

Scoping study to strengthen the Technical Vocational Education and Training in the Dairy Sector in East Africa



By Richard Hawkins, Mariëtte Gross and Harm Holleman



Disclaimer

This report was commissioned by the Netherlands Ministry of Agriculture, Environment and Food Quality. However, the content and opinions in this report are the responsibility of the authors, and do not reflect the official position of the Ministry.

Table of Contents

Acronyms.....	iv
Executive Summary	vi
1 Context and Objectives	1
2 Methodological Approach	2
3 EA Dairy Industry and Labour Market Needs	3
3.1 Overview of dairy sector in East Africa	3
3.2 Dairy development in East Africa.....	3
3.3 Labour market needs in the EA dairy sector.....	5
4 Current Dairy Training in East Africa	6
4.1 “Informal” Training	6
4.1.1 Practical Dairy Training Farms.....	6
4.1.2 Private Advisory/Training Companies.....	7
4.1.3 Public organizations offering short-term training	8
4.1.4 Training materials and modules.....	9
4.2 Vocational (ATVET) Programmes.....	11
4.2.1 Kenya.....	11
4.2.2 Uganda	13
4.2.3 Ethiopia	14
4.2.4 Tanzania	16
4.2.1 Rwanda.....	17
4.3 Academic (BSc and Postgraduate) Training	17
5 TVET Development in East Africa	21
5.1 Kenya.....	21
5.2 Uganda	22
5.3 Ethiopia	23
5.4 Tanzania	24
5.5 Rwanda	25
5.6 Regional TVET needs.....	25
6 NL Interests and Roles in EA Dairy Training	27
6.1 Netherlands Embassies.....	27
6.2 The Netherlands Nuffic Programme.....	27
6.3 Netherlands East Africa Dairy Partnership	29
6.4 Borderless Network (East Africa table).....	29
6.5 Dairy Training Centre	30
6.6 Private Sector.....	31
7 Options for Support to Practical Dairy Training	32
7.1 Potential intervention areas	32
7.2 Potential project options	35
7.2.1 Integrated regional project	36
7.2.2 Individual national/institutional projects	36
7.2.3 Regional project linked to separate national projects.....	37
Annex 1: Terms of Reference, Dairy TVET Scoping Study	39
Annex 2: List of persons interviewed	43
Annex 3: Overview of Dairy Sector, E. Africa	46
Annex 4: Dairy development programmes in E. Africa	48
Annex 5: Nuffic (NICHE/Innocap) Dairy and selected TVET Projects	51
Annex 6: Suggested blended learning modules	53

Acronyms

2SCALE	Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship Project (Africa-wide)
ACE2	Africa Centres of Excellence Project (East Africa)
AFRISA	Africa Institute for Strategic Services and Development (Uganda)
AHITI	Animal Health and Industry Training Institute (Kenya)
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ATTSVE	Agricultural Transformation Through Stronger Vocational Education, Ethiopia
ATVET	Agricultural Technical Vocational Education and Training Institute
BMGF	Bill and Melinda Gates Foundation
BTVET	Business, Technical and Vocational Training
CAADP	Comprehensive Africa Agriculture Development Programme
CAVM	College of Agriculture, Animal Sciences and Veterinary Medicine (Rwanda)
CBET	Competency-Based Education and Training
CDACC	Curriculum Development Assessment and Certificate Council (Kenya)
CoVAB	College of Veterinary Medicine, Animal Resources and Biosecurity, Makerere University (Uganda)
CUE	Commission for University Education (Kenya)
DANIDA	Danish International Development Agency
DDA	The Dairy Development Authority, Uganda
DIT	Department of Industrial Training (Uganda)
DTC	Dairy Training Centre (Netherlands)
DTI	Dairy Training Institute (Kenya)
EA	East Africa
EADD	East Africa Dairy Development Programme
EASTIP	East African Skills Transformation Investment Project
ECAATP	Eastern and Southern Africa Agriculture Transformation Project
EDGET	Enhancing Dairy Sector Growth in Ethiopia (Project, Ethiopia)
EMDIDI	The Ethiopian Meat and Dairy Industry Development Institute
EMPIA	Ethiopian Milk Producers Industry Association
EP	Eldoret Polytechnic
ESADA	Eastern and Southern Africa Dairy Association
EU	Egerton University (Kenya)
FAO	Food and Agriculture Organization of the United Nations
FTVETA	Federal Technical and Vocational Education and Training Agency (Ethiopia)
GIZ	German Development Agency (<i>Gesellschaft für Internationale Zusammenarbeit</i>)
GUCD	Gulu Country Dairy Research Farm and Dairy Business Training Centre (Uganda)
IFAD	International Fund for Agricultural Development
INES	Institute of Applied Sciences (Rwanda)
HCL	Happy Cow Ltd (Kenya)
HE	Higher Education
KAVES	Kenya Agricultural Value Chain Enterprises Project
KMDP	Kenya Market Led Dairy Project
LFSDP	Livestock and Fish Sector Development Project (Ethiopia)
L-MIRA	Livestock Micro Reform in Agribusiness Project (Ethiopia)

LITA	Livestock Institute Training Agency (Tanzania)
MinBuZa	Ministerie van Buitenlandse Zaken, the Netherlands
MinLNV	Ministerie van Landbouw, Natuur en Voedselkwaliteit, the Netherlands
MoALF	Ministry of Agriculture, Livestock and Fisheries, Kenya
MoES	Ministry of Education and Skills (Uganda)
MoLF	Ministry of Livestock and Fisheries (Ethiopia)
MoLDF	Ministry of Livestock Development and Fisheries (Tanzania)
NACTE	National Council for Technical Education (Tanzania)
NAGRC	The National Animal Genetic Resources Centre and Data Bank (Uganda)
NARO	National Agricultural Research Organization (Uganda)
NEADAP	Netherlands East Africa Dairy Partnership
NABC	Netherlands-African Business Council
NICHE	Netherlands Initiative for Capacity development in Higher Education Programme (Netherlands)
MAK	Makerere University (Uganda)
UNCHE	Uganda National Council for Higher Education
NGO	Non-government organization
NICHE	Netherlands Initiative for Capacity development in Higher Education
NL	the Netherlands
OC	Occupational Competencies
OKP	Orange Knowledge Programme (Nuffic, the Netherlands)
OS	Occupational Standards
PDTF	Practical Dairy Training Farm
PPP	Public Private Partnership
RDDP	Rwanda Dairy Development Project
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SAGA	Semi-autonomous government agency
SEAD	Strengthening Education for Agricultural Development Project (Rwanda)
SHMDP	Southern Highlands Milkshed Development Project (Tanzania)
SKY	Skilling Youth for Employment in Agri-business Project (Uganda)
SNV	Netherlands Development Agency
SSUP	Support to Skilling Uganda Strategy Project (Uganda)
TIDE	The Inclusive Dairy Enterprise Project (Uganda)
TNA	Training Needs Assessment
TOR	Terms of Reference
TVET	Technical and Vocational Education and Training
TVETA	TVET Authority (Kenya)
TVETI	Federal TVET Institute (Ethiopia)
UEAB	University of East Africa, Baraton (Kenya)
UGAPRIVI	Uganda Association of Private Vocational Institutions
UNCHE	Uganda National Council for Higher Education
UoN	University of Nairobi (Kenya)
USDP	Uganda Skills Development Project
UVQF	Uganda Vocational Qualifications Framework
VETA	Vocational Education and Training Authority (Tanzania)
WDA	Workforce Development Authority (Rwanda)

Executive Summary

1. ***Dairy is economically important in the East African region***, and considerable investments are being made in the sector by national governments, with the support of multi-lateral agencies (e.g. World Bank, IFAD) and bi-lateral development partners (e.g. Netherlands, Denmark, Sweden). While most (about 85-95%) of the milk produced in the region does not enter commercial value chains which involve processing, being consumed on-farm or sold as “raw milk”, national governments are emphasizing the development of the commercial sector in strategic agriculture, livestock and dairy development plans.
2. ***The Netherlands government, green education institutes and the private sector have been major players in dairy development in the region***. EKNL programmes have focussed particularly on commercial milk value chains in Kenya, Uganda and Ethiopia. Through Nuffic and the NICHE programme, The Netherlands has supported specific higher education and training organizations, many with a focus on dairy education and training. The Netherlands East Africa Dairy Partnership (NEADAP) intends to support dairy development in the region, with a particular focus sharing experience and lessons learned on key themes of fodder, milk quality, and cooperative development. The Netherlands private sector sees significant opportunities to invest in the dairy chain in the region, which will in turn provide increased incentives to farmers; it also has a key role to play in supporting practical dairy training.
3. ***Both public and private stakeholders in the dairy sector agree that skills development is crucial***. Dairy industry stakeholders (commercial farms, processors) universally agree that current graduates from both TVETs and universities typically lack practical skills, even if they have been exposed to the relevant theory. While occupational standards (OS) and relevant curricula for practical, competency-based training (CBET) are being developed in several countries (albeit with room for improvement), the lack of instructors with expertise in delivering CBET curricula, as well as suitable facilities and infrastructure at colleges and universities (farms, processing plants, with comparable standards to the best commercial businesses), remain key limitations.
4. ***Labour market skills requirements in the dairy sector are relatively well defined***. A number of studies have identified dairy related job and competency profiles. Government approved Occupational Standards (OS) have been developed for dairy farm manager (production), processing plant manager in Kenya and Ethiopia (at least). Additional OS are planned for e.g. feed processing, cooperative management (Ethiopia). Component skills in specific areas include animal husbandry, milk handling, business and marketing, organizational management. While there is a need for career development through formal certificate, diploma and bachelor qualifications, there is an even greater need and demand for continuing professional development and skills upgrading through short courses.
5. ***A great variety of organizations currently offer, and/or are actively developing plans for dairy training and education***. Public and private universities, typically offer BSc programmes in general agriculture or livestock which include dairy as component courses, but some also offer training at

diploma, certificate and short courses. Agricultural TVETs – including polytechnics and agricultural colleges, both private and public - typically offer similar programmes at certificate and diploma (levels 1-5), and also short courses for skills upgrading and continuing professional development. NGOs, research organizations, private training organizations, and industry players (e.g. processors, professional associations, dairy development authorities or boards, research organizations) commonly offer or are planning to develop short courses (e.g. 1 -2 weeks, sometimes up to 3 months), focussing on practical training in aspects of dairy production, processing, agri-business and dairy extension. With very few exceptions, these short courses are not formally recognised or accredited by TVET authorities.

6. The formal TVET sector in East Africa has developed considerably in the last 1-2 decades. *All countries now have TVET policies in place, but structures, procedures and capacities for developing and delivery of CBET, and accreditation mechanisms are still being developed for both national and institutional levels.* National educational (university and TVET) policies notwithstanding, it is too simplistic to assume that all or even most practical dairy training will be undertaken by the formal TVET institutes in the near future. Universities, polytechnics, agricultural colleges and industry players are all offering or intending to offer practical training and short courses in dairy production, processing, or extension (ToT). This is a fast-evolving area, with considerable investments planned in all countries for new training institutes, facilities and programmes in dairy. In many cases, these different actors interact or collaborate to offer training and education, and so it is more realistic to view this as an integrated skills development “system”, rather than as distinct “vocational” and “academic sectors represented by colleges and universities, respectively.
7. Given the above, Netherlands support for to a few specific organisations (e.g. as previously provided under the Nuffic NICHE programme), either at regional or national level, is unlikely to have a widespread and sustainable impact on the regional dairy sector. More cost effective and with *better potential to have impact at scale would be to support a range of interested training organizations* (including TVETs, universities, and sector organizations, both private and public sector based) to more effectively deliver practical and/or CBET curricula which have either now been formally approved or are being developed, so that graduates have the skills needed.
8. *The Netherlands has an advantage and the capacity to develop practical, blended-learning materials for the dairy sector.* With adaptation to specific local conditions, curricula and languages (building on the practical modules already in existence in each country), a generalised framework could greatly assist the variety of educational and training institutes to implement practical and/or CBET programmes already in operation or planned. Rolling out such materials at regional level, with initial pilots at key training institutes in each country, would alleviate the considerable costs of further curriculum development, improve the effectiveness of current and future training, and contribute to developing regional quality standards in dairy CBET. All training organizations and stakeholder visited expressed interest in such support and the concept of blended learning materials.

9. There is considerable investment in the region to support education and especially TVET development; the Netherlands does not have a comparative advantage in attempting to lead these processes. However, there are *areas where Netherlands partners can usefully support these processes when specifically related to the dairy sector*, including:
- a) **Supporting linkages** between industry stakeholders and training institutes, to: 1) improve the definition of OS, Occupational Competencies (OC) and CBET curricula; 2) offer facilities for student practical sessions (attachments and internships), and 3) explore mechanisms for financing training through industry levies;
 - b) **Supporting trainers** at the current Practical Dairy Training Farms to become independent training and/or advisory companies;
 - c) **Developing the competencies of trainers** to design and deliver CBET in dairy (i.e. training of instructors);
 - d) **Developing the competencies of training** institutes to assess dairy CBET delivery (i.e. as “assessor institutes”);
 - e) **Facilitating the accreditation of dairy training programmes** with national accreditation mechanism
 - f) **Developing the competencies of national TVET authorities** to develop and approve dairy curricula;
 - g) **Developing dairy farms and processing facilities of training organizations** to ensure that they serve as models of the dairy industry.
10. SNV, together with Wageningen University Research, the Friesian and Agriterrra, has presented a proposal to MinLNV to support NEADAP for the period 2018-2020. The proposal aims to support sustainable development of the dairy sector in East Africa through promotion of innovations and good practices by EA and NL stakeholders, and generate evidence-based policy recommendations. Proposed activities include the establishment of a e-learning platform and blended learning modules. *Proposals developed from this scoping study should be closely integrated with NEADAP activities.*
11. *There are both advantages and disadvantages to a dairy skills development project* at regional level, as opposed to one or more national projects. Advantages include:
- **the greater potential for scaling and development impact**, resulting from the larger overall budget (from pooling different resources), greater synergy with existing national programmes, and greater synergy between the different activities proposed;
 - **visibility** of the Netherlands as a “preferred partner” for dairy development in the region;
 - **the sharing of the significant costs** of developing high-quality, blended-learning materials, which would be difficult to justify for one single country;
 - **the sharing of experiences and relative national strengths** (e.g. development of private training/advisory services in Kenya; development of CBET instructors and TVET systems in Ethiopia; institutional roles of e.g. Dairy Board in Kenya, Uganda; quality assurance mechanisms in Kenya; linkage of PDTFs with formal educational sector in Uganda, etc.);
 - **the linkage with regional projects** such as those educational projects and centres of excellence supported by the World Bank (e.g. ECAATP, EASTIP, ACE2).

Disadvantages of a regional project include the greater project preparation and transaction costs (involving negotiation and coordination *between* different embassies and multiple funding agencies and mechanisms, which may have specific requirements in terms of policies, country funding allocations, selection of implementing agencies, accounting requirements, etc.).

12. *Three options for potential project options or modalities are discussed:* a fully integrated and comprehensive regional project; independent national projects; and a “mixed” model comprising a regional project to support national projects (including those financed by the Netherlands as well as other donors and/or national governments). The activities which could be undertaken, and the financing possibilities of each model are briefly discussed. On the basis of the advantages and disadvantages discussed, it is recommended that a regional project (either as option 1 or 3) be strongly considered by MinLNV and other Netherlands stakeholders. An initial estimate of the cost of such a regional project (covering 3 countries) is EUR 3m. Additional funding would allow the project to cover all 5 countries and have greater impact.

1 Context and Objectives

The Netherlands' Ministries of Foreign Affairs (MinBuza) and Agriculture, Nature and Food Quality (MinLNV), in the context of the "From Aid to Trade" policy, intend to strengthen their contributions to dairy development in East Africa and profile The Netherlands as the "preferred dairy development partner" in the region.

The Netherlands government currently provides considerable support to dairy development in East Africa. Dairy programmes financed through the Netherlands Embassies/DGIS include those in Ethiopia (EGDET, DairyBISS), Kenya (KMDP, 3R Kenya Project) and Uganda (TIDE). In addition, a range of private companies from the Netherlands are active in the dairy sector in East Africa, with interests in feed manufacturing, fodder commercialization and milk processing, among others.

During a key 3-day workshop in 2014 in Kampala, key dairy stakeholders from the region came together to identify a number of common themes that could benefit from East Africa-wide cooperation ([Makoni et al, 2014: "White Gold: Opportunities for Dairy Sector Development in East Africa; Wageningen-CDI](#)). Among these themes was capacity strengthening, leading to further stakeholder workshops in Rwanda, Tanzania and Kenya later in 2014 ([Vernooij et al, 2015: Visions on dairy capacity building for East Africa; Wageningen-Livestock Research](#)).

At a later "round table" with all relevant stakeholders from the Netherlands in July 2017, organized by the Netherlands-African Business Council (NABC), four these themes were singled out as relevant for a Netherlands-led regional Dairy East Africa programme: milk quality, fodder, farmer organisation, and Technical Vocational Education and Training (TVET). Further workshops were held in September 2017 and January 2018, to discuss and integrate these themes, leading to a proposal (February 2018) for a 2-year project to be implemented by the Netherlands East African Dairy Partnership (NEADAP; led by SNV, in collaboration with WUR, the Friesian and Agriterro), which will enhance East Africa wide learning and scaling of best practices around the key themes of milk quality, forage and inclusive business models.

The new "Orange Knowledge Programme" (OKP) of Nuffic, funded by MinBuZa, provides a potential opportunity to support the systemic change needed in dairy TVET in the different East African countries. This will require strong buy-in and support from relevant training institutions and government departments in East African countries, as well from private parties in the Netherlands and East Africa. MinLNV therefore commissioned a "Scoping Study" to assess the need, relevance, priorities, limitations and possible modalities of an East African Dairy TVET project, with the ambition to formulate a project or programme that initiates and contributes to the systemic change considered necessary to enable and ensure that TVET systems and services are based on the needs of a professional, competitive, sustainable and inclusive dairy sector. The study was tasked to look at the public responsibilities for TVET, especially at system level, the initial education/training, the scope and options for the private parties in training & coaching, cost recovery options and business models. Also, the need and prospects of PPP-arrangements were to be included ([Annex 1 – TOR for the Scoping Study](#)). *This report presents the results of this scoping study.*

2 Methodological Approach

The scoping study focused on current activities in the 2 sectors: dairy development and TVET.

In terms of dairy development, an attempt was made to identify the major initiatives in the East African region, and especially their activities in terms of training: who, what, how, where and when. In particular, differences in training needs as related to the contexts of the different countries were noted, and these related to the differences in commercial development of the sector (small-scale informal and raw milk value chains vs commercial, processed milk product value chains). Attempts were also made to cover and evaluate the spectrum of training needs, ranging from in-service or continuing professional skills upgrading and short courses, to the longer vocational and academic programmes (certificate, diploma and degree level courses).

In relation to TVET programmes, the importance (or not) and mechanisms of formal accreditation of training courses, programmes, trainers and institutes, was investigated. The relevance of such accreditation to longer-term sustainability of the educational programmes and institutional development within the TVET sector was also considered. Finally, the relative interests of both public and private training institutes in East Africa (accreditation, financial structure), and those of potential partners in the Netherlands (e.g. DTC and the “Franchise Model”) were reviewed.

The initial phase of the scoping study - a desk study and preliminary (mostly telephone) interviews carried out during December 2017 - therefore focused on understanding a) the demand for training in the region, b) the current training offer by Practical Dairy Training Farms (PTDFs), ATVETs/Colleges and Universities, and c) the institutional structure of training institutes (accreditation issues).

During the second phase of the study, key stakeholders were visited in 3 countries (Kenya, Uganda and Ethiopia) to resolve outstanding issues, identify the different stakeholder interests, and develop a common vision of a potential dairy TVET project. These stakeholders included:

- NL Embassies (Agriculture Attachés and Food Security officers):
- Ministries/Departments of Livestock
- Ministries of Education/ TVET Directorates/Agencies,
- TVET/Skilling projects (e.g. SKY, SSUP, Uganda)
- Dairy Development Boards (Kenya, Uganda)
- ATVETs, Universities and Polytechnics offering or planning to offer CBET training in dairy
- Dairy Development Programmes (KMDP, TIDE, EDGET) and Practical Dairy Training Farms (PDTFs).
- Industry bodies (Dairy Producers, Processor and Feed Associations, Industry Development Institutes)
- Relevant regional organizations (ASARECA-ECAATP; ESADA)

A full list of those contacted is provided in [Annex 2](#).

3 EA Dairy Industry and Labour Market Needs

3.1 Overview of dairy sector in East Africa

Dairy is one of the fastest growing sectors of agriculture in East Africa. It contributes between 7 and 25% of the overall agricultural GDP, or between 2 and 8% of the overall GDP of countries in the region (see Annex 4). Although figures given in Annex 4 are somewhat outdated, the overall milk production of some 11.7 billion litres per year at farm gate prices that vary from €0.12-0.34/l implies an overall farm gate milk value of approx. € 3.2b. At the farm level, it is estimated that for every 1 000 litres of milk produced daily, 77 full-time jobs are created (Staal et al., 2008, cited in [FAO, 2017](#)). This would imply about 2.5m jobs in the 5 countries studied being linked to milk production.

Current milk consumption levels in the region are currently relatively low – at between 20 litres/person/day (Ethiopia) and 115 l/p/d (Kenya). These consumption rates and dairy production are expected to increase rapidly in coming years, as the number of middle income increasing consumers increases, to something closer to the World Health Organization recommended consumption of 200 l/p/d. There is also a recognised need to reduce dairy imports in some countries (e.g. Ethiopia), and a small but fast-growing export sector of milk and milk products in others (e.g. Uganda).

While milk is predominantly (80-90%) produced by smallholders with one or few cows producing less than 10 litres/cow/day, and is marketed locally as raw (unpasteurized) milk, countries in the region increasingly are emphasizing more specialised dairy production, commercial value chains and processed products (e.g. [Kenya Dairy Master Plan, 2010](#); [Tanzania National Dairy Master Plan](#) (in development); [Rwanda National Dairy Strategy, 2013](#); Uganda Dairy Master Plan, 1993 and [Agriculture Sector Strategic Plan 2015/16-2019/20](#); [Ethiopia Livestock Master Plan, 2015](#)). These ambitious plans recognise the need for increased capacity and professional development in the dairy sector.

3.2 Dairy development in East Africa

International donors and investors have also recognised the importance of dairy development in East Africa and provided considerable investment ([Annex 4](#)):

As part of its policy to improve Food Security and Nutrition, Netherlands Embassy programmes have provided over €25m of support to dairy development in Kenya ([Kenya Market-Led Dairy Programme - KDMP](#)), Uganda ([The Inclusive Dairy Enterprise – TIDE project](#)), and Ethiopia ([Enhancing Dairy Sector Growth in Ethiopia – EDGET](#)), [Dairy Business Information and Support Service Project – DairyBiss](#)). Dutch agencies, especially SNV and Wageningen University Research have led the implementation of these projects, which have also received support from private advisory and training organizations in the Netherlands (e.g. [the Friesian](#), [Dairy Training Centre](#), [Roodbont Publishers](#), etc.).

The International Fund for Agricultural Development, IFAD, is currently supporting dairy development projects in Kenya ([Smallholder Dairy Commercialization Programme - SDCP](#)), and Rwanda ([Rwanda Dairy Development Project - RDDP](#)). A further project developed for Tanzania ([Southern Highlands Milkshed Development Project - SHMDP](#)), is on hold (at the time of writing), pending review by the new Tanzanian

Government. Together, these projects represent some €100m of loans to these 3 governments, which are or will be implemented through national and/or local governments.

USAID has recently (2017) completed the [Rwanda Dairy Sector Competitiveness Programme \(RDCP II\)](#) in Uganda, with support totalling USD 15m, and implemented by Land O'Lakes. The [East Africa Dairy Development Program II \(EADD-II\)](#) – representing USD 25m support to Kenya, Uganda, Tanzania from the Bill and Melinda Gates Foundation, and implemented by Heifer International, ILRI, Technoserve, and others, is due to be completed in 2018.

In Ethiopia, the World Bank is providing approx. USD 170m to the [Livestock and Fish Sector Development Project \(LFSDP\)](#), which will support the implementation of the recent Livestock Master Plan, with a focus on 4 main livestock value chains, one of which is dairy. It will operationalize this support through competitive sub-projects to link farmers to markets, and support practical training. The establishment of a specialized Federal dairy TVET college is also being considered. Dairy is also a priority in all 4 of the “Integrated Agro-Industrial Parks” currently being developed in Oromia, Amhara, Tigray and SNNPR, which represent a government flagship strategy to facilitate and focus value addition to agriculture in Ethiopia.

A separate project in Ethiopia financed originally by the BMGF and the World Bank – the **Livestock Micro Reform in Agribusiness Project (L-MIRA)** – has the objective to improve access to livestock inputs, especially feed and drugs, through reform of policies on animal drugs, feeds and genetics. One of the components of the L-MIRA project is to promote public-private dialogue on livestock, including exploration to establish an Ethiopian Dairy Board.

Development of dairy value chains in the region also receives considerable support through more general programmes such as [2SCALE](#) (Netherlands), [KAVES](#) (USAID), and investment bodies such as IFC/GAFSP ([Pearl Dairies in Uganda](#), Velocity Dairy in Ethiopia). Comic Relief (UK) is supporting the [Income and Employment for Women and Youth in the Dairy Sector Project](#) in N. Tanzania, implemented by SNV.

At the regional level, ASARECA, through [the East Africa Agricultural Productivity Programme \(EAAPP\)](#) has supported the [Centre of Regional Dairy Centre of Excellence \(RDCoE\)](#) at KALRO, Naivasha, Kenya. This Centre mainly undertakes research and provides technical support to the regional dairy sector. Under a new phase of support from a multi-donor trust fund, the follow-on [Eastern and Central Africa Agriculture Transformation Project \(ECAATP\)](#) will include postgraduate education and TVET training as well as research, focussing on Egerton University and the Dairy Training Institute in Kenya, as well as “Centres of Specialization” in each of the 9 project countries in East and Southern Africa (although the participation of Ethiopia had not yet been confirmed at the time of visiting).

3.3 Labour market needs in the EA dairy sector

The dairy value chains in the region have been well mapped and their challenges noted (e.g. FAO reports for [Kenya](#), [Ethiopia](#), [Rwanda](#); [KMDP report on Smallholder Dairy Value Chain Interventions](#); WageningenUR reports on “[White Gold. Opportunities for Dairy Sector Development Collaboration in East Africa](#)”, [Investment opportunities in the Ethiopian Dairy Sector](#), [Quick Scan Dairy Sector Tanzania](#); Technoserve Reports on the [Dairy Value Chain in Rwanda](#); [Dairy Value Chain in Uganda](#); SNV report on [Dairy Investment Opportunities in Uganda](#), [USAID-KAVES value chain analysis in Kenya](#), etc.). As a result of these studies and the many dairy development programmes the training needs for stakeholders in those value chains are relatively well documented.

A comprehensive [labour-market needs assessment of the dairy sector in Kenya](#) was undertaken in 2012-13, within the scope of the KMDP, and the NUFFIC NICHE KEN 124/127 projects. The study focussed on graduates of Egerton University as well as Bukura Agricultural College and the Dairy Training Institute (see below). It found that certificate and diploma holders were preferred for most of the jobs among the profiled industry players, graduate or postgraduate qualifications were popular with development and research agencies. The industry players also indicated that most new graduates exhibit functional deficiency, and thought that non-technical subjects such as agribusiness, business research, franchise management, staff management, financial management, entrepreneurship, record keeping, M&E, communications, product development, and impact assessment should be included in training, as well as the technical aspects of dairy and food science. Skills required for dairy farming were more technical, focussing on milking and milking techniques, feeding of animals, foot trimming, identifying diseases, amongst others. Graduates interested in self-employment were limited by capital, as well as self-confidence, even though they appreciated the benefits of entrepreneurship. The study also noted the lack of adequate facilities for practical training purposes in most of the training institutions studied (universities and colleges).

The study also identified job and competency profiles for employees such as farm manager, milking assistant, feed assistant, extension officer, feed manufacturer/animal nutritionist, veterinary officer, milk grader, quality assurance officer, factory manager, production and product development manager, programme officer, researcher etc., as well as identifying suitable educational programmes at universities, ATVETs and colleges.

[A Training Needs Assessment \(TNA\) exercise for dairy stakeholders was conducted by Faida MaLi](#), based in Arusha to More MilkIT project locations in Tanga and Morogoro regions in 2014. This study resulted in a series of training needs identified for different stakeholders (farmers, input suppliers, milk vendors, extension staff, women and youth), including: leadership and good governance training to members and leaders of groups/ cooperatives; business awareness and entrepreneurship skills; record keeping and gross margin analysis (for cattle keepers); negotiation skills and supply contract management (for farmers); value addition (livestock keepers); technical skills (hygiene and milk handling, pasture/fodder management, animal health and breeding); establishment of milk business hubs, etc.

4 Current Dairy Training in East Africa

Dairy training is discussed here under 3 subheadings: a) Informal, on-the-job, training; b) vocational certificate/diploma (TVET, level 1-4), competency-based training; and c) more academic BSc, MSc (university) level education.

4.1 “Informal” Training

“Informal training” is defined here as short-term training (1-5 days, occasionally longer), to upgrade practical skills of persons already in employment or business, and where formal, nationally-approved TVET qualifications are not normally given. Trainees typically are given some theoretical background, but mostly focus on practicing skills on “Practical Dairy Training Farms”, their own neighbours’ farms or dairy processing plants. Trainers include staff of dairy development projects, selected experts from national educational institutes, private or government advisory services (often trained further as instructors), and Dutch PUM experts. All the dairy development projects noted above conduct such informal training, often arranged with cooperative groups, “dairy hubs”, or milk collection centres.

In general, public advisory services and training are not highly valued by the private sector or development projects. Most extension agents (e.g. the livestock Development Agents in Ethiopia) are trained in general livestock production and do not have sufficient practical experience in dairy skills to effectively serve farmers. In Kenya, training of farmers has suffered since livestock production and veterinary services were devolved to counties without national guiding principles and policies; there are no standard training manuals for farmers and other value chain actors, support to extension services, and those regulating the sector do not understand their role either. As one Kenyan interviewee put it: “It is a jungle out there”. In Uganda, the various reforms to the extension service over the last 2 decades have also had a detrimental effect on effective support to the dairy sector.

Consequently, livestock development projects such as the NL supported KMDP, TIDE, EDGET and DairyBiss have focussed on enhancing the skills of specialised dairy trainers and advisors, through training of trainers, and associated development of training materials and training facilities such as Practical Dairy Training Farms (PDTFs).

4.1.1 *Practical Dairy Training Farms*

PDTFs have been developed by both TIDE in Uganda and KMDP in Kenya (KMDP uses the term “Practical Dairy Training Centres” or PTDCs). These are commercial farms where the owners and/or associated trainers also offer training services, usually on a commercial basis. Courses at PDTFs usually last between 1 and 4 days duration, with trainees accommodated on farm (in accommodation facilities and classrooms often developed by the projects).

KMDP has supported four PDTFs in Kenya: [Lewa \(Baraka Farm\)](#) PDTF (Eldoret), Mawingu PTDF (Nyeri) and Willens PTDF (Eldoret), and Itiri (Meru). These PTDFs were selected by KMDP from a list of 13 training farms across the country. KMDP has supported the farms to adopt best practice in dairy production,

supported training of trainers, the development of practical training modules, and also to establish business linkages with value chain actors.

Similarly, TIDE has established 3 PTDFs in Uganda. **Mutanga Farm** specializes in health and nutrition, **Rubierwa Farm** in breeding, and **Agdi Farm** in animal nutrition. Typically, they each offer one course of 4 days each month, for groups of 20 farm owners or farm managers. The 3 PTDFs have 8 trainers between them, and the training packages were developed using international materials but also input from local experts (e.g. from Makerere University). Farmers pay approx. EUR 100 for the 4-day programme (including EUR 50 for accommodation).

One of the farms, Agdi, has been certified by the Department for Industrial Training (DIT), and now also offers training arranged by the SKY project, and for students from Makerere University - AFRISA programmes (see below), such that it now is training almost full time. While the future of the 8 trainers employed by TIDE to train on the PTDFs is not certain, the intention is to develop a sustainable business model for private training and advisory services.

Nevertheless, the sustainability of PTDFs as a business is not certain. The development of training activities as a commercial activity has often taken a back seat to the “core business” of dairy production. A combination of poor marketing of courses, the inability of trainees to pay the fees, and the fact that practical dairy managers may not make good trainers have all limited the impact and sustainability of PTDFs. One option to upgrade PTDFs being explored in Kenya is to link the farms to specialised training organizations, which can take the responsibility of providing qualified trainers, marketing of the courses and logistics, etc.

4.1.2 Private Advisory/Training Companies

A number of private companies offer dairy training. “ProDairy”, a new company in Kenya, intends to build on the practical training expertise gained at Baraka Farm (owned by Lewa Childrens Home). The Rabobank Foundation has shown interest to support further development and evaluation of this concept of a private training services, with the possibility to eventually scale out to other countries in the region and beyond.

KMDP has also collaborated with another private dairy advisory company in Kenya, **Perfometer**, which now has a staff of 12. Using the modules developed with KMDP, Perfometer offers 3.5-day, on-farm, practical dairy training for farmers and farm managers, as well as a more theoretical 5-day training for dairy investors, both on a commercial basis. Together with KMDP it also organised a [one-week dairy training tour to the Netherlands in 2017](#). In collaboration with [Strathmore Business School](#) in Kenya, Perfometer is organizing a ‘[Dairy Investors Program](#)’, in 2018, consisting of a one week module in Kenya followed by a 1-week intensive exchange programme in Denmark, aimed at investors and commercial dairy farmers.

In Uganda, **Pearl Dairies** has contracted the private Dutch dairy advisory group “The Friesian” (with funds from World Bank IFC) to train advisors (extension agents) to serve their cooperative suppliers. The training will consist of a 3-month programme, with 2 years of follow-up mentoring of the advisors by the Friesian. Each advisor is expected to serve 20 farmers after training.

In Ethiopia, the [DairyBiss Project](#) is training 65 advisors to service mainly the commercial dairy sector. They have developed 3 programmes, for [dairy farm owners/managers](#), dairy business development, and dairy processing. Each programme consists of about 8 modules, of about 4 days each. Currently, farmers do not pay for the advice given, and there is some doubt if a fully commercial model for advisory services is possible in Ethiopia in the near future, even with the larger commercial farms.

In Uganda the Gulu Country Dairy Research Farm and Dairy Business Training Centre, GUCD, (<http://www.gulucountrydairy.com>) was built in 2013 with the support of Partners Worldwide, a USA-based Christian philanthropic network (<http://www.partnersworldwide.org/>). GUCD intends to offer two 4-month courses per year to prepare students to operate a dairy business, as well as shorter 5-day modules in the core areas including dairy farming as a business, feeding, animal husbandry, dairy cattle housing, silage making, crop production, equipment care, genetics, and ration balancing.

In Kenya, the private company “[Happy Cow](#)” (HCL), currently processing 15,000 l/day milk from 2,000 small scale farmers), intends to establish a Dairy Training Centre near the Egerton University Farm in Njoro, as part of a larger programme of development in collaboration with Heifer International, which also includes scaling up quality-based milk payments. DANIDA has indicated support for part of the costs of the proposed centre through payment of student fees during the first 3.5 years. DTC plans are to offer 20 courses per year, of 2 weeks duration each, with 15 students per course.

4.1.3 Public organizations offering short-term training

[The Ethiopian Meat and Dairy Industry Development Institute, EMDIDI](#), conducts in-service training of 1-2 weeks on dairy processing (e.g. cheese, yoghurt production) for the 35 processing companies in the country, using its 14 specialised dairy processing staff (of a current total staff of 265). It has plans to expand its facilities, including construction of training facilities, labs, etc., and including accommodation for up to 100+ trainees.

The [National Agricultural Research Organization \(NARO\)](#), Uganda, is rehabilitating dairy facilities at Nakasasa, near Kampala. The farm has approx. 250 hectares, jointly owned by Makerere University, AFRISA, mostly under pasture, and with a herd of 150 cows. NARO intends to increase the herd to 250, and construct “state of the art” feed mills, dairy barns, milking parlour, dairy processing facilities, laboratories for artificial insemination, bio-digesters, etc., and accommodation for up to 100 persons. Currently run under NARO, the intention is to create a semi-autonomous institute under “NARO Holding Ltd”, offering practical short courses are proposed in dairy production value chain including utilisation and preservation of animal feed, feed formulation, calf management, production and replacement of heifers and disease management, among others, in collaboration with Makerere University – AFRISA (see section 4.2, below).

[The Dairy Development Authority \(DDA\)](#) in Uganda manages the Entebbe Dairy Training School (DTS). Established in 2014, it intends to skill dairy stakeholders in value addition, milk quality control, etc., through 4 training modules each of 10 days: cold control and QA; value addition and small-scale

processing; farm production and management; dairy business. Currently, only the first 2 of these modules are offered. Training is not accredited. Participants contribute to food; other costs are paid by the DDA. The DTA does not have its own farm, livestock or processing plant; it uses the facilities of the nearby NAGRC (see below), as well as those of commercial processors to provide practical opportunities for trainees. The DDA recognizes that its own staff of 30 (including 10 trainers) needs skills upgrading.

[The National Animal Genetic Resources Centre and Data Bank \(NAGRC\)](#) was established under the Animal Breeding Act, 2001, to support implementation of the National Animal Breeding Policy. It also is required to offer and conduct specialised training to technicians dealing in breeding and to train staff and farmers in aspects of animal and fish breeding. Currently, it offers a 1-month practical training on a quarterly basis in artificial insemination, and although the training is regarded as good quality, there are questions regarding the percentage of trainees who go on to operate in the field.

The [Africa Institute for Strategic Services and Development \(AFRISA\)](#) was established as an autonomous Centre under CoVAB, the College of Veterinary Medicine, Animal Resources and Biosecurity of Makerere University, in 2010. The Board includes representation from the Ministries of Agriculture, Education (BTNET, Directorate of Technical Training), Finance, and farmers. AFRISA offers a range of tailor-made short courses in animal industry value chains (dairy, pigs, feed, poultry, fish, bees, goats). It has the objective to “impart practical and business skills in milk production, value addition and entrepreneurship”, and currently offers tailor-made courses of few days to 1 year to people with minimum education, and in local languages, as well as 2 month-courses to upgrade graduate skills. Courses are focussed around the development of business enterprises, and participants are graded on business outcomes. Courses are subsidized by local and national government, FAO, and church groups from Sweden, Finland and Uganda. Seventy percent of the training time is in the field. AFRISA has plans to establish a 2-year diploma and 1-year ordinary certificate programmes in dairy industry and business, and a diploma in feed industry and business. AFRISA is currently accredited by UNCHE (Uganda National Council for Higher Education). AFRISA has partnered with PTC Netherlands, but this relationship appears to be currently dormant.

The Dept. of Food Science at **Makerere University** in Uganda also offers short courses in food processing, dairy value addition (yoghurt, cheese) and has processing facilities on campus.

4.1.4 Training materials and modules

KMDP, TIDE, EDGET and DairyBiss have each developed practical training modules for their respective use.

KMDP has supported the further development of 8 modules developed over a period of 8 years and with original input from the Stichting Habari and former staff of the DTC. Each module supports 1-day training sessions (including both theory and practice) and are used to train commercial dairy farmers and farm managers.

TIDE has also developed its own training materials (not directly based on, but perhaps inspired by, the Kenyan modules). These are adapted to local language and provide day by day guides for trainers to deliver the 60% practical, 40% theory training programmes described above.

DairyBiss has developed 8 modules for each of its 3 programmes (dairy production, dairy business, dairy processing), although these are not yet finalized. These modules have been developed by staff of national universities and ATVETS (Ambo, Salale, Asala, Holeta), with support from external experts from the Netherlands. As well as training a cadre of advisors, the universities involved plan to use the modules to develop commercial short courses (e.g. 2-week programmes).

[EDGET \(Enhancing Dairy Sector Growth in Ethiopia\)](#) has developed, with national public agencies and the DTC-NL 10 practical training packages for training of trainers (extension agents) as well as extension material for farmers (packages for trainers include dairy housing and manure management; breed improvement and fertility; dairy cattle health, dairy farm management; dairy farm economics; as well as guides for dairy farmer extension groups, etc). These materials are being used by 1,500 agricultural extension workers to train 2600 dairy farmers extension groups as well as 13,500 Lead farmers and 65,000 dairy households in Ethiopia.

The International Livestock Research Institute - ILRI – has produced a number of training manuals for the dairy industry as an activity within its dairy development programmes, in collaboration with other regional actors. Among these are:

- [Smallholder dairy farmer training manual](#) (2016);
- [Setting up sustainable dairy business hubs: A resource book for facilitators”](#) (2015).
- [Hygienic milk handling, processing and marketing: Reference guide for training and certification of small-scale milk traders in East Africa \(2006\)](#)
- [Fundamentals of marketing and dairy business management: A training guide for small-scale dairy farmers, milk traders, transporters and processors in Eastern Africa \(2006\)](#)

With the support from various donor organizations, the East African Farmers’ Federation (EAFF), together with Perfometer (a private dairy advisory and training organization) has also produced the “[Farmers Dairy Management Handbook](#)” (2016). Roodbont Publishers have also developed its “[Cow Signals” series](#), including “Cow Signals Basics East Africa edition.

4.2 Vocational (ATVET) Programmes

Longer and more formal occupational courses, which provide professional qualifications at the certificate and diploma levels, are provided by agricultural colleges, agricultural technical and vocational education and training (ATVET) institutes, and some universities. In all cases reviewed, challenges include the quality of the occupational standards and related curricula, the capacities of instructors to deliver CBET programmes, the facilities available at the institutes to enable practical instruction (especially that relevant to modern commercial farming), and also the linkages to the private sector (e.g. to develop occupational standards and curricula, as well as host trainees for practical experience).

4.2.1 Kenya

The Dairy Training Institute (DTI) established in Naivasha, Kenya, in the 1960s, is the only dedicated dairy training centre in the East Africa region. The DTI is managed and funded by the Ministry of Agriculture, Livestock and Fisheries. The Institute offers two long-term courses in Dairy Management and Dairy Science and Technology with a duration of one- and two-years respectively, as well as a series of short-term technical courses on demand. The DTI currently has 230 students, all from Kenya.

A team comprising SNV, The Friesian, PTC+, the Dairy Training Centre of the Netherland, the Kenya Dairy Processors Association and DTI staff developed a [business plan for the DTI](#) in 2013, which envisaged the DTI as an accredited state-of-the-art training centre that could serve the whole East African region. The business plan focused on the key mandate of DTI, e.g. practical dairy training, and proposed to restructure DTI around four business units: Dairy Training Unit, Dairy Farm Unit, Conference Hall Unit and a Fodder Production Unit. The Dairy Training Unit, to cater for 420 students from year 5 onwards, would offer a one-year course focusing on all aspects of the dairy value chain, and a two-year course with specializations in either dairy farm management or dairy processing, as well as a range of short courses. The Dairy Farm Unit and Lucerne Production Unit would be run as commercial units. To implement the business plan, an investment of EUR 5.3m was foreseen. While the DTI itself considers the business plan to be “70% implemented”, a critical element was designation of the DTI as a “semi-autonomous government agency” (SAGA) in line with the Dairy Industry Act of 2012. This proposal is said by the DTI to be nearing approval by the government (already approved by the MoALF, and now with the Treasury), although other stakeholders consulted were not so confident that SAGA status would be achieved in the near future.

In collaboration with Egerton University (EGU), the DTI was beneficiary of the “dairytrain” project (www.dairytrain.org), (NICHE-KEN-127-139), between 2012 and 2016. This project, with a budget of €1,148,527 and implemented by a consortium consisting of WageningenUR, AERES and SNV, was designed to improve the capacity of EGU and the DTI to deliver competent graduates for enhanced competitiveness in the dairy value chain, through improvements in organization, and curricula at the certificate, diploma, BSc & MSc level. SNV has also supported the DTI through the KMDP project.

With support from the CAADP TVET programme and GIZ, the DTI has developed a national dairy curriculum for 2 occupational standards: dairy farm manager, dairy processing plant manager, and at levels 3-6 (3 being farm worker under supervision; 4 farm worker, 5 being 1-year certificate level, and 6 being 2-yr diploma level). These curricula are said to be now validated by “dairy sector skills committee”

and approved by the Curriculum Development Assessment and Certificate Council (CDACC), under the Kenya National Qualifications Authority, and the DTI is now developing trainers guides, learners guides, resource materials. However, some stakeholders consulted expressed continuing reservations about the quality of these curricula, and the DTI itself expressed the need for upgrading of its instructors to be able to deliver these CBET curricula.

In general, Dutch stakeholders have expressed some reservations concerning continued investment in the DTI, at least without the change to SAGA status as foreseen in the business plan. It should be noted however, that the ECAAT Project, supported by the World Bank, is likely to invest in the DTI as a key TVET (as well as the nearby Kenya Dairy Research Centre) for dairy development, following its strategy of considering Kenya as regional “Centre of Leadership” in dairy.

[Bukura Agricultural College](#) (Western Kenya – near Kakamega), falls under the MoALF, although it gained Semi-Autonomous Government (SAGA) status in 2002. It offers a 1-year Certificate Course in Agriculture and Community Development, and 2-year Diploma programmes in Agriculture and Biotechnology; Food Science and Nutrition; Animal Production and Health Management, Agricultural Extension and Community development and Agribusiness Management and Marketing. The College currently has 1500 students, mostly from Kenya, and a few from e.g. S Sudan. Graduates go on to work in flower/tea industries, MoALF, etc.

With 508 acres of land, it has 82 cows, of which 28 were milking (at the time of writing), the College recently (2016) opened a dairy processing plant (financed by GIZ, with NL-Nuffic providing equipment). It was supported from 2011 to 2017 by NICHE-KEN-124 and 134 – “Capacity building for improving dairy and horticulture programmes to meet the requirements of the labour market and to contribute to food security and the commercialization of the sector”, with a budget of EUR 749,984. The Dutch consortium was led by Q-Point B.V., with support from Delphy, Egerton University, HAS Den Bosch, and Radboud University Nijmegen.

Bukura has 80 staff now familiar with CBET (10 in dairy), following training by TVETA, and intends to become CBET assessment centre. The College participated with the DTI and others to develop the dairy curriculum noted above.

Other agricultural colleges in Kenya with dairy farms, offering short courses specialised in dairy, or supported by KMDP, include:

- [Baraka Agricultural College](#) (BAC), is an independent College located near Molo, offering a Diploma in Entrepreneurial Agriculture as well as Certificate and Diploma in Sustainable Agriculture and Rural Development. Established by the Catholic Diocese of Nakuru in 1974, the College now stresses sustainable agriculture and is underpinned by a Catholic ethos. BAC has been supported by the Nuffic NICHE-KEN-214 project, Institutional Capacity Development for sustainable agricultural improvement, with a project budget of €894,705 from 2015 until December 2018, with the NL consortium being led by CINOP Global with Aeres Group and SNV in support.
- **Latia Resource Centre** (not visited during this study) has also received Nuffic support, through NICHE-KEN-213 (2014-Sept. 2018; NL consortium led by Maastricht School of Management, and

Wageningen CDI, with input from the DTI, Kenya). This project addresses the needs of the agro-industry sector in three main areas: dairy, horticulture and piggery, with training courses being developed, educational operations and organizational capacity improved. As part of the project, Latia intends to apply the DTI curriculum for dairy training. The Nuffic budget of the project is EUR 547,927. Latia Resource Centre has also received support from GIZ to develop CBET curriculum in horticulture - but it has taken over 3 years for the Centre to get approval from the Curriculum Development Assessment and Certification Council (CDACC) because of limitations on technical expertise in CBET and its associated processes (RUFORUM, unpublished report 2017¹).

- **Eldoret Polytechnic (EP)** is one of 11 national polytechnics. It is semi-autonomous, with its own Board of Directors. It has a total of 9,000 students. EP offers course in general agriculture, including modules on crops, livestock (not specifically dairy), economics, engineering following a 2-yr certificate (levels M1, M2) with 3rd yr diploma (M3). EP is interested to develop more a more specialized dairy programme, as Eldoret is located in one of the main dairy areas of Kenya. However, it recognizes that developing curricula is expensive. The curricula at EP do not currently follow a CBET approach and consist of 60% theory and 40% practical. While Government policy is for Polytechnics to use a CBET approach, EP lacks the capacity to do this (CBET being a new approach). Accreditation of EP programmes was through the Kenya Institute of Curriculum Development, but if future will fall under CDACC.
- **AHITI – Animal Health and Industry Training Institute**, (not visited) with main campus at Kabete, and others at Nyahururu and Ndomba, was founded in 1965. It offers diploma courses in animal health management, and diploma and certificate courses in animal health and production (as [listed on the government website](#)).

Vocational training in Kenya is not only offered by Colleges and Polytechnics, as Universities are also interested to offer vocational programmes; sometimes in spite of national educational policies (see section 4.3, below). Three Kenyan Universities – **Egerton**, **Laikipia** and **Baraton** – are planning to offer certificate and diploma level, competency-based, training in dairy. This initiative is being supported by SNV and the KMDP as an alternative to the current dependence on the DTI for this type of training. However, it is as yet clear if and how these universities will accredit these courses (i.e. via TVETA or the Kenya Commission for University Education) and the degree to which the curriculum will be competence based (see below for issues of accreditation).

4.2.2 Uganda

The [Bukalasa Agricultural College](#) is the main agricultural college in Uganda. It offers a 2yr certificate in general agriculture, and an additional 2-yr diploma where students can specialise in crops, livestock or agribusiness. The livestock option - animal production and management – includes modules in dairy production. Bukalasa also offers 2-4-week tailor-made short courses in dairy production, livestock feed mixing, etc. A dairy demonstration farm is planned. The College has currently a workforce of 60 people of whom 30 are lecturers and 30 junior officers. Bukalasa Agricultural College is one of 4 selected Colleges expected to receive significant support as “Centres of Excellence” under the [Uganda Skills Development Project](#) (USDP), supported by the World Bank (budget approx. USD 100m) and located in the MoES.

¹ Technical and Vocational Education and Training (TVET) Scoping Study In Selected African Countries. Report as yet unpublished by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)

Rwentanga Farm Institute, located in the Mbarara milkshed, is one of 12 Public Vocational Training Institutions also to receive support under the USDP. It offers certificate programmes in general agriculture and recently started to also offer diploma programmes in crop and animal production. It currently has a farm with herd of about 30 dairy cows (milked by hand).

Kyera Agricultural Training College, a private college, also in Mbarara District, and close to the border with Tanzania, also offers crop and livestock diplomas. The college is recognised by the Uganda National Council for Higher Education (UNCHE).

Busitema University (formerly Arapai Agricultural College) also offers a 2-year diploma programme in Animal Production and Management at its Arapai campus.

4.2.3 Ethiopia

Agricultural TVETs (ATVETs) are perhaps more developed in Ethiopia than in other East African countries, the current system being established 15-20 years ago to develop a cadre of extension agents across the country. This system is well described in a recent study – *“Together towards effective practical agricultural education”*, commissioned by the Netherlands Embassy and RVO (*Rijksdienst voor Ondernemend Nederland*)².

ATVETs in Ethiopia come under both Federal and Regional governance. There are currently 5 Federal ATVET Colleges: Ardaita, Alage, Agarfa in Oromia, Mizan Teferi in the Southern Nations and Nationalities People’s Region (SNNPR) and Gewane in the Afar Region. There are an additional 14 Regional ATVETs: 5 in Oromia Region (Holeta, Nejo, Kembolcha, Bako and Yabello); 3 in Amhara (Woreta, Kombolcha and Mertule Mariam), 3 in Tigray (Malchew, Wukro and Shire), and 2 in SNNPR (Wolaita Sodo and Dilla), and 1 in the Benishangul-Gumuz Region (Assosa). Within the different Regions, the governance of the ATVETS varies: in Oromia and Tigray, governance of the ATVETs comes under the Regional TVET Bureau; in Amhara and the SNNRP it falls under the Regional Agricultural Bureau.

The ATVETs in Ethiopia had the main mandate of developing a cadre of Development Agents (DAs), of which 3 -4 are located in each *Kebele* of the country (one each for natural resources, crops, livestock; in a few *Kebele* also cooperative development). They therefore had similar curricula, focused on these areas of competence. The full complement of some 70,000 DAs is now in place (with a turnover of approx. 7,000 per year), and the future of the ATVETs has been the subject of some discussion. While some advocate that individual ATVETs should develop more in-depth competencies in particular commodities or disciplines (e.g. in dairy), others argue that students are unlikely to travel between regions (and languages – while ATVETS mostly use English as the language of instruction, some in e.g. Amhara teach in local language), and hence each region should serve the full complement of disciplines/commodities. Even

² This study is not yet finalized/published (at the time of writing), and the in-depth conclusions are not included here. However, we believe the general conclusions are not incompatible with this current report

within regions such as Oromia, where dairy is a key sector), and where Holeta ATVET has gained a reputation for dairy training, the Regional TVET Bureau argues that all colleges in the Region should offer all the occupations available.

Currently, the MoLF is considering the establishment of 4 new federal ATVETs as part of the activities of the Livestock and Fish Sector Development Project (LFSDP³), which has been designed to support the recent Livestock Master Plan. The new ATVETs would have thematic mandates, focusing on dairy, fish, poultry and red meat, respectively. At the time of writing, however, the decision on whether to go ahead with these new centres had not been confirmed.

As with other countries reviewed, problems exist with occupational standards and related CBET curricula. Even when these are considered to be developed (e.g. dairy processing at Holeta), stakeholders such as EMPIA, EMDIDI (both consulted), who would be expected to have participated in the development of these standards/curricula, profess ignorance of these.

Several of the ATVETs mentioned have dairy farms and offer livestock courses, although **Holeta ATVET** is currently seen by many persons contacted as the best placed (geographically, in the main milkshed around Addis Ababa), and one of the most suitable for TVET level dairy training in Ethiopia. This Regional ATVET comes under the Oromia (Regional) TVET Agency, and has recently been supported by Nuffic (NICHE-EHT-146, budget EUR 874,216, implemented from 2012-2017, by Dutch partner ICRA, with support from CINOP Global, the International Labour Organisation, and the Royal Tropical Institute). The project has enabled Holeta ATVET to develop an agribusiness curriculum more suited to employees and especially entrepreneurs in commercial agriculture, focussing on dairy and horticulture. It has extensive land, a dairy herd of about 40 (20 milking + 20 heifers) and has recently purchased small milking machines (although funds for further development of dairy infrastructure are currently being sought; it does not yet have processing (cooling/ pasteurizing) facilities and sells raw milk locally.

Holeta has recently been given Polytechnic status, which means it now offers a range of instruction from short courses through to level 5 in a range of disciplines. Level 1 curricula focuses on general agriculture, level 2 offers specialization in livestock production, level 3 in dairy production, level 4 in animal production and marketing management, and level 5 in advanced animal production and marketing management. Short courses can be developed from modules at all levels.

Holeta is also one of 6 Ethiopian TVET colleges (and the only agricultural TVET), proposed as a Centre of Excellence under the “[East African Skills Transformation Investment Project](#)” (EASTIP), funded by the World Bank. Under this project, Holeta proposes to develop expertise in 3 curricula including dairy processing. The budget for Holeta from this project is expected to be in the region of USD 10-15m; using (part of) these resources Holeta intends to construct a dairy processing plant. Holeta is currently developing a strategic plan for project implementation.

³ The LFSDP has been agreed with the World Bank, although the 1st disbursement had yet to be made (at the time of writing). The approximate budget of the project is USD 170m.

Holeta is also one of 2 ATVETS specialized in training instructors for ATVETs in Ethiopia (Wukro in Tigray being the other). Under a 3-year programme, initiated in 2017, instructors will be trained in agro-processing curricula (dairy, meat, fruit and vegetable) up to level 4 and then train to levels 1 and 2. In 2017, 106 students were registered on the programme, 80% of which is technical training and 20% is pedagogy. The Ethiopian TVET Institute provides budget and the trainers for the curriculum, and trainees gain a BSc in TVET instruction. Currently, most ATVET instructors are drawn from universities, have not usually experienced CBET themselves, and hence are not considered as having the skills needed for practical instruction (as opposed to theory).

Dalhousie University, in collaboration with the MoANR, and with funds from the government of Canada, is supporting the [Agricultural Transformation Through Stronger Vocational Education \(ATTSVE\)](#) Project. This project is supporting 4 ATVET colleges to specialize in diverse sectors, including Maichew (dairy production), Woreta (rice), Nejo (coffee, tea and spices) and Wolaita Sodo (vegetables, roots and tubers).

4.2.4 Tanzania

In **Tanzania**⁴, there is currently no specialised dairy training at certificate or diploma level. The eight livestock training institutions of the [“Livestock Institute Training Agency” \(LITA\)](#), LITA campuses offer long courses at certificate (NTA level 4&5) and Diploma (NTA level 5&6) levels in more general animal health and production, veterinary technology, etc., approved by NACTE (see below). Dairy modules are included within these programmes. The LITA institutes also offer tailor-made training programmes (which offer certificates of participation; these courses do not need to be approved by the National Council for Technical Education - NACTE). Of the LITA institutes [LITA Tengeru](#), LITA Mbeya and LITA Buhuri are best placed to develop more specialized dairy programmes. LITA Tengeru has a dairy processing unit as does LITA Mbeya (where the dairy farm and facilities are shared with the Livestock Research Institute).

Tengeru formerly offered a certificate in dairy husbandry, but this was discontinued after the collapse of the EA Community in 1977. More recently, a curriculum for a specialized 6-month dairy programme was developed in 2010 by Tengeru, with support from Sokoine University of Agriculture, for the Tanzania Dairy Board. In 2015, this Programme - Professional Development Diploma in Dairy Technology (PDDT) for 50 Diploma/BSc students was held, with 90 days at LITA Tengeru, and 90 days at practical stations. However, this programme has not been repeated. According to LITA Tengeru, it was found to be not very attractive to dairy industries in Tanzania, where they need hands on training, and LITA is still in collaboration with TDB to further develop a tailor-made curriculum which will address the needs of the dairy industry in Tanzania.

⁴ Although some persons were contacted from both Tanzania and Rwanda, these countries were not visited during the scoping study, and hence information presented here on these two countries is inevitably more limited.

4.2.1 Rwanda

In **Rwanda**, TVET programs are provided in the Provincial Integrated Polytechnic Regional Centers (IPRC) and are designed to build a technical and entrepreneurial workforce that responds to the needs of the job market, and to the different training needs of learners from different socio-economic and academic backgrounds. Technical and vocational education trainings are offered at all levels: competence-based trainings (TVET Certificate), technical secondary school A2 (East African A-level) and A1 Diploma (equivalent to Higher Diploma), at IPRCs in all 5 provinces. However, there appear to be no specialised dairy development programmes at diploma or certificate levels.

The Nuffic RWA268 [Strengthening Education for Agricultural Development](#) (SEAD) Project supports the [University of Rwanda](#), [the Institute of Applied Sciences \(INES\)](#), and the TVET sector. It is implemented by Mott McDonald, with SNV, Q-Point and Delphis as project partners. It focusses on 4 value chains: horticulture, potato, dairy and poultry, with the objective of linking the provincial polytechnics (IPRCs) to the private sector and linking the university closely to the TVETs and TVET sector. Dairy activities are mainly located in the NW Region, in collaboration with the [College of Agriculture, Animal Sciences and Veterinary Medicine](#) (CAVM), Busogo Campus and Musanzi Polytechnic. The project is establishing a “Service Training and Innovation Centres” (STIC) for dairy, using private sector facilities as venue for student training. The campus dairy processing unit is also rented to a private company, at minimum rent, with the condition of access to students for training. SEAD cooperates closely with the Rwanda Dairy Platform. As part of the project activities directed towards community outreach, the Polytechnic gives short courses for skills development in dairy, and the CAVM sends students to the Polytechnic for 3-6 months for more practical training.

4.3 Academic (BSc and Postgraduate) Training

There has been a tremendous growth in the number of universities in the region during the last few decades. For example, in the early 1980s, the University of Nairobi (UoN) was still the only university in the Kenya; by 2013 there were 55 public and private universities, with about 120,000 students, half of whom were enrolled at UoN. Similarly, Addis Ababa University was founded in 1950, by 2000 there were still only 2 universities, and there are now some 60 (31 public, and 29 private) universities in Ethiopia. A considerable number of these universities offer BSc degrees in general agriculture or animal production, but most of these only contain a few courses on dairy. In addition, these courses are generally regarded as too theoretical with graduates lacking in practical skills (e.g. RUFORUM, unpublished report 2017), and generally unfitted for the labour market (e.g. in the dairy industry).

The most notable exceptions are: [Egerton University](#), (EU) in Kenya, founded as a Farm School in 1939, upgraded to an Agricultural College offering diploma programmes in 1950, and established as a University in 1987. The Dairy and Food Science and Technology department was started in 1963. Currently it offers 15 diploma, 60 bachelor, 51 masters and 28 PhD programmes in 51 academic departments, 10 faculties and 3 Colleges. It has a total student enrolment of 25,000.

EU is the only university in the region with a specialised BSc in dairy technology and management, “designed to produce a diploma graduate qualified to work in milk processing industries in production and managerial capacities; to venture into entrepreneurship in the food industry; to teach; and to pursue further education in food related disciplines”. EU also currently offers BSc programmes in Animal Science, Food Science and Technology, Agribusiness Management, Veterinary Medicine, Agricultural Education and Extension, as well as additional programmes at BSc, MSc and PhD level. Egerton also supports

curriculum development at the DTI and also Bukura College of Agriculture. It also has an open and distance learning programme, and an extensive range of research projects with national and international partners.

EU has received support from Nuffic, with an emphasis on dairy programmes, through:

- **NICHE-KEN-127-139** (the “Dairytrain” project, to build capacity to deliver competent graduates for enhanced competitiveness in the dairy value chain, with a budget of EUR 1,148,527, implemented from 2012-2016, with the support of a Dutch consortium consisting of WageningenUR, AERES and SNV.
- **NICHE-KEN-271**- “Capacity Building for Strengthening the Livestock Value Chain”, with a budget of EUR 1,099,138, being implemented from 2016 until 2020 with input from Q Point.
- **NICHE KEN-274** Functioning Dairy Agribusiness Incubator. €24,900 11/2015-4/2016 Egerton University. Wageningen UR
-

According to RUFORUM, (unpublished report, 2017) these investments by Nuffic (especially the Dairytrain project) have been instrumental in leading to embedded value chain analysis and management in the University’s training programmes, adoption of an experiential and competency-based training approach with 60% practical and 40% academic coursework, and a positive and influential relationship between the University, the Dairy Training Institute, and other ATVETs in Kenya.

The [University of East Africa Baraton](#) (UEAB) is a private (7th day Adventist) university near Kapsabet in Kenya. 80% of its students are from Kenya, others come from East and even West Africa. UEAB currently offers 4-year BSC programmes in agribusiness and agriculture, as well as diplomas and certificate programmes that use a TVET curriculum. The university falls under the Kenyan Commission for University Education (CUE), although some programmes are now accredited by CDACC. BSc and diploma programmes include an 8-week attachment programme, although it is acknowledged that the placement is not always as professionally rewarding as intended. The university is currently benefitting from a Nuffic INNOCAP grant (INNOCAP-KEN-300) to develop blended learning curricula, with staff attending the DTC in the Netherlands. The focus of these blended learning curricula is more on short courses, leading to certificate. Materials are currently about 25% developed, and using the DTC platform, although the sustainability of this arrangement is questionable, once current funding ends). UEAB is one of 3 universities currently developing a more practical and vocational programme in dairy (see section 4.2), for which it intends to get accreditation via the CDACC. UEAB recognises that its staff need capacity building in CBET curriculum development and delivery; and also recognises that CBET programmes are relatively costlier. The university has a farm of 339 acres, with 130 cows (47 milking at the time of visit).

[Makerere University](#) (MAK) in Uganda, established in 1922 as a technical school, in 1949 as a University College affiliated to University College London, and in 1970 as an independent University, now has 9 semi-autonomous Colleges, and over 38,000 students. The College of Veterinary Medicine, Animal Resources and Biosecurity (CoVAB), includes a BLB - Bachelor of Industrial Livestock and Business, with options for specialization in Year Two including Dairy Industry & Business. MAK facilities include the Makerere University Agricultural Research Institute (MUARIK) and Continuing Agricultural Education Centre (CAEC) at Kabanyolo under the College of Agriculture and Environmental Sciences, which includes 650 hectares, a dairy unit and feed mill and animal science laboratories, as well as the 150-hectare Buyana Stock Farm

under CoVAB. CAEC is currently implementing about 200 projects, financed by a range of national and international agencies.

Under CoVAB, **AFRISA** was established as an autonomous centre to offer more development-oriented and vocational training (see section 4.2 above).

[Sokoine University of Agriculture](#) in Tanzania started as an agricultural college in 1965 and became a university in 1984, and currently has over 5 colleges, 4 centres, and over 5000 hectares of land in 4 campuses. It does not have specialised programmes in dairy, although it has courses in dairy cattle management, dairy and beef cattle husbandry, dairy technology, etc. as core or elective courses in its 2-year diploma programme in tropical animal health and production, and its 3-year BSc in Animal Science, etc., although training in dairy technology is limited to 30 hrs and about 15 hours exposure for B.Sc. Animal science and B.Sc. Food Sciences/B.Sc. graduates respectively.

Since 2010, SUA has been discussing with the Tanzania Ministry of Livestock Development and Fisheries (MoLDF) and the Tanzania Dairy Board a proposed professional 6-month diploma course in dairy technology (modelled on the “International Diploma Dairy Husbandry and Milk Processing” of the NL), to be offered at the Livestock Training Institute (LTI) Tengeru or similar, with expertise from SUA (Kurwijila and Chove, 2010). However, there does not seem to have been much development since then.

The [College of Agriculture, Animal Sciences and Veterinary Medicine](#), at the University of **Rwanda**, includes dairy production as one course within the BSc programme on animal production (see Section 4.3)

In Ethiopia, the DairyBISS project has worked with [Ambo University](#), where the College of Agriculture and Veterinary Sciences, Dept. of Animal Science at Ambo offers the 3-yr BSc in Animal Science that includes 1 course in dairy production. DairyBISS is also exploring collaboration with [Bahir Dar University](#) (College of Agriculture and Environmental Sciences) and [Mekelle University](#). [Jimma University](#) also includes dairy cattle production as one course within its BSc in Animal Science. The College of Agriculture at [Hawassa University](#) has BSc programmes in Animal and Range Sciences, as well as Agribusiness and Value Chain Management. [Haramaya University](#) also has a long history of agricultural teaching: The College of Agriculture and Environmental Science currently offers a BSc programme in Animal Science (which includes a course in milk production). Haramaya University has a dairy farm, as well as laboratory for dairy science and technology. Jimma, Ambo, Haramaya and Hawassa universities were collectively supported by the AGRIBIZZ project (Nuffic ETH-019) to develop commercial agriculture programmes in Ethiopia.

In summary, a number of Universities in the region either have dairy courses as a component of more general BSC programmes in animal production. A few universities also have – or intend to have - diploma/certificate programmes, although the degree to which these programmes are competency based, and/or recognised by national TVET authorities is still unclear. Accreditation of such courses is likely to prove time consuming and expensive.

Several universities have collaboration agreements with TVETS (e.g. Ambo with Holeta; Egerton with the DTI). A recent scoping study on TVET carried out by the Regional Universities Forum for Capacity Building in Africa (RUFORUM, unpublished report), cites the linkages between EU and the DTI – as developed through the Nuffic DairyTrain Project, as an exemplary example of university-TVET collaboration, leading to enhanced mobility as well as motivation of teaching staff of the DTI, as well as the improvement of competency-based learning at EU. Additionally, the facilitation of academic progression of students from Certificate through Diploma to BSc and MSc level is seen by RUFORUM as a model that is lacking in most tertiary institutions, and critical to upgrading skills across different strata of the labour market – although others may argue that certificate courses should be seen as a sufficient professional objective. Universities can also play a role in reviewing or developing curricula at TVETS (as does EU at the DTI, the Bukura College of Agriculture, and AHITI).

Universities are regulated by Ministries of Education, with Commissions or Councils established to assure quality, set standards and assure relevance in the quality of university education. They are responsible for accreditation of universities and university programmes (e.g. The [Commission for University Education \(CUE\)](#) in Kenya; [Tanzania Commission for Universities](#); [Higher Education Relevance and Quality Agency \(HERQA\)](#), in Ethiopia; [Uganda National Council for Higher Education \(UNCHE\)](#), in Uganda, etc.

In 2015, CUE (Kenya) ordered universities to stop offering Diploma and certificate programs, but the universities went to court and a temporary injunction was issued allowing universities to continue offering these programs pending final determination of the matter. CUE's views are that offering of diplomas and certificates by universities lowers the quality of degree programs since the same faculty and facilities are used to teach both degree and diploma programmes. The CUE does not therefore approve or accredit the diploma programmes in dairy offered by EU or UoN.

In general, and as evidenced by numerous studies, challenges faced by East African universities include excessive enrolments, unsustainable expenditure patterns, declining quality and relevance, loss of quality staff, disconnect from the labour market. Many private sector stakeholders have indicated that graduates typically require retraining in specialized areas including management skills to be able to perform in the private sector and run commercial agricultural enterprises

5 TVET Development in East Africa

A good overview of Technical and Vocational Training concepts and practice is provided by [“Through Competence-Based to Employment-Oriented Education and Training: A Guide for TVET Practitioners”](#). It provides a good overview of competence based vocational education and training (CBET), and key concepts/elements such as “national qualifications framework”, “competence standards” (also known as in East Africa as “occupational standards”), “curricula” or training plans, “levels of competence”, and assessment/certification procedures.

All countries in the EA region have made efforts in recent years to strengthen TVET, recognising the importance for employment (especially youth employment) and future economic growth. TVET authorities in each country register TVET institutions and trainers, and licence or accredit programmes and trainers. All the TVET authorities recognise the need for a competence-based curriculum (focussed on practical skills development, rather than generic knowledge), emphasize the importance and realization of a TVET responsive to the needs of the labour market, increasing employer involvement and engagement in TVET and creating win-win relationships between industry and education.

TVET policies, strategies and governance structures are now in place in all EA countries. However, the abilities of the relevant authorities to effectively implement the policies, oversee the development of occupational standards and competency-based curricula, and accredit/register CBET programmes are still lacking in many instances.

Reviews of Agricultural TVET in Africa have been provided by CAADP-NEPAD ([Review of Agricultural Technical Vocational Education and Training \(ATVET\) in Africa: Best Practices from Benin, Ethiopia, Namibia and Sierra Leone](#)); by Helvetas [“Study on Agricultural Technical and Vocational Education and Training \(ATVET\) in Developing Countries”](#) (with case studies of Benin and Ethiopia); by Innovate [“The Role of Agricultural Technical and Vocational Education and Training in Developing Countries: A Review of Literature, Issues and Recommendations for Action”](#) with case study of Ethiopia); and by recently by RUFORUM – “Technical And Vocational Education And Training (TVET) Scoping Study in Selected African Countries” (as yet unpublished, with focus on Kenya, Uganda and Rwanda, and experiences from the interaction between the Dairy Training Institute and Egerton University in Kenya).

5.1 Kenya

Under the Ministry of Education fall the 3 Departments of Early learning and Basic Education, University Education and Research, and Training and Skills Development (formerly Technology and Vocational Training).

The Department for Training and Skills Development is responsible for policy, curriculum development, registration and supervision of TVET institutions in the country. TVET institutions fall under the responsibility of the National Government whereas the village polytechnics, craft centres and farmers

training centres and by extension similar institutions that train operators in vocational trades and skills, are under the responsibility of respective County Governments. Arrangements are underway to decentralize the operations of the Ministry including TVET to all the 47 counties.

The [Technical and Vocational Education and Training \(TVET\) Act of 2013](#) established the TVET Authority (TVETA) as a State Corporation (<http://www.tvetauthority.go.ke>). TVETA currently publishes a full list of 845 registered public and private institutions, with a further 295 that have “accreditation in progress” and 180 “recommended for improvement”.

Of the institutes described in section 4.2, the DTI, AHITI, Bukura, the Kenya YMCA College of Agriculture and Technology (formerly Limuru Agricultural Youth Centre, and Eldoret Polytechnic Training Institute are listed as accredited. Baraka Agricultural College is not shown as accredited while Latia is shown as “recommended for improvement”. Other websites also show lists of Agricultural Colleges in Kenya (e.g. <https://softkenya.com/education/agricultural-colleges-in-kenya/>)

TVETA has also been the beneficiary of NICHE KEN 283 - Strengthening the capacities of TVETA for enhancing the performance of the TVET education system in Kenya € 1,135,077 7/2017-6/2020, co-implemented by MDF Training & Consultancy + Cadena international development projects; HAS Den Bosch; University of Eldoret.

The Curriculum Development Assessment and Certificate Council (CDACC) falls under the Kenya National Qualifications Authority, along with the Commission for University Education (CUE) and regulation of basic education. CDACC’s role is to ensure that TVET curricula are developed and approved in line with occupational standards. This includes, in theory if not yet in practice, all short courses such as those described in Section 4.1. above.

5.2 Uganda

Uganda introduced the Ugandan Vocational Qualifications Framework (UVQF), based on the [Business, Technical and Vocational Training \(BTVE\) Act of 2008](#), and as a part of the BTVE’s overarching ten-year (2012-2022) strategic plan ‘[Skilling Uganda](#)’ (Ministry of Education and Sports, 2011). The BTVE Department falls under the Ministry of Education and Sports (MoES), although “other ministries and stakeholders are involved and assume responsibility for selected strategies, notably the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF)”.

The BTVE act also established the [Uganda Vocational Qualifications Framework \(UVQF\)](#), and mandated the [Department of Industrial Training](#) (DIT) to develop, apply, expand and improve the application of the UVQF, promote and regulate apprenticeship/ traineeship/ internship schemes, assess and award Uganda Vocational Qualifications, accredit training institutions or companies as UVQF assessment centres. The DTI is also responsible for the operationalization of the “TVET Council” (TVC), which falls under the Ministry of Education and also the “Agricultural Sector Skills Council” (ASSC) under the TVC. The ASSC is private sector led and has a mandate for the “assessment of training packages” (ATPs), which provide a

framework (guidelines) for CBET curricula. Currently, the cost of ATPs (approx. EUR 20,000) is a constraint to accreditation of training programmes such as those described in section 4.2).

The [Support To Skilling Uganda Strategy Project \(SSUP\)](#) (2015-2020), implemented by the Belgian Development Agency [Enabel](#), is supported by the World Bank, Ireland, Belgium, and the EU. It includes the component to develop skills in TVET (across all sectors, not just agriculture). An interesting component within the project is the “Skilling Development Fund” (SDF), which consists of 3 regional baskets (Karamoja, Albertine and Ruwenzori, Northern Uganda and Kiryandongo), with the objective to create trainer-industry partnerships to develop new training programmes. Other donors are invited to open baskets in other geographic regions or even on specialised themes; these could then be administered and or supported by the SSUP.

The [Skilling Youth for Employment in Agri-business \(SKY\)](#) project (2016-2021), supported by the NL Embassy (EUR 8m) and the [AVSI Foundation](#) (EUR 3.5m), and implemented by the AVSI aims to “strengthen the capacity of agri-skills providers in a sustainable way to provide marketable and employable skilling” and to facilitate the **Skilling Uganda Authority** to be support agri-skilling. It has the target to get 4000 youth into employment. The AVSI “[Baseline report – skilling youth for employment in agribusiness \(SKY\) project](#)” describes youth employment in the agricultural sector, agribusiness entities, learning farms and profiles agro-institutions and colleges in the 4 zones of the project area (Western Uganda, Mt. Elgon area, the Lake Victoria Crescent, and Lake Kioga). Currently, the only dairy-related support by SKY is to Agdi Farm (see section 4.1).

The Uganda Business and Technical Examinations Board (UBTEB) emphasizes Competence Based Education and Training (CBET) where training with production is mandatory and is part of the examinations (<http://www.ubteb.go.ug/ubteb/our-profile>). UBTEB [lists 217 BTVET institutions](#) (mostly private), of which 57 offer national certification in (general) agriculture. No institutes specialized in dairy are shown. AFRISA and the GUCD are not listed.

In addition, the [Uganda Association of Private Vocational Institutions](#) (UGAPRIVI) – “Your Partner In Skills Development” asserts that the majority of the vocational skills training conducted in Uganda is provided by private BTVET Institutions, lists 862 private vocational institutions drawn all over Uganda as members of UGAPRIVI, with 45 public vocational institutions considered as listed affiliate members, and mentions a further 350 other private vocational institutions not yet members of UGAPRIVI. UGAPRIVI listed organizations include the [Mbuye Farm School](#) (near Masaka), as offering a diploma in animal husbandry; and the [Institute of Agriculture, Business and Technology](#) (Serere), offering a Diploma in Animal Production and Management.

5.3 Ethiopia

Ethiopia has a well-established TVET sector, described in [Technical and Vocational Education and Training in Ethiopia](#) (2013), and more recently in the 2016 Wageningen PhD thesis “[Towards Competence-Based Technical-Vocational Education and Training in Ethiopia](#)” by Getachew Habtamu.

More formally, the Ethiopian TVET strategy is described in the 2008 document “[Building Ethiopia: National technical Vocational Education and Training](#)”, and its current legal basis is the “[Technical and Vocational Education and Training Proclamation No. 954/2016](#)”. The strategy/policy of TVETs in Ethiopia falls under the Federal Technical and Vocational Education and Training Agency (FTVETA), headed by the State Minister for TVET, Ministry of Education, while their individual governance, etc. is under the Line Ministries (e.g. MoANR in agriculture, MoLF for dairy).

The [Federal Technical and Vocational Education and Training Agency](#), (FTVETA), under the Ministry of Education, is in charge of implementing the Ethiopian TVET System Reform, which has been carried out since the launch of the National Outcome-Based TVET Strategy. Its activities consist of developing system policy, initiating labour market demand analysis, developing occupational standards in line with the national TVET qualification framework, implementing an occupational assessment and certification system, supporting private TVET institutions, etc.

The **Federal TVET Institute of Ethiopia** (TVETI), established in 2011, functions as university, but its focus is on teaching TVET instructors. It uses 50% theory and 50% practice in its own teaching. TVETI is mandated to train TVET instructors (to BSC level) across 15 sectors (of which Agriculture is one). Recently, the TVETI has prepared 8 curricula in agro-processing instruction, which are now being offered at Holeta and Wukro ATVETS. Dairy processing is one of these (others include meat processing; fruit and vegetable processing; other curricula yet to be developed include animal feed processing technology, honey and beeswax, poultry products). The training materials for these courses exist but are considered as not yet sufficient. The TVETI lacks funds to develop blended learning materials.

5.4 Tanzania

The [National Council for Technical Education](#) (NACTE) was established by Act of Parliament to oversee and coordinate the provision of technical education and training in Tanzania. The scope of NACTE covers all tertiary education and training institutions other than universities and their affiliated colleges, delivering courses at technician, semiprofessional and professional levels leading to awards of certificates, diplomas degrees and other related awards. NACTE lists 556 registered schools – although not all of these have yet been accredited. Among these are the 8 Livestock Training Agencies (LTAs), including Tengeru and Buhiri – both of which have been suggested as potential sites for more intensive dairy development.

Also in Tanzania, the [Vocational Education and Training Authority VETA](#) is the authority to oversee all vocational training. In the past by then it was a Dairy Development programme equipped VETA with the training curriculum to support the dairy skill development based on workplace competence.

5.5 Rwanda

the [Workforce Development Authority \(WDA\)](#) was established in 2008 to support the Technical and Vocational Education and Training (TVET) Policy of 2008, updated in 2015, with the mission “to promote, facilitate, and guide the development and upgrading of skills and competencies of the national workforce in order to enhance competitiveness and employability”. The WDA has established policies, structures, CBET curricula and trained trainers, The WDA oversees the Technical and Vocational Training and Education curricula across the country. The WDA currently lists 70 active schools, although only one curriculum in “animal husbandry”, and there are no specialized dairy programmes developed as yet. The WDA also offers programmes at “business incubation centres”: one of these, at Masaka, has dairy processing facilities had a 6-month programme in culinary and food processing (including yoghurt and cheese processing), but is not currently active.

5.6 Regional TVET needs

In summary, TVET agencies and authorities exist in each country, with a mandate to develop and oversee competency-based training to fit graduates for the workforce. However, there are few specialized courses in dairy production and/or processing, and the TVET agencies appear to have limited capacity to develop such programmes. The processes of certification and accreditation of curricula at TVET organizations can include various stages: needs assessment; development of occupational standards; curriculum development; curriculum piloting; validation by industry and finally curriculum certification by the TVET agency. This process is time consuming and expensive, and a problem is that both the applicants and approving institutions are not always fully conversant with competency-based training (RUFORUM, 2017, unpublished report).

To remedy problems such as these GIZ, among others, has supported the development of competency-based curricula in six countries on several value chains, including dairy (in collaboration with the DTI in Kenya). It has also trained the teaching staff of pilot institutions with who it collaborates to deliver CBET Programme.

The RUFORUM ATVET scoping study (unpublished draft, 2017) concludes that lacking is an institution that facilitates and promotes regional networks of TVETs along the lines of:

- Provision of continue evidence-based and impact-oriented advice for interventions at regional level;
- Support to TVET policy reviews, policy development and in-depth analysis of specific priority areas, including value chains, funding, labour market needs;
- Support to capacity-building initiatives of regional decision-makers and institutions responsible for the training of capacity development of TVET staff;
- Support to the emergence of regional TVET agendas, peer learning and knowledge sharing, encouraging and support multilateral initiatives and collaborative activities that promote transformation and attractiveness of TVET at regional level;
- Promotion of TVET policies for the development of entrepreneurial skills, through strategies such as incorporating courses in entrepreneurship into formal curricula and certification, supporting small

businesses in providing workplace training and stimulating the creation of incubators and co-operative projects with the private sector and communities;

- Strengthened regional cooperation and inter-agency collaboration, facilitating the debate on cross-border recognition of qualifications by exploring the potential development of regional guidelines on quality assurance for the recognition of qualifications;
- Creating a platform for sharing of best practices, new technologies and modules, innovative ideas and exploiting regional opportunities.

6 NL Interests and Roles in EA Dairy Training

6.1 Netherlands Embassies

For the three Netherlands Embassies in visited during the study - Kenya, Uganda, Ethiopia - dairy development remains a priority, being seen as a sector with considerable potential for improving local livelihoods, food security and also future trade with the Netherlands.

The NL Embassy in Ethiopia is currently developing a strategy for Dutch support to the development of the Ethiopian dairy sector. This strategy aims to integrate the continued work of the DairyBiss and Edget projects (with decentralized Embassy funding) with private sector involvement (using programmes public-private programmes such as those of the Netherlands Enterprise Agency, RVO), and TVET development (funded by Nuffic). The Embassy sees the possibility of regional projects as an opportunity to learn from the experience of other countries in dairy development and wants to focus efforts within Ethiopia on key milksheds, rather than spread these efforts across the country.

The NL Embassy in Kenya is prioritizing food security, water use and climate smart agriculture (where dairy is also relevant). As decentralized funding from MinBuZa to the Kenya Embassy is being reduced, support to the KMDP-II programme is expected to be phased out in 2019. The NL Embassy in Kenya also noted the support being given by GIZ to TVET development in Kenya, and future support to dairy by DANIDA, suggesting that links should be made to these programmes by any dairy TVET support from the Netherlands.

In Uganda, future funding envelopes for the NL Embassy (MinBuza decentralized funding, Nuffic), and hence the future of the support to the TIDE project after 2019, appeared to be less clear at the time of the study. Future dairy TVET activities in Uganda should link to Uganda Skilling Youth (SKY) Project, which is supported by the EKNL.

6.2 The Netherlands Nuffic Programme

The Nuffic NICHE programme has supported tertiary education institutes in the East African region, including many with significant dairy programmes and interests (see Section 4.2 and Annex 5). In each project, one or a few individual universities or TVETs has been supported to develop or strengthen its academic and managerial staff, academic programmes, policies and infrastructure, usually with the goal of producing graduates more suited to needs of the labour market.

For the purpose of support to the dairy sector in East Africa, it is difficult to see how focus on one or even a few selected institutions can have the desired widespread and regional impact. While there is currently only one dedicated institute for dairy training in the region (the Dairy Training Institute in Kenya), a great variety of organizations currently offer, and/or are actively developing plans for dairy training and education. These include public and private universities, which typically offer BSc programmes in general agriculture or livestock and which include dairy as component courses. Some universities also offer

certificate and diploma courses, and/or short courses for professional upgrading. Agricultural TVETs – including polytechnics and agricultural colleges, both private and public – also typically offer similar programmes at certificate and diploma (levels 1-5) in general agriculture and livestock production (some with opportunities to specialize in dairy at level 3 and above), and also may offer short courses for skills upgrading and continuing professional development. NGOs, research organizations, private training organizations, and industry players (e.g. processors, professional associations, dairy development authorities or boards, research organizations) all commonly offer or are planning to develop short courses (e.g. 1-2 weeks, sometimes up to 3 months), focussing on practical training in aspects of dairy production, processing, agri-business and dairy extension, although, with very few exceptions, these short courses are not formally recognised or accredited by TVET authorities.

It is therefore too simplistic to assume that all or even most practical dairy training will be undertaken by the formal ATVET institutes in the near future, national educational (university and TVET) policies notwithstanding. This is a fast-evolving area, with considerable investments planned in all countries for new training institutes, facilities and programmes in dairy. In many cases, these different actors interact or collaborate to offer training and education, and so it is more realistic to view this as an integrated training “system”, rather than as distinct “vocational” and “academic” sectors, represented by colleges and universities, respectively.

Given this integrated system, Netherlands support for one or a few specific organisations, either at regional or national level, is unlikely to have a widespread and sustainable impact on the regional dairy sector. More cost effective and with better potential to have impact at scale would be to support a range of interested training organizations (including TVETs, universities, and sector organizations, both private and public sector based) to more effectively deliver practical and/or CBET curricula which have either now been formally approved or are being developed, so that graduates have the skills needed.

The Nuffic NICHE (Netherlands Initiative for Capacity Development in Higher Education) Programme is currently being phased out (current projects will be complete by 2022, and no new projects are being developed under this programme). The new [OKP \(Orange Knowledge Programme\)](#), initiated in 2017 and running to 2022, consists of consists of 4 components: partnership projects between TVET and higher education institutions locally and in the Netherlands; tailor-made training (TMT) for groups; individual scholarships for mid-career professionals; and alumni activities. All the 5 countries of the EA region here are included as “full programme countries” under the OKP, meaning that they are eligible for all of the 4 programme components.

At the time of writing, “Country Plans of Implementation” are being prepared, which will define the capacity needs of these countries and hence OKP priorities. It is understood that these will focus on specific sectors, according to Embassy priorities, and also on vocational training (rather than on more academic university programmes). In Kenya and Ethiopia, at least, these priorities are expected to include support to TVET programmes in the dairy sector. The EKNL Kenya has reservations about any possible regional OKP project in dairy due to potential transaction costs, and would expect to see a clear added value (business case for) to Kenya for such a regional OKP project, as the budget for such a project will likely be drawn from the individual country OKP budgets.

6.3 Netherlands East Africa Dairy Partnership

At the time of this scoping study, the Netherlands East Africa Dairy Partnership was developing a proposal⁵ to MinLNV for support to enhance East-Africa wide learning and scaling of best practices, focusing on the key themes of milk quality, forage and inclusive business models. This proposal envisages funding of EUR 650,000 from MinLNV, and an additional funding of EUR 100,000 from other sources, over 2 years with a projected starting date in May 2018.

The Consortium Partners of NEADAP include the SNV Netherlands Development Organisation Wageningen University Research, Agriterro, and the Friesian (Agro Consulting BV). SNV is the lead organization, with contact person Ms Mary Njuguna, Acting Country Director SNV Kenya.

The aim of this regional project is to strengthen, complement, and bring more synergy between Netherlands-funded dairy initiatives in the region, and at the same time profile the Netherlands dairy sector and stakeholders more clearly as preferred knowledge and investment partner for dairy development in East Africa.

Significant outputs of the project should include “white papers” on lessons learned from experience in Kenya, Uganda and Ethiopia, blended learning material development and support to planning of curricula on the key themes (milk quality, forage, agribusiness), and the establishment of a NEADAP e-platform to consolidate and share experience, documentation, training materials, etc.

There is therefore considerable scope – and need for - actions proposed to support dairy training by this scoping study to be integrated with those of the proposed NEADAP project and vice-versa.

6.4 Borderless Network (East Africa table)

The [Borderless Network](#) is a joint collaborative effort of Agricultural Education (“Green”) Institutes in the Netherlands, the Ministry of Foreign Affairs, the Ministry of Agriculture, Nature and Food Quality and the Top Sectors Agro and Food & Horticulture and Nuffic.

The focus of the Network is cooperation between education, industry and government (the “Triple Helix”) in East Africa, to jointly work together on societal and economic issues of food security, food safety and climate change, and promote the competitiveness of the agriculture and horticultural sectors for knowledge, innovation and training.

The Borderless Network is currently implementing the Nuffic Innocap project “Building a profitable dairy industry through enhanced practical capabilities of dairy training institutions in Ethiopia”, under the

⁵ The NEADAP proposal referred to here is dated February 2018.

leadership of ICRA and the Alage Agricultural, Technical, Vocational, Education & Training College in Ethiopia, and involving a number of colleges and industry players in Ethiopia. This project has the intended outcome that lecturers and trainers provide practice-oriented courses on up-to-date dairy production and processing techniques and provide real-life learning context (at farms or processing units) for their students and trainees.

One of the priorities of the Network is to develop models and activities for e-learning & blended learning, as a way of increasing outreach with lower cost along with high, commonly agreed quality standards, and to this end is currently conducting an explorative study on ‘upscaling options for an agro-E-platform’ in the Region.

The Chair of the Borderless Network is currently⁶ held by Robert Baars (Van Hall Larenstein and coordinator for Ethiopia). Other members include: G.J. Duives (Has Den Bosch); G. van Dieren (Wellant, Coordinator Rwanda); H. Andringa (Nordwin, Coordinator Uganda); J. van Mierlo (CDI WUR, Co-Coordinator Kenya); H. Holleman (Aeres, Co-Coordinator Kenya); Mariëtte Gross (ICRA); H. Tellegen (DTC, Coordinator South Sudan and Tanzania); J. van Nieuwenhuizen (Nuffic); V. Musch (MinEZ); and A. Rohde (MinLNV).

The Borderless Network (E.A. Table) is therefore positioned to be a key organization to implement activities in practical dairy training as proposed by this scoping paper.

6.5 Dairy Training Centre

The [Dairy Training Centre](#) in the Netherlands has been a consortium member or has had close links with Netherlands dairy projects in East Africa, and has underpinned much of the training activities and development of training materials by those projects.

The DTC has developed an interesting e-learning approach based on [a franchise concept](#). This model has 3 levels of franchise: bronze, silver and gold. These different levels progressively offer support in the form of online training materials, access to the DTC online learning platform, training of trainers, and accreditation. The gold level are preferred partners in tenders, and receive on-site support, marketing support for trainings for farmers and industry. With the support of Nuffic Innocap, and in collaboration with the KMDP, it has introduced this concept to university partners Kenya (primarily Egerton, UEAB and Laikipia). This pilot is intended to spearhead the development of e-/blended learning in dairy.

However, feedback from some of these organizations in Kenya during the scoping mission indicated reservations on the future uptake of the franchise, owing to the costs and perceived difficulties on recouping a return on the investment costs. Additional concerns included the difficulty to “lock” materials produced by the University itself only for own use, as well as the integration of less performing aspects of

⁶ At the time of writing in April, 2018.

the model. For these reasons, we conclude that an alternative, more open model of support focusing on blended learning materials will be more attractive to educational partners in the region.

During the time of this study, the DTC was declared bankrupt. While the future of the DTC is therefore uncertain, the assumption here is that the organization itself it will continue to exist as a group of dairy training experts, active in both the Netherlands and probably the East African region.

6.6 Private Sector

A range of Netherlands companies is active in East Africa (see NEADAP proposal for table). These companies include farms (e.g. Genesis and Alpha and CowGrow Farms in Ethiopia), processors (e.g. Holland Dairy in Ethiopia, Happy Cow, Countryside Dairies and Bio Foods in Kenya), livestock genetics and AI (e.g. Bles Dairy, Firma Deker, CRV genetics in Kenya and Uganda), equipment suppliers (e.g. van de Heuvel, Dejirene Ltd., Ante BV in Kenya, Muller in Kenya, Uganda, and Ethiopia), feeds and fodder (De Heus Koudijs, Fit Ltd in Kenya), training and advisory services (DTC, the Friesian, ProDairy, Roodbont), etc.

The private sector has a role to play in delivering needed services to smallholder agriculture, in the form of stock, feed, advice, training, milk collection) to surrounding farms. It also has a key and direct role to play in supporting vocational education and training.

7 Options for Support to Practical Dairy Training

7.1 Potential intervention areas

On the basis of the previous sections to this report, a number of possible activities are identified here to support to practical training and TVET in the dairy sector, which could have a significant impact at national and regional levels. The core activity suggested is the development of blended learning materials, linked to a range of supplementary activities to assure the use and impact of such materials.

1. *Develop training modules.*

As described in section 4.1.4, NL funded dairy development projects in the region have spent considerable effort in developing modules for practical training sessions on PDTFs, for both farmers and dairy advisors/extension agents. To a large extent, the genesis, or at least inspiration for these materials can be traced back to the DTC. The “Cow Signals” produced by Roodbont Publishers are also in use in East Africa. The AERES group has experience in developing practical animal husbandry modules for use in the Netherlands and is interested to develop dairy modules.

The Netherlands therefore has a particular advantage and capacity to develop practical, blended-learning materials for the dairy sector. With adaptation to specific local conditions curricula and languages by local partners in each country (building on the practical modules already developed), and piloting by selected institutions in each country, a generalised framework could greatly assist the variety of educational and training institutes to implement practical and/or CBET programmes and curricula already in operation or planned, as well as support practical short courses for farmers supported by development projects.

Rolling out such materials at regional level, with initial pilots at key training institutes in each country, would alleviate the considerable and repetitive costs of further training material development in each country and/or training organization, improve the effectiveness of current and future training, and contribute to developing regional quality standards in dairy CBET. All training organizations and stakeholder visited expressed interest in such support and the concept of blended learning materials.

An initial listing of modules that could be developed is given in Annex 6. The cost of such material development is estimated at EUR 40,000-50,000 per basic module (depending on the amount of material or number of screens), with additional costs to adapt to the specific contexts of each country at EUR 5,000 per module, and translation costs at an additional EUR 5,000 module.

2. *Train trainers*

Currently, a key limitation to improvement of improved dairy production practice at scale remains the scarcity of trained and practically oriented farm instructors. All the dairy development projects visited have placed considerable emphasis in developing trainers/instructors for training farmers in groups (cooperatives, milk hubs), often at PDTFs or model farms. The demand for – and usefulness of – such on-the-job training or continuing professional development (short courses of 1 week) is seen as great – or even greater – than that for the longer-term vocational or

academic training at ATVETs or universities. The skills required by instructors fall in three broad areas:

- practical dairy production skills
- dairy business skills
- training skills (e.g. for practical, group learning, and in formal CBET curricula design, delivery and assessment for ATVET instructors).

3. Develop dairy curricula

Specialised dairy curricula (for dairy production and processing) have been developed for the Dairy Training Institute in Kenya (with support from GIZ); however, the quality and practical nature of these curricula have been questioned by stakeholders. Curricula in dairy processing are also being developed at Holeta Polytechnic and Wukro ATVET in Ethiopia, with support from the Federal TVET Institute (which in turn [is supported by the German KfW and IP Consult](#)). Curriculum development is a lengthy and often contested process, and hence it is suggested here that it should **not** be a primary objective *per se* of a short to medium-term Netherlands project to support dairy training, although targeted support to e.g. enable participation of the private sector could be considered (see point 6 below). It is also expected that the development of carefully designed training materials, as in point 1 above, will influence dairy curricula, without being prescriptive in terms of curriculum definition.

4. Synthesise and document best practice

NEADAP, with financial support from MinLNV, proposes to enhance regional learning and scaling of best practices, focusing on the key themes of milk quality, forage and inclusive business models. The interventions proposed here can complement NEADAP actions, especially in regard to development of training materials, and best practice in dairy training -both in short courses and TVET programmes. The proposed platform of NEADAP can also be used to support the distribution of training materials as suggested in point 1 above.

5. Strengthen national TVET institutions

Considerable efforts are being made by national governments and external donors to strengthen the TVET system in the region. While policies, strategies and relevant institutions are now largely in place, and the concepts and practice of competency-based training (CBET) are being developed, occupational standards and relevant curricula for the dairy sector are still lacking (or, where developed as in Kenya, still offer room for continued improvement). The lack of instructors with expertise in delivering CBET curricula, as well as suitable facilities and infrastructure at colleges and universities (farms, processing plants, with comparable standards to the best commercial businesses), remain key limitations. The Netherlands can usefully support these processes when specifically related to the dairy sector, including:

- Developing the competencies of national TVET authorities to develop and approve dairy curricula;

- Developing the competencies of training institutes to assess dairy CBET delivery (i.e. as “assessor institutes”);
- Facilitating the accreditation of dairy training programmes (with national accreditation and curriculum approval mechanisms).

Implementation of such actions should be carefully integrated with national TVET departments and/or other national programmes to develop TVET, to ensure that processes and practices introduced are compatible with broader national practice and guidelines.

6. ***Develop private training/advisory services***

The current Dutch projects such as TIDE and DairyBiss have created a cadre of practical dairy trainers. While these projects are also seeking ways of sustaining these groups beyond the project lifetimes as private advisors and/or trainers, their future is not yet assured. In Kenya, individuals have established or intend to establish professional advisory and training services (e.g. Perfometer, led by previous staff of SNV, which also implements part of the KMDP project; ProDairy, led by previous staff of one of the PDTFs), but the viability of groups in other countries is likely to need external support, at least in the short to medium term. While developing high quality training modules and continued backstopping with practical training methods will be useful, additional support in providing ready markets via development projects, developing business plans, and assisting companies to obtain the legal accreditation necessary⁷ will also enable the longer-term emergence of private dairy advisory and training services.

7. ***Strengthen linkages between training organisations and the private sector***

Development of effective TVET programmes depends on close linkages between (often public) training colleges and the private sector. The role of the private sector in this regard includes:

- Participating in the development of occupational standards and definition of competencies required;
- Participating in the development of training materials which reflect modern production, processing and services practice;
- Participating in training sessions as resource persons, and offering facilities and supervision to students/trainees on work placement attachments, internships
- Developing private training programmes, and/or providing funds (e.g. through levies by industry associations) for training programmes.

Such linkages are still weak in the East African dairy sector, the significant efforts of projects such as KMDP, TIDE and DairyBiss notwithstanding. Such efforts should be continued and supported in any regional dairy TVET programme.

8. ***Strengthen linkages between training, research and education***

The interaction between Egerton University and the DTI in Kenya, as facilitated by the Nuffic supported “Dairytrain” project (KEN127/139) was cited by the RUFORUM ATVET review (unpublished) as a model for the region. As can be seen from the numerous instances mentioned

⁷ While most organizations involved in short term training have not yet considered the need for formal accreditation by TVET authorities, the greater capacity of those authorities for regulation in future may make this necessary. As one TVET authority remarked: “we can shut them down”.

in this report, the interaction between PDTFs, ATVETs, universities and research organizations imply that practical training should be seen as an outcome of the interaction between all these types of organization, rather than just e.g. ATVETs alone. Not only are universities offering, or planning to offer, short courses, certificate and diploma programmes, as well as introducing more practical training or CBET into their BSc curricula, they are also supporting the development of CBET curricula and training instructors from ATVETs in CBET delivery, and also using the practical training facilities developed by programmes such as TIDE as part of their regular programmes. These linkages should be encouraged and facilitated by any regional dairy TVET programme.

9. *Develop ATVET infrastructure*

A weakness of many ATVETs, cited by stakeholders in the dairy sector, is that farms and processing facilities do not match those of the private sector – where graduates will be employed. However, in view of the considerable investments currently being planned by national programmes such as the LFSDP in Ethiopia and the USDP in Uganda, as well as regional programmes such as ECAATP, EASTRIP (which will support Holeta in Ethiopia), the Netherlands should only provide support for TVET infrastructure in exceptional cases.

7.2 Potential project options

Most of the dairy development projects described in Annex 4, including those financed via the Netherlands Embassies, are **national projects** in scope (even if focussing mainly on specific milksheds), and intended to have an impact on the dairy sector at national level. Most educational and skilling projects described in this report are also national in scope. Most of the Nuffic NICHE projects described in Annex 5 have been focussed on one or few **specific HE institutes**, with the exception of the SEAD project in Rwanda (RWA 249/268), also referred to as a “Niche 2” project, and projects to support national higher educational systems (e.g. KEN211, RWA013), which can also be considered to be national in scope. The few **regional dairy development projects** include as the BMGF/USAID EADD-II (which is programmed to end in 2018), and regional research/educational projects such as ECAATP, EASTRIP, etc. which are funded mainly through World Bank funds (and which, in practice, are also financed in the form of IDA loans to individual governments).

The above actions could be implemented through 3 project “modalities”:

1. an **integrated regional project** (integrating Dutch MinLNV, MinBuza, Embassy, Nuffic OKP and private sector funding, with or without additional funds from non-NL sources such as e.g. IFAD, and national government programmes);
2. **separately-funded national and/or institutional projects** (with OKP funding, NL Embassy allocations, and/ or national government funding with e.g. WorldBank, IFAD support, etc.)
3. a **regional project** (e.g. with finance from MinLNV, MinBuza, Nuffic-OKP, possibly additional funds from e.g. IFAD) linked to **separate national projects** (e.g. financed via the NL Embassies, national OKP allocations, national governments, etc.);

Each of these options has implications in potential impact, “transaction costs”, Netherlands visibility, and funding arrangements.

7.2.1 Integrated regional project

An integrated regional project could focus on all the activities noted above in section 7.1. It could be financed through integrating funding from, for example: MinLNV, MinBuza, Embassy funding available to the 5 countries, Nuffic-OKP, and private sector funding from within the Netherlands (e.g. Friesland Campina, Rabobank Foundation, etc.). Additional funding from external sources could include an IFAD regional grant (preliminary interest has been expressed), other bilateral sources (e.g. DANIDA, which has significant dairy programmes in the region) or multi-lateral sources. It could also include a funding commitment or component from national governments, from existing dairy development programmes in each country (e.g. LFSDP in Ethiopia, RDDP in Rwanda, etc.).

The main **advantages** of a regional dairy skills development training project include:

- the greater potential for **scaling and development impact**, resulting from the larger overall budget (from pooling different resources), greater synergy with existing national programmes, and greater synergy between the different activities proposed.
- **maximum visibility of the Netherlands** as a “preferred partner” for dairy development in the region (assuming the Netherlands would take the overall lead in such a project);
- the sharing of the significant costs of **developing high-quality, blended-learning materials**. The cost of the basic development of the modules described in Annex 6, is estimated at EUR 1.45m (at EUR 40-50,000 per module, for all 32 modules, depending on the amount of material or number of screens), which would be difficult to justify for one single country.
- the **sharing of experiences** and relative national strengths (e.g. private development of training and advisory services in Kenya; development of CBET instructors and TVET systems generally in Ethiopia; institutional roles of e.g. Dairy Board in Kenya, Uganda; quality assurance mechanisms in Kenya; skills development funds, linkage of PDTFs with formal educational sector in Uganda, etc.);
- the **linkage with regional projects** such as those educational projects and centres of excellence supported by the World Bank (e.g. ECAATP, EASTIP, ACE2).

The main **disadvantages** of such a modality would be the greater project preparation and transaction costs (involving negotiation and coordination between different embassies and multiple funding agencies and mechanisms, which may have specific requirements in terms of policies, country funding allocations, selection of implementing agencies, accounting requirements, etc.).

7.2.2 Individual national/institutional projects

National and/or institutional projects to support practical skills development in the dairy sector could cover most of the activities described in Section 7.1 – with the likely exception of Activity 1: the development of blended learning materials. It is unlikely that a single national project could cover the costs of the developing the package of blended-learning materials as described in Annex 6, which is the main activity proposed here.

Such national or institutional-level projects could be financed either through (existing or new) NL Embassy programmes, the OKP programme, or other donors,

The main **advantages** of supporting regional dairy training via national projects include the simpler and more flexible funding arrangements, and greater alignment with existing instruments such as Embassy programmes, the OKP (as currently understood by the authors of this report, although it is recognised that the programme is still taking shape), and national programmes.

The main **disadvantages** of this modality include:

- the lower potential for scaling and development impact at a regional scale;
- the difficulty in financing the costs of high-quality, blended-learning materials – which would likely be prohibitive for any one institutional or national project;
- an overall inefficiency represented by fragmented, uncoordinated and possibly duplicated actions, uninformed by lessons learned elsewhere in the region (“re-inventing wheels”);
- the lower visibility of the Netherlands as a “preferred partner” at a regional level.
-

7.2.3 Regional project linked to separate national projects

The third option would be a compromise or integration of the 2 models above: i.e. a regional project which would support and complement a number of national projects. Under such a scenario, a regional project could focus on activities 1-4 described in Section 7.1, where scale and synergies are likely to be greatest, i.e. the development of basic modules, training of trainers, development of curricula, synthesis of lessons learned and best practice). Separate national projects, would then focus more on adaptation of the modules to national conditions, and the supplementary activities 5-9.

The regional project could integrate funding from, for example: MinLNV (incorporating the proposed NEADAP project), MinBuza, (part of the) Embassy funding available to the 5 countries, (part of) the Nuffic-OKP funding available to the countries in region, and private sector funding from within the Netherlands. Additional funding from external sources for a regional project could also include an IFAD grant and/or other possibly interested bilateral sources.

A preliminary estimate of the cost of such a regional project focussing on activities 1-4 is EUR 3m, including EUR 1.3m for the development of regional blended-learning materials; EUR 0.9 m for their adaptation/translation in 3 countries (EUR 300,000 per country), EUR 0.3m for training of trainers, and EUR 0.5m for the development of a regional platform, exchanges/conferences, etc.

National projects, providing additional funds for activities 5-9, could include those financed by Dutch instruments (via Embassies, the Nuffic OKP programme) as well as national government projects and development programmes in each country (e.g. LFSDP in Ethiopia, RDDP in Rwanda, etc.).

The advantages and disadvantages of such a “mixed” model are intermediate between those of a (mainly) regional and (solely) national projects. Advantages include:

- The greater scale and benefit from using centrally developed blended-learning modules across a number of countries in the region (and potentially beyond);

- The support to individual national/institutional projects from a regional project, promotion of exchanges and mutual lesson learning/ development of best practice at a regional scale;
- A common programme and economies of scale from “training of trainers” and development of vocational curricula;
- The integration of the activities proposed here with those of the proposed NEADAP project;
- The easier and more flexible development and implementation of administratively separate, but coordinated, projects;
- The relative visibility of the Netherlands from the regional component.
-

The potential disadvantages of this model include those mainly associated with the regional project component, including the greater coordination costs during preparation (when further negotiation with national governments would be desirable), and implementation (e.g. travel, communication). If the programme is financed (at least in part) via the OKP – and based on the current understanding of the OKP by the authors of this report - a regional component would presumably need to be negotiated with Nuffic and the respective Embassies, to agree on the amounts to be drawn from the different national “pots” allocated to each country.

Annex 1: Terms of Reference, Dairy TVET Scoping Study

Background and scope of the assignment

The Netherlands Ministry of Foreign Affairs and Agriculture, Nature and Food Quality have the intention to strengthening our contribution to dairy development in East Africa and with the aim to become the preferred partner for dairy development in East Africa. This in the context of the so called “trade and aid” policy. Through bilateral programs we invest considerably in dairy development in Ethiopia (EDGET & Dairy BISS), Kenya (KDMP) and Uganda (TIDE). For Uganda and possibly also for Rwanda is an Impact cluster (PSD-ppp- instrument) under development, initiated by the Netherlands private sector. In Rwanda a large IFAD-project on dairy development is being implemented and the Rwandan government indicated that it welcomes complementary support from the Netherlands, especially in the field of improving milk quality through the introduction of quality-based payment systems. In Tanzania SNV implements the “Income and Employment for Women and Youth in the Dairy Sector” project. Partly also through these different projects and the completed 2g@there project a wide range of private Dutch companies are active in the dairy sector in East Africa. Up to now there has been limited contact and no cooperation between various projects referred above. This is seen as a missed opportunity in joint learning and joint assessment and scaling of good practices and market opportunities.

Therefore, it has been agreed within the BZ-MinLNV covenant food security to initiate an umbrella program Dairy East Africa aimed at joint learning and scaling and thereby further strengthening the profile of the Netherlands in East Africa and to provide an East Africa wide platform for Dutch companies.

The intended Dairy East Africa umbrella project is also a logical follow up of the report “White Gold: Opportunities for Dairy Sector Development in East Africa”. This report is the result of a collaborative project initiated by the Netherlands, in which IFAD, GIZ, ILRI, ASERECA, USAID, ACIAR and Bill & Melinda Gates Foundation participated. These parties recognized that the growing investments by donors and private sector necessitates better collaboration and exchange of information between stakeholders. The project was coordinated by CDI- WUR and carried out country studies and stakeholder consultations in each country in East Africa and in April 2014 a 3-day workshop was organized in which key stakeholders and key experts of the different countries participated. In the workshop a number of common themes were identified that could benefit from East Africa wide cooperation. These were: 1. More milk from roughage; 2. Breeding for more and better animals; 3. Animal health; 4. Strengthening of farmer organizations and access to finance; 5. Safeguarding and rewarding good quality milk; 6. Better policy through better availability of data on farm/firm, chain, and sector level; 7. Competency of dairy farmers, staff, and entrepreneurs along the value chain; 8. Sustainable intensification related issues –biogas and closing the nutrient cycle. It was also agreed which combination of partners would take the lead for the different themes. Due to a change of positions of a number of the involved staff within the different organizations the collaborative action did not materialize. The report however still functions as an important reference document with a large number of downloads from the WUR-website.

In order to determine the relevant themes for a Netherlands Dairy East Africa umbrella project a small assignment was given to NABC for coming with all relevant stakeholders from the Netherlands, and to agree on a shortlist of themes and who is well placed to lead them.

This resulted in the recommendation to include the following themes:

1. Technical Vocational Training and Education;
2. Forage Production; handling, storage, marketing & efficient use of manure (closing the circle);
3. Milk Quality and Quality Based Payment Systems;
4. Strengthening Cooperatives.
- 5.

For 2 and 3 an assignment (see annex 1) has been given to prepare a project proposal, Agriterra has agreed to come with a proposal for 4.

For theme 1 a scoping study (prior to a project proposal) is proposed based on the following considerations:

- In East Africa dairy is important in terms of employment, livelihood and nutrition. Productivity is still relatively low, value chain efficiency sub-optimal and milk quality generally poor. This makes that the competitiveness of the dairy industry in East Africa is rather poor and also resulting in relatively high consumer prices. At the same time with urbanization and increasing of income the demand for milk will increase considerable, which offers opportunities for growth and employment. For seizing this potential enhanced productivity and market led value chain development is key. It is widely acknowledged that the lack of basic knowledge and skills is one of the crucial limiting factors. Developing knowledge and skill has to go hand in hand with developing improved productions systems and evidence based improved practices.
- The ongoing projects in Kenya, Uganda and Ethiopia are implementing a wide range of TVET and extension activities both through government and private parties. This has also led to the development of various private initiatives for training and coaching services for farmers. Especially in Kenya we see a lot of dynamics in this field, which is already quite well documented. Therefore, a thorough assessment is needed of the ongoing activities, the needs and gaps as perceived by government and private stakeholders before a full-fledged proposal can be developed.
- An interesting and relevant development in Kenya is that three Kenyan Universities have come together and developed a comprehensive concept note on proposed Kenyan-Universities competency based dairy curriculum.
- Within the Netherlands the so called Borderless Network (a joint collaborative effort of Agricultural Education Institutes, Ministry of Foreign Affairs, Ministry of Agriculture, Nature and Food Quality and the Top Sectors Agro and Food & Horticulture and Starting Material) one of the priorities is to develop models and activities for e-learning & blended learning, as a way of increasing outreach with lower cost along with high, commonly agreed quality standards. The Dairy Training Centre in the Netherlands has developed an interesting e-/blended learning approach based on a franchise concept. Amongst others with supported of INNOCAP, it is introducing this concept step by step in Kenya. First partners are three Universities (also initiators of the above mentioned concept note). This pilot is seen as a spearheading the development of e-/blended learning. It is considered worthwhile to assess relevance of further development and possibility of scaling of this model within and across East Africa and the need and possibility of including more partners from the Dutch side. Next to this the Borderless Network is conducting at this moment an explorative study on 'upscaling & options for an agro-E-platform'.
- In the past, the Netherlands and other donors have conducted capacity building activities within the framework of dairy development projects. In most cases the capacity building activities stopped with the ending of the project. Through Niche and TMT institutional capacity building

projects for dairy or related to dairy have been carried out and some are still under implementation. The general feeling is that the connection with the 'world of work', with private sector parties active in training & coaching and with the bilateral dairy projects is sub-optimal. In addition, the various Nuffic Niche projects supporting one or more individual universities with curriculum development and training, have not really led to a systematic approach on practical dairy training and education and some sense of a 'national curriculum' that can be rolled out country wide. There is a general agreement that these shortcomings need to be overcome in the future. The development of a national TVET-Dairy curriculum based job profiles is considered an important requisite.

- The other 3 themes of the Dairy East Africa umbrella project have also important and relevant skill capacity building components. These to be developed components need to be included in a TVET project.
- The funds available within the BZ-LNV covenant are not sufficient to develop a capacity building program that can initiate, guide and support the systemic change needed in TVET in the different East African countries.
- Nuffic has been tasked by the Ministries of Foreign Affairs to develop a new Knowledge Development Program (KOP). The inception phase is now being implemented. Based on first discussions a regional Dairy-TVET program, well embedded in national structures and frameworks could, possibly qualify for support through KOP. For this it is necessary that it is supported and prioritized by the Ministry of Foreign Affairs and the Ministry of Agriculture, Nature and Food Quality and it get equally strong buy-in and support from relevant training institutions and government departments in East African countries, as well from the Netherlands and East African private parties.
-

2. The assignment

Conduct a scoping study on the need, relevance, priorities, limitations and possible modalities of an East African Dairy TVET-project. This project or program initiates and contributes to the systemic change considered necessary to enable and ensure that TVET systems and services are based on the needs of a professional, competitive, sustainable and inclusive dairy sector. The study should thoroughly look at the public responsibilities for TVET, specially at system level, the initial education/training, the scope and options for the private parties in training & coaching, cost recovery options and business models. Also the need and prospects of ppp-arrangements should be included.

The context described above and the views of the Embassies' food security experts and Agricultural Counselors in the different EA-countries should be captured and given due attention. The same is true for the Ministry of Foreign Affairs and the Ministry of Agriculture, Nature and Food Quality policy officers responsible for capacity building programs and/or East Africa and also general policy and priorities of the steering committee of the Borderless Network should be taken into account. In addition, innovative developments within the Netherlands like the national and international field of TVET need to be described shortly and assessed on its relevance. Next to that use should be made of relevant guiding documents like the IOB study "Synthesis report of the evaluation of Dutch support to capacity development, facilitating resourcefulness". It is recommended to base the final advice on a number of scenarios and a limited number of distinct preferably innovative modalities. Also detailed and broadly supported recommendations should be made for starter/pilot activities.

3. Result

A concise report of maximum 30 pages, complemented with annexes, providing description of the issues, the challenges and opportunities for contribution to a future proof dairy TVET in East Africa, and well assessed interventions packages and implementation modalities developed in close consultation with stakeholders. Followed by an advice for Netherlands-led project or program on Dairy- TVET-East Africa, describing its purpose, outcome, strategy and program components in such a way that it can be easily transformed in a Term of Reference for developing a project proposal. This is complemented by recommendation for starter/pilot activities. The final report should be ready not later than April 30, 2018.

Before December 15, 2017 an interim report will be ready summarizing the outcome of a desk study and interviews with key stakeholders.

Annex 2: List of persons contacted

Contact Person	Organization
Netherlands	
Martin de Jong	The Friesian
Victor Volkerts	Q-Point
Joep van Mierlo	Advisor, Animal Production Systems, CDI, Wageningen University Research
Jan van de Lee	Wageningen Livestock Research
Adriaan Vernooij	Wageningen Livestock Research
Sabdiyo Dido Bashuna	CTA
Johanna van Nieuwenhuizen	Nuffic
Global	
Antonio Rota	Lead Technical Specialist, Livestock Development, IFAD, Rome
Kenya	
Anton Jansen	Coordinator KMDP, SNV
Joseph Langat	KMDP, SNV
Jos Creemers	ProDairy
Johan Fieten	ProDairy
Eusebius Mukhwana	Consultant (prev. Deputy CEO at Commission for University Education)
Sanne Willems	First Secretary, Food Security, EKNL
Rose Makenzi	Policy Officer, Food Security and Water, EKNL
Ingrid Korving	Agricultural Counsellor, Kenya and Tanzania, EKNL
Philip Cheron	Kenya Dairy Board
Peter Ngaruiya	East and Southern Africa Dairy Association, ESADA
David Maina	Managing Director, Perfometer
Monica Ndungo	Acting CEO, Kenya Dairy Processors Association
Dominique Menjo	Chairman, Kenya Dairy Processors Association
Meshack Opwora	Acting Director, TVET Directorate, MoE
Gerard Oosterwijk	Manager, Happy Cow Dairy
Gabriel Mungai	Principal, Dairy Training Institute
John Kabira	Deputy Principal, Dairy Training Institute, Naivasha
Janet Riungu	Lecturer Dairy Training Institute, Naivasha
Samuel Matoke	Director Dairy Section, Ministry of Livestock and Fisheries
Alexander Kahi	Deputy VC for Academic Affairs/Dept. Animal Science, Egerton University
Tobias Otieno	Dept. Animal Science, Egerton University
Victor Kaplangat	Egerton University and Agriprofocus

Samuel Mwonga	Department of Crops, Horticulture and Soils, Egerton University
Mary Gathuma	Head of Training, MoLF
Getrude Sawe	
Abraham Mwangi	Dep. Principle, Academics, Eldoret Polytechnic
Catherine Wekunda	County Extension Advisor, Agricultural Sector Support Dev. Program
Korso Gude Butucha	Deputy Vice Chancellor, Academics, University of Eastern Africa, Baraton
Noah Angwenyi	University of Eastern Africa, Baraton
Preston	Coordinator of TVET programmes, University of Eastern Africa, Baraton
Richard Wekesa	Principal, Bukura Agricultural College
Beatrice Osumbah Gode	Deputy Principal, Bukura Agricultural College
Uganda	
Anno Galema	First Secretary, Food Security and Private Sector Development, EKNL
Tine Deschacht	Program Office Dev. Cooperation, Embassy of the Kingdom of Belgium
Niels de Block	Enable; Support to Skilling Program
Samuele Rizzo	SKY (Skilling Youth) Project
Justus Rutasaire	Director of Corporate Services, National Agriculture Research Organization
Dr Rueben Kawagga	Principal Dairy Development Officer, Dairy Development Authority, Uganda
Herbert Sabila	Principal Tutor, Dairy Development Authority
Alex Mukasa	Senior Vet Officer, MAAIF
Stephen Magume	Ag. Principal Officer, Ag. Ext. and Skills, Dir. of Agr Extension Services, MAAIF
Umran Kagwa	Consultant
Michael Kansime	Dir. Programs, Africa Inst. for Strategic Animal Res. Services & Development (AFRISA)
Cyprian Ebong	Interim Executive Secretary, ASARECA
Anthony Egeru	Program Manager, RUFORUM
Steven Aikiriza	TIDE- SNV
Paul Kimbugwe	Senior M&E, Dairy Advisor, TIDE, SNV
William Kihire	SNV TIDE
Rinus van Kinken	Coordinator TIDE; SNV
Dan Twesige	Student, Bukalasa Agricultural College
Dick Bugingo	Managing Director, Agdi Dairy Farm
Ronald Bamundaga	Lakeside Dairy
Rwanda	
Carian Emeka	Agricultural Counsellor, EKNL
Rob van de Gevel	MottMcDonald and SEAD Project, Rwanda
Straton Habumugisha	Consultant
Tanzania	

Deogratus Mlay	Dairy Development Expert, Tanzania Dairy Board
Margaret Pallangyo	CEO, Livestock training Institute, Tengeru
Lusato Revocatus Kurwijila	Sokoine University
Ethiopia	
Mahlet Yohannes	Private Sector and Industrial Development, EDGET, SNV
Gerrit Holtland	Coordinator, Hortilife, SNV
Tinsae Berhanu	DairyBiss Project
Jan Willem Nibbering	First Secretary, Food Security EKNL
Niek Bosmans	Agricultural Counsellor, EKNL
Tariku Teka	Director, Dairy Directorate MoLF
Hikuepi Epi Katjuongua	Senior Ag. Economist, Food and Agricultural Practice, World Bank
Amanuel Assefa	Senior Agribusiness Consultant, LMIRA Project, World Bank
Thomas Chrenet	Senior Policy Advisor, MoLF
Fasil Reda	Country Program Coordinator, UNIDO
Belachew Hurrisa	President, Ethiopian Milk Processing Industry Association, EMPIA
Teshome Lemma	State Minister for TVET, Ethiopia
Usman Surar Siraj	Director General, Federal Cooperative Agency
Kassaye Abdissa,	Oromia TVET Bureau Head. Oromia TVET
Dereje Regassa	Director of Planning; Oromia Cooperative Promotion Agency
Alemayehu Ita	Dep. Head, Oromia Cooperative Promotion Agency
Debela Bersisa	Dean; Holeta ATVET
Merga Nagassa,	Vice Dean, Holeta AtVET
Biadgelign Ademe	Dean, Academic Affairs, TVET institute
Taddesse Guta	Deputy Director, Ethiopian Meat and Dairy Industry Development Institute (EMDIDI)
Alemu Gudeta	Manager, Salale Dairy Cooperative
Yadecha Gameda	Chair, Salale Dairy Cooperative

Annex 3: Overview of Dairy Sector, E. Africa

Type of data	Ethiopia	Kenya	Rwanda	Tanzania	Uganda
Population (000,000) (% annual increase) ⁱ	89.2 (2.6%)	44.2 (2.7%)	11.1 (2.2%)	49.1 (2.6%)	38 (3.5%)
Land area (000 km ²)	1,127	582.6	26.33	945.2	241.04
GDP/capita (US\$) WB (2012/13) ⁱ	454	943	620	609	547
Dairy contribution to GDP (%)	-	4	3.5 ^v	2	3
National cattle population (million) ⁱ	49.2	18	1.35 ⁱⁱⁱ	21	12.8
Specialized dairy cattle population (million)	0.33 ^{viii}	3.5	0.75 ^v	0.78 ⁱⁱⁱ	0.65
National milk prod./year (million litres)	3,300	6.650 ^x	731 ^v	2,100 ⁱⁱⁱ	1,190
% of production by smallholder farmers ⁱ	95	80			
Production per cow smallholder (litres/day) ^{vi}	1.5	5-10			
Production/cow commercial farmer (l/day) ^{vi}	12	>17-19		10-15	
Number of small scale producers	1,600,000 ^{ix}	1,800,000	80,000 ^v		
Number of med./large scale producers	500 ^{ix}				
Number of registered milk processors ^{vi}	40 ^{ix}	42	30 ^v	83 ⁱⁱⁱ	14
Milk processing capacity (litres/day)	210,500	2,900,000	280,000 ^v	463,800 ⁱⁱⁱ	1,018,000
Actual milk processed (litres/day)	127,050	1,170,000	98,000 ^v	167,000 ⁱⁱⁱ	624,000
% installed capacity utilized	60	40	35 ^v	36 ⁱⁱⁱ	61
Milk consumption/capita (litres per year) ^{iv}	19	115	64 ^v	45 ⁱⁱⁱ	55
% of pasteurized / unpasteurized milk sales ^{vi}	2/98 ⁹	12/88	25/75 ^v	10/90 ⁱⁱⁱ	20/80
Milk price (USD/litre), farm gate	0.41	0.39	0.22	0.18	0.14
Milk price retail processed milk (USD/litre)	1.08	1.02	1.41	0.72	0.81

- i Retrieved from White Gold table 3.1 ([original source](#))
- ii Retrieved from White Gold table 3.1 ([original source](#)), currency equivalent by OANDA.com
- iii Retrieved from [IFAD design report Tanzania](#), 2016
- iv Retrieved from [White Gold report](#) table 3.1 (original data obtained from country National Dairy Strategy documents: Dairy Development Authority in Uganda, MinAgri in Rwanda, KDB Kenya, TDB in Tanzania and DDA in Ethiopia plus East African Dairy Development Reports and country key informant interviews)
- v Retrieved from [IFAD design report Rwanda](#), 2016
- vi Retrieved from [White Gold report](#) (body text in country value chain summaries, chapter 2-6), also [Kenya Quick Dairy Scan](#)
- vii Retrieved from [White Gold report](#) table 3.1 (original source; data collected during country visits key informant interviews)
- viii Retrieved from [Ethiopia Livestock Master Plan](#), table 13
- ix From (unpublished) draft dairy strategy, EKNL, Ethiopia, 2018.
- x From (unpublished) draft strategy Kenya Dairy Producers Association, 2017 estimate

Note: some of the figures included in the table are underestimates, given recent growth in the sector.

Annex 4: Dairy development programmes in E. Africa

Programme/ Project	Time Frame	Finance Source and amount	Implementing/ Coordinating Agency	Main intervention areas, number of beneficiaries
Kenya Market-led Dairy Programme KMDP I, KMDP II	2012-2019	Netherlands Embassy Kenya (EUR 5.5m, 2012-2016)	SNV	(1) dairy value chain (increasing efficiency, effectiveness & inclusiveness of the dairy value chain); (2) sector issues (promoting/supporting interventions and innovations that address systemic issues).
The Kenya Agricultural Value Chain Enterprises (KAVES – Feed the Future)	2013-2018	USAID (USD 40m- including other commodities)	Fintract Inc and 30 Kenyan government and private sector organizations	Grants to smallholder farmers, businesses, and national and county government partners to address value chain constraints.
Smallholder Dairy Commercialization Programme (SDCP) – Kenya	2006-2019	IFAD and Government of Kenya (USD 17m: 2016-2019)	Dept of Livestock, MoALF, KENAFF (technical services)	Organizational development, capacity building of producers and processors, value chain development in 9 counties. Target beneficiaries 26,000 dairy farmers and 600 traders/processors.
The Inclusive Dairy Enterprise project (TIDE), Uganda	2015-2019	Netherlands Embassy Uganda (EUR 9m; 2015-19)	SNV (with DDA, Friesian, WU)	Development of 20 practical dairy training farms. 5,000 small and larger farmers will benefit from practical training.
Dairy Enterprise Loan Programs, aBi Trust - Uganda	2013-ongoing	Agribusiness Initiative (aBi) Trust (Multi-Donor Fund, incl. NL - EUR 3.5m)	Uganda Crane Creameries Cooperative Union	Acquisition of 100 milk coolers, 100 generators, 100 testing kits, 100 mini lab 10 road tankers and 4 refrigerated trucks, etc.
DairyBISS, Ethiopia	2015-2018	Netherlands Embassy Ethiopia	WUR (with EIAR + Ambo University)	Focus on commercial dairy sector. Establish a dairy business platform , business development, capacity building, and business information development.

EDGET - Enhancing Dairy Sector Growth in Ethiopia	2012-2017	EKN-funded (Embassy of the Kingdom of the Netherlands)	SNV	Development of rural milk value chain through capacity building, improved dairy technology, marketing of milk products, establishment of dairy input dealers and dairy cooperatives. Target beneficiaries: 65,000 dairy farmers + 500,000 children
LFSDP – Livestock and Fish Sector Development Project	2018 - 2024	World Bank (USD 180m)	MoLF, Ethiopia	Implementation of Ethiopian Livestock Master Plan. Dairy is one of 4 key value chains targeted for development. Emphasis on smallholders (60%), primary coops and community interest groups (30%) and commercial farmers (10%).
Girinka (One cow per poor family program), Rwanda	2006-ongoing	Government of Rwanda	Rwanda Agricultural Board (RAB), under (MINAGRI).	Provision of dairy cows to poor households, to improve their livelihoods diet. Target is 350,000 households by 2017.
Rwanda Dairy Sector Competitiveness Programme (RDCP II)	2012-2017	USAID (USD 15m)	Land O'Lakes	Now completed, the project focused on improving production, market access, product quality, and increasing local demand, developing milk collection centers (MCCs).
Rwanda Dairy Development Project - RDDP	2016-2022	IFAD + GoR + Heifer Project Int. (USD 65m)	MINAGR	Build capacity of cooperatives. Target beneficiaries: 52,000 smallholder dairy farms with zero-grazing systems; 22,000 with semi-extensive systems; 15,000 farm assistants, 640 farmer field schools, etc.
Southern Highlands Milkshed Development Project (SHMDP) , Tanzania	2019-2024	IFAD + GoT, Heifer International (USD 41m)	Zonal Project Management Unit under MALF.	Value chain approach, focussed on smallholders. Capacity building of farmer organizations, service providers, farmers, etc. Development of dairy training modules with LITA, SuA. Target beneficiaries: 67,000 smallholders.
Income and Employment for Women and Youth in the Dairy Sector	2016-2021	Comic Relief (approx. GBP 1.87m)	SNV+Nronga Women's Dairy Coop. Society, CABO, MMA	Increasing employment, incomes and livelihoods of 18,500 women and youth in N. Tanzania.
East Africa Dairy Development Program II	2014 to 2018	Bill & Melinda Gates Foundation (USD 25.5m)	Heifer International,	In Phase 1 (2008-2013) , EADD provided extensive training to 179,000 farming families in the program, developed 27 milk collection hubs, formed 68 farmer business associations. Phase

(EADD-II) - Kenya, Uganda, Tanzania			ILRI, ICRAF), Technoserve & ABS TCM Ltd	It has scaled up this approach through milk hubs. Target beneficiaries: 136,000 farmers.
-----------------------------------------------------	--	--	-----------------------------------------	------------------------------------------------------------------------------------------

Annex 5: Nuffic (NICHE/Innocap) Dairy and selected TVET Projects

Ethiopia

NICHE-ETH-019 - Supporting the development of commercial agriculture programmes at Ethiopian Universities – AGRIBIZZ €3.500.000 – 9/2010 – 8/2014 Jimma University + Ambo University; Haramaya; Hawassa University – Q-Point B.V.

NICHE-ETH-098 - Study of A-TVET training methods and curriculum development for Agribusiness - €49.495; 5/2011-6/2011- Ardaita Agricultural Technical Vocational Education & Training College + Holeta Agricultural Technical Vocational and Educational Training College - Consultancy and Training for Rural Transformation

NICHE-ETH-138 - Ardaita A-TVET Agribusiness - €893,668 – 7/2012 – 6/2017 – Ardaita Agricultural Technical Vocational Education & Training College – AERES Group + Fair and Sustainable, HAS Den Bosch, MDF, Stichting Agri Next Level, Tilberg University

NICHE-EHT-146 – Holeta ATVET Agribusiness €874,216 – 8/2012-7/2017 - Holeta Agricultural Technical Vocational and Educational Training College – ICRA + CINOP Global; International Labour Organisation; Royal Tropical Institute

NICHE ETH-178 - Capacity Development on Small Scale and Micro-Irrigation for Agarfa A-TVET College (Agarfa A-TVET SSI/MI) €1,655,687 - 7/2013-6/2017 - Agarfa A-TVET - Q-Point B.V. + Haramaya University; HAS Den Bosch; Hedbez Business & Consultancy PLC; IPC Groene Ruimte

Kenya

NICHE-KEN-124, 134 - Capacity building for improving dairy and horticulture programmes to meet the requirements of the labour market and to contribute to food security and the commercialization of the sector - € 749,984 11/2011-9/2017 - Bukura Agricultural College - Q-Point B.V. + Delphy; Egerton University; HAS Den Bosch; Radboud University Nijmegen

NICHE-KEN-126-140 - Development and improvement of demand-driven horticulture training to contribute effectively to commercialisation, including value addition, quality improvement and extension services- € 1.499.486 – 1/2012-12/2016 - Horticulture Practical Training Centre Kenya - Wageningen UR + Aeres Group; DLV Plant BV Legal; React Africa Limited

NICHE-KEN-127-139 Build capacity to deliver competent graduates for enhanced competitiveness in the dairy value chain (“dairytrain”) - €1,148,527 1/2012-4/2016 – Egerton University – WageningenUR + AERES + SNV

NICHE-KEN-211 Capacity building for improved linkages between the private sector and universities and TVETs in Kenya € 637,867 2/2015-1/2019. LIWA Kenya trust Maastricht School of Management (MSM) + East African Business Council, Q-Point B.V.

NICHE KEN-213 Development of of Latia Resource Centre and its Agricultural Training €547,927 10/2014-10/2018 - Faraja Latia Resource Center - Maastricht School of Management (MSM) + Dairy Training Institute; Wageningen UR

NICHE-KEN-214 BAC-Institutional Capacity Development for sustainable agricultural improvement (BAC-ICD) €894,705 – 1/2015-12/2018 Baraka Agricultural College - CINOP Global + Aeres Group; SNV

NICHE-KEN-271 Capacity Building for Strengthening the Livestock Value Chain. €1,099,138 10/2016-9/2020 – Egerton University – Q Point. BV

NICHE KEN-274 Functioning Dairy Agribusiness Incubator. €24,900 11/2015-4/2016 Egerton University. Wageningen UR

NICHE KEN-281 Enhancing the Capacity of Kenya School Of Agriculture For Improved Practical And Labour Market Oriented Agricultural TVET Education. 2017-2020. Q-Point + HAS UAS, CINOP + Egerton + Micas Ltd

NICHE KEN 283 Strengthening the capacities of TVETA for enhancing the performance of the TVET education system in Kenya € 1,135,077 7/2017-6/2020. TVETA (Technical and Vocational Education and Training Authority) MDF Training & Consultancy + Cadena international development projects; HAS Den Bosch; University of Eldoret

INNOCAP-KEN-300 II - Use of blended learning in training programs in dairy farm management in Kenya. € 196,515 10/2016-10/2018. DTI

Rwanda

NICHE-RWA-013 Strengthening of the Workforce Development Authority (WDA) and support to the establishment of an integrated TVET system in Rwanda € 3,998,637 7/2010-6/2017. Workforce Development Authority Mott MacDonald+ BBC Media Action; Center for Employment Initiatives; Scottish Police Authority

NICHE-RWA-173 Socio-Economic Improvement through an Integrated Crop & Livestock System (ICLS) in Rwanda € 875,000 – 3/2013 – 2/2017 UR-Nyagatare Q-Point B.V. DLV Rundvee Advies BV; Egerton University; HAS Den Bosch; Wakala East Africa

NICHE-RWA-249-268 Strengthening educational institutes in providing capacity building services for sustainable agricultural development in Rwanda € 9,935,588 8/2015-6/2021. Institut d'Enseignement Superieur de Ruhengeri; University of - Mott MacDonald + Delft University of Technology; Delphy; Maastricht

Annex 6: Suggested blended learning modules

The main deliverables of the proposed intervention is a series of operational and validated modules that can be adapted and used by ATVETs, Universities, and training providers (both private and public) in the East African region.

The exact number and definition of the modules will need to be agreed by key stakeholders, but provisionally includes 10 modules each in dairy production and dairy processing, and also 7 modules each in dairy cooperative management and dairy extension and training (see Table below).

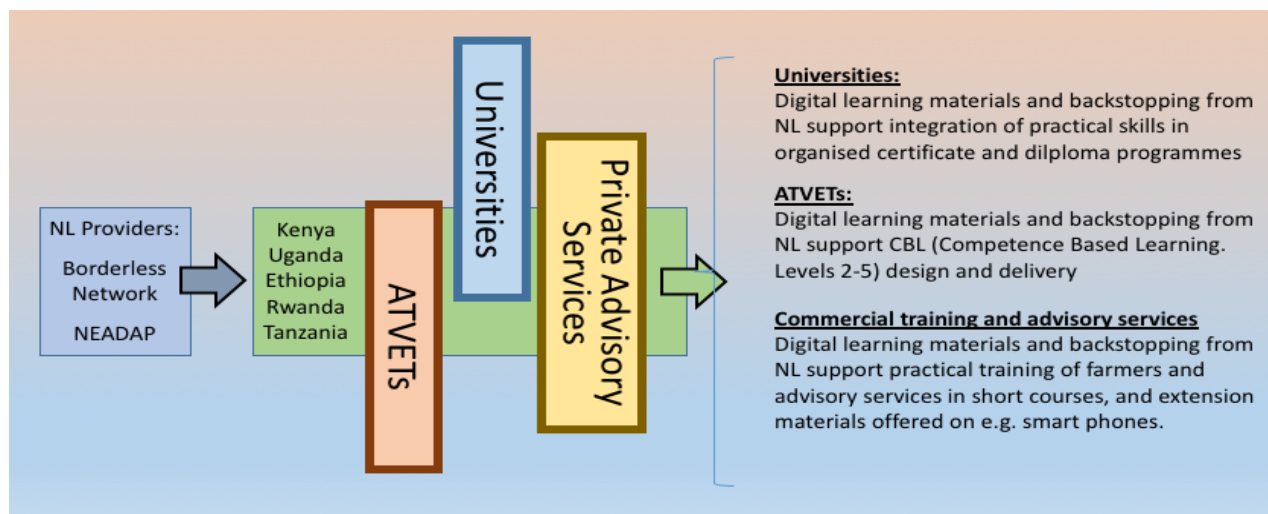
Provisional list of training modules in 4 key areas

<p>1. DAIRY FARM PRODUCTION</p> <ul style="list-style-type: none"> • Animal health and welfare • Use of vaccines, antibiotics and drugs • Feed, forages and silage • Pasture agronomy • Cow comfort and housing • Milking and milk handling • Calf management • Dairy breed improvement • Managing manure and residues • Dairy farming as a business 	<p>2. DAIRY PROCESSING</p> <ul style="list-style-type: none"> • Milk composition and properties • Food safety standards and legislation • Raw milk handling, hygiene and storage • Quality based payment systems • Liquid milk products • Processed dairy products • Packaging and waste management • Maintenance of dairy equipment • Dairy processing as a business
<p>3. MANAGING A DAIRY COOPERATIVE</p> <ul style="list-style-type: none"> • Organizational assessment • Strategic and business planning • Governance and group leadership • Financial management and administration • Including women and youth in dairy business • Milk quality and payment systems • Marketing & distribution of dairy products 	<p>4. DAIRY EXTENSION & TRAINING</p> <ul style="list-style-type: none"> • Adult learning and communication • Extension and training methods • Organizing a training session with farmers • Understanding the dairy value chain • Managing business relationships • Training and advisory services as a business • Assessing training and advisory programmes

The basic (scientific) core principles – estimated 60-70% - of the modules will be common across the East Africa. However, the modules will need to be adapted for use in the different countries, to account for local conditions (different practices, cultures, languages, pre-existing learner experience, knowledge) and provide suitably contextualized illustrations, videos, etc.

The modules will be designed to support blended learning: offering learners the possibility to learn basic principles and concepts at their own pace and time of convenience. The basic knowledge will then be supplemented by practical skills training adapted to the programmes of participating commercial training

centres, dairy development programmes, ATVET programmes (levels 2-5), university BSc/diploma/certificate and short course programmes (e.g. which include specialized dairy courses and/or elements within broader livestock production programmes). This usage is illustrated in the Figure below:



Modules will be adapted to the needs of each country by one or two selected pilot institutions in each country. While these will need to be agreed by NL and regional stakeholders, suitable pilot organizations could include, for example, Holeta Polytechnic (Ethiopia); University of East Africa Baraton (Kenya) and AFRISA (Uganda).

Distribution and support of the modules will be delivered through a dedicated dairy e-learning platform, integrated with the proposed NEADAP e-platform.

Where possible, (e.g. on basic production techniques), the modules will also be adapted for smart phone use: linkage will be explored with existing e-platforms such as that of [e-cow](#)