BREEDTECH PROJECT IMPLEMENTATION PLAN

Building Capacity in Plant Breeding and Biotechnology Education and Research through partnership program in Africa, Middle East and Europe for Agricultural transformation (BREEDTECH)

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1.0 Project Background

Agriculture activity is an important sector in major developing countries including Kenya, Ethiopia, and Palestine. In these three countries, the agricultural sector contributes to 38%, 20% and 7% of the Gross Domestic Product (GDP) and employs 67%, 40%, and 7% of total employment respectively. Despite its importance, agriculture in Mediterranean and African regions face many challenges. This hinders agricultural productivity to significantly contribute to the increased demand for food due to increased number of populations in these countries. In this perspective, water quantity and quality have been continuously declining during the last years. Climate change, the scarcity of land resources, rapid population growth, pollution of the aquifers, marine environment, desertification and land degradation are some of the challenges facing the agricultural sector. The negative impacts on agricultural sector may lead to damaged crops, emergence of new pests and diseases, decreased water availability, loss of biodiversity, poor soil health and reduced crop yield. According to the Food and Agriculture Organization (FAO), pest outbreaks are increasingly frequent and are responsible for nearly 40% of crop yield losses in maize, potatoes, rice, soy and wheat in the world. This is a catastrophic situation in a world where food and nutritional insecurity is already the reality for more than 800 million.

For example, in Kenya, climate change is set to ravage tea production, the biggest global supplier of black tea, hence threatening the livelihoods of millions of farmers, shrinking production areas by 25% by 2050. In addition, the number of people affected by food insecurity stands at 22.5% of the total population, mainly in arid and semi-arid lands which occupy 80% of Kenya land area. In Ethiopia, climate change impact has left the country in its greatest hunger crisis in 20 years as many people go without food and clean water. Around six million Ethiopians face acute food needs, and 3.9 million Ethiopian women and children are nutritionally vulnerable. As at July, 2021, nearly half a million Ethiopians were displaced due to drought and seasonal flooding. On the other side, Palestine lies within the Mediterranean climatic zone that is characterized by a hot, arid, and water-scarce region that has experienced an increase in temperatures over the past fifty years. Palestine is one of the country most vulnerable to climate change. The major exposures anticipated include more frequent droughts and increased desertification, changes in economic viability of

crops (e.g. shorter growing seasons), increased crop water requirements, decline in grazing ranges and stocks and high food prices.

To adapt to Climate Change, agricultural and natural resource management research and development (R&D) can contribute to climate change adaptation and mitigation through Plant Breeding and biotechnology (Wubei, 2015, Hermann et al., 2021). In last decades, crop improvement and development through plant breeding and good agronomic practices have contributed to massive and rapid yield increases in many crops, with an estimated annual gain of 0.8–1.2% in crop productivity and increased tolerance to a variety of biotic and abiotic stress. However, long time invested in variety development and breeding cycles presents an obstacle to an accelerated response of plant breeders to the growing demand for food production. In addition, other challenges faced by crop improvement programs and breeders include the changing landscape of intellectual property rights (IPR) management that can impede collaboration; a growing need for advanced technology such as DNA testing, genomics, and bioinformatics, along with expertise for applying these tools within selective breeding programs; and increased need in modifying curricula in HEs training institutions to meet industry demands and changing technology.

Therefore, the challenge that most plant breeding systems, particularity in developing countries face, is to increase crop production by speeding up the breeding cycle of climate-resilient crops. Recent modern plant breeding methods and biotechnology offer a vast choice of options and innovations in the breeding methods. These newly developed methods can be used to cope with the devastating plant biotic and abiotic stresses to combat the growing demand for food. In this decade, novel techniques, e.g., genomic selection, modern speed breeding, and high-throughput crop genotyping have shown to speed up the plant breeding process. Biotechnological interventions such as genetic engineering (gene transformation) has also played an important role in the precise development of crops with desirable traits. Several interventions were achieved in last few years includes:

i. Speed breeding which is a non-GMO approach enabling the scientists and researchers to turn over many generations in a single year and select plants with desirable traits between thousands of variations.

ii. With the rapid advancement of next-generation sequencing (NGS) platforms, the complex genomes of many important crop species such as sorghum, soybean, barley, potato, and wheat have been sequenced.

iii. Molecular breeding including genomic selection GWAS, and marker assisted backcrossing.

The main obstacle, is that all these new approaches and techniques are limited only in developed countries. In developing countries such as Kenya, Ethiopia, and Palestine the limitation in accessing these new approaches is due to lack of resources, technical skill and personnel. Further, numerous factors and challenges continue to hamper progress in agriculture in the Global South, such as Africa and MENA region, particularly due to lack of investment in rural and agricultural development, and limited access to improved technology and inputs. The latter includes insufficiency of long-term investment in breeding improved crop cultivars adapted to local conditions (Wilkus et al. 2021) and the negative social context with regards modern agricultural technologies such as rDNA (GMO).

Therefore, there is an urgent need for skill transfer, technology adoption and implement the cutting-edge plant breeding technologies to developing countries targeting new generation of plant breeders, physiologist and biotechnologists to realize the benefit of the new techniques and utilize it to effectively contribute to food and nutritional security, sustainability crop production and climate change adaptation and mitigation. The innovative aspect of BREEDTECH is not only capacity building in terms of human and infrastructural development for Higher Education Institutions (HEI's) in Kenya, Ethiopia, and Palestine but also addresses challenges faced by agricultural rural communities.

1.1 The general goal of BREEDTECH

To build capacity of academicians, researchers and students from African and Palestinian HEI's in Plant Breeding and Biotechnology through training and field mobility to European partner institutions and infrastructural upgrading.

Additionally, BREEDTECH will contribute to Sustainable Development Goals directly or indirectly by addressing agriculture, food supply and sustainability (SDG2 (Zero Hunger), SDG 4 (Quality Education), SDG12 (Responsible Consumption and Production), SDG13 (Climate

Action), SDG15 (Life on Land), SDG 9 (Industry, Innovation and Infrastructure) and SDG17 (Partnership for Goals). BREEDTECH project goals align EACEA program priorities such as inclusion and diversity, environment and fight against climate change.

1.2 Inclusion and Diversity

According to world bank (2019), Kenya, Ethiopia, and Palestine, 59%, 59%, and 21 % of population are employed in the agricultural sector. In Kenya (40%), Ethiopia (36%), and Palestine (25%) of undergraduate students in faculties of agriculture are female. Improving and updating curriculum for plant breeding and biotechnology and integrating this technique in practical courses will target gender issues either on universities or farmer levels.

On other side, BREEDTECH consortium consisted of Partners from six different countries from three different regions regardless gender, age, ethnicity, religion, beliefs, disability, or intersectional factors.

1.3 Environment and fight against climate change

Acquiring new knowledge and experience through theoretical and practical courses related to plant breeding and especially, breeding of climate-resilient crops, will support the concept of sustainable development mainly in rural zones in partner countries. New experience and competence will increase the awareness of new generations (under and graduate students) with the important of adopt innovative practices to minimize the negative impact of climate change and become true actors of change.

1.4 Needs analysis and specific objectives

Currently, global warming causes a range of negative impacts on plant production especially due to rapid changes in temperatures, alterations of rainfall patterns, floods or drought conditions, and outbreaks of pests and diseases. These situations combined with high population growth significantly increases the world's food and nutritional demand. The impacts are more persistent in developing countries. Thus in order to produce 70% more food by 2050 and feed the ever-increasing world population, the use of new technologies, appropriate expertise and collaborative approach is mandatory. Therefore, fulfilling the goal of attaining food and nutritional security for the present and future generations is of prime importance. Biotechnology enables creating more

genetic variability among crops which can be exploited from crop improvement. The development of biotechnological approaches such as genetic engineering, RNA-mediated gene silencing, genome mapping, marker assisted selection and genomic selection armored with next generation sequencing have paved the way for precise and faster genetic improvement of crops as compared to classical methods of plant breeding. Such efforts are currently at infant stage in most of the developing countries.

Fast population growth, climate change impacts and limited human capacity in crop improvement among the consortium countries require technological solutions to improve agricultural production. Agro-industrial parks have been established in most of the consortium countries and there is need for sustainable supply of agricultural raw material. To meet the demand for food and nutrition, agricultural raw material supply and enhanced farmers' incomes there is need to improved productivity.

Therefore, BREEDTECH programme is designed to train and equip competent, innovative and creative graduate and postgraduate students in the field of Plant Breeding and Biotechnology across African and Palestinian HEIs through provision of an educational program that integrates the advanced knowledge and expertise in their field. There is need to develop a program in Plant Breeding and Biotechnology, that will entail advanced knowledge in genetics, genetic engineering and bio-informatics in institutions of higher learning in the consortium countries.

The program will improve quality of higher education in African and Palestinian countries and enhance plant breeding and biotechnology relevance for the labour market and society. The project also aims to improve the level of competences and skills of African and Palestinian personnel as well as enhancing the management, governance and innovation capacities and internationalize HEIs. This project will further foster regional integration and cooperation across different regions by sharing good practices through the implementation of harmonized curriculum in Plant Breeding and Biotechnology. The overall objective of the proposed project is to build education and research capacity of HEIs of the African and Palestinian countries through a partnership program in Plant Breeding and Biotechnology for Agricultural transformation with European HEIs.

BREEDTECH is a three-year cross regional project which brings together a consortium of HEIs and a firm from Kenya, Ethiopia, Palestine, Italy, Sweden, and Serbia.

1.5 Overall goal

BREEDTECH aims at building the capacity in plant breeding and biotechnology education and research in Africa and the Middle East, involving African and Palestinian higher education institutions in the research movement related to plant breeding and biotechnology in Europe by encouraging researchers and academics to take an interest in the concept, domains, tools, and digital technology of plant breeding and biotechnology.

1.6 Specific objectives:

i. To develop and implement the harmonized curriculum in Plant Breeding and Biotechnology in African and Palestinian HIEs.
ii. To equip and modernize research facilities and infrastructure on Plant Breeding and Biotechnology in African and Palestinian HEIs.
iii. To train graduate and post graduate students and staff in Plant Breeding and Biotechnology in African and Palestinian HEIs.
iv. To mentor young institutions of higher learning to develop and review their programs in Plant Breeding and Biotechnology in African and Palestinian HEIs
v. To develop innovations and technologies to mitigate the impacts of climate change through advanced methods of Plant Breeding and Biotechnology in African and Palestinian HEIs.
vi. To promote and enhance public-private sector partnerships with HEIs in Plant Breeding and Biotechnology in African and Palestinian HEIs.

BREEDTECH project implementation plan (PIP) serves three main purposes:

a) It consolidates the activities and procedures into a single implementation handbook.
b) Provides an opportunity to identify gaps and clarify concepts into coherent processes required to operationalize the BREEDTECH project.
c) Provides timeliness and milestones for project implementation with regard to the resources and responsibilities of various actors in the project.

2.0 Project Description

The Project development objective is to strengthening the capacity of 24 academic staff on teaching and research activities and improve the skills and competence levels of 12 students who participate in field and training visit European HEIs, 420 participants on Knowledge sharing and transfer workshops on plant breeding and biotechnology from African and Palestinian HEIs. Additionally, the project will improve agricultural technologies for better productivity, sustainability and environmental safety by equipping and upgrading 6 research center and laboratories in African and Palestinian HEIs.

The project has four main components designed as work packages (WP) as summarized below:

2.1 WP1: Management and Evaluation

Led by Egerton University (EgU) and Associazione Culturale (Pixel). The WP aims to ensure the highest collaboration and coordination between partners and stakeholders, ensure that the objectives are met within budget and scheduled timescales, and quality standards. EgU will prepare and implement the project coordination and management plan (MP) including the management of all financial, legal and technical aspects of the project. Pixel will prepare the quality plan for assessment, evaluation and quality assurance. This WP defines the procedures that will regulate the project progress and organize all the project meetings. Individual partner institutions will coordinate institutional specific project activities and submit the reports to the coordinator. EgU will compile and submit quarterly, annual, and end of project report to EACEA. To ensure that the project outcomes are being realized, M&E and Quality assessment Plan will be managed by Pixel. The project will adopt the structured internal monitoring and evaluation strategies existing in the respective partner institutions.

The Quality Plan outlines the results framework that specifies the indicators to be monitored to ensure project efficiency, effectiveness and accountability in the implementation. Quality plan will also evaluate quantitative indicators (meeting minutes, curriculum, questionnaires from the beneficiaries, project partners and stakeholders and progress reports among others). The Quality average mark of 7 in a scale from 1 (poor) to 10 (excellent) will be the benchmark for satisfactory results. For results below the threshold the project partnership will implement corrective measures.

2.2 WP2: Capacity Building and Research Facilities Upgrading

This WP led by Sant'Anna School of Advanced Studies (SSSA), Institute of Field and Vegetable Crops, Serbia (IFVCNS), and An Najah National University (ANNU), Palestine. The two European HEIs will provide training and capacity building opportunities to students and academic staff from African and Palestinian HEIs in the field of plant breeding and biotechnology.

This WP aims at providing hands on experiential training and capacity building opportunities on latest biotechnology methods to students and academic staff from African and Palestinian HEIS in the field of plant breeding and biotechnology. The focus will be on training 24 academic staff and 12 (BSc, MSC and PhD) students. Trained staff and students will to transfer gained knowledge and skills to their cohorts in their respective institutions. Further there will be two, 5-day capacity building workshops in Italy and Sweden for African and Palestinian universities students through lectures, laboratory sessions, field visits, and networking sessions with researchers and professionals from Italy and Sweden universities. They are also tasked to arrange co-supervision of postgraduate students in the African and Palestinians HIEs. SLU and SSAA to implement an upgrade of African and Palestinian HEIs research and laboratory facilities through coordination among the project partners, objective selection of the equipment that best meets the needs of each African and Palestinian HEIs.

2.3 WP3: Curriculum Development/Review and Plant breeding and Biotechnology Transformation

WP3 is led by Swedish Agricultural University (SLU), Haramaya University (HU) and Oda Bultum University (OBU). This WP aims at curriculum development or review and Plant Breeding Biotechnology Transformation through student-faculties-private sector and HEIs engagement. The partner institutions in Africa and Palestine will develop new and reviewing existing curriculums and conduct self-assessment existing programs that aligns with the project objectives. This will involve stakeholders' participation in the needs assessment and identification of priority areas such as students advising and support, facilities and infrastructure improvement, staff development activities and institutional benchmarking process and also conduct peer curriculum evaluation. They will ensure specific quality assurance measures to adhere to during curriculum review and

assessment. These will include passing the program through various stages of curriculum review before being adopted as an academic program for the partner universities. In addition, the rules and regulations for the developed and reviewed programs will provide the procedures for admission requirements, structure of courses, duration of study, course loadings, examination regulations and assessment procedures guiding the program to ensure quality as stipulated in the respective partner Universities Catalogues and country university regulations.

The African and Palestinian HEIs will initiate student-led projects which will focus on addressing specific challenges in their home countries related to plant breeding and biotechnology. There shall be student-led workshops for their peers on the latest techniques and advancements in plant breeding and biotechnology. This will encourage more students to get involved in the field of Plant breeding and Biotechnology and ensure the sustainability and long-term impact of the project. Three incubators will be established each in Palestine, Egerton and Haramaya University to support startups and entrepreneurs in the plant breeding and biotechnology sector. The startups will be provided with the resources and support they need to turn ideas into successful businesses in deep collaboration and engagement with the private sector.

3.4 WP 4: Impact and Dissemination.

This is led by Al Quds Open University (QOU) and Laikipia University (LU). The WP aims at ensuring high visibility, impact, sustainability and outreach of the project activities and outcomes. There will be opportunities of sharing and learning experiences gained during the implementation of the project. Information feedback loop consisting of findings, conclusions, and recommendations from the project implementation processes will be developed. Technical backstopping by partner institutions will entail making resources in educational content available to all consortium members and to other external beneficiaries. This WP will be achieved through developing BREEDTECH website, promotional materials, students and staff knowledge sharing workshops to discuss the outcomes and ongoing research, conference participation, develop action plans and networking meetings. The WP will also develop platform for BREEDTECH Massive Open Online Course (MOOC). The WP will also search and source for Open calls for proposals for the consortium to apply to expand the consortium. Although the WP are independent, they are interlinked in their implementation to realize the overall success of the project (Figure 1)

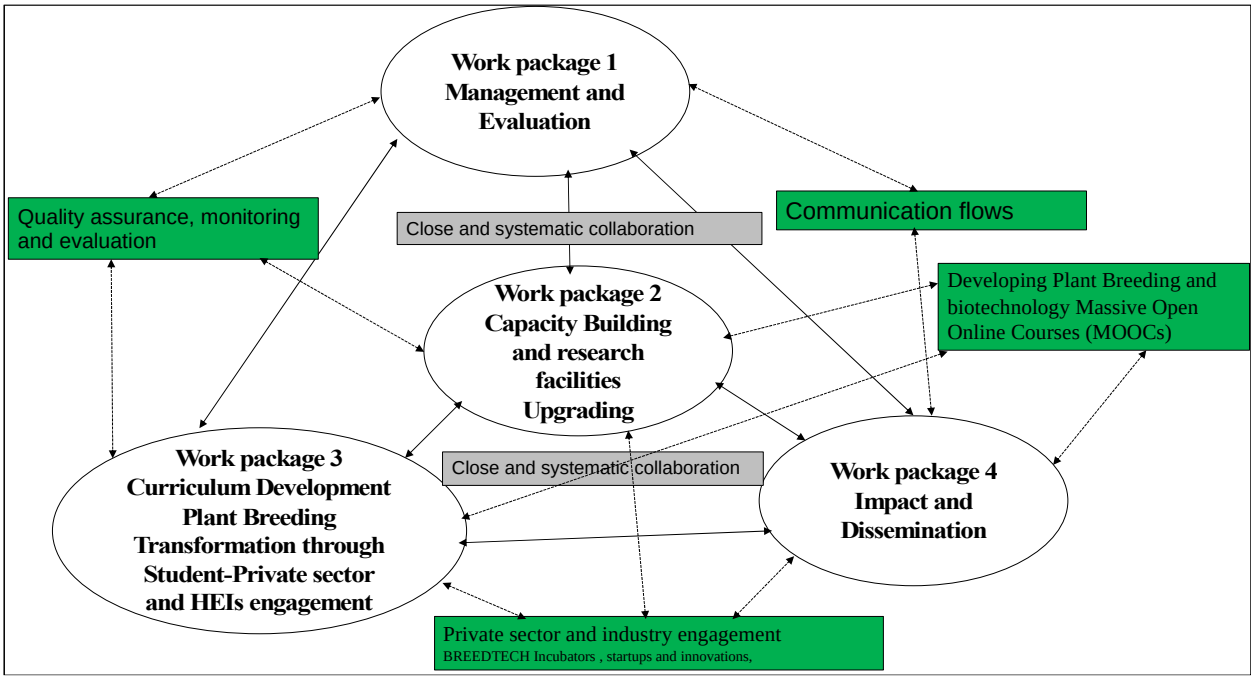

Figure 1: Linkage and interlinkages between work packages and other project components

3.0 Project Workplan

The project start date is on 1st March 2024 and end date is 1st March 2027. The following key project activities have been achieved towards implementing the project to date include: Channeling the funds to the Egerton University bank account, signing of project agreement, partnership agreement between the consortia members. The implementation of work packages will be done according to the work plan and description of activities in Table 1 below.

Table 1: Project workplan *(Gantt chart)*

								2024				2025				2026				2027	
No.	**Number**	**Relative Number in WP**	**Description of project activities**	**Lead Beneficiary**	**Type**	**Dissemination Level**	**Due Date (in months)**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q3**	**Q4**
1	D1	D1.1	Management Handbook/plan	EgU	R	SEN	3	■	■												
2	D2	D1.2	Quality Plan	Pixel	R	SEN	34	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	D3	D1.3	Evaluation Reports	Pixel	R	SEN	36		■		■		■		■		■		■		■
4	D4	D1.4	Midterm progress reports	Pixel	R	SEN	18			■	■	■	■	■	■	■	■	■	■	■	■
7	D7	D2.1	Development of Training materials for capacity building training 1 for staff	SSSA	R	PU	5		■	■											
8	D8	D2.2	Development of Training materials for capacity building training 2 for students	SSSA	R	PU	5			■	■										
9	D9	D2.3	Report on capacity building for training 1 for staff	IFVCNS	R	SEN	9			■	■	■									
10	D10	D2.4	Report on capacity building training 2 /Student Visits to program countries HEIs	IFVCNS	R	SEN	18				■	■	■	■							
12	D12	D2.5	Reporting on Upgrade of centers and laboratory facilities	ANNU	R	PU	12		■	■	■										
13	D13	D3.1	Curriculum Development/Review Content	SLU	R	PU	9		■	■	■	■	■	■							
15	D15	D3.3	Curriculum developed/reviewed- pilot courses	HU	R	PU	30							■	■	■					
16	D16	D3.4	Official approval of developed/reviewed curriculum	SLU	R	SEN	18						■	■	■	■					
17	D17	D3.5	Students Pilot Projects	OBU	R	SEN	30			■	■	■	■	■	■	■	■				
18	D18	D3.6	The establishment of 3 BREEDTECH Incubators	HU	R	PU	34			■	■	■	■	■	■	■	■	■	■		
19	D19	D4.1	Project Website	QOU	DEC	PU	18		■	■	■	■	■	■	■	■	■	■	■	■	■
20	D20	D4.2	Dissemination Plan	QOU	R	SEN	3	■													

21	D21	D4.3	Final project conference	QOU	R	SEN	33												
22	D22	D4.4	Knowledge sharing workshop in Kenya	LU	R	SEN	24												
23	D23	D4.5	Knowledge sharing workshop in Ethiopia	OBU	R	SEN	24												
24	D24	D4.6	Knowledge sharing workshop in Palestine	ANNU	R	SEN	24												
25	D25	D4.7	Scientific papers and research presentation	QOU	R	PU	30												
26	D26	D4.8	BREEDTECH Massive Open Online Course (MOOC)	QOU	R	PU	30												

Key: R-Report, PU-Public, SEN-Sensitive, D –Deliverables, DEC-Type (website, patent filing and videos, etc)

4.0 Results Framework for BREEDTECH Project

The results framework (Figure 2) for BREEDTECH graphical shows the representation of the flow of changes that the project intends to deliver throughout the project cycle in achieving its overall goal.

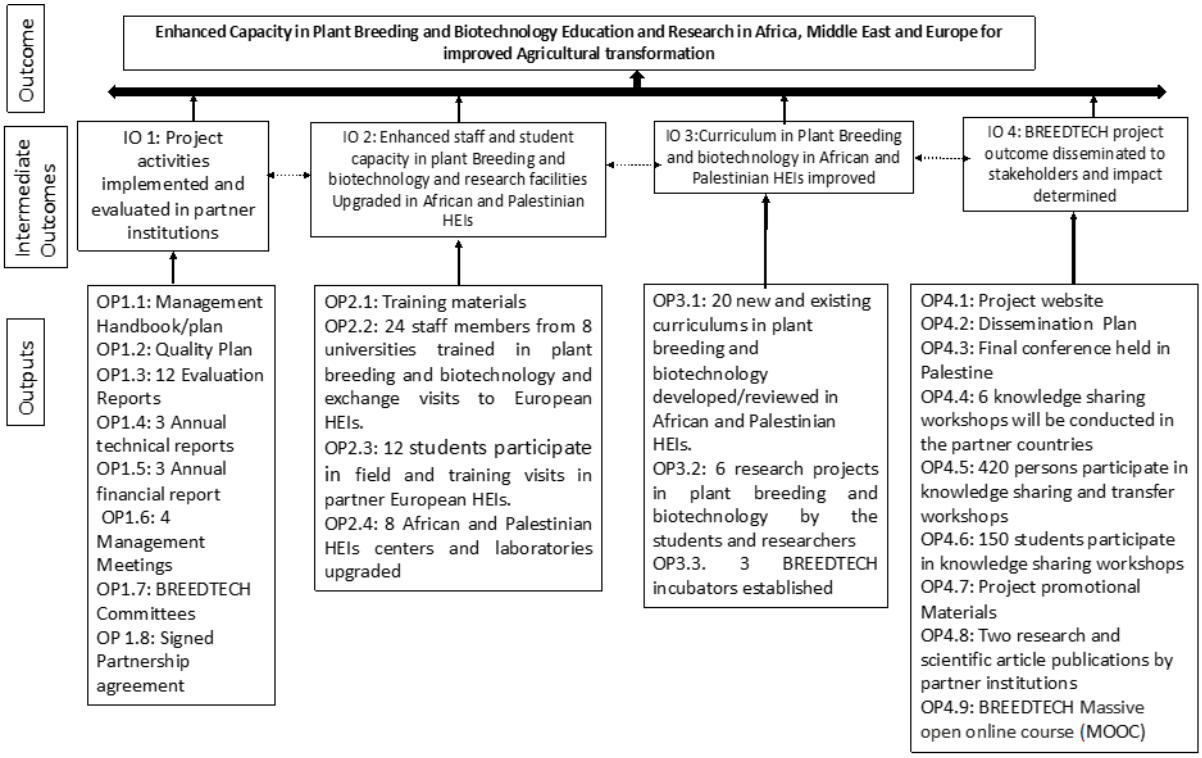

Figure 2. Results Framework for BREEDTECH project

5.0 Implementation Organization

5.1 Guiding rules and regulations

The project quality assurance plan under WP1 led by Pixel will meet internal requirements for traceability at the project implementation level for each partner institution so that the activities are correctly managed and the objectives are achieved on schedule. For internal monitoring and evaluation, the project has developed a results framework specifying the indicators to ensure project efficiency, effectiveness and accountability in implementation. The framework indicates project outcomes, outputs and their corresponding indicators. Project coordination focuses on managing the project, and the partnership, including intercultural relations, team building and reporting of project activities and finance utilization.

The overall project is coordinated by Egerton University, Kenya while individual partner institutions coordinate partner specific project activities. Activity reports from specific partners will be submitted to the overall coordinator to compile and submit to EACEA The project has developed a project management plan that outlines: key activities, mid-year, annual, and end term work plan to monitor the project deliverables (Table 1).

M&E information will flow from the respective institution team level to the project coordinator before dissemination to higher level stakeholders (Figure 3). Feedback will consist of findings, conclusions, recommendations and lessons learned from the project implementation processes. The feedback will be used to improve performance, provide information on relevant policy formulation, decision-making, and promote learning culture within the partner institutions. Internal controls on utilization of the project funds will be done through respective institutional monitoring and evaluation procedures. The project will benefit from a structured quality assurance, monitoring and evaluation strategy existing in the respective partner institutions.

For example, Egerton University where BREEDTECH will be hosted, has policies on quality assurance and research. The quality assurance policy, implemented by the Directorate of Quality Assurance details how academic quality is maintained. Activities undertaken by the Directorate include program assessments, course evaluations, analysis of external examiners' reports, satisfaction surveys, academic audits, and advice and guidance on matters related to quality.

Also, the University's research policy, implemented by the Division of Research and Extension through the Director of Research, provides the framework for conducting research efficiently and effectively in the University. The Policy contains rules, principles and regulations that University researchers and their collaborators should observe while conducting research in order to maintain the integrity and dignity of the University. Besides the research policy, the University also has an intellectual property rights policy (IPR) aimed at protection of intellectual property when created, conceived and/or generated by its staff, students and research partners in either single or joint undertakings. In its efforts to safeguard against corruption, the University established an Integrity Promotion Office (IPO) which plays the role of an internal ombudsman, where complaints are reported and investigated. The IPO also independently regularly reports to Ethics and Anti- Corruption Commission. In addition, there

is Corruption Prevention Committee (CPC) which approves the workplan of IPO, and receives and implement their reports, chaired by the Vice Chancellor.

BREEDTECH project Activities will be conducted in a transparent manner at all times. The project will develop technical and financial reports and share with the funding agency to enhance transparency and accountability. Further, the project will put in place an independent complaint handling mechanism where complaints will be made and responded to with a good recording system to show the related details including the time the complaint that was reported and the time the response was made. Egerton University and other partner institutions have risk management mechanisms.

5.2 BREEDTECH Governance Structure

BREEDTECH project will be governed by two key organs: Project management board and the Institutional project teams. Egerton University the lead institution will utilize the existing administrative structure for the overall oversight in the project implementation, financial management and curriculum inclusion of newly developed and reviewed programs led by the head of academic and research division.

Four levels of decision makers will be followed in the project:

a) **Project Manager (PM)/Coordinator**: is responsible for the day to day coordinating various project activities. PM will be the contact person between all work-packages leaders and coordinate the activities between different work-packages. As well, PM will be the contact point between project consortium and EU agency.PM will be sure that all activities are implemented smoothly without problems and according to the schedule. One of his rules is sure the budget spends according to the agency rules as well to the allocated budget. PM will be responsible to call for MC meetings either regularly or whenever is needed.

b) **Project Management committee (PMC):** This committee will formed from the representative of each institute. The roles of this committee are: draw the general policy for project consortium, discuss and approve the implementation of next coming tasks, agree on the time and locations of events (country, period, specific topic of the training visits number of participants), if there is any delay in activity implementation, discuss the reasons and suggest solutions. The decisions usually are taken by majority, if the votes are equal; the opinion of PM is considered. The members of MC are appointed in Kick off

meeting. PMC meet usually periodically or when there is necessary for meeting virtually. Four Management meetings will be held in different countries.

c) **Conflict resolution Committee (CC)**: in case there is serious problem or event, could impact project implementation seriously; CC meet to discuss and take decision. CCs decisions are obligatory and PM has to take the steps to Carry it out. CC members will be appointed from high level decision makers or administrative in the involved institutes.

d) **Monitoring and evaluation lead**: In this case the M&E lead will be an independent expert who will conduct monitoring of the project outputs and outcomes, impact assessment in relation to financial allocations to achieve value for money.

The Secretariat will comprise of the project coordinators, project team members and administrative support. The project will be supported by Deans of the Faculties/schools/colleges, Directors of Post-graduate and undergraduates' programs/school, Quality Assurance and program leaders, key partners, industry and other stakeholders. The management board will be the main decision-making body on proposed programs and major activities, and will meet four times in the project period.

Curriculum development teams and program leaders will oversee training, research, incubation and outreach components of the project. These are lecturers/researchers and technologists in their professional disciplines. The project will be managed with minimal bureaucracy from the main stream University to ensure efficiency in its operations. The institutional project team will be key in ensuring competitive procurement, and the management of the project. The integrated ICT system which includes video conferencing will be used to enhance communication and virtual consultative meetings.

For transparency and accountability, BREEDTECH web-page will be developed and used for all data sharing including advertisements for various project activities, events and outcomes. Any partner institution collaborating with BREEDTECH will sign an MoU and nominate a focal person responsible for overseeing the implementation of partnership MoU with that Institution.

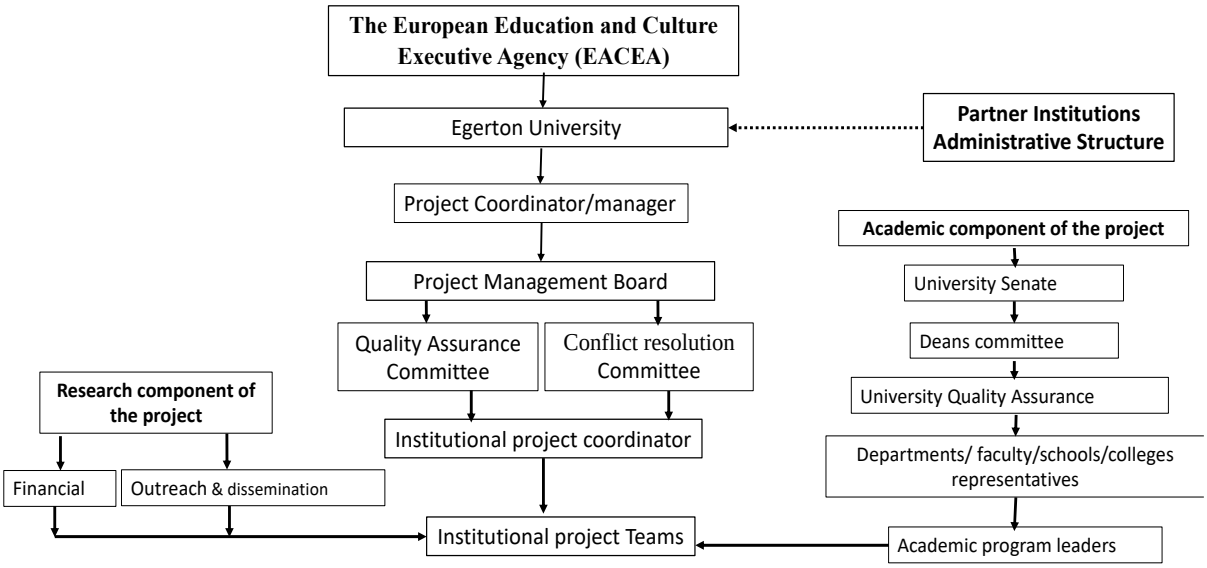

Figure 3. Proposed BREEDTECH organization structure

5.3 Performance monitoring

The project will benefit from a structured monitoring and evaluation strategy developed by Pixel in the quality plan. The strategy is adapted to the project characteristics and needs. An agreed work plan and the related calendar of activities and deadlines which are organized according to the project work packages provides a clear outline that identifies: the characteristics of the project deliverables and their indicators for assessment of the in progress and final results. The qualitative indicators will be assessed through the results of the questionnaires, with an average mark of 7 in a scale from 1 (poor) to 10 (excellent) as the benchmark for satisfactory results. For results below the threshold the project partnership will implement corrective measures.

Evaluation of the project activities and related outputs will be carried out through the creation for every project aspect, of ad hoc evaluation questionnaires. The questionnaires will be filled in both by the project's partners (as far as the management activities; information systems; meeting organization etc. are concerned) and the final users (as far as the evaluation of products, material and services developed within the project's framework are concerned). The questionnaires will be specifically designed to allow the collection of both numeric data and testimonials. The project partners representatives are tasked to evaluate the quality of project aspects such as:

i. Project planning
ii. Management
iii. Research activities
iv. Output dissemination

v. Exploitable outcomes.

At the end of the specified activity implementation as per the WPs, the Project Manager/Coordinator in cooperation with the Quality Assurance Committee will evaluate the progress, outputs and results. If the progress, outputs and results are approved, then the Project Manager/Coordinator will transfer to the beneficiary the next remittance of the funding as per the beneficiary's budget in accordance with the rules described in the Grant Agreement by the deadlines described in Table 2.

Table 2: Overview of activities and reporting datelines

Activity	Period	Reporting dateline
Project Start date	1.03.2024	
Quartely reports year 1	Month 1-3, 4-6, 7-9	30th May 2024; 30th August 2024; 30th November 2024
Mid-year 1 Financial report	Month 1-6	30th August 2024
Annual technical and financial report year 1	Month 1-12	28th February 2025
Quarterly reports year 2	Month 13-15, 16-18, 19-21,22-24	30th May 2025; 30th August; 2025; 30th November 2025
Mid-year 2 Financial report	Month 13-18	30th August 2025
Annual technical and financial report year 2	Month 13-24	28th February 2026
Quarterly reports year 3	Month 25-27, 28-30	30th May 2026; 30th August; 2026
Mid-year 3 Financial report	Month 28-30	30th August 2026
End of Project technical and financial report year 3	Month 31-33	30th November 2026
Final project report revisions, correspondence and project closure	Month 34-35	28th February 2026
Project end date	Month 36	1st March 2027

5.4 Project Ethics and Values

BREEDTECH will comply with the ethical standards and the applicable EU, international and national law on ethical principles and commit to and ensure the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

6.0 Detailed Budget

The total project cost is estimated EUR 787,575.00 and funded by The European Education and Culture Executive Agency (EACEA). Budget breakdown per partner and budget category payment to the partner will be made according to the planned budget headings, in accordance with the following structure (Table 3). The pre-financing 1(initial) 551,302.50 € is 70% of 787,575.00 €.

Table 3. Budget table

No	Beneficiary	Estimated EU contribution Estimated eligible lump sum contributions (per work package) WP1	WP2	WP3	WP4	Maximum grant amount
1	Egerton University (EgU)	16,082.00 €	57,251.00 €	11,412.00 €	9,967.00 €	94,712.00 €
2	Al-Quds Open University (QOU)	19,549.00 €	59,321.00 €	14,445.00 €	15,851.00 €	109,166.00 €
3	Laikipia University (LU)	15,841.00 €	57,251.00 €	5,971.00 €	8,523.00 €	87,586.00 €
4	Pixel - Associazione Culturale (Pixel)	38,501.00 €	0.00 €	0.00 €	6,317.00 €	44,818.00 €
5	Haramaya University (HU)	14,205.00 €	57,251.00 €	10,785.00 €	8,523.00 €	90,764.00 €
6	Oda Bultum University (OBU)	15,842.00 €	57,251.00 €	5,970.00 €	8,523.00 €	87,586.00 €
7	An-Najah National University (ANNU)	19,549.00 €	59,321.00 €	9,630.00 €	9,206.00 €	97,706.00 €
8	Sveriges Lantbruksuniversitet (SLU)	21,379.00 €	12,904.00 €	9,630.00 €	11,498.00 €	55,411.00 €
9	Scuola Superiore Di Studi Universitari E Di Perfezionamento S Anna (SSSA)	24,624.00 €	14,753.00 €	13,068.00 €	12,394.00 €	64,839.00 €
10	Institut Za Ratarstvo I Povrtarstvo Institut Od Nacionalnog Znacaja Za Republiku Srbiju (IFVCNS)	22,919.00 €	11,171.00 €	9,630.00 €	11,267.00 €	54,987.00 €
	TOTAL	**208,491.00 €**	**386,474.00 €**	**90,541.00 €**	**102,069.00 €**	**787,575.00 €**

Equipment Costs: Equipment is intended exclusively for the partner country universities, where it must be installed as soon as practically possible. The equipment must be recorded in the inventory of university where it is installed. This university is the sole owner of the equipment

Subcontracting Costs: This category covers related to subcontracting for specific project tasks. In accordance with the nature of this heading it is foreseen entirely for the project main applicant and includes project related services such as promotion, dissemination, publications, Translation of materials into national languages for dissemination, website design and hosting training courses.