

# EU-AU R&I Partnership on FNSSA

## Stage 2

EU-AU R&I Partnership on FNSSA: investment strategies and measures identification.

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## Table of content

Executive summary .....	5
1. Introduction .....	8
2. Key Performance Indicators .....	9
3. Overview of the scoring of the projects.....	13
4. Ranking of the projects .....	15
5. Identification of top projects for each priority area .....	17
6. Inventory of measures and investment strategies .....	19
7. Overview of projects potential, needs and proposed measures .....	25
8. Detailed identification of the development potential and needs of top projects.....	29
8.1. DualCassava: Dual-resistant cassava for climate resilience, economic development and increased food security of smallholders in eastern and southern Africa (21) – Score: 1.95. (African Union Research Grant II) .....	31
8.2. Crop and Soil Health Improvement for Sustainable Agricultural Intensification towards Economic Transformation in West Africa (19) – Score: 1.58. (DG INTPA) .....	32
8.3. UPSCALERS: Upscaling Site-Specific Climate-smart Agriculture and Land use practices to Enhance Regional Production Systems in West-Africa (20) – Score: 1.43. (African Union Research Grant II).....	34
8.4. Promote sustainable management of Tuta absoluta, an invasive pest of Solanaceous vegetables for food and nutritional security in East Africa (13) – Score: 1.21. (African Union Research Grant II).....	35
8.5. PASUSI: Participatory Pathways to Sustainable Intensification. Innovation platforms to integrate leguminous crops and inoculants into small-scale agriculture and local value chains (49) – Score: 1.15. (ERA-NET Cofund, LEAP-Agri).....	36
8.6. EcoAfrica: ECOlogical intensification pathways for the future of crop-livestock integration in AFRICAn agriculture (17) – Score: 1.06. (DG INTPA) .....	36
8.7. MAB Chicken: Marker-assisted breeding of selected native chickens in Mozambique and Uganda (8) – Score: 1.01. (African Union Research Grant II).....	37
8.8. EatSANE: Education and Training for Sustainable Agriculture and Nutrition in East Africa (41) – Score: 1.33. (ERA-NET Cofund, LEAP-Agri) .....	39
8.9. Enhancing nutritional quality of plantain food products through improved access to endophyte primed and high pro vitamin A plantain cultivars under integrated soil fertility management practices in Nigeria, Cameroon and Gabon (12) – Score: 1.06. (African Union Research Grant II).....	40

8.10.	SafeFish: Development of bacteriophage cocktails as disease biocontrol agents for improved aquaculture productivity, food and nutrition safety in Ghana and Uganda – Score: 1.41. (African Union Research Grant II) .....	41
8.11.	AFRICA-MILK: Promote ecological intensification and inclusive value chains for sustainable African milk sourcing (46) – Score: 1.32. (ERA-NET Cofund, LEAP-Agri).....	42
8.12.	SPEAR (Empowering small-scale farmers): towards the SDGs through participative, innovative and sustainable livestock and poultry value chains (33) – Score: 1.08. (ERA-NET Cofund, LEAP-Agri) .....	43
8.13.	Enhancing the nutrition and health of smallholder farmers in East Africa through increased productivity of biofortified common bean and improved postharvest handling (11) – Score: 1.08. (African Union Research Grant II).....	43
8.14.	Implementation of Agroforestry Systems in S. Tomé and Príncipe and development of non-wood forest products (NWFP) in Angola and S. Tomé and Príncipe to improve income-generation and food security (15) – Score: 1.38. (African Union Research Grant II).....	45
9.	Detailed identification of measures and investment strategies .....	47
9.2.	Crop and Soil Health Improvement for Sustainable Agricultural Intensification towards Economic Transformation in West Africa (19) – Score: 1.58. (DG INTPA) .....	48
9.3.	UPSCALERS: Upscaling Site-Specific Climate-smart Agriculture and Land use practices to Enhance Regional Production Systems in West-Africa (20) – Score: 1.43. (African Union Research Grant II).....	49
9.4.	Promote sustainable management of Tuta absoluta, an invasive pest of Solanaceous vegetables for food and nutritional security in East Africa (13) – Score: 1.21. (African Union Research Grant II).....	50
9.5.	PASUSI: Participatory Pathways to Sustainable Intensification. Innovation platforms to integrate leguminous crops and inoculants into small-scale agriculture and local value chains (49) – Score: 1.15. (ERA-NET Cofund, LEAP-Agri).....	50
9.6.	EcoAfrica: ECOlogical intensification pathways for the future of crop-livestock integration in AFRICAn agriculture (17) – Score: 1.06. (DG INTPA) .....	51
9.7.	MAB Chicken: Marker-assisted breeding of selected native chickens in Mozambique and Uganda (8) – Score: 1.01. (African Union Research Grant II).....	51
9.9.	Enhancing nutritional quality of plantain food products through improved access to endophyte primed and high pro vitamin A plantain cultivars under integrated soil fertility management practices in Nigeria, Cameroon and Gabon (12) – Score: 1.06. (African Union Research Grant II).....	53
9.10.	SafeFish: Development of bacteriophage cocktails as disease biocontrol agents for improved aquaculture productivity, food and nutrition safety in Ghana and Uganda – Score: 1.41. (African Union Research Grant II) .....	54
9.11.	AFRICA-MILK: Promote ecological intensification and inclusive value chains for sustainable African milk sourcing (46) – Score: 1.32. (ERA-NET Cofund, LEAP-Agri).....	54

9.12. SPEAR (Empowering small-scale farmers): towards the SDGs through participative, innovative and sustainable livestock and poultry value chains (33) – Score: 1.08. (ERA-NET Cofund, LEAP-Agri) .....	55
9.13. Enhancing the nutrition and health of smallholder farmers in East Africa through increased productivity of biofortified common bean and improved postharvest handling (11) – Score: 1.08. (African Union Research Grant II).....	55
9.14. Implementation of Agroforestry Systems in S. Tomé and Príncipe and development of non-wood forest products (NWFP) in Angola and S. Tomé and Príncipe to improve income-generation and food security (15) – Score: 1.38. (African Union Research Grant II).....	57
10. Conclusions and recommendations for similar future initiatives .....	58
Annex I: Detailed assessment of the projects.....	60
Annex II: Interviews with project coordinators.....	64
Annex III: Africa Funding Landscape .....	65
Annex IV: Visual fiches of top projects.....	66

## Executive summary

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This report presents the results of the mapping exercise carried out by Ecorys on behalf of the European Commission. This **mapping exercise** has the purpose of assessing a sample of projects from the EU-AU R&I Partnership on the Food and Nutrition Security and Sustainable Agriculture (FNSSA) initiative. The objectives of this assessment are threefold: (1) **identifying the top projects** of this initiative based on their innovation potential and expected scale up results, (2) assessing their **potential and needs & next steps required** for them to scale up, (3) proposing individually-tailored **investment strategies and measures** for each of the top projects so they can reap their full potential and reach the marketplace.

This report builds on the extensive information gathered during Stage 1 of the broader FNSSA mapping exercise, through which 34 projects were comprehensively analysed by means of desk research, a questionnaire and individual interviews with project coordinators.

Within this second stage of the mapping study, the starting point was to carry out a scoring of the 34 projects by **applying the KPIs** developed (and agreed on with the European Commission in Stage 1) to each project. There are a total of 14 KPIs grouped into three categories: (i) business & economic, (ii) social and (iii) environmental one. Each category has a specific weight, the business & economic one has a 50% weight and the other two have a 25% weight respectively. Performance in **business and economic KPIs** is in general satisfactory, most projects acquiring points for achieving a *Change in productivity*. Performance with respect to **social KPIs** is also generally good, mostly given that projects acquire points for achieving *Impact on poverty* and *Impact on food security*. However, performance of the projects is more varied when considering **environmental indicators**, with the indicator easiest to acquire points from being *Impact on resource efficiency*. Moreover, there is **great heterogeneity** in terms of total scores of projects, with some scoring a mere 0.1/3 and others scoring 1.95/3.

As second part of this exercise, and based on the scoring carried out, the 34 **projects were ranked** and ordered according to their potential. Top projects performed strongly in the business and economic category. This was expected as this category was given special importance. They tend to also perform relatively well in the social category, although there is great heterogeneity amongst them. With respect to the environmental category, top projects have very mixed results, with some of them achieving very strong scores and others having below average performance. Projects could potentially score between 0 and 3 (3 being the highest theoretical potential score). All projects with a score higher than 1 were identified as **“top projects”** and classified into the 4 priority areas of the FNSSA initiative. These priority areas are: (1) **Sustainable intensification**, (2) **Agriculture and Food Systems for Nutrition**, (3) **Expansion and Improvement of Agricultural Markets and Trade**, and (4) **Cross-cutting issues**. Half of top projects pertain to the first area, followed by the other three in the order presented above.

As a third element, this exercise developed a non-exhaustive **inventory of investment strategies and measures** that would allow projects to scale up. Some measures are more of a general nature while others are specific to agricultural research and to the African context. The inventory

includes public and private **funding** options, **technology transfer** options, **business development** support mechanisms, and intellectual property (**IP**) **protection**.

As a fourth element of this exercise, the top 14 projects were analysed in further detail using the information gathered on Stage 1 and conducting new interviews with project coordinators. Hence, a **detailed assessment of their potential**, as well as their needs and next steps for a scale up to happen, is presented. The projects assessed perform strongly in the business & economic category, and some also have promising results in terms of environmental outcomes. Therefore, the scale up of most projects would likely translate into **strong positive economic outcomes** or into a **combination of economic and environmental impacts** in the contexts in which they are rolled out. However, performance of top projects in the social category is mixed. Most projects have potential to produce a durable impact in terms of **food security and poverty alleviation**. Nevertheless, the improvement of the situation of specific groups (e.g. women, youth) is unlikely to continue once the scale up is achieved and the project terminated unless particular attention will be paid to ensuring sustainable and widespread access to projects' positive outcomes. With regards to the **needs and next steps**, most projects would need **additional funding** for a successful scale up to occur. Moreover, many projects would need some type of **business development support** in order to translate the research outputs into economic and entrepreneurial opportunities. Furthermore, some would need assistance in **transferring the results** to the private sector and/or in **managing IP rights**.

As a fifth element of this exercise, investment strategies and measures for each of the top 14 projects were proposed. These proposals build on the needs and next steps identified, as well as on the inventory developed. **Financial investment strategies** were proposed for each project. For most of them, the proposed strategy is a **combination of public and private funds**. With respect to **business development support**, many projects would greatly benefit from it and this would increase their probability of successfully scaling up. Similarly, the acquisition of some types of **IP rights** is worth exploring for many projects, although its desirability diverges according to the nature of the research output. Almost all projects should use some type of Technology Transfer Offices (**TTO**) to manage the transfer of the developed technology to the private sector, in a way that it could be beneficial to all parties involved.

This exercise concluded with a presentation of some general remarks/reflections about the projects, as well as recommendations for future FNSSA initiatives and similar programmes. With regards to the innovation environment needed to scale up successful projects and produce a durable and positive impact in African economies and communities, there is still **room for improvement**. One of the **obstacles** is the **transfer** of the developed technologies to the private sector, which currently lacks institutional support. Similarly, there is a **need for better links** of research groups with business development support institutions. With regards to the funding environment, there are plenty of public and private financing options. Nonetheless, coordinators usually do not know about the existence of many public funding programmes and often **lack the connections or visibility with private investors**. Considering the obstacles and needs identified, several betterments could be attained when designing similar future initiatives, mainly **improving connections between researchers and the private sector and investors**. For example, a centralised platform that could put in contact projects, public and private funders, private companies and incubators would be a simple and effective way of doing so.



## 1. Introduction

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This document provides the European Commission<sup>1</sup> with an assessment of 34 of the 47 projects selected for the conduction of the **mapping exercise** on the projects developed under the framework of the EU-AU R&I Partnership on FNSSA. Fundamentally, the objective of this mapping exercise is to identify and analyse the **scale up potential and needs** of the most promising projects – those with the highest innovation and commercialisation potential. After identifying these projects and their needs, **financial and technical assistance proposals** are made in order for their full potential to be reaped.

This study has been conducted considering what was agreed with the European Commission, and taking into account the KPIs that have been developed as well as the information gathered during Stage 1 of this assessment. Therefore, this Stage 2 of the mapping exercise ranks the 34 projects assessed in the previous stage, identifies the most promising projects, develops an inventory of investment strategies and measures available for their scale up, analyses the potential and needs of these projects, and finally proposes tailored measures and strategies for each one of them.

**Section two** presents an overview of the KPIs developed and agreed with the European Commission on Stage 1. These KPIs allow for an objective scoring of all the assessed projects. This scoring, as well as the ranking of the projects, is presented in **Sections three and four**. The identification of top projects for each priority area of the EU-AU FNSSA partnership, based on the scoring and ranking developed previously, is shown in **Section five**.

**Section six** provides a comprehensive, but non-exhaustive, inventory of possible investment strategies and measures suitable to address the needs of top projects and allow them to scale up and reach the marketplace. This inventory has been elaborated using desk research as well as further inputs and materials from the European Commission.

**Section seven** presents an overview of the potential, needs & next steps, and proposed investment strategies & measures of the identified 14 top projects. The potential and needs, as well as the proposed measures and strategies, are further elaborated and detailed in **Sections eight and nine**, respectively. The report ends with some general conclusions and recommendations for the whole programme and similar initiatives.

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<sup>1</sup> Unit for International Cooperation in DG Research & Innovation



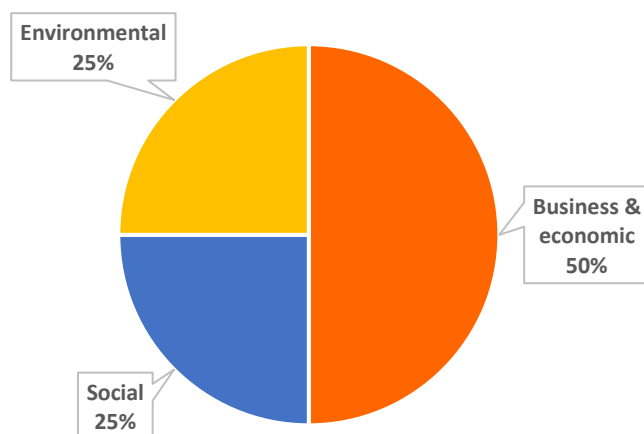
## 2. Key Performance Indicators

This section presents the Key Performance Indicators (KPIs) agreed upon in the previous, first stage of this project’s mapping exercise. After the individual assessments of projects’ uptakes, scale up potential, and unmet needs, 14 KPIs under three separate categories were developed that will allow for the scoring and ranking of projects.

Three different types/categories of KPIs were defined according to their nature. These are (i) business and economic, (ii) social, and (iii) environmental. The **business and economic** indicators aim to measure business readiness and potential. Given their central importance in indicating scalability, the overall score within this category is weighted 50% in the final scoring of the projects. These KPIs include measures such as production cost changes and creation of business opportunities. The fact that most projects were unable to yield quantitative estimates of their economic impact<sup>2</sup> was considered when defining the indicators.

The **social** KPIs intend to measure the capacity of the projects to create a social impact<sup>3</sup> in the communities they are working with. These include sub-indicators such as impact on vulnerable groups and civil society engagement. This type is weighted 25% in the final scoring. The **environmental** KPIs aim to measure the impact of the project in the environment<sup>4</sup> and include sub-indicators such as resource use efficiency and value chain shortening. This type is also weighted 25%.

Figure 1. Weights per category



<sup>2</sup> “Economic impact” is defined as the effect of a project’s research output on the economy of the targeted sector, as well as its spill over effects in other sectors. Examples are changes in productivity or the creation of new business avenues.

<sup>3</sup> “Social impact” is defined as the effect of a project’s research output on the livelihoods and social structures of a population. Examples are impact on food security or changes in gender relations.

<sup>4</sup> “Environmental impact” is defined as the effect of a project’s research output on the environment. Examples are changes in resource use efficiency or supply chain shortening.

Table 1. Key Performance Indicators

KPI	Description	Measurement		Score
<b>Revenue change</b>	The aim of this indicator is to measure the impact of the output of the project in the income of producers	<i><u>If quantitative data available</u></i>	<i><u>If only qualitative data available</u></i>	
		<0-0%	Negative or none	0
		0-5%	Low increase	1
		5-15%	Medium increase	2
<b>Change in cost</b>	The aim of this indicator is to measure the impact of the output of the project in production costs (incl. intermediary goods, energy consumption, distribution, labour costs, etc.)	<i><u>If quantitative data available</u></i>	<i><u>If only qualitative data available</u></i>	
		<0-0%	Positive or none	0
		0-5%	Low decrease	1
		5-15%	Medium decrease	2
<b>Change in productivity</b>	The aim of this indicator is to measure the impact of the project in the relation between production output and inputs. An increase in productivity can be due to a cost reduction, a revenue increase or both.	<i><u>If quantitative data available</u></i>	<i><u>If only qualitative data available</u></i>	
		<0-0%	Negative or none	0
		0-5%	Low increase	1
		5-15%	Medium increase	2
<b>New business opportunities</b>	The aim of this indicator is to assess whether the output of the project leads to the creation of new industries and/or to the expansion of existing industries, including but not limited to potential set up or enhancement of product value chains/transformational (processing) industries (e.g. creation of a pharmaceutical company in charge of producing a fish biophage cocktail,		None	0
			Improbable	1
			Probable	2
			Already achieved	3

BUSINESS AND ECONOMIC (50%)

SOCIAL (25%)		expansion of the paper industry as a result of using cassava flour in an innovative way; milk treatment and transformation into yoghurt and cheese; coffee and cocoa-to-chocolate value chains, etc.).).		
	<b>Patents</b>	The aim of this indicator is to assess the patentability potential of the outputs of the project	No	0
			Improbable	1
			Probable	2
			Already patented	3
	<b>Impact on women</b>	The aim of this indicator is to measure the impact of the output of the project in the living conditions and social status of women. This includes economic opportunities, empowerment and social standing.	None or negative	0
			Low positive impact	1
			Medium positive impact	2
			High positive impact	3
	<b>Impact on youth</b>	The aim of this indicator is to measure the impact of the output of the project in the living conditions and social status of youth. This includes economic opportunities, empowerment and social standing.	None or negative	0
Low positive impact			1	
Medium positive impact			2	
High positive impact			3	
<b>Impact on poverty</b>	The aim of this indicator is to measure the impact of the output of the project in poverty (incl. income increases)	None or negative	0	
		Low positive impact	1	
		Medium positive impact	2	
		High positive impact	3	
<b>Impact on food security</b>	The aim of this indicator is to measure the impact of the output of the project in the availability (i.e. access or presence of satisfactory amounts of food at disposal), safety and nutritional content of food	None or negative	0	
		Low positive impact	1	
		Medium positive impact	2	
		High positive impact	3	
<b>Opportunities for civil society involvement</b>	The aim of this indicator is to evaluate the degree of participation and enjoyment of civil society	None	0	
		Low	1	
		Medium	2	

<b>ENVIRONMENTAL (25%)</b>		(incl. producers, consumers, government officials, NGOs, etc.) in project outputs	High	3	
	<b>Impact on climate change resilience</b>	The aim of this indicator is to measure the impact of the project in building local resilience to climate change	None or negative	0	
			Low positive impact	1	
			Medium positive impact	2	
			High positive impact	3	
	<b>Resource efficiency</b>	The aim of this indicator is to measure the impact of the output of the project in improving the sustainable use of scarce resources	<u>Sub-indicator</u> <u>Value range</u>		Arithmetic mean of the four sub-indicators
			Water	0-3 (Zero-High)	
			Land (incl. soil quality)	0-3 (Zero-High)	
			Energy	0-3 (Zero-High)	
			Agricultural inputs (incl. pesticides, fertilizers, antibiotics, etc.)	0-3 (Zero-High)	
<b>Value chain shortening</b>	The aim of this indicator is to measure the ability of the output of the project in reducing the environmental cost of product and/or input distribution (i.e. “from farm to fork”). This is deeply related to the reduction of the carbon footprint.	None or negative	0		
		Low positive impact	1		
		Medium positive impact	2		
		High positive impact	3		

### 3. Overview of the scoring of the projects

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Based on the KPIs presented in the previous section, for each indicator, all 34 projects analysed have been given a score. On top of this, a **total score** was quantified for each project, so to measure the overall performance of the project along the three categories. The detailed assessment of projects is presented in [Annex I](#).

Performance of projects with respect to **business and economic** KPIs is satisfactory in general. Most projects acquired points for achieving a *Change in productivity*. Due to the definition of productivity developed in the KPIs, these changes are necessarily a result of scoring in *Revenue change* and/or in *Change in cost*. This normally occurred through the creation of cheaper substitutes for intermediate inputs or by increasing output by input given. Most projects acquired points for creating *New business opportunities*, mainly as a side effect of the increases in productivity generated. *Patents* seem to be the indicator most difficult to score in, with only 44% of projects acquiring any points in this area.

Performance with respect to **social** KPIs is also generally good. All projects have scores above zero in some of these indicators, although they normally have lower values than in the business and economic category. Most projects acquire points for achieving *Impact on poverty* and *Impact on food security*. This is mainly due to increases in agricultural productivity and/or resilience, therefore augmenting food supply quantity and stability and positively impacting food security and the revenue of vulnerable producers. The KPI that seems to be the most difficult to achieve points for is *Opportunities for civil society engagement*, with only 17% of projects acquiring any points for this. Those which did gain these, did so mainly by fostering the creation of local associations or community groups (not necessarily linked to the creation of new businesses). The projects that acquired points for achieving *Impact on youth* and *Impact on women* normally did so by directly targeting these groups as beneficiaries of their activities.

Performance of the projects is more varied when considering **environmental** indicators. Overall, most of the projects scored very low in this category and they normally did not score points in more than one environmental KPI, in contrast with respect to the two previous categories. Moreover, a sizable number of projects did not acquire any points at all in this category. The indicator which seems to be the easiest to acquire points from is *Impact on resource efficiency*. Most of the points in this KPI come from projects' outputs allowing for a more efficient use of either agricultural input (incl. pesticides, fertilizers, antibiotics, etc.) or land (incl. soil quality). The indicator in which projects scored less is *Value chain shortening*, with only 11% achieving some point in this category, mainly by fostering the use of local products over imported ones. *Impact on climate change resilience* seems to also be a hardly attainable KPI, with only 15% of projects acquiring some points in this regard. Those which did, did so mainly through the creation of climate monitoring tools or by issuing policy recommendations.

It is important to consider that the maximum total score possible is 3. This is only achieved if a project achieves perfect scores in all indicators, something that is theoretically possible but is extremely unlikely in practice (in fact, no project managed to achieve a total score of 2/3). Moreover, there is **great heterogeneity** in terms of the total scores, with some scoring a mere

0.1/3 and others scoring 1.95/3. Given the importance that has been given to the business and economic category, projects that fare better in this regard tend to achieve higher total scores. Nonetheless, those that have very low total scores tend to perform poorly in all categories and not just in the business and economic one.

#### 4. Ranking of the projects

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Based on the scoring carried out in the previous section, the 34 projects have been ranked according to their total score. This orders projects **according to their potential** and allows for the identification of the most promising ones. The ranking is shown in Table 3 below.

The top 14 projects performed strongly in the **business and economic** category. This was expected as this category has been given special importance. As agreed in the previous phase of this mapping exercise, it has a weight of 50%, in contrast with the 25% weight that the other categories have. The projects that showed the best performance in this category are DualCassava (21), Crop and Soil Health (19), and SafeFish (9), precisely those that occupy the top places in the ranking.

The top 14 projects tended to perform relatively well in the **social** category, although there is great heterogeneity among them. The projects that have the best performance are EatSANE (41), Agroforestry Systems in S. Tomé and Príncipe (15) and MAB Chicken (8).

With respect to the **environmental** category, the top projects have very mixed results, with some of them achieving very strong scores and others having below average performance. The projects that fare the best are DualCassava (21), UPSCALERS (20) and AFRICA-MILK (49).

It is important to note that, considering the special importance that was given to business and economic indicators, some projects that are very interesting from a social or sustainable point of view may not be included in the top places of the ranking. These projects tend to achieve a below average score in the business and economic category but have a remarkable performance in some of the other two. For the social category, this is true for VITAPALM (40) and, to a lesser extent, for MUSBCEA (27). For the environmental category, this is the case for SESASA (42) and AfriCultuRes (51).

With respect to the bottom places of the ranking, these projects performed poorly in every category. They normally did not acquire any points in most indicators and have full categories with a score of zero. Therefore, projects ranked as having the lowest potential are not an illusion of the special weight given to the business and economic category: they also performed poorly in the social and environmental categories.

Table 2. Ranking of projects

	Project	Score
Highest potential	DualCassava (21)	1,95
	Crop and Soil Health (19)	1,58
	UPSCALERS (20)	1,43
	SafeFish (9)	1,41
	Agroforestry Systems in S. Tomé and Príncipe (15)	1,38
	EatSANE (41)	1,33
	AFRICA-MILK (46)	1,32
	Sustainable management of <i>Tuta absoluta</i> (13)	1,21
	PASUSI (49)	1,15
	SPEAR (33)	1,08
	Enhancing the nutrition and health of smallholder farmers (11)	1,08
	Enhancing nutritional quality of plantain food products (12)	1,06
	EcoAfrica (17)	1,06
	MAB Chicken (8)	1,01
	ASF-RESIST (18)	1,00
	Solar powered micro irrigation (16)	0,98
	AfriCultuRes (51)	0,67
	MetVac (39)	0,66
	MUSBCEA (27)	0,65
SmallFish (29)	0,61	
OPTIBOV (43)	0,61	
AFRICA (48)	0,56	
OR4FOOD (6)	0,51	
VITAPALM (40)	0,51	
Aspergillus species and Aflatoxin Contamination (10)	0,50	
SESASA (42)	0,48	
MuVHA (25)	0,45	
ATMA4FS (28)	0,28	
SEACRIFOG (23)	0,27	
MycoSafe-South (34)	0,25	
Pest-free fruit (47)	0,16	
NUTRIFOODS (24)	0,10	
NOURCITY (31)	0,10	
SERVInnov (37)	0,10	
Lowest potential		



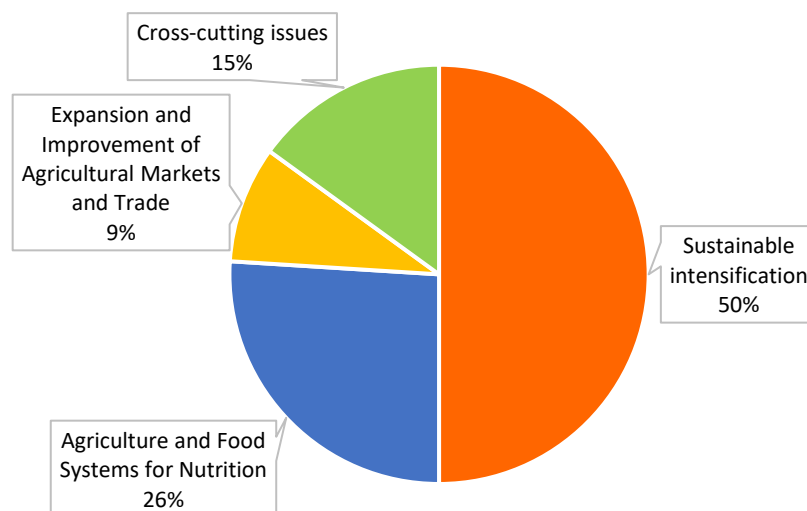
## 5. Identification of top projects for each priority area

Based on the ranking developed in the previous section, the top projects for each of the **four priority areas** of the FNSSA initiative (as defined by the 2016 Roadmap of the R&I Partnership) have been identified. These priority areas are:

- Sustainable intensification.
- Agriculture and Food Systems for Nutrition.
- Expansion and Improvement of Agricultural Markets and Trade (within and between Africa and Europe).
- Cross-cutting issues.

Each project was categorized within one of the four areas. This was done according to the project’s objectives and activities. 50% of the projects have been identified as belonging to the Sustainable Intensification area, 26% to the Agriculture and Food Systems for Nutrition area, 9% to the Expansion and Improvement of Agricultural Markets and Trade area, and 15% to the Cross-cutting issues area. All projects with a score above 1 have been identified as “top” ones.

Figure 2. Proportion of projects in each priority area.



The top projects for each priority area are:

- Sustainable intensification:
  - DualCassava (21)
  - Crop and Soil Health (19)
  - UPSCALERS (20)
  - Sustainable management of *Tuta absoluta* (13)
  - PASUSI (49)

- EcoAfrica (17)
- MAB Chicken (8)
  
- Agriculture and Food Systems for Nutrition:
  - EatSane (41)
  - Enhancing nutritional quality of plantain food products (12)
  
- Cross-cutting issues:
  - SafeFish (9)
  - AFRICA-MILK (46)
  - SPEAR (33)
  - Enhancing the nutrition and health of smallholder farmers (11)
  
- Expansion and Improvement of Agricultural Markets and Trade:
  - Agroforestry Systems in S. Tomé and Príncipe (15)

It is important to note that there is **great heterogeneity** in the proportion of top projects of each priority area. In the area of Sustainable intensification, 43% of projects are considered top ones, and this proportion rises to 80% in the Cross-cutting issues area. In contrast, in the Expansion and Improvement of Agricultural Markets and Trade area, 33% of projects are identified as top, and in Agriculture and Food Systems for Nutrition, only 25%.

## 6. Inventory of measures and investment strategies

An **inventory of measures and investment strategies** suitable to tackle FNSSA projects’ needs has been developed. This inventory is the **first step** in the identification of financing and business development opportunities that will allow projects to **overcome the barriers** on their way to scale-up and reach the marketplace. Additionally, an overview of the funding landscape is available in [Annex III](#).

Table 3. Inventory of measures and investment strategies

Category	Measure	Description	Potential	Reference
Public Financing	<b>ACP Investment Facility (ACP IF)</b>	An instrument of the European Investment Bank, the ACP IF supports projects promoting the development of the private sector. Among its priorities in Africa, it includes the funding of environmental actions and the support to local SMEs and microenterprises. The EIB provides financing through local intermediaries.	ACP IF can be a good instrument for projects unable to find financing from other sources. Moreover, the ACP IF has an Impact Financing Envelope directed at high-risk investments, what could be especially interesting for promising research projects. A list of intermediaries in Africa is available <a href="#">here</a> .	<a href="#">Handbook on European funding opportunities for African start-ups &amp; entrepreneurs, 2019.</a>
	<b>African Investment Platform (AIP)</b>	Part of the European Fund for Sustainable Development, the AIP fosters investments that support sustainable growth in Africa, including agriculture. AIP combines grants with loans from Development Financing Institutions and private finance. The AIP uses local intermediaries, such as commercial banks, angel investors or national promotion banks.	AIP can be a good facility for high-risk projects having difficulties to find funding. Its special focus in agriculture makes it very relevant for FNSSA projects. More information <a href="#">here</a> .	<a href="#">Handbook on European funding opportunities for African start-ups &amp; entrepreneurs, 2019.</a>

Category	Measure	Description	Potential	Reference
	<b>Horizon Results Platform</b>	An instrument of the European Commission that has the objective of turning valuable research results into impactful real innovations. The platform connects researchers, private investors and policymakers to direct funding and attention towards useful research that could have a valuable effect on the economy and society.	The Horizon Results Platform can be an excellent tool for projects to connect with potential investors and policymakers and to showcase the value of their research. More information <a href="#">here</a> .	<a href="#">Horizon Results Platform, European Commission.</a>
	<b>Development Aid</b>	Financing programmes and opportunities for start-ups and innovators can be found in the international development programmes of non-African countries.	Development funds directed at start-ups and incipient companies can be used by FNSSA projects to reach the market. These can take the form of loans and grants. Some international development agencies especially present in Africa are Agence Française de Développement, UKAid, FMO and Norfund.	
	<b>Other multilateral institutions</b>	Funding opportunities for African entrepreneurs can be found in the programmes of several multilateral institutions.	Several multilateral institutions offer funds for innovative and entrepreneurial start-ups as part of their development strategy. Some of the most relevant ones for FNSSA projects are the International Finance Corporation programmes in <a href="#">agribusiness</a> and <a href="#">venture capital</a> and the AFDB <a href="#">Youth Entrepreneurship and Innovation Multi-Donor Trust Fund</a> .	

Category	Measure	Description	Potential	Reference
Private Financing	<b>Venture Capital and Business Angels</b>	<p>Due to the high risk that investing in start-ups and innovative companies entails, traditional financial institutions tend to avoid holding positions in them. Due to the difficulties of accessing traditional funds, entrepreneurs can turn to business angels and venture capital firms. These investment firms fund risky projects through an acquisition of part of the start-up's equity.</p>	<p>Venture capital firms and business angels are a good option for projects having difficulties to access traditional financial institutions. Repositories with information about African business angels and venture capital firms are available in <a href="#">Africa Angels</a>, <a href="#">Brussels-Africa Hub</a> and <a href="#">African Business Angels Network</a>.</p>	
	<b>Crowdfunding</b>	<p>Crowdfunding consists in microfinancing by companies or individuals to a promising start-up. There are four types of crowdfunding:</p> <ul style="list-style-type: none"> <li>• Reward crowdfunding: patrons receive the product that the company offers as a reward for their contribution.</li> <li>• Donation crowdfunding: donors do not receive any remuneration for their contribution, the project is normally social or humanitarian.</li> <li>• Crowdlending: lenders provide microcredits to the start-up, for which an interest is charged.</li> <li>• Equity crowdfunding: like business angels, although at a micro scale. Investors provide micro-investments through which they become owners of a small part of the company.</li> </ul>	<p>Crowdfunding can be an excellent resource for some projects that struggle to attract bigger scale investments. Moreover, reward crowdfunding can be useful for projects planning on supplying products such as improved plant varieties. Additionally, donation crowdfunding can be suitable for projects with limited profitability but with a strong social or environmental impact. Some African crowdfunding platforms are <a href="#">JumpStart</a>, <a href="#">CharmImpact</a> and <a href="#">NaijaFund</a>. Specific to agricultural ventures is <a href="#">AfricaCrowdfunding</a>.</p>	<p><a href="#">InfoDev (World Bank)</a></p>

Category	Measure	Description	Potential	Reference
Business Development Support	<b>Cooperative Companies</b>	Cooperative companies are autonomous associations of persons who jointly-own an enterprise with the aim of fostering some common objectives. Especially relevant for FNSSA projects are agricultural cooperatives, through which farmers pool their resources to supply themselves with input and/or market their products.	Establishing a cooperative company could be specially interesting for some types of projects. Those projects who plan on delivering agricultural inputs to farmers or on marketing some product could benefit from resource pooling. Meanwhile farmers are involved in the management of the company and directly benefit from the project's output.	
	<b>Boost Africa</b>	An instrument of the European Investment Bank, within the framework of ACP IF, that aims to support young African entrepreneurs in the launching of competitive companies. The facility provides business advisory services, skills transfer and intermediated venture investments. The programme also includes an Innovation and Information Lab that incubates promising projects.	Boost Africa can be a good programme for projects planning to transform into entrepreneurial ventures but lacking the skills to make such a jump. Through its provision of business advisory services and its incubator programme, promising projects can acquire the knowledge necessary to become successful innovative companies. More information <a href="#">here</a> .	<a href="#">Handbook on European funding opportunities for African start-ups &amp; entrepreneurs, 2019.</a>
	<b>Business Support Structures (BSS)</b>	BSSs have the mission of supporting promising projects on their first steps towards becoming successful competitive companies. These structures count with experienced professionals that can accompany and advise entrepreneurs on their way to become innovative firms. They provide new start-ups with workspaces, mentoring, training and finding funding opportunities. These structures can take the form of	BSSs are an excellent opportunity for promising projects and start-ups that plan to enter the market but lack the skills and resources to successfully leap forward. BSSs are normally specialised in specific sectors, although other types can be found (e.g. women-oriented BSSs). The number and diversity of these structures in	<a href="#">Training material from the second AEIP event.</a>  <a href="#">Afric'innov.</a>

Category	Measure	Description	Potential	Reference
Technology Transfer and Protection		incubators or accelerators. BSSs can be purely private or be attached to educational & research institutions or the public administration.	Africa is huge. <a href="#">Afric'innov</a> and <a href="#">BIC-Africa</a> have networks of reliable African BSSs.	
	<b>Tech Hubs</b>	Tech Hubs are physical spaces where start-up companies interact and develop their business models. They usually include BSSs, but also co-working spaces and marketplaces. Tech Hubs offer a wide range of services, as well as networking opportunities and the experiences of entrepreneurs in similar positions.	Tech Hubs are a good opportunity for entrepreneurs, not only to access BSSs, but also to connect with different start-ups and learn from others' experiences. This can be greatly beneficial for the development of a business plan and for the establishment of partnerships. Some of the most important African Tech Hubs are the Wennovation Hub and the Co-creation Hub.	
	<b>Intellectual Property</b>	Intellectual Property (IP) rights are protected by law and provide innovators and entrepreneurs with a great opportunity to commercialise their innovations.	Acquiring IP rights (e.g. patent, seed certifications) is a good way to transform the research project into a viable entrepreneurial opportunity and may incentivise investors to provide financing to the start-up. ARIPO is the regional IP protection organisation. <a href="#">This</a> directory provides contact details of the different national African IP offices.	<a href="#">Why Intellectual Property matters, AEIP 2021</a>
	<b>Technology Transfer Offices (TTOs)</b>	Technology Transfer Offices (TTOs) are important institutions for the successful transferability of research outputs to entrepreneurs. These institutions	Projects having developed valuable marketable outputs should consider transferring these to entrepreneurs through TTOs. This allows	

Category	Measure	Description	Potential	Reference
		allow for a bridge between researchers and the private sector so that technology and outputs can reach the marketplace and generate economic and social value.	technology to reach people willing to develop it into a business opportunity and to disseminate its beneficial results into the wider economy and society. An example of a regional agricultural TTO is <a href="#">WACCI</a> .	



## 7. Overview of projects potential, needs and proposed measures

The **potential, needs and next steps** of each of the top projects have been analysed. Additionally, possible **investment strategies and measures** that would allow these projects to scale up are proposed based on the information collected in the inventory. Fig. 3 below presents the proportion of projects whose potential fits in a specific category (i.e. economic, environmental, food security). Fig. 4 and Fig. 5 show the percentage of projects for each need and for each measure proposed, respectively. Table 4 presents an overview of each project’s assessment and of the proposed measures. Then, Section 7 develops a detailed analysis of projects’ potential and needs. Section 8 completes the exercise by providing a detailed proposal of investment strategies and measures for each top project.

Figure 3. Proportion of top projects for each potential category.

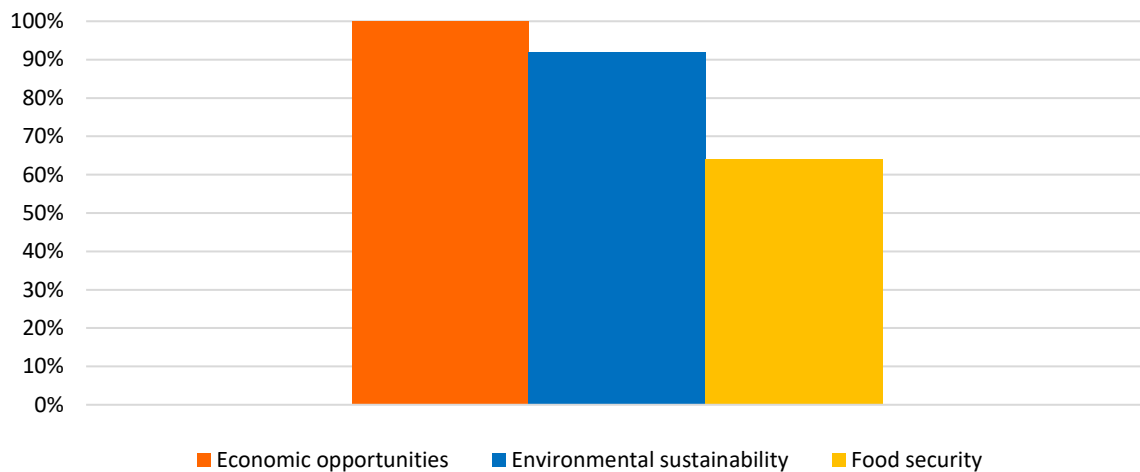


Figure 4. Proportion of top projects per specific need.

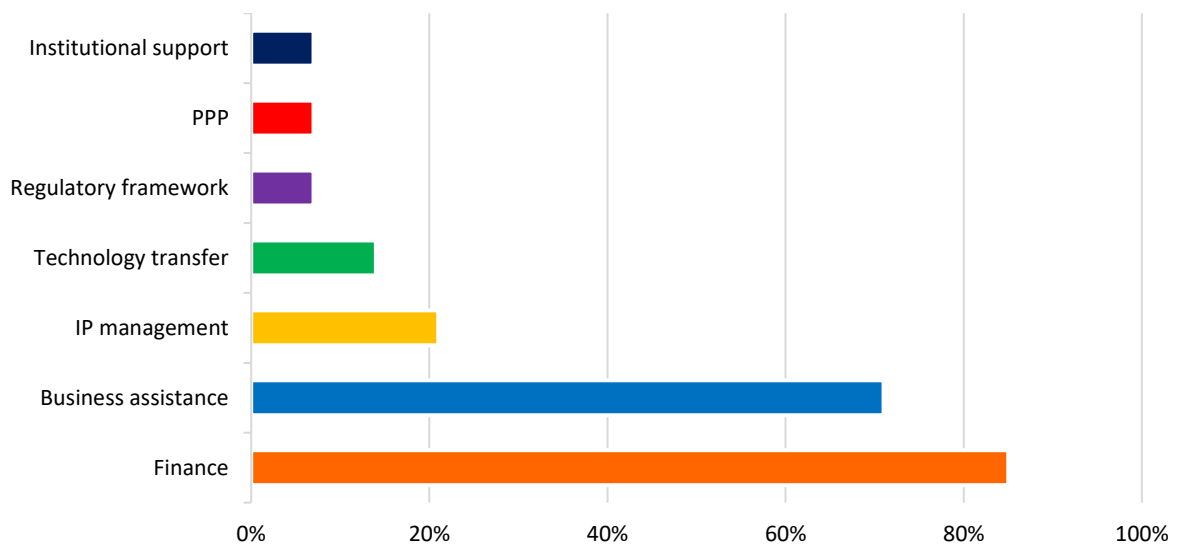


Figure 5. Proportion of top projects per proposed investment strategy and measure.

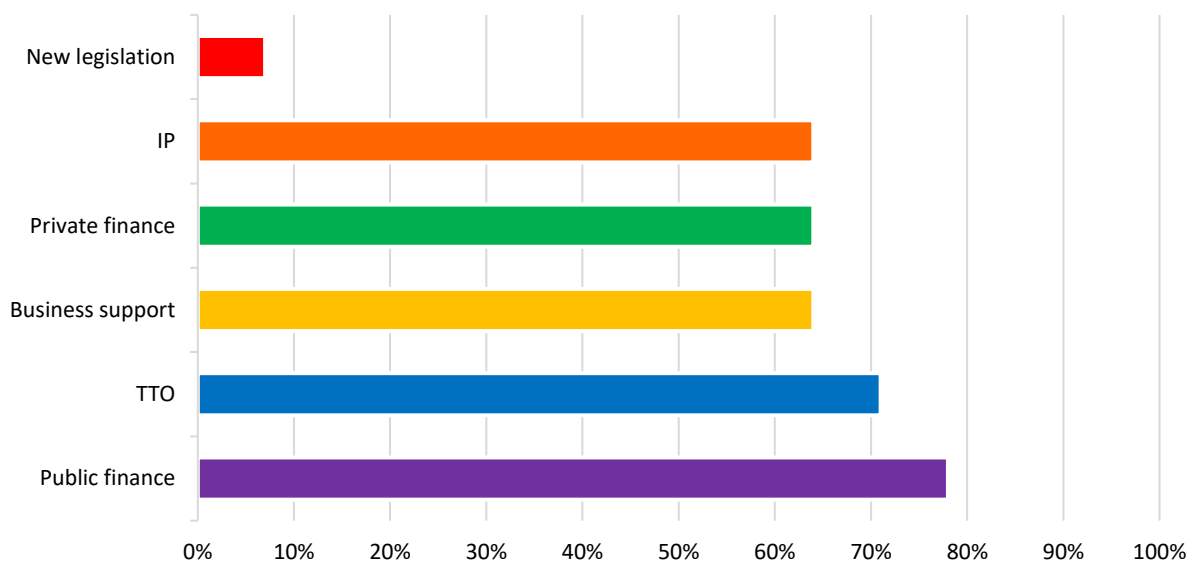


Table 4. Overview of top projects

Project	Potential	Needs and next steps	Investment strategies and measures
MAB Chicken (8)	Economic opportunities Environmental sustainability	Finance Business assistance IP management	IP TTO Business development support Private finance Public finance
SafeFish (9)	Economic opportunities Environmental sustainability Food security	Finance Technology transfer Business assistance New regulatory framework	IP TTO Business development support Private finance Public finance New legislation
Enhancing the nutrition and health of smallholder farmers in East Africa (11)	Economic opportunities Environmental sustainability Food security	Finance Business assistance	IP TTO Business development support Private finance Public finance

Project	Potential	Needs and next steps	Investment strategies and measures
Enhancing nutritional quality of plantain food products in Nigeria, Cameroon and Gabon (12)	Economic opportunities Food security	Finance Business assistance IP management	IP Business development support Public finance
Promote sustainable management of <i>Tuta absoluta</i> (13)	Economic opportunities Environmental sustainability	Finance	TTO Business development support Private finance
Implementation of Agroforestry Systems in S. Tomé and Príncipe (15)	Economic opportunities Environmental sustainability	Finance Business assistance	Business development support Private finance Public finance
EcoAfrica (17)	Economic opportunities Environmental sustainability	Business assistance	Public finance
Crop and Soil Health Improvement (19)	Economic opportunities Environmental sustainability Food security	Finance Technology transfer Business assistance	IP TTO Business development support Private finance Public finance
UPSCALERS (20)	Economic opportunities Environmental sustainability Food security	Finance Business assistance	IP TTO Public finance
DualCassava (21)	Economic opportunities Environmental sustainability Food security	Finance Business assistance	IP TTO Business development support Private finance Public finance
SPEAR (33)	Economic opportunities Environmental sustainability Food security	Public-Private Partnership (PPP)	IP TTO

Project	Potential	Needs and next steps	Investment strategies and measures
EatSANE (41)	Economic opportunities Environmental sustainability Food security	Finance Institutional support	TTO Public finance
AFRICA-MILK (46)	Economic opportunities Environmental sustainability Food security	Finance Business assistance IP management	IP TTO Private finance Public finance
PASUSI (49)	Economic opportunities Environmental sustainability	Finance	TTO Business development support Private finance

## 8. Detailed identification of the development potential and needs of top projects

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For each of the top projects identified in previous sections, an **assessment of both their potential as well as their needs** was carried out. The assessment conducted in this section allows for a detailed understanding of the characteristics of each one of these top projects, as well as the obstacles they face to becoming successful entrepreneurial opportunities. Moreover, this assessment will allow for the **identification of investment strategies and measures** to support the **scale up** of these promising projects.

Given that all projects analysed in this section were identified as “top” based on their potential, each of them showed **very promising results** that would produce a significant positive impact if scaled up. Due to the significant weight allocated to the business & economic KPIs, the projects assessed performed strongly in this category. Therefore, the scale up of most of these projects would likely translate into **strong positive economic outcomes**, such as sector-wide productivity increases, creation of new start-ups and companies, and new markets.

Moreover, many projects also yielded promising results in terms of environmental outcomes. Hence, the scale up of numerous projects would probably translate into a **combination of economic and environmental impacts**, such as more sustainable production techniques or improved resilience to drought.

However, performance in the **social category is more mixed**. As stated previously, many projects have potential to produce a durable impact in terms of **food security and poverty alleviation**. Nevertheless, the improvement of the situation of specific groups (e.g. women, youth) normally comes from directly targeting vulnerable groups as beneficiaries of the activities themselves, something that is unlikely to continue once the scale up is achieved and the project terminated. As an example, many projects target vulnerable groups by encouraging them to take part in the project’s activities. This should not be expected to immediately change their disadvantageous situation because projects’ activities do not address the socioeconomic structural causes of these groups’ vulnerabilities. There are, however, some notable exceptions, as elaborated in the detailed section below (i.e. projects PASUSI, MAB Chicken, AFRICA-MILK and EatSANE). Against this background, possible future planning aiming to secure projects’ continuation and/or scale up should therefore endeavour to ensure sustainable, widespread and inclusive access to projects’ positive outcomes, so that they could lead to equitable socioeconomic benefits across African societies.

With regards to the **needs and next steps**, there are some common trends that are important to point out. Firstly, most projects would need **additional funding** for a successful scale up to occur. In this regard, there is great heterogeneity in the amounts that coordinators estimate that would be needed, ranging from €60,000 to €5 million. Secondly, many projects would need some type of **business development support** in order to translate the research outputs into economic and entrepreneurial opportunities. Moreover, some would need assistance in **transferring the results** to the private sector and/or in **managing IP rights**. Lastly, a few projects’ scale ups have **very specific needs**, such as a new regulatory framework or a Private-Public Partnership to be implemented.

This assessment was conducted utilising the information collected in the first phase of the FNSSA mapping exercise, as well as with a series of interviews carried out with some project coordinators that agreed to participate. [Annex II](#) provides a snapshot of the projects' assessments that were complemented by interviews.

In the priority area of **sustainable intensification**, seven projects were identified as being top. The assessment of their potential and needs is identified below.

**8.1. DualCassava:** Dual-resistant cassava for climate resilience, economic development and increased food security of smallholders in eastern and southern Africa (21) – **Score: 1.95.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Maruthi Gowda, on December 7, 2021.*

**a. Potential:**

- The project has proven its potential to enhance farmers’ resilience to drought and crop disease, and to increase business opportunities in the poultry feed manufacturing sector and others.
  
- The project has introduced drought mitigation mixed cropping techniques of maize and cassava, together with a newly developed cassava variety that is both drought- and disease-resistant. The implementation covered local maize farmers in a sample of districts in Malawi and Tanzania. A Randomized Controlled Trial (RCT) carried out by the researchers showed that the introduced technique increases farmers’ resilience to adverse shocks, their revenue, their investment, and their households’ dietary diversity.
  
- The project has also introduced cassava as a partial substitute for the more expensive maize in the poultry feed manufacturing industry. This has led to 17% increases in profit for feed manufacturers and 27% increases in revenues for cassava farmers. Moreover, the project coordinator believes that cassava could also be introduced as a raw material in the bakery, paper, and starch industries. All of this means new business opportunities for cassava farmers (i.e. development of a novel poultry feed; possibility of using cassava in the bakery, paper and starch transformative value chain industries).
  
- The project has therefore the potential to produce a durable impact in terms of socioeconomic opportunities for African farmers, feed manufacturers, and other entrepreneurs and workers across agricultural and food systems’ value chains. As an evident side-effect, it is also promising in terms of food security and poverty alleviation. Moreover, the project has potential to produce a positive environmental impact, since the substitution of imported maize shortens distribution chains, and the introduction of disease and drought-resistant cassava varieties mitigates the impact of climate change and reduces the need for pesticides.

**b. Needs and next steps:**

- Additional funding is needed to carry out an array of activities necessary for the scale up. These activities include supplying the new cassava varieties to local entrepreneurs, as well as technical training to local farmers to equip them with mixed cropping methodologies and capacity to multiply the seeds. Some infrastructure is also needed for this to happen, including chipping machines, vehicles and laboratories. This would also allow to enhance seed transformation/processing value chains.
- Awareness among farmers in drought-prone areas, as well as among feed manufacturers, should be generated. Additionally, training for farmers on mixed-cropping techniques, as well as training for feed manufacturers, needs to be provided. Moreover, the improved cassava varieties need to be introduced in the national seed systems. To scale up in the bakery, paper and starch industries, there is a need to mentor and encourage private sector partners to invest in appropriate processing and drying technologies. The widespread commercialisation of cassava residues to be used in poultry feed manufacturing also needs developing better links between farmers and feed manufacturers, and promoting the appearance of intermediaries where these do not exist.

**8.2. Crop and Soil Health Improvement** for Sustainable Agricultural Intensification towards Economic Transformation in West Africa (19) – **Score: 1.58.** (Funded through “DG INTPA”)

*Some of the information below comes from an interview held with the project coordinator, Eric Danquah, on November 29, 2021.*

**a. Potential:**

- The project is promising in terms of sustainably intensifying agricultural output and creating new business and employment opportunities.
- The project has introduced improved varieties of crops (rice, maize and tomato) to local farmers. Moreover, it provides extensive training to value chain actors and farmers through field schools and workshops. This leads to a sustainable increase in local agricultural productivity (between 20% and 80% depending on the crop) and output, as well as an increase of farmers’ revenue (30%-40%). Additionally, good agronomic practices and pest management strategies have been taught and implemented.
- New product developments have already started, such as SHITOR, a cowpea-based product that is expected to increase this commodity’s demand. This creates new agribusiness opportunities and increases the value-added of this industry. Moreover, the developed maize, tomato and cowpea varieties may be patentable and, therefore, possible to commercialise or license. As part of this



project, the West Africa Centre for Crop Improvement (WACCI) has already released 3 maize hybrids and is in the process of getting approval for 3 new tomato varieties. Several companies are already interested in the maize hybrid.

- The project has therefore the potential to create business and employment opportunities for local farmers by increasing productivity and income in an environmentally sustainable manner. Therefore, it is also promising in terms of food security and poverty alleviation. Additionally, the project achieves this economic impact in an environmentally friendly way, since the productivity increases and the associated income rises are a consequence of the introduction of improved varieties and the use of soil health management techniques.

**b. Needs and next steps:**

- The complete scale up would take 3 to 5 years. This scale-up would directly benefit approx. 40,000 farmers and train 1,000 extension officers, which could eventually translate in up to a million farmers benefitted.
- The Farmers Field School initiated through the project could be expanded to include a much higher number of farmers and further spread good agronomic practices and the introduction of improved varieties. The same is true for the Value Chain Workshops organised during the project, which could be enlarged to include all actors in the value chain and combined with entrepreneurship training. This should include both public and private sector involvement.
- New crop varieties could be released to the market, this will create opportunities for the licensing of intellectual property and their commercialization, translating into business and employment opportunities. The project is already working with an agribusiness start up (Legacy Crop Improvement Centre, Koforidua, Ghana) to start raising private funds for the large-scale production of certified seeds of the developed maize hybrids. The coordinator expects an uptake of the improved maize varieties by 40% of Ghana's farmers in 5 years-time and the national government has shown interest in exploring the possibility of subsidizing certified seed production. Moreover, WACCI has reached an agreement with a tomato processing company in Ghana to produce the developed tomato varieties at a large scale and the developed variety is expected to be the dominant one in the market in 2 to 3 years-time.
- For this scale up to happen, some specialized assistance and funding is needed. Technical assistance in developing a business plan and support in creating links with partners and investors to facilitate the generation of start-ups would be greatly beneficial. Moreover, funding of between €3million to €5million is deemed necessary during for the next 5 years to expand the impact, create cooperatives and establish support systems for farmers. These new funds would also support the creation of start-ups and businesses (e.g. seed companies,

commercial seed producers, farmers' cooperatives, food processing companies, etc.) and the marketing of cowpea-based products. Additionally, the plant varieties created need to be scaled-up to be commercialized.

**8.3. UPSCALERS:** Upscaling Site-Specific Climate-smart Agriculture and Land use practices to Enhance Regional Production Systems in West-Africa (20) – **Score: 1.43.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Seyni Salack, on December 2, 2021.*

**a. Potential:**

- The project is promising in terms of sustainably intensifying small-scale farming and increasing resilience to climate change.
- The project increases small-scale farmers yields and revenues. It is estimated that labour productivity is increased by a 100% and land productivity by a 200%. This is thanks to the development of a user-friendly app with customized climatic forecasts for farmers' fields, the construction of several facilities for farmers to use, the identification of sustainable intensification pathways (soil quality improvements, compost production, biogas reuse, etc.), and training to farmers on agroclimatic techniques. The estimated increase of farmers' household income is of 50-52%.
- The project is also promising in its capacity to improve governments' agricultural policy in Burkina Faso, Ghana and Niger. The development of decision-making tools for climate-smart policies and the training of national extension officers on the delivery of agroclimatic information to farmers are expected to further improve agricultural output and resilience to climate change.
- Moreover, the project also increases agricultural production resilience to climate change. By delivering customized climatic information and training farmers on agroclimatic techniques, it has been possible to significantly enhance productivity by between 10% and 20% despite the very adverse conditions of the 2018-2020 crop seasons.
- Therefore, the project is promising in terms of creating economic opportunities for small-scale farmers, and in terms of improving food security. The project can sustainably increase agricultural output and improve climate change resilience at the same time, therefore ensuring a stable future food production.

**b. Needs and next steps:**

- Firstly, customized climate information services are scalable by the weather services of all countries. Technical assistance for the distribution of these customized climatic information services would be needed. This will take an additional 3 years in order to develop a concept of operations for the agroclimatic services. The team aims to reach at least 500 farmers by the end of 2022.
- Moreover, the intensification pathways can be implemented at larger scale. For example, the production of compost for farmers is a scalable practice. The team aims to distribute at least 20 more biodigesters next year (2022).
- They will need funding to maintain the centralised interconnected app system once the project officially ends. Moreover, the scale up of the project would require additional financing (~450,000€).

**8.4.Promote sustainable management of *Tuta absoluta*, an invasive pest of Solanaceous vegetables for food and nutritional security in East Africa (13) – Score: 1.21.** (Funded through “African Union Research Grant II”)

**a. Potential:**

- The project has potential in the sustainable intensification of agricultural output through the environmentally sensible management of pests.
- The project has developed new Integrated Pest Management (IPM) technologies and has disseminated it to tomato farmers for the sustainable management of *Tuta absoluta* in Kenya, Tanzania and Uganda. This has increased agricultural productivity (and quality) by mitigating the infestations. The increase in productivity has positively impacted farmers’ income, both in amount and stability. Moreover, as the output increases and the cost decreases (order of improvements yet to be quantified), new business and employment opportunities have been created in value chain processes as IPM technologies allowed for more and cheaper primary inputs for tomato processors.
- The project is therefore promising in terms of creating economic opportunities for farmers and in improving food security by increasing agricultural yields. Moreover, IPM technologies have also allowed for a more sustainable agriculture by significantly reducing the use of pesticides and fostering a good equilibrium of the ecosystem, for example by allowing the activities of pollinators.

**b. Needs and next steps:**

- The project needs starter kits for farmers to further disseminate the developed IPM technologies. Moreover, in the medium term, financial assistance would be needed to upscale the IPM dissemination to other regions and countries.

**8.5. PASUSI:** Participatory Pathways to Sustainable Intensification. Innovation platforms to integrate leguminous crops and inoculants into small-scale agriculture and local value chains (49) – **Score: 1.15.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

*Some of the information below comes from an interview held with the project coordinator, John Sumelius, on December 20, 2021.*

**a. Potential:**

- The project is promising with regards to the sustainable intensification of agricultural output, the increase of resilience to climate change and the improvement of women’s position in society.
- The project is expected to reduce production costs and increase productivity (order of improvements yet to be quantified) of legume farms. The identification of the most economically viable crops and practices has led to the introduction of inoculated soybean production and land rotation techniques. This has led to cost reductions and increase yields (order of improvements yet to be quantified). Moreover, indirect economic opportunities could be generated if the volume of inoculants is scaled-up and a market is formed. Some strains of rhizobia and soybeans have already been patented in Ghana and Uganda.
- The project has therefore the potential to reduce legume farmer poverty, improve soil quality and increase resilience to climate change. Moreover, given the fact that women make up most of the workforce in this area, the improved economic opportunities could lead to an increase in the economic independence of local women. Additionally, two women innovation platforms have been created.

**b. Needs and next steps:**

- The project and/or its outputs can be scaled-up by solving information problems within the governance systems that currently block farmers from transforming their systems. For this to happen, additional funds would be needed (order of desirable financial support yet to quantified).

**8.6. EcoAfrica:** ECOlogical intensification pathways for the future of crop-livestock integration in AFRICAn agriculture (17) – **Score: 1.06.** (Funded through DG INTPA)

**a. Potential:**

- The project has the potential of increasing crop production in a sustainable manner, as well as improving food security as a result.
- The project uses innovative techniques (e.g. pest-mitigating cropping system, high-quality organic fertilizers, etc.) to sustainably intensify production while protecting soil properties at the same time. This has led to increases in agricultural yields and in farmers' revenue (order of improvements yet to be quantified). Cost reductions have also been observed (though are yet to be exactly quantified) by using plants with insecticide characteristics that allow for a reduction in the purchase of fertilizers and pesticides. Additionally, several upland rice varieties tested during the project are in the process of being registered.

**b. Needs and next steps:**

- The project and/or its outputs could be scaled-up through nationwide programmes. For this to happen, technical and logistical assistance would be needed in order to diffuse the techniques developed and to target the most suitable areas for exploitation. To do so, the team would need to work with lots of farmers to collect a large amount of biomass for recycling (biogas, organic fertilizer, etc.). Furthermore, it will also need equipment to generate these products.

**8.7.MAB Chicken:** Marker-assisted breeding of selected native chickens in Mozambique and Uganda (8) – **Score: 1.01.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Filomena dos Anjos, on December 9, 2021.*

**a. Potential:**

- The project is promising in terms of a sustainable intensification of chicken meat and egg production.
- The project has improved native chicken ecotypes and developed feed based on scavengeable resources. This was introduced to farmers in Mozambique and Uganda. These new chicken breeds are more productive and of better quality (meat and eggs), this will improve the economic opportunities of farmers and ameliorate the living conditions of rural communities. The project will create business and employment opportunities in the hatchery sector, day-old brooded chicks' industry and in mother units and communal incubators. Moreover, it may lead to the development of a scavengeable feed industry. The chicken breeds may be patentable.

- The project is therefore promising in terms of economic development. Additionally, the production increase (yet to be exactly quantified) is sustainable because semi-intensive production is promoted. Besides, the project can have a positive impact in women's standing in society. Since this activity is mostly carried out by women, an increase in their productivity could increase their economic independence.
  
- b. Needs and next steps:**
- Nationwide programmes in Uganda and Mozambique that helped to introduce improved chicken varieties are needed. Some progress has already taken place in Uganda, as the chicken breeds have started to be transferred to farmers. Nonetheless, Mozambique has not begun yet.
  
- In order to implement these programmes, government commitment and NGO support is needed, as well as additional funding.
  
- The project would need support to conduct future steps in several fronts: (a) it will need technical assistance to develop a business plan and to be mentored on intellectual property management, (b) it will need support in accessing markets, (c) women groups will need some type of assistance (funds for egg incubators, feed, vaccines and other components).

In the priority area of **agriculture and food systems for nutrition**, two projects were identified as being top. The assessment of their potential and needs is identified below.

**8.8. EatSANE:** Education and Training for Sustainable Agriculture and Nutrition in East Africa (41) – **Score: 1.33.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

**a. Potential:**

- The project has provided training for farmers on new cropping systems and practices. Moreover, they have established and developed value chains for green leafy vegetables.
- The project is therefore promising in creating new economic and business opportunities. The novel cropping systems has led to important productivity increases and to significant rises in farmers’ income (order of improvements yet to be quantified). Moreover, the new market avenues are now reachable to farmers, as these have started marketing dried vegetables and accessing more profitable markets thanks to the improved storage practices (i.e. solar drying).
- Furthermore, the project has a strong potential with respect to food security, as the practices developed lead to more nutritious food, reduces food losses and increases dietary diversity. In terms of sustainability, the project is also promising since the new cropping systems prevent soil erosion and biodiversity losses.

**b. Needs and next steps:**

- The project’s outputs could be scaled up by diffusing the techniques and novel cropping systems at a large scale. This will need permanent institutional support (e.g. extension officers). Disseminating best practices in an easy and understandable language is therefore key, and should target nutritional experts, rural advisors and extension officers.
- A stakeholders’ board would be important to exchange information and diffuse the materials among all interested actors. If the project is to be scaled-up to other countries, value chain and stakeholders’ workshops are also key. Youth targeting must also be a priority in order to ensure participation of this vulnerable group into the economic opportunities that the project can provide.
- The scale up of the project would need financing in order to continue developing materials and scaling-up trainings.

**8.9. Enhancing nutritional quality of plantain food products** through improved access to endophyte primed and high pro vitamin A plantain cultivars under integrated soil fertility management practices in Nigeria, Cameroon and Gabon (12) – **Score: 1.06.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Masso Cargele, on November 30, 2021.*

**c. Potential:**

- The project has developed fertilisers and designed rates of fertilisation for plantain cultivation, what increases the crop’s productivity and output. More importantly, several plantain-based products and processes have been developed. Among them, plantain flour with high provitamin A content, a new solar drying technology, and a new process for deep-fat frying starchy banana that leads to significant reductions in oil use.
- The project is therefore promising in creating new economic and business opportunities, as well as new markets. The project leads to important productivity increases (order of improvements yet to be quantified) in both plantain production (e.g. fertilisers) and processing (e.g. solar drying, deep-fat frying). Moreover, the new products developed create new market avenues for producers and other value chain actors (e.g. plantain flour).
- Furthermore, the project has a strong potential with respect to food and nutrition security, as the products developed with high provitamin A content easily cover the vitamin A requirements of pre-school children and pregnant women.

**d. Needs and next steps:**

- The project’s outputs could be scaled up by diffusing the techniques at a large scale. The team has already developed a business plan to implement production and processing techniques by the youth. Nonetheless, seed systems are not well organised and this represents an obstacle for large-scale transfer. All value chain actors should be included in the expansion.
- The scale up of the project would need financing to bring the business plan into practice.
- The team believes that some outputs of the project can be patentable. Private involvement is needed for the production of endophytes.



In the priority area of **cross-cutting issues**, four projects were identified as being top. The assessment of their potential and needs is identified below.

**8.10. SafeFish:** Development of bacteriophage cocktails as disease biocontrol agents for improved aquaculture productivity, food and nutrition safety in Ghana and Uganda – **Score: 1.41.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Jesca Nakavuma, on November 29, 2021.*

**a. Potential:**

- The project is promising in terms of increasing food output and improving the environmental footprint of aquaculture.
- The project has developed phage cocktails that act as biocontrol for the management of bacterial pathogens in tilapias. This leads to fish mortality reductions of around 60% and output increases of 20%. Besides, phage cocktails are cheaper than the currently used antibiotics. The project is therefore promising in terms of creating business and economic opportunities for tilapia farmers by increasing productivity.
- The project has also potential with regards to food security and sustainability. The phage cocktail stabilises and increases food supply. Moreover, they do so by introducing ecologically harmless biocontrol technology, therefore reducing the environmental impact of aquaculture.

**b. Needs and next steps:**

- The project and/or its outputs could be scaled up by transferring the research output to fish feed manufacturers. Moreover, biocontrol technologies for other species could be researched.
- A new regulatory framework is needed to introduce the phage cocktail to the aquaculture sector. Public involvement is therefore needed.
- The team would need assistance in developing a business plan and managing intellectual property, as they have planned to patent the phage cocktail.

- The scale up would need funds in order to make the appropriate investments to develop the productive infrastructure needed.

**8.11. AFRICA-MILK:** Promote ecological intensification and inclusive value chains for sustainable African milk sourcing (46) – **Score: 1.32.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

**a. Potential:**

- The project has developed agroecological dairy cows feeding practices and efficient dairy collection systems. Moreover, the team has created Dairy Innovation Platforms (DIPs) in each of the dairy processor networks involved. These platforms have directly involved women farmers into the discussion.
- The project is therefore promising in terms of food and nutrition security, as it is expected to increase access to safe dairy products in Kenya and Madagascar thanks to a better management of milk quality all along the dairy value chain.
- The project has also potential with respect to environmental sustainability, as products are produced with local milk and not imported powder milk, therefore shortening the distribution chain.
- Furthermore, the project may create local business and economic opportunities in the dairy industry based on fresh milk produced locally. The project leads to increased productivity and output, and reduced collection costs.

**b. Needs and next steps:**

- Some of the output of the project (i.e. *Jabnde*, a rationing software for African dairy cows) might be patentable and could be commercialised. Discussions are being held with the legal department of CARD in this respect.
- The project can be scaled-up by expanding the use of *Jabnde* to livestock technicians in charge of monitoring milk production on farms.
- The team would need assistance in implementing the organisational innovations (i.e. dairy collection systems).
- The scale up would need funds to make the appropriate investments to expand the practices and systems developed (~60,000€).

**8.12. SPEAR** (Empowering small-scale farmers): towards the SDGs through participative, innovative and sustainable livestock and poultry value chains (33) – **Score: 1.08.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

**a. Potential:**

- The project has developed new ways of preserving milk and meat, protocols for participatory value chain modelling, and training modules.
- The project is promising in terms of economic development. The local cereal-based feed developed in Senegal is more affordable than the current solutions, what gives the possibility to more poultry farmers. Poultry farmers increase productivity and output as a result (order of improvements yet to be quantified).
- The project also improves the environmental footprint by utilising locally grown cereals for feed manufacturing. With respect to food and nutrition security potential, the project improves access to nutritious food in Senegal and Kenya by the preservation of food and the increased nutritional values provided by introducing insect meals as animal feed in Kenya.

**b. Needs and next steps:**

- For the project’s output to scale up at the national level, a Private-Public Partnership (PPP) will need to be created.

**8.13. Enhancing the nutrition and health of smallholder farmers in East Africa** through increased productivity of biofortified common bean and improved postharvest handling (11) – **Score: 1.08.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Pamela Paparu, on December 1, 2021.*

**c. Potential:**

- The project has the potential of reducing hunger, improving food and nutrition security and fostering responsible food production. The promotion of biofortified beans and pre- and post-harvest handling practices increases output and safety of the beans. This results in safer and more nutritious food.

- The project is also promising in terms of economic development. The bean variety is more productive and increases yields (order of improvements yet to be quantified), therefore generating business opportunities for small-scale farmers. Moreover, row spacing and the use of selective herbicides allows for labour cost reductions (order of improvement yet to be quantified).
- The project also improves the environmental footprint of bean production by promoting the safe use of pesticides thanks to row spacing, which reduces seed amount per acre.

**d. Needs and next steps:**

- For the project's output to scale up, the bean variety seeds should be diffused to allow for a large-scale multiplication of seed production. One farmer group has already taken over this task; however, they will need enhanced capacity to carry it out successfully. Moreover, they will need training in quality production and marketing. Additionally, farmers should be trained in the safe use of pesticides and on reducing post-harvest losses.
- Accordingly, the project will need technical assistance in planning future steps and developing a plan of action. Additional funding will also be needed.
- Farmers will need training and technical support to set up cooperatives and to establish the bean seeds production facilities.

In the priority area of **expansion and improvement of agricultural markets and trade**, one project was identified as being top. The assessment of its potential and needs is identified below.

**8.14. Implementation of Agroforestry Systems in S. Tomé and Príncipe** and development of non-wood forest products (NWFP) in Angola and S. Tomé and Príncipe to improve income-generation and food security (15) – **Score: 1.38**. (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Maria do Céu Madureria, on November 30, 2021.*

**a. Potential:**

- The project has the potential of expanding agricultural markets by opening new market avenues for the products created. The project developed three Non-Wood Forest-Products (NWFP) Chains (Foods & Aromatic Plants; Medicinal Plants; Mushrooms). Moreover, the team also developed new lines of healthier food and medicinal natural products.
- Furthermore, the project is promising in terms of environmental outcomes/improvements. The team has implemented agroforestry techniques (AFS), rehabilitated degraded natural areas, and developed a Biological and Fair-Trade certification for all NWFP. These techniques have also been taught to small scale farmers and Ministry of Agriculture technicians of S. Tomé and Príncipe. AFS techniques have allowed for an increase in output and productivity (order of improvements yet to be quantified), while maintaining quality and ensuring sustainability.
- The project therefore creates economic and business opportunities because it increases agricultural productivity through AFS and creates new market avenues by developing NWFPs and introducing mushrooms into national food markets. All of this while ensuring environmental protection and giving value to sustainable production by creating a Biological and Fair-Trade certification.

**b. Needs and next steps:**

- The project could be scaled up by expanding AFS to the whole national territory of Angola and S. Tomé and Príncipe, and by developing more lines of NWFP. The original plan was to locally market NWFP to international tourists. Nonetheless, given the situation derived from COVID-19, the team is focusing on commercialising the developed products on international markets. The Biological and Fair-Trade certification should be key part of this strategy.

- The project has already created seven micro-business groups that will implement AFS techniques and market the developed NWFPs in S. Tomé and Príncipe. These groups need technical assistance in order to evolve into long-term sustainable companies. The team has already established contact with two incubators to benefit from their help in this respect.
- The scale up will need financing for these micro-business groups to succeed. Moreover, the team will need to create a network of partnerships to ensure the expansion of AFS to other territories at the national or regional level.

## 9. Detailed identification of measures and investment strategies

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The identification of **measures and investment strategies** for top projects was conducted based on the needs and potential assessment carried out in the previous section, as well as on the inventory developed. Several **financing and business development** opportunities have been singled out for each project according to their scalability potential and needs. The measures and investment strategies identified in this section will allow the projects to **overcome the barriers** on their way to scale up their results and become **successful entrepreneurial opportunities**.

It is worth highlighting some common trends in the proposed measures. Firstly, given that all projects would need additional funds for a successful scale up, financial investment strategies have been proposed for each project. For most of them, the proposed strategy is a **combination of public and private funds**. However, some scale ups are **unlikely to be financed by the private sector** and the proposed strategy is therefore **completely based on public funding**. Likewise, some projects would probably **not need public financial assistance**. Hence, the proposed investment strategy is **purely based on private finance**.

With respect to **business development support**, many projects would greatly benefit from it and would **increase their probability of successfully scaling up**. Therefore, it has been proposed that most of them seek assistance from specialised professionals in this field. Similarly, the acquisition of some types of **IP rights are worth exploring** for many projects, although its desirability diverges according to the nature of the research output. Almost all projects should use **some type of TTO** to transfer the developed technology to the private sector. Given the difficulties that may arise in finding a satisfactory institutional TTO in the African context, **alternatives can be used**. For example, utilising field schools or stakeholders' boards already established by many projects could be a good way to overcome this obstacle.

In the priority area of **sustainable intensification**, seven projects were identified as being top. Investment strategies and measures deemed adequate to their needs are identified below.

**9.1. DualCassava:** Dual-resistant cassava for climate resilience, economic development and increased food security of smallholders in eastern and southern Africa (21) – **Score: 1.95.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Maruthi Gowda, on December 7, 2021.*

- **Intellectual property:** the acquisition of IP rights on the developed cassava varieties should be considered. The regional IP rights organisation, ARIPO, allows to protect these through the legal concept of Plant Variety Protection (PVP).
- **TTO:** the project should consider utilising a TTO to transfer the developed cassava varieties and the poultry feed solution to entrepreneurs and the wider economy. This will allow the output to be developed into a commercial good that can reach the market.
- **Business development assistance:** in order to design viable feed manufacturer businesses, as well as introducing the output in the bakery, paper and starch value chain sectors, some type of business advisory service needs to be provided. Booster Africa and its incubator programme should be considered for this purpose.
- **Financing needs:** public funding is probably the most suitable investment source for this project at this stage. The funds necessary to produce the developed cassava varieties and to build the infrastructure needed are unlikely to come from private investors. This is due to the nature of the output itself (new techniques, plant varieties) and also due to the zero or very low price needed to allow widespread diffusion. At present, indeed, project coordinators think that for a widespread diffusion of the techniques and varieties, these have to be free or heavily subsidized. ACP IF, AIP and development agencies funds should be considered. Alternatively, the establishment of a cooperative of seed producers could also be envisaged.

**9.2. Crop and Soil Health Improvement** for Sustainable Agricultural Intensification towards Economic Transformation in West Africa (19) – **Score: 1.58.** (Funded through DG INTPA)



*Some of the information below comes from an interview held with the project coordinator, Eric Danquah, on November 29, 2021.*

- **Intellectual property:** the acquisition of IP rights on the developed tomato, rice and maize varieties should be considered. The regional IP rights organisation, ARIPO, allows to protect these through the legal concept of Plant Variety Protection (PVP). Moreover, a recently passed Ghana law (Plant Breeders Rights) recognises IP rights for improved varieties, which can be licensed and commercialised abroad among ECOWAS Member States.
- **TTO:** the project should consider transferring the developed varieties through the TTO that the research centre (WACCI) already has. This will allow the varieties to reach the marketplace and farmers.
- **Business development assistance:** to create start-ups that can scale up seed production and commercialisation of the new varieties, technical assistance is needed to develop a business plan. Moreover, the creation of a private company to incorporate and commercialise the developed technologies or the licensing of the new products developed to an external one would also need business development support. Boost Africa or BSSs should be considered in these regards.
- **Financing needs:** public and private financing should be considered. The establishment of start-ups for the scale up of the varieties and its commercialisation could be financed by venture capital firms or crowdfunding (reward, equity or crowdlending). The establishment of support systems and the strategy of impact expansion could be funded through public programmes such as AIP, ACP IF, or the AFDB facility.

**9.3. UPSCALERS:** Upscaling Site-Specific Climate-smart Agriculture and Land use practices to Enhance Regional Production Systems in West-Africa (20) – **Score: 1.43.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Seyni Salack, on December 2, 2021.*

- **Financing needs:** the most suitable form of financing for scaling up this project is public funding. Local farmers are likely unable/unwilling to spontaneously purchase the agroclimatic app and subscribe to the sustainable intensification trainings. The relatively expensive costs of the app, together with the very reduced investment capacity of local farmers, would make them prioritise other

investments if they had to assume the whole real price of the service. Therefore, the provision of these services would probably need to be free or at low public prices. Development funds or multilateral institutions' facilities should be considered. Nonetheless, other options, such as farmer associations and/or cooperatives to finance communal biodigesters should also be explored.

- **Intellectual Property:** the project should assess the possibility of acquiring IP rights for the developed app. The app could be useful for agricultural insurance companies, which may be willing to buy/license the rights and to invest in its further development and expansion.
- **TTOs:** the diffusion of biodigesters would need the support of some specialized institution. A recently created African Alliance on Biodigester is worth exploring in this respect.

**9.4. Promote sustainable management of *Tuta absoluta*,** an invasive pest of Solanaceous vegetables for food and nutritional security in East Africa (13) – **Score: 1.21.** (Funded through “African Union Research Grant II”)

- **TTO:** the project should consider transferring the developed IPM through a TTO to local entrepreneurs. This will allow the technology to reach the marketplace and farmers.
- **Business development assistance:** to create start-ups that can produce IPM kits at a large scale, technical assistance is needed to develop a business plan. Boost Africa or BSSs should be considered.
- **Financing needs:** private financing should be considered. The establishment of start-ups for the scale up of the IPM and its commercialisation could be financed by business angels or crowdfunding (reward, equity or crowdlending).

**9.5. PASUSI:** Participatory Pathways to Sustainable Intensification. Innovation platforms to integrate leguminous crops and inoculants into small-scale agriculture and local value chains (49) – **Score: 1.15.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

*Some of the information below comes from an interview held with the project coordinator, John Sumelius, on December 20, 2021.*

- **TTO:** the project should consider utilising a TTO to transfer the inoculants it developed to entrepreneurs and the wider economy. This will allow the output to turn into a commercial good that can reach the market.

- **Business development assistance:** in order to design viable inoculant companies, some type of business advisory service should be provided. Booster Africa and BSSs should be considered.
- **Financing needs:** private financing is probably the most suitable investment source for the scale up of this project. The establishment of start-ups for the scale up of inoculant production and its commercialisation could be financed by venture capital or crowdfunding (reward, equity or crowdlending).

**9.6. EcoAfrica:** ECOlogical intensification pathways for the future of crop-livestock integration in AFRICAn agriculture (17) – **Score: 1.06.** (Funded through DG INTPA)

- **Financing needs:** the most suitable form of financing for scaling up this project is public funding. Local farmers are likely unable/unwilling to spontaneously purchase/subscribe to the sustainable intensification trainings developed as part of the project. The low investment capacity of local farmers, together with the difficulties of privately selling a non-patentable knowledge product, makes private provision of the service hardly possible. Therefore, the provision of these services would probably need to be free or at low public prices. Development funds or multilateral institutions facilities should be considered to make this possible.

**9.7. MAB Chicken:** Marker-assisted breeding of selected native chickens in Mozambique and Uganda (8) – **Score: 1.01.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Filomena dos Anjos, on December 9, 2021.*

- **Intellectual property:** the project should seek assistance in filing for and managing IP rights for the developed chicken breed.
- **TTO:** the project should consider transferring the developed chicken breed and feed through a TTO to local entrepreneurs. This will allow the breed to reach the marketplace and farmers at a larger scale.
- **Business development assistance:** in order to create companies that can raise the chicken at a larger scale and access the market, technical assistance is needed to develop a business plan. Boost Africa or BSSs should be considered.

- **Financing needs:** private and public financing should be considered. The establishment of companies could be financed through an agricultural cooperative scheme. The funds needed to support women groups could come from public programmes of development agencies and ACP IF.

In the priority area of **agriculture and food systems for nutrition**, two projects were identified as being top. Investment strategies and measures deemed adequate to their needs are identified below.

**9.8. EatSANE: Education and Training for Sustainable Agriculture and Nutrition in East Africa (41) – Score: 1.33.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

- **TTO:** the project should transfer to farmers the novel cropping systems through institutional structures. To do so, agricultural extension officers should be used, and best practices materials should be disseminated in an easy and understandable language.
- **Financing needs:** public financing should be considered. Development agencies and multilateral institutions’ funding programmes should be explored.

**9.9. Enhancing nutritional quality of plantain food products** through improved access to endophyte primed and high pro vitamin A plantain cultivars under integrated soil fertility management practices in Nigeria, Cameroon and Gabon (12) – **Score: 1.06.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Masso Cargele, on November 30, 2021.*

- **Intellectual property:** the project should explore the possibility of acquiring IP rights for the developed output. Support should be sought in these regards.
- **TTO:** the team is already considering negotiating a loyalty fee with local private companies to recognising the innovation.
- **Business development assistance:** to disseminate the developed fertilisers and techniques, technical assistance is needed to further develop the business plan that the team has already created. Boost Africa or BSSs should be considered.
- **Financing needs:** public financing should be considered. The funds needed to support youth groups could come from public programmes of development agencies, ACP IF and multilateral institutions. The African Union has already shown interest in the scale up of this project.

In the priority area of **cross-cutting issues**, four projects were identified as being top. Investment strategies and measures deemed adequate to their needs are identified below.

**9.10. SafeFish:** Development of bacteriophage cocktails as disease biocontrol agents for improved aquaculture productivity, food and nutrition safety in Ghana and Uganda – **Score: 1.41.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Jesca Nakavuma, on November 29, 2021.*

- **Intellectual property:** the project should seek support in managing IP rights for the developed phage cocktail.
- **TTO:** the project should consider transferring the phage cocktails through a TTO to local fish feed manufacturers. This will allow the developed solution to reach the marketplace and aquaculture farmers.
- **Business development assistance:** in order to develop a sustainable business plan and to license the acquired IP rights, technical assistance is needed. Boost Africa or BSSs should be considered.
- **New legislation:** public involvement is needed to create a new regulatory framework respondent to the needs and characteristics of the technology here developed.
- **Financing needs:** private and public financing should be considered. The large-scale production of phage cocktails could be financed through an agricultural cooperative scheme or by crowdfunding.

**9.11. AFRICA-MILK:** Promote ecological intensification and inclusive value chains for sustainable African milk sourcing (46) – **Score: 1.32.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

- **Intellectual property:** the project should explore the possibility of acquiring IP rights over the software developed (“*Jabnde*”).
- **TTO:** the project should consider transferring and expanding the organisational innovations by using institutional structures, such as agricultural extension officers.

- **Financing needs:** private and public financing should be considered. The development and expansion of *Jabnde* could be financed through crowdfunding or venture capital. Alternatively, public funding options should be explored. ACP IF, AIF and Horizon Results Platform can be considered.

**9.12. SPEAR** (Empowering small-scale farmers): towards the SDGs through participative, innovative and sustainable livestock and poultry value chains (33) – **Score: 1.08.** (Funded through “ERA-NET Cofund, LEAP-Agri”)

- **Intellectual property:** the project should explore the possibility of acquiring IP rights for the innovative protocol for meat and milk preservation, transformation and commercialisation in Senegal.
- **TTO:** the project should consider transferring and disseminating the protocols and techniques by using institutional structures, such as agricultural extension officers. Alternatively, Private-Public Partnerships (PPPs) could be created.

**9.13. Enhancing the nutrition and health of smallholder farmers in East Africa** through increased productivity of biofortified common bean and improved postharvest handling (11) – **Score: 1.08.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Pamela Paparu, on December 1, 2021.*

- **Intellectual property:** the project should explore the possibility of acquiring IP rights for the biofortified beans. Seeds could be certified, this would encourage farmers to produce them at a large-scale, while protecting their rights when doing so.
- **TTO:** the project would need to transfer the certified beans through a TTO to local seed entrepreneurs. This will allow the beans to reach the marketplace and farmers at a larger scale. Moreover, links with prisons, hospitals, and schools should be made to encourage the adoption of biofortified beans in these institutions.<sup>5</sup>

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<sup>5</sup> Prisons, hospitals and schools in Rwanda and Uganda tend to produce food on site for inmates, patients and students. Beans are an integral part of the diet of people within these institutions.

- **Business development assistance:** in order for farmer groups to multiply seed production, they will need technical assistance to establish cooperatives, enhance their capacity, and foster links with the markets. Boost Africa or BSSs should be considered to do so. Moreover, a stakeholders' board should be created to take over the output and progress of the project once it will come to an end.
- **Financing needs:** private and public financing should be considered. The establishment of companies could be financed through an agricultural cooperative scheme. Additional funds could come from national public subsidies and development agencies. The team has already received financing from Uganda's government to boost the last phase of the project. Moreover, Public-Private Partnerships (PPPs) should be explored.



In the priority area of **expansion and improvement of agricultural markets and trade**, one project was identified as being top. Investment strategies and measures deemed adequate to their needs are identified below.

**9.14. Implementation of Agroforestry Systems in S. Tomé and Príncipe** and development of non-wood forest products (NWFP) in Angola and S. Tomé and Príncipe to improve income-generation and food security (15) – **Score: 1.38.** (Funded through “African Union Research Grant II”)

*Some of the information below comes from an interview held with the project coordinator, Maria do Céu Madureria, on November 30, 2021.*

- **Business development assistance:** to enhance the capacity of the micro-business groups, technical assistance is needed to develop a business plan, especially with respect to commercialising NWFP in international markets (e.g. even beyond Africa). To do so, the team has already contacted NGO MOVE (fundraising and support for local expansion) and NGO Quá Tela (help transfer agribusiness products to the private sector). Seeking the support of an additional organisation specialised in exporting and international markets should be strongly considered.
- **Financing needs:** private and public financing should be considered. The establishment of companies and the enhancement of micro-business groups should seek private finance. The project has already made moves in this direction (NGO MOVE). Additionally, a cooperative companies’ structure should be explored. Moreover, part of the funds needed for business expansion and for the diffusion of AFS practices to the whole territory could come from public finance. The team has already advanced in this direction by contacting the Global Environmental Fund (GEF). Funding from ACP IF should also be considered.

## 10. Conclusions and recommendations for similar future initiatives

Overall, this mapping exercise has enabled us to draw some **general conclusions** about the performance of the FNSSA initiative of the EU-AU R&I Partnership. Moreover, some **recommendations** can be proposed to improve the design of similar future initiatives and of the African research and innovation landscape.

Based on our assessment, the FNSSA initiative has been successful for most of its part. The initiative has been able to produce an **important proportion of high-achieving projects** which have generated a number of important outputs with regards to economic and social development and environmental sustainability. The fact that certain projects did not produce significant outputs should not be seen as a failure, but rather as a necessary and understandable outcome in exercises that are most times pioneering, exploratory and ‘pilot’ in their nature, aiming indeed to promote innovation in a given context. In other words, as for all research and innovation programmes, the FNSSA partnership initiative could be somehow considered a “probability game” in which only a fraction of the pool of projects can be expected to arrive to meaningful results immediately at the end of the first cycle of funding.

Nonetheless, some **obstacles not inherent to the nature of innovations** themselves were also found to hamper the progress of several projects. For instance, delays in the disbursement of AU funds, the complexity of preparing financial reports and bureaucratic tasks, and the disruptions caused by COVID-19 were the issues most widely cited by coordinators.

With regards to the **innovation environment** needed to scale up successful projects and produce a positive impact in African economies and communities, there is still room for improvement. One of the identified obstacles concerns the **transfer of the developed technologies** to the private sector, a step of paramount importance for valuable outputs to produce a durable social and economic impact. The lack of institutional TTOs and the low capacity and quality of many of the existing ones represents a hindrance and, even though many projects have come up with innovative solutions (e.g. field schools, stakeholder boards, etc.), there is a **need for more professional institutionalised TTOs**. Similarly, there is a need for **better links with business development support institutions** and systems. Despite the current business development support ecosystem in Africa not being dissatisfactory, project **coordinators often lack connections** with it. There is therefore a need for better information and stronger linkages between researchers and business development assistance systems.

With regards to the funding environment, the situation is rather encouraging. There are **plenty of public financing programmes**, mainly from multilateral institutions and development agencies, but also from African national governments. **The private funding landscape is also satisfactory**, with a developed ecosystem of business angels, venture capitals crowdfunding platforms and cooperative companies’ schemes. Nonetheless, coordinators repeatedly reported being unaware of many public funding programmes and often lack the connections with private investors. Therefore, there is a **need for researchers to better access funding information and opportunities**.

Considering the obstacles and needs identified, **several improvements could be achieved** when designing similar future initiatives and/or when further supporting the existing ones here examined and ranked, mainly by improving connections between researchers and the private sector and investors. Accordingly, we propose the institution of **a centralised EU-AU supported platform**, that could link and put in contact projects, public and private funders, private companies and incubators, in a simple and effective manner. In this sense, the ‘Boost Africa’ initiative could represent a good starting point to do so. Nonetheless, platforms should be made much more comprehensive and project coordinators should directly be informed about their existence, accessibility and availability as many simply do not know about them.

Regarding the general innovation landscape and ecosystem in Africa, and thinking particularly about the next EU-AU Africa Summit 2022 and the joint EU-AU Innovation Agenda for Africa, particular efforts should be made to try **to improve connections between researchers and the private sector**. Investments and a widespread continental initiative to create **more institutional TTOs** and improve and professionalise the existing ones should be considered.

## Annex I: Detailed assessment of the projects

Table A1. Detailed projects' assessment

	Business and economic (50%)					Social (25%)					Environmental (25%)			Total score
	Revenue change	Change in cost	Change in productivity	New business opportunities	Patents	Impact on women	Impact on youth	Impact on poverty	Impact on food security	Civil society engagement	Impact on climate change resilience	Impact on resource efficiency	Value chain shortening	
OR4FOOD (6)	1	0	1	1	0	2	0	0	1	0	0	0.75	0	<b>0.51</b>
MAB Chicken (8)	1	0	1	3	1	1	1	1	2	2	0	0.75	0	<b>1.01</b>
SafeFish (9)	3	2	3	2	2	0	0	1	1	1	0	0.75	0	<b>1.41</b>
Aspergillus species and Aflatoxin Contamination (10)	1	1	1	0	1	0	0	0	2	0	0	0	0	<b>0.5</b>
Enhancing the nutrition and health of smallholder farmers (11)	1	2	1	3	0	2	0	1	2	0	0	1.5	0	<b>1.07</b>
Enhancing nutritional quality of plantain food products (12)	2	2	2	1	1	1	1	0	2	0	0	0.75	0	<b>1.06</b>
Sustainable management of <i>Tuta absoluta</i> (13)	2	2	2	3	0	1	1	1	2	0	0	0.75	0	<b>1.21</b>

	Business and economic (50%)					Social (25%)					Environmental (25%)			Total score
	Revenue change	Change in cost	Change in productivity	New business opportunities	Patents	Impact on women	Impact on youth	Impact on poverty	Impact on food security	Civil society engagement	Impact on climate change resilience	Impact on resource efficiency	Value chain shortening	
Agroforestry Systems in S. Tomé and Príncipe (15)	2	2	2	3	0	2	1	1	2	1	0	1.5	0	<b>1.37</b>
Solar powered micro irrigation (16)	2	2	2	1	0	1	1	1	0	0	0	1.5	0	<b>0.97</b>
EcoAfrica (17)	2	2	1	1	2	0	0	1	1	2	0	0.75	0	<b>1.06</b>
ASF-RESIST (18)	2	2	2	2	0	0	0	1	1	2	0	0	0	<b>1</b>
Crop and Soil Health (19)	3	2	3	3	1	0	0	3	2	0	0	1.5	0	<b>1.57</b>
UPSCALERS (20)	2	2	3	2	0	1	1	2	2	0	2	0.75	0	<b>1.42</b>
DualCassava (21)	3	3	3	3	1	0	0	3	2	0	1	0.75	3	<b>1.95</b>
SEACRIFOG (23)	0	0	0	0	0	0	0	1	1	0	2	0	0	<b>0.26</b>
NUTRIFOODS (24)	0	0	0	0	0	0	0	1	1	0	0	0	0	<b>0.1</b>
MuVHA (25)	1	1	1	0	1	0	0	1	0	0	0	0	0	<b>0.45</b>
MUSBCEA (27)	1	1	1	1	0	1	1	1	2	0	0	0	0	<b>0.65</b>

	Business and economic (50%)					Social (25%)					Environmental (25%)			Total score
	Revenue change	Change in cost	Change in productivity	New business opportunities	Patents	Impact on women	Impact on youth	Impact on poverty	Impact on food security	Civil society engagement	Impact on climate change resilience	Impact on resource efficiency	Value chain shortening	
ATMA4FS (28)	0	1	0	0	0	0	0	1	1	0	0	0	1	<b>0.28</b>
SmallFish (29)	2	0	1	1	0	0	0	1	2	0	0	0.75	0	<b>0.61</b>
NOURCITY (31)	0	0	0	0	0	0	0	0	2	0	0	0	0	<b>0.1</b>
SPEAR (33)	2	2	2	2	1	0	0	1	1	0	0	0	1	<b>1.08</b>
MycoSafe-South (34)	0	0	0	0	1	0	0	1	2	0	0	0	0	<b>0.25</b>
SERVInnov (37)	0	0	0	0	0	0	0	1	1	0	0	0	0	<b>0.1</b>
MetVac (39)	2	0	1	1	1	0	0	0	2	0	0	0.75	0	<b>0.66</b>
VITAPALM (40)	0	0	0	0	1	2	2	2	1	0	0	0.75	0	<b>0.51</b>
EatSANE (41)	2	2	2	2	0	2	2	2	2	0	0	1.5	0	<b>1.32</b>
SESASA (42)	0	0	0	1	1	0	0	0	1	0	2	0.75	0	<b>0.47</b>
OPTIBOV (43)	1	1	1	1	0	1	0	1	1	0	0	0.75	0	<b>0.61</b>
AFRICA-MILK (46)	2	2	2	1	2	1	0	1	1	2	0	0	2	<b>1.31</b>

	Business and economic (50%)					Social (25%)					Environmental (25%)			Total score
	Revenue change	Change in cost	Change in productivity	New business opportunities	Patents	Impact on women	Impact on youth	Impact on poverty	Impact on food security	Civil society engagement	Impact on climate change resilience	Impact on resource efficiency	Value chain shortening	
Pest-free fruit (47)	0	0	0	0	0	0	0	1	1	0	0	0.75	0	<b>0.16</b>
AFRICA (48)	1	1	1	1	0	0	0	1	1	0	0	0.75	0	<b>0.56</b>
PASUSI (49)	0	2	2	1	3	2	0	2	0	0	1	0.75	0	<b>1.14</b>
AfriCultuRes (51)	1	1	1	1	0	0	0	1	1	0	2	0	0	<b>0.66</b>

## Annex II: Interviews with project coordinators

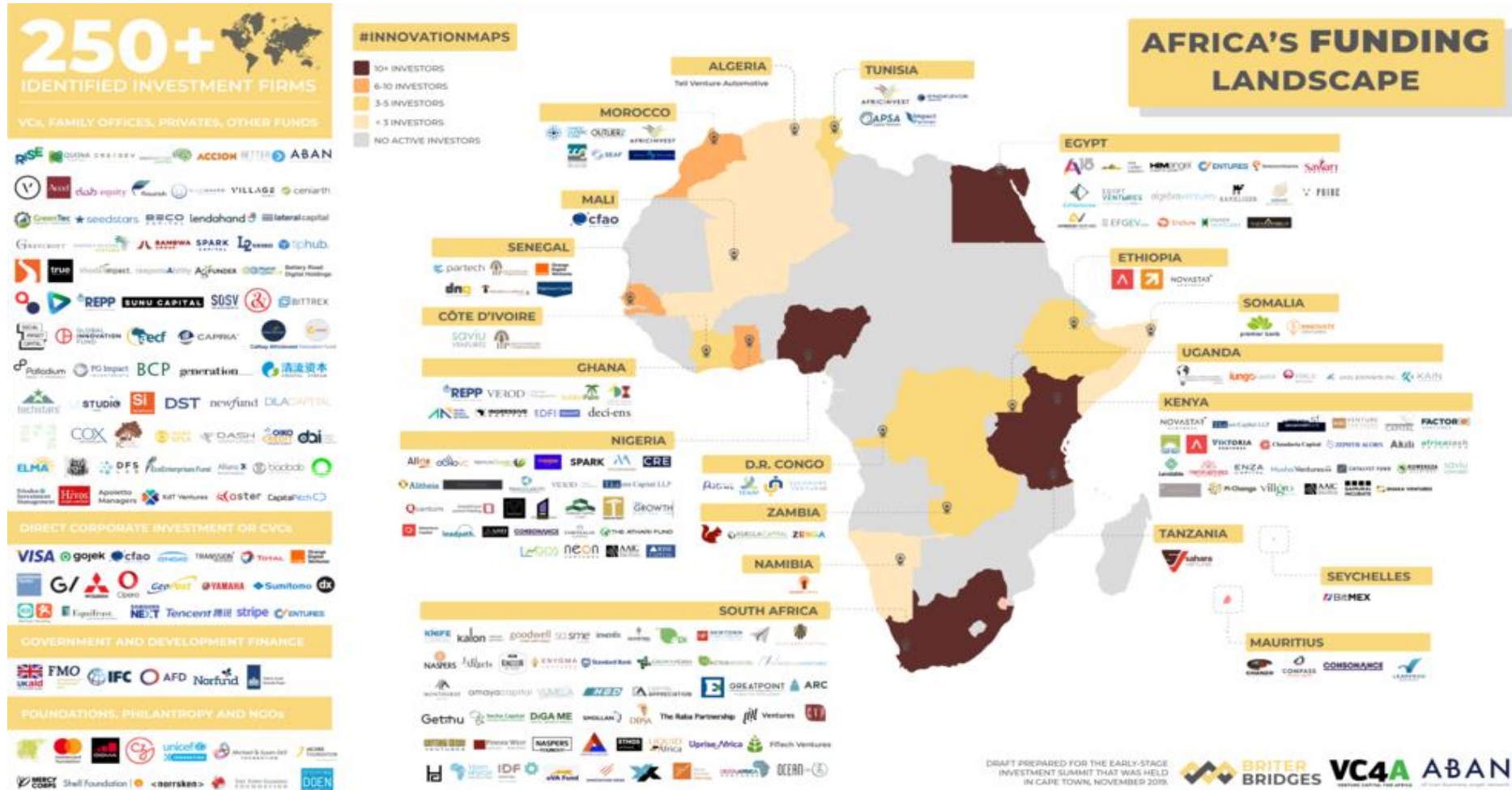
Table A.2: Interviews held

Project name	Date of the interview	Interviewee
<b>SafeFish (9)</b>	November 29	Jesca Nakavuma
<b>Crop and Soil Health (19)</b>	November 29	Eric Danquah
<b>Enhancing nutritional quality of plantain food products in Nigeria, Cameroon and Gabon (12)</b>	November 30	Masso Cargele
<b>Implementation of Agroforestry Systems in S. Tomé and Príncipe (15)</b>	November 30	María do Céu Madureria
<b>Enhancing the nutrition and health of smallholder farmers in East Africa (11)</b>	December 1	Pamela Paparu
<b>UPSCALERS (20)</b>	December 2	Seyni Salack
<b>DualCassava (21)</b>	December 7	Maruthi Gowda
<b>MAB Chicken (8)</b>	December 9	Filomena dos Anjos
<b>PASUSI (49)</b>	December 20	John Sumelius



## Annex III: Africa Funding Landscape

Figure A.1. Africa's Funding Landscape 2019




Source: Briter Bridges, <https://briterbridges.com/innovation-maps>

Annex IV: Visual fiches of top projects

### Dual Cassava – Climate resilience, economic development and food security in Malawi and Tanzania.

Coordinator: University of Greenwich  
 Budget: €898,116 (AU Research Grants II)  
 Start date: March 2018  
[Website](#)




#### Objectives

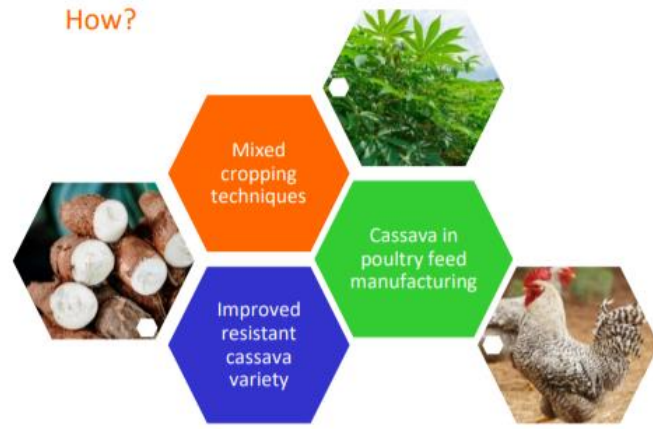
Mitigate the impact of cassava diseases and drought

Create economic opportunities along the cassava value chain

Increase food security in the region



#### How?




#### Business & Development Outcomes

3.2% increase in farmers' resilience to drought	17% increase in feed manufacturers' profits
20% increase in farmers' income	25% decrease in chicken mortality
Reduced environmental footprint	

#### Investment strategies and assistance needed

- Public funding sources
- Business development assistance
- Technology transfer
- IP rights advise

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**Crop and Soil Health Improvement for Sustainable Agricultural Intensification towards Economic Transformation in West Africa**

Coordinator: WACCI  
 Budget: €895,000 (AU Research Grants II)  
 Start date: June 2018  
[Website](#)



**Objectives**



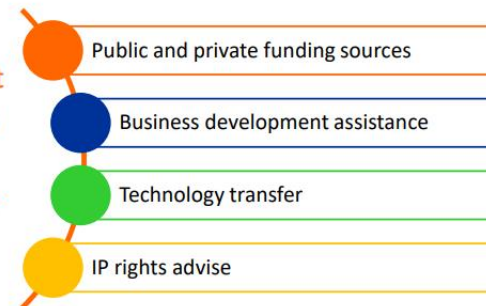
**How?**



**Business & Development Outcomes**

20% to 80% increase in local agricultural productivity (varies with crop)	New markets developed along agribusiness value chains
30% to 40% increase in farmer's revenue (varies with crop)	Sustainable pest and soil health management techniques introduced

**Investment strategies and assistance needed**



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**UPSCALERS - Upscaling Site-Specific Climate-smart Agriculture and Land use practices to Enhance Regional Production Systems in West-Africa**

Coordinator: WASCAL  
 Budget: €867,382 (AU Research Grants II)  
 Start date: February 2018  
[Website](#)



**Objectives**



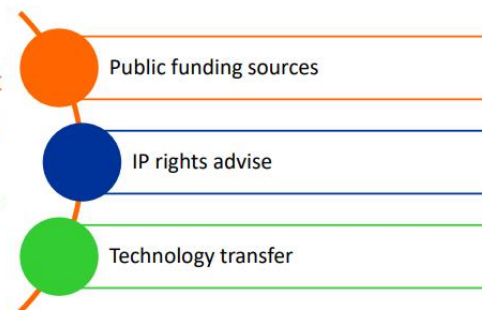
**How?**



**Business & Development Outcomes**

<p>Significant increase in local agricultural productivity</p> <p>50%-52% increase in farmer's income</p>	<p>Delivery of decision-making tools for climate-smart policies</p> <p>Improved resilience to climate change (increased productivity despite very adverse 2018-2020 conditions)</p>
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**Investment strategies and assistance needed**



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**EatSANE - Education and Training for Sustainable Agriculture and Nutrition in East Africa**

Coordinator: University of Hohenheim  
 (ERA-Net Cofund, LEAP-Agri)  
 Start date: September 2018  
[Website](#)



**Objectives**



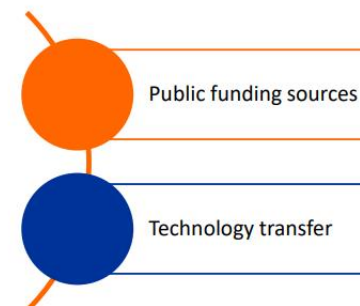
**How?**



**Business & Development Outcomes**

Significant increase in local agricultural productivity	Improved access for farmers to markets thanks to new storage technologies
More nutritious food, reduced food losses, increase in dietary diversity	
New value chains for green leafy vegetables	Reduced environmental footprint of agricultural practices

**Investment strategies and assistance needed**



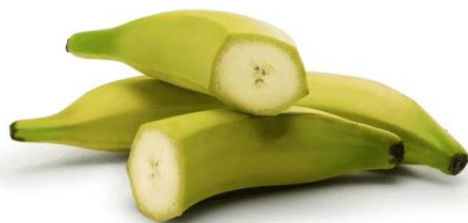
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**Enhancing nutritional quality of plantain food products through improved access to endophyte primed and high pro vitamin A plantain cultivars under integrated soil fertility management practices in Nigeria, Cameroon and Gabon**

Coordinator: IITA  
 Budget: €886,225 (AU Research Grant II)  
 Start date: December 2018  
[Website](#)



**Objectives**



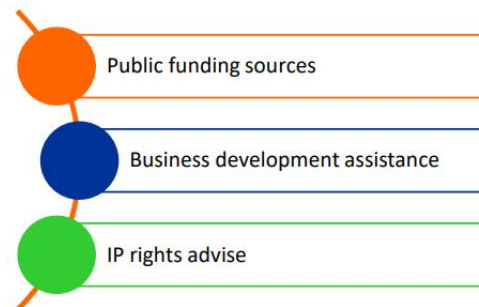
**How?**



**Business & Development Outcomes**

Significant increase in plantain productivity and output	New market avenues for developed plantain-based products (e.g. plantain flour)
New plantain processing techniques (e.g. solar drying, deep-fat frying)	Improvements in food security (plantain-based products with high provitamin A content)

**Investment strategies and assistance needed**



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**SafeFish - Development of bacteriophage cocktails as disease biocontrol agents for improved aquaculture productivity, food and nutrition safety in Ghana and Uganda**

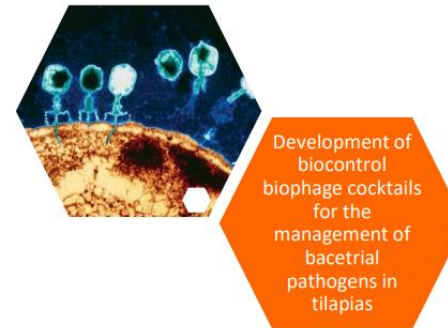
Coordinator: Makerere University  
 Budget: €719,238 (AU Research Grant II)  
 Start date: December 2018  
[Website](#)



**Objectives**



**How?**



**Business & Development Outcomes**

60% decrease in tilapia fish mortality	Biophage cocktail as a cheaper substitute for antibiotics
20% increase in tilapia fish output	Biophage cocktail environmentally harmless

**Investment strategies and assistance needed**

- Public and private funding sources
- Business development assistance
- Technology transfer
- IP rights advise
- New regulatory framework

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**AFRICA-MILK - Promote ecological intensification and inclusive value chains for sustainable African milk sourcing**

Coordinator: CIRAD  
 Funder: ERA-Net Cofund, LEAP-Agri  
 Start date: September 2018  
[Website](#)



**Objectives**



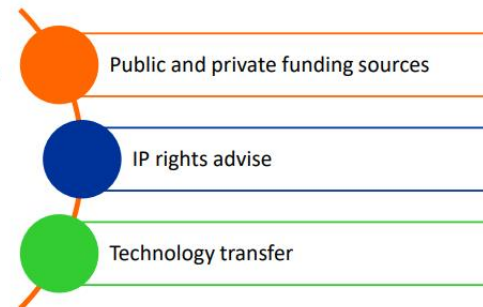
**Business & Development Outcomes**

Increased safety of dairy products thanks to better management of milk quality	Reduced environmental footprint of locally produced milk in comparison with imported milk powder
Significant increases in milk productivity	Reduced costs of milk collection

**How?**



**Investment strategies and assistance needed**



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**Implementation of Agroforestry Systems in S. Tomé and Príncipe and development of non-wood forest products (NWFP) in Angola and S. Tomé and Príncipe to improve income-generation and food security**

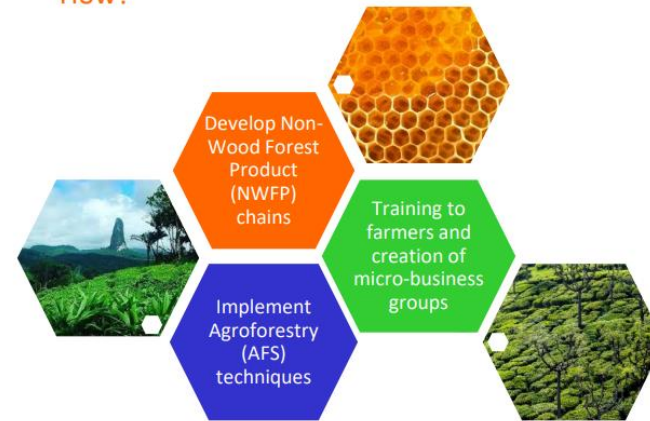
Coordinator: University of Coimbra  
 Budget: €720,170 (AU Research Grant II)  
 Start date: June 2018  
[Website](#)



**Objectives**



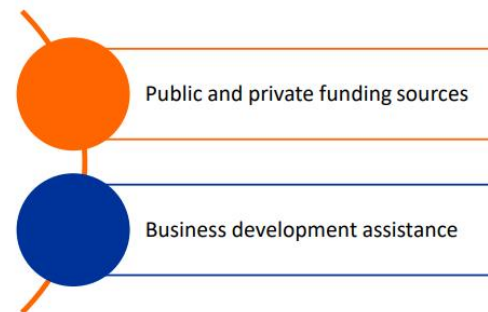
**How?**



**Business & Development Outcomes**

New markets for the developed NWFPs, mushrooms and medicinal plants	Rehabilitation of natural degraded areas
Increase in agroforestry productivity	Creation of a Biological and Fair Trade Certificate

**Investment strategies and assistance needed**



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