other countries**.**

Similarly, VITA/EIDP has over twenty years' experience of working in Eritrea and Vita is considered as a key player, vital in responding to emerging needs and addressing programmatic gaps not always covered by other development partners. VITA, with its long years of strong partnerships with the Government, continues to be a trusted development partner and Vita/EIDP's comparative advantage on understanding national context is a strong advantage to the consortium partnership.

Teagasc, SHA and VITA have jointly worked in the EIDP program for the past three years on seed system improvement, the Dubarwa pilot dairy project and other natural resource programs targeting key technology transfer, technical advice and sharing of best practices between Ireland and Eritrea as relevant mechanisms for addressing food and nutrition security.

The State authorities are associates to the contract and are playing an active role in the implementation of the project.

At the national level, the Eritrea-Ireland Development Partnership Office (EIDP)[3] is providing all necessary support for managing project activities and interlocking between international and national actors. The EIDP has the experience, expertise, local knowledge, relationships and resources to ensure an effective implementation partnership with the local stakeholders.

[3]EIDP is a partnership structured under an MoU between MoA, Teagasc, Vita, and SHA, with an office in Asmara.

3.3 Describe your relationship with any other organisations involved in implementing the action:

- Associate(s) (if any)
- Contractor(s) (if any)) Consultants?
- Final beneficiaries and target groups

All of the Associates with whom we are working, with one exception, belong to the public sector and we have referred to them above: the exception is the National Union of Eritrean Women (NUEW).

In Eritrea, women contribute a considerable amount of labour in the agricultural production system, estimated to average 80%. There is a growing concern that women and other disadvantaged groups may miss the benefits arising from the enhancement of market-oriented production and marketing of high-value commodities. Gender concerns will, accordingly, be a primary concern of the project implementation phase, with the overall objective of empowering women and other groups to participate more fully in all aspects of the dairy value chain and thereby contribute to the attainment of project outcomes and outputs. As such, it is important that the project link in with the NUEW and other women's groups from the outset.

Teagasc has worked indirectly with the NUEW, but one of our key partners, Vita, has a long history of working with women's groups in Eritrea, including the Eritrean Women in Agribusiness Association (EWAA). Vita has empowered rural women through the provision of firewood-efficient locally made cooking stoves, "*Adhanet*", and enhanced access to clean source of water by maintaining manually operated water pumps. These interventions have contributed to the reduction of firewood consumption and negative health impacts

The target groups will be all the actors along the dairy value chain, with a new emphasis of involving the private sector. These include:

1. resource-poor livestock farmers;
2. private and cooperative input and output market agents and service suppliers, including milk collection and processing entities, as well as AI and veterinary services;
3. small scale entrepreneurs (e.g. National Union of Eritrean Women) and
4. public-sector bodies including the National Agriculture Research Institute (NARI), Hamelmalo Agricultural College (HAC), MoA (mainly AED), and regional governments (Zobas).

In addition, the project will affect the following final beneficiaries:

1. consumers of the new high-value dairy products who will enjoy greater availability of more cost-effective, quality products; and
2. national economy which will benefit from increased employment, additional food exports and reduced food imports.

Teagasc has established excellent relationships with all of the private sector target groups over the past decade. We are familiar with the issues and know key leaders involved. Based on our experience of agricultural development in Ireland, our approach to this project will be to:

- create a multi-stakeholder partnerships that will empower smallholder dairy farmers;
- facilitate private sector investment along the dairy value chain;
- strengthen human and institutional resources of the public research and extension services to accelerate the impact of innovation at scale, particularly in the context of the severe climate change impacts expected in Eritrea.

As experience from other countries has shown, to be successful in developing a value chain, innovation systems approaches are required that include, from the start of the diagnostic process, a wide range of the stakeholders who participate in joint problem identification and analysis. This enables expert and research knowledge to be integrated with local and indigenous knowledge, market intelligence (including prevailing regulatory and policy environments) and consumer demands. A fully participatory approach will be adopted to developing a menu of interventions that can be applied along the value chain and in the testing, adaptation and validation of those options.

This project will involve working local government units, as the focus will be on three study Zobas. Again, Teagasc and its partner Vita are familiar with the local government structure and institutions in Eritrea and have established some good working relationships over the years.

3.4 Where applicable, outline any links and synergies you have developed with other actions.

CSARIDE will build on the work invested over a number of years in a pilot dairy project, the Dubarwa Pilot Community Dairy Project, funded by the Irish Government and Teagasc.

This project was designed to improve local food security through access to reliable source of milk and improved household incomes by implementing a cooperative dairy model that can be replicated across Eritrea. Maximum attempt was made to introduce better performing dairy cattle breeds that are adaptable to the climatic conditions of the area, and improving the available forage resources. This project leveraged the expertise of Teagasc using the very best of Irish expertise in dairy herd production and management together with Ireland's experience of cooperative development, as well as its expertise in research, extension and farmer capacity building to help Eritrean farmers establish successful, modern dairy farms.

The project has helped improve farmers' and extension agents' knowledge and skill on dairy husbandry and has demonstrated that forage- based dairy production is suitable in small-scale village level farming systems in Eritrea provided that appropriate breed is selected. In addition, it has built good expertise in NARI in all aspects of forage production and has created a good floor to strengthen the research-extension-farmers linkage at all levels.

Similarly, IFAD as a major development partner in Eritrea, has made considerable investments in the past 20 years to boost agricultural production, enhance the resilience of smallholder farmers and contributed to the HH improved food and nutrition security through different program portfolios including PCRRDP and NAP projects. Currently, the MoA has signed a new five-year contract (starting mid-2020) with IFAD towards implementation of the Integrated Agriculture Development Project (IADP). The CSARIDE project will draw lessons from previously implemented projects and work synergistically with ongoing programs for better outcome for enhanced CSA dairy value chains that impact for better food and nutrition security and youth employment creation.

Further, the PC has initiated consultation with IFAD Rome to encourage synergy between the IADP and CSARIDE, both in capacity development, targeting and synergizing larger investment for better outcome for development of CS dairy value chains, in particular, and the livestock development sub- sector in general.

CSARIDE will also add value to previous investments made by the EU in support of the Eritrean agriculture sector. In particular, the 10th EDF project 'Support to Agriculture/Food Security in Eritrea' has made considerable investments in support of dairy sub-sector through dairy cattle provision as well as investments in milk cooling facilities and strengthening dairy associations in Zobas Maekel, Gash Barka and NSR. Lessons drawn from the implementation of these actions will be systematically collected and documented for further learning.

We are building links and synergies with the ongoing TAP/FAO DeSIRA-funded project. So far, we have held a number of virtual meetings with FAO HQ in Rome and with FAO representatives in Asmara. As a result, both parties are fully aware of each other's DeSIRA projects and are fully committed to working together to ensure that the DeSIRA funding is used in the most effective manner. Besides, the PM is a member of the Country Project Team (CPT) of TAP-AIS and has participated in several virtual team meetings and related activities. Furthermore, the EU 10th EDF funding (Euro 41 million project) that focused on supporting the agricultural sector has contributed a lot in strengthening the dairy industry through the supply of equipment to dairy cooperatives, provision of training and acquisition of various veterinary supplies and stand-alone photo voltaic materials.

3.5 If your organisation has received previous EU grants in view of strengthening the same target group, in how far has this action been able to build upon/complement the previous one(s)? (List all previous relevant EU grants).

This is the first grant contract with the lead applicant. However, the co-applicants (SHA and VITA), as well as the MoA, have implemented a number of collaborative projects. CSARIDE will draw lessons from earlier projects implemented in the sector, while also creating synergies with on-going investments.

3.6 Where applicable, include a traineeship report on each traineeship which ended in the reporting period to be prepared by the trainee including the result of the traineeship and assessment of the qualifications obtained by the trainee with a view to his/her future employment.

4 Visibility

In accordance with Article 6 of the general conditions applicable to European Union (EU)-financed grant contracts for external actions[4], the project beneficiaries will publicise the role of the EU in financing the project, and all publicity measures will comply with the specifications set out in the EU's Communication and Visibility Requirements document.[5] In particular, under Article 6.2 of the general conditions, the beneficiary has prepared a communications plan and will report on its implementation under Article 2. In particular, the beneficiaries will comply with the requirements to display the EU emblem on project publications, websites etc., along with appropriate text. The project partners will also inform

[4] https://ec.europa.eu/clima/sites/clima/files/paris_agreement/docs/annex_g_ii_general_conditions_en.pdf

[5] https://ec.europa.eu/europeaid/sites/devco/files/communication-visibility-requirements-2018_english.pdf

local authorities and relevant stakeholders that the action is being implemented with EU financial support.

The European Commission may wish to publicise the results of action. Do you have any objection to this report being published on the website of DG International Cooperation and Development? If so, please state your objections here.

NO.

Name of the contact person for the action:	Dr Lance O'Brien
Signature:	
Location:	Teagasc HQ, Oak Park, Carlow, Co Carlow, IRELAND
Date report due:	02/04/2022
Date report sent:	01/04/2022