



Mauritius Breadfruit Sector Consortium

**2<sup>nd</sup> Partnership Inception Workshop**



**Workshop Report**

8<sup>th</sup> & 9<sup>th</sup> August 2012

Food and Agricultural Research Council (FARC),  
Reduit, Mauritius

Supported by the PAEPARD Project

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## Introduction

The Mauritius Breadfruit Sector Consortium organized a two-day Partnership Inception Workshop on 8<sup>th</sup> and 9<sup>th</sup> August 2012 at the Food and Agricultural Research Council, Reduit. This workshop is supported and is part of the Platform for African-European Partnership on Agricultural Research for Development (PAEPARD) Project, which is facilitating this collaboration among various stakeholders in the Breadfruit Sector in Mauritius as well as European Partners (African-European Partnership).

The opening of the workshop was done by the Director General of the Food and Agricultural Research Council (FARC), whereby directors and representatives of the organizations participating in the workshop activities were present. The participants of the workshop were from the Food and Agricultural Research Council (FARC), the Agricultural Services of the Ministry of Agro-Industry and Food Security (MAIFS), Conserverie Sarjua International Ltd, the Natural Resources Institute (NRI) - University of Greenwich, Rose-Belle Sugar Estate, Greenworld Company Ltd and the Professional Association of Producers / Exporters of Horticultural Products from Mauritius (APEXHOM). The workshop was facilitated by two external facilitators, selected and trained by PAEPARD.

The overall objectives of the workshop were to (1) develop Concept Notes for each of the Research questions formulated from previous workshop and working sessions, (2) discuss on possible funding opportunities, (3) develop a partnership action plan.

During the two days of the workshop, the participants were exposed to presentations and group activities in line with the workshop objectives.

The presentations served to increase awareness and understanding of the PAEPARD project in Mauritius and give an over-view of past activities of the consortium; to explain how to write project proposals and tap funding opportunities. Group activities were formulated to develop Concept Notes for the different Research Questions generated.

This report covers the proceedings of the two-day workshop held on 8<sup>th</sup> and 9<sup>th</sup> August 2012 as well as the background materials used during the workshop.

## Day 1: Opening of workshop and Introduction to project planning tools

### Workshop Opening

#### Objective:

For head of organizations and all stakeholders of the Mauritius Breadfruit sector Consortium to get an over-view of all activities organized by the consortium to date, and the objectives and activities of the 2<sup>nd</sup> Partnership Inception Workshop.

#### Description:

The opening ceremony was held at the Food and Agricultural Research Council (FARC), whereby workshop participants and the Directors/representatives of the following organizations were present: The Food and Agricultural Research Council (FARC), the Agricultural Research and Extension Unit (AREU), the University of Mauritius (UoM), the Agricultural Services of the Ministry of Agro-Industry and Food Security (MAIFS), Conserverie Sarjua International Ltd, the Natural Resources Institute (NRI) - University of Greenwich, Rose-Belle Sugar Estate, Greenworld Company Ltd and the Professional

Association of Producers / Exporters of Horticultural Products from Mauritius (APEXHOM).



Figure 1: The Director General of FARC during his speech

The participants and representatives of the different organizations were welcomed by Mrs. Boodhram, the Laboratory & Nursery Manager of FARC, who invited Mr. Ramkissoon, the Director General of FARC to address the audience. Mr. Ramkissoon

started his speech by welcoming all the

partners present at the workshop opening, and highlighted that the European Partner of the consortium, Mr. Whitfield from the Natural Resources Institute (NRI) was also present in the room. He gave an over-view of the activities of the consortium and explained the importance of breadfruit as an alternative source of carbohydrate in the context of food security in Mauritius and how each stakeholder has a role to play to contribute in the breadfruit value-

chain. This was followed by a Power-Point Presentation by Mr. Gunesh who gave more details on the PAEPARD project: Context, objectives, expected results, activities, the Mauritius Breadfruit Sector Consortium (Figure 2).

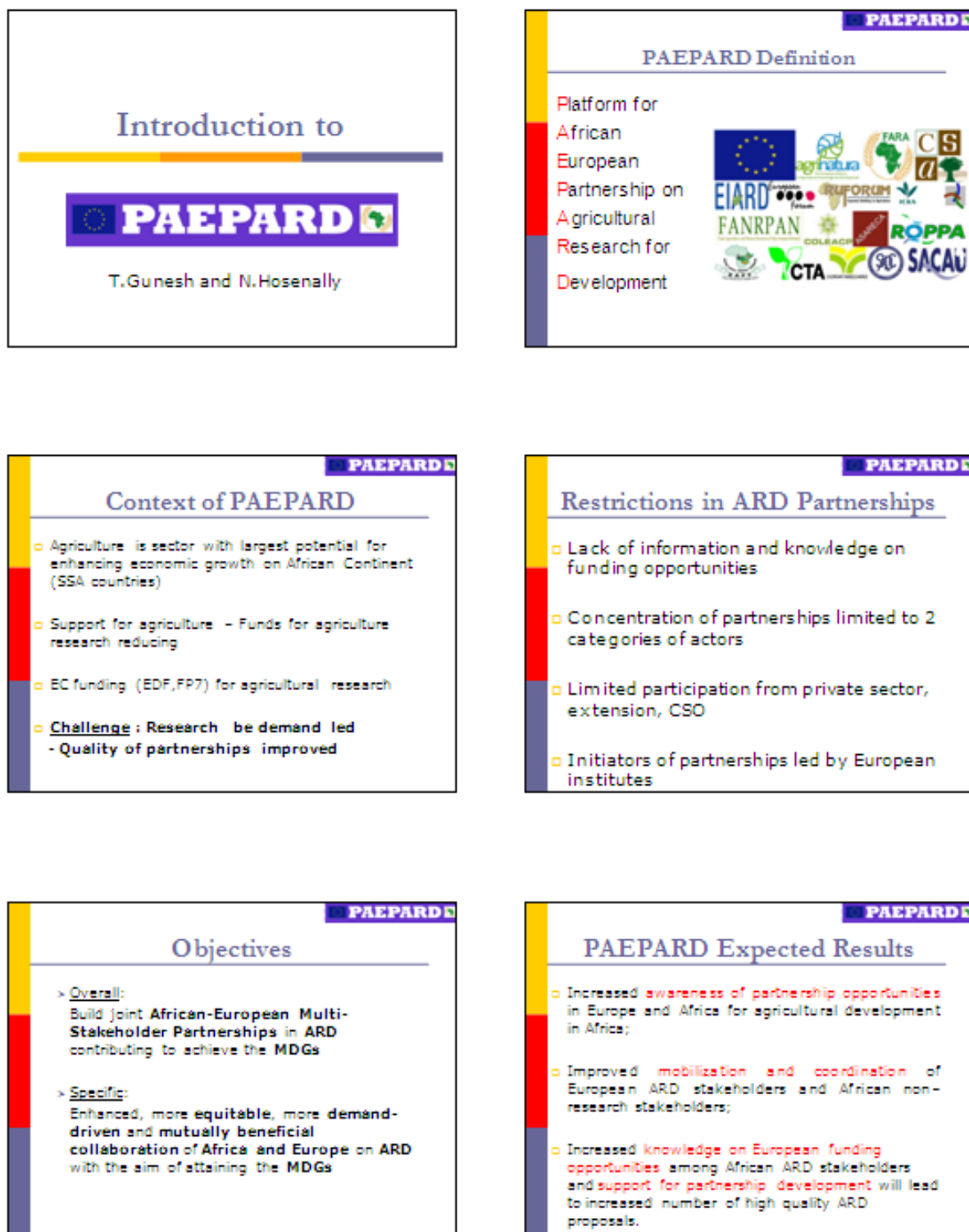


Figure 2: Presentation on PAEPARD

### Major Activities

- o Mobilization of European stakeholders and African non-research stakeholders;
- o Information and knowledge management of opportunities for partnership between African and Europe;
- o Capacity building on partnership building within a multi-stakeholder innovation partnerships;
- o Partnership brokerage between African and European stakeholders;
- o Advocacy for agricultural research for development

### PAEPARD – 2<sup>nd</sup> Call for Concept Note

- o Published May 31, 2011
- o 69 Concept Notes received on July 15, 2011
- o 10 Consortia Selected
- o Mauritius consortium among the 10 selected

### Federating Themes

- o Food security and climate changes
- o Post harvest technologies
- o Knowledge management and indigenous knowledge inclusion
- o Capacity building and institutional development
- o Market access, value chain, pricing
- o Water use and management
- o Financing mechanisms, access to credit

Consortia	Themes / Objectives
Ghana (Ghana Producers Association of Ghana)	Control of angular leaf spot disease of Citrus in Ghana
Benin (Gajagnon, Farmers Federation)	Apports à la sécurité économique des ménages ruraux par la production, la commercialisation et la transformation du soja au Bénin
Burkina-Faso (Association pour la Recherche et la Formation en Agro-écologie (ARFA))	AGROPROTECTA: un groupement agricole économique pour la protection biologique des cultures et la fertilisation organique des sols pour une agriculture saine et durable au Sahel
Mauritius (Food and Agricultural Research Council, Radut, Mauritius)	Micro propagation and cultivation of in vitro breadfruit plants and development of novel products from breadfruit as an alternative source of carbohydrates in Mauritius.
Cote d'Ivoire (Centre Suisse de Recherches Scientifiques)	Agriculture pour l'éducation (A RE) des enfants en âge scolaire (5 - 10 ans) en milieu rural et péri-urbain

Consortia	Themes / Objectives
Nigeria (Department of Animal Husbandry and Fisheries, Federal University of Technology, Akoka, Oshodi/Abeokuta, Ogun State, Oshodi/Abeokuta, Nigeria)	Genetic and high level (cellular, seed) analysis and knowledge delivery to Nigerian poultry industry (ICOPAFAD)
Burundi (Département de Coopération et Développement Agronomique et Développement (DCA))	Renforcement et transfert des technologies de conservation des semences et de la sélection de l'amélioration au Burundi
Uganda (New Gen Africa Ltd)	Kenya Selection and Characterisation of Urban Environments - Paris
Uganda (Forum of Uganda Farmers (UOFUM))	Enhancing resilience and access to services for increased productivity, income and nutritional security of smallholder farmers in East and Central Africa
Cameroon (Coopération Régionale des Organisations Rurales du Cameroun (COPROC))	Intégration et innovation à destination de l'agro-industrie en Afrique Centrale/Océanie: la recherche-innovation partenariale, au cas de COPROCAM dans la région du Centre-Cameroun

### Title of Proposed Partnership

- o Micro-propagation and Cultivation of in-vitro breadfruit plants in view of enhancing availability and quality of fruits and development of novel products from breadfruit as an alternative source of carbohydrates in Mauritius. (Edited version)

Figure 2 (contd): Presentation on PAEPARD



**Figure 3: Mr Gunesh during his presentation**

The next part of the presentation was on the work progress of the Mauritius Breadfruit Sector consortium, which was presented by Miss. N. Hosenally. The presentation was on the different activities of the consortium, their objectives and outcomes. The main activities of the consortium comprised of the First Partnership Inception Workshop, Working Sessions and other meetings with the consortium members (Figure 4).

The wiki of the Mauritius Breadfruit Sector Consortium was also presented to the stakeholders and the objectives and functions of the different pages on the website were explained by the facilitator.

By the end of the presentation, the audience had a clear picture of the work that has been done by the consortium and the objectives of the 2<sup>nd</sup> Partnership Inception workshop were explained, which were to:

- Develop Concept Notes for each of the Research question formulated
- Discuss on possible funding opportunities
- Develop a partnership Action plan

During their presentation, the facilitators stressed upon the fact that in order to develop the breadfruit sector to achieve food security, the different stakeholders of the consortium should work in collaboration and the development of these concept notes is only the initial steps of this long-term engagement for the sustainability of the Breadfruit Sector in Mauritius.



Figure 3: PAEPARD Activities



**PAEPARD**

**Work session: 28<sup>th</sup> March 2012**

▣ **Objectives:** Use of questions generated to identify research areas along 6 value chain components



▣ **Outcome:** 10 research areas identified

**PAEPARD**

**Other related issues**

- ▣ Need for extension of shelf life
- ▣ Research on health benefits of breadfruit
- ▣ Cheaper methods of drying breadfruit
- ▣ Market research
- ▣ Germplasm from Hawaii
- ▣ Temperature fluctuations during transport
- ▣ Ethylene release when packed with pineapple.
- ▣ Wrapping of breadfruit causing softness
- ▣ Packing constraints – France v/s UK

**PAEPARD**

**Breadfruit week  
(Organised by MAIFS and AREU)**

▣ **Objectives**

- To create awareness on the nutritional values of breadfruit and diverse utilisation of breadfruit.

▣ **Outcome**

- Has created a lot of demand for planting material.

**PAEPARD**



**PAEPARD**

**Working sessions – 10<sup>th</sup> & 16<sup>th</sup> May**

▣ **Objectives**

- To Prioritise Research Areas
- To Formulate Research Questions

▣ **Outcome**

- 5 Research areas prioritised
- 5 Research questions formulated

**PAEPARD**



Figure 4 (Contd): PAEPARD Activities

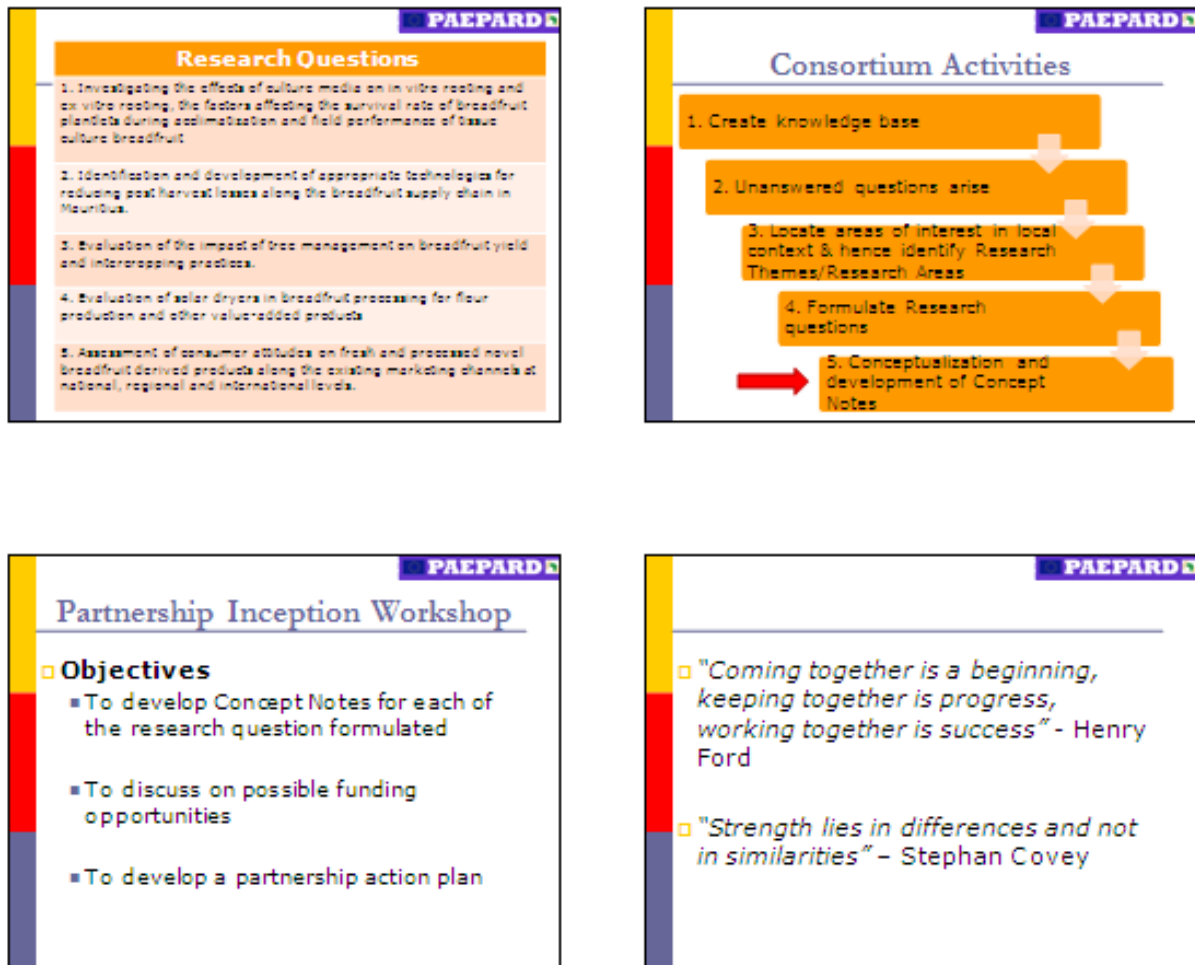


Figure 4 (Contd): PAEPARD Activities

After the Presentation, the participants got the opportunity to ask question and share their views/concerns regarding the activities of the consortium. Comments came mainly from the private sector, who claimed that there is lack of funding and incentives for growers, processors and exporters, which are impeding the development of the breadfruit Sector in Mauritius.

## Session 1: Group Allocation and SWOT Analysis

### Objective:

To evaluate the Strengths, Weaknesses, Opportunities and Threats in each of the projects for which concept notes were to be developed during the workshop.

### Description:

From previous working sessions, 5 Research Topics were generated and one group was formed for each topic (A total of 5 Groups). Before proceeding with the SWOT Analysis, each participant was allocated to a group, depending on their role in the consortium and their contribution in the development of the concept note. For each group, it was ensured that partners were from different stakeholder groups (research, non-research, private sector etc.).

Once the participants were allocated to a group, the Facilitator explained the purpose and importance of doing a SWOT Analysis, which is one of the essential tools used in project planning. The participants were required to work in their respective groups and had to present their work after discussion. The time allocated for this activity was 1 hour. (Figure 6)



Figure 5: Participants doing SWOT Analysis for their respective Research Topic

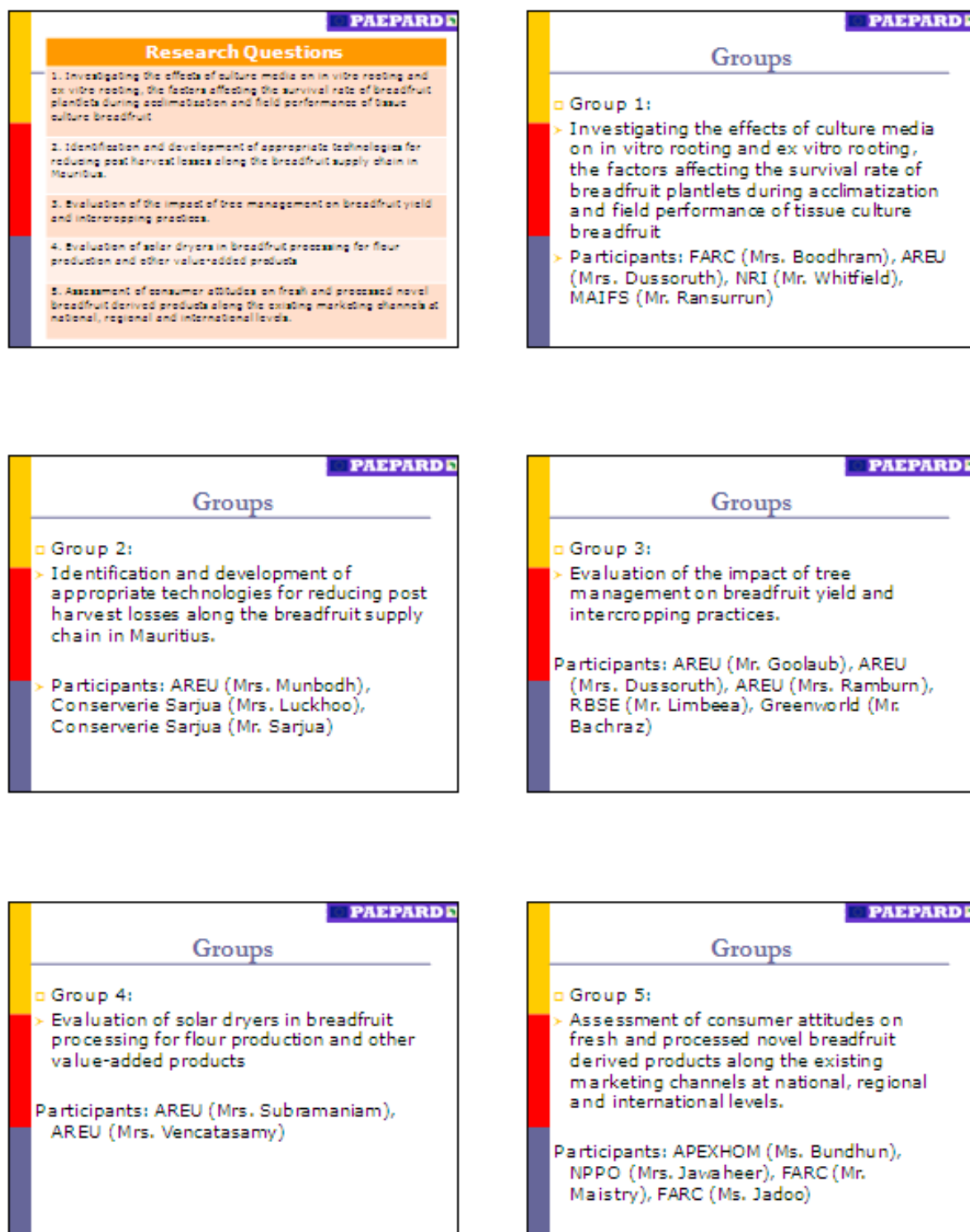


Figure 6: Group Allocation

## Session 2: Project Planning Tools

### Objective:

The objective of this session was to introduce different project planning tools to the participants, explain how to plan a project proposal and engage them in Group Activity.

### Description:

The project planning tools were explained by Mr. Gunesh through a Power-Point Presentation. After the presentation, each group was required to do a Logical Framework (Log Frame) for their respective Research Topic. This activity was the last one for Day 1.

**PROJECT PLANNING TOOLS**

**Commonly used planning tools**

- Logical framework (logframe)
- Results-based management
- Funding agencies mainly use the logframe for assessing, following up and evaluating projects
- Implementing organizations use it for planning, implementing and following up projects

**Analysis and Planning Phase**

Analysis phase

- Stakeholder analysis
- Problem analysis
- Objective analysis
- Strategy analysis

Planning phase

- Constructing the logframe matrix

**Stakeholder analysis**

- Who the stakeholders are?
- Their perception of the problem
- The resources they bring to the project
- Their expected roles in resolving problem the project seeks to address
- Areas of possible conflict

**Problem Analysis**

- Strongly influences design of a project
- In depth analysis of the problem project seeks to address.

1. SWOT analysis
2. Problem tree
3. Objectives analysis

**The logframe matrix**

	INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
GOAL				
PROJECT PURPOSE				
OUTPUT (DIRECTED RESULTS)				
ACTIVITIES				
INPUTS				

Figure 7: Logframe Matrix

## Day 2: Development of Concept Notes

Day 2 begun with the presentation of log frames by each group, whereby participants got the opportunity to have an insight of the other projects and also share their views and ask questions to the other groups.



Figure 8: Presentation of Log-frame by each group

After completing the Log Frame Matrix, it was agreed by all that the log frame offers the following advantages:

- Problems are analysed systematically
- The objectives are clearly formulated, logical and measurable
- The risks and conditions for success of a project are taken into consideration
- There is an objective basis for monitoring and evaluation

Therefore, with a log frame, the project proposal becomes coherent.

### Session 3: Project Proposal

**Objective:**

To explain the different sections of a Research Proposal and highlight points to be considered when writing a research or project proposal.

**Description:**

A PowerPoint presentation was delivered by Mr. Gunesh, whereby each section of a proposal was described and explained:

- Project Goals
- Project Objectives
- Strategies to attain Project Objectives
- Writing the project objectives
- Develop Project Activities
- Performance Indicators
- Expected Results
- Monitoring and Evaluation
- Budget and proposal packaging

### Session 4: Funding Opportunities

**Objective:**

To brainstorm on the different funding opportunities available at local, Regional and International levels so as to target those which are in line with the project proposals of the consortium.

**Description:**

This session was explained through a PowerPoint presentation by the facilitators, followed by a short brainstorming session, whereby the participants gave their input on the different funding sources and opportunities that were available at National, Regional and International Level. (Annex)

It was also discussed about how to tap funding opportunities when they are available. For some of the projects, it was agreed that funding from the Food Security Fund (Local) could be a good opportunity since the development of the breadfruit sector is on the Agenda of the

Government. Regarding Regional and International funding, a list of potential donors was presented and the stakeholders were encouraged to visit the PAEPARD Blog regularly to check for latest funding opportunities that may be of interest to the consortium. Moreover, consortium partners were also invited to share funding opportunities with others as and when they are spotted.

## **Session 5: Development of Concept Notes**

### **Objective:**

To develop Concept Notes for each of the Research topics formulated during past activities of the consortium.

### **Description:**

For the Mauritius Breadfruit Sector Consortium, the system called ‘cascading projects’ has been adopted by designing a series of parallel projects with the same goal, but different purposes. This is why log frames were made for each of the 5 cascading projects. The advantages of cascading projects are that:

- They avoid the need to design very complex projects
- Each project and sub-project has a clearly defined purpose
- Each project purpose has clear responsibilities

Having got a background on (a) Project Planning tools, (b) different aspects of a project proposal, (c) potential funding sources & their requirements and having completed the SWOT Analysis and Log frame for each of the 5 cascading projects, the participants were provided with a guideline on Key Concepts of Project formulation (developed by ICRA) and were asked to start writing the concept notes.

Each Concept note was expected to have the following Elements:

- **Cover page**
  - Title of Proposed Project
  - Dates of operation
  - Name of implementing organization
  - Contact person



- **Executive summary** (2-4 pages, depending on overall size of the project)
  - Title
  - Location
  - Duration
  - Objectives
    - Goal
    - Purpose
    - Outputs
    - Activities
  - Budget
    - Total Cost
    - Solicited Amount
    - Contributions from beneficiaries
    - Contributions from other donors
  - Implementing institution
- **Principal Document**
  - Justification
  - Objectives
    - Goal
    - Purpose
    - Outputs
    - Activities
  - Participation of beneficiaries
  - Organization
  - Work Plan
  - Monitoring and Evaluation
  - Budget
- **Technical Appendices**

Before coming to the workshop, each group had already started to gather information and did a desk research on their respective Research Topic. In addition, each group was also provided with a laptop with internet connection, which they could use to search for any information that was required in writing the concept note.

The rest of the day was taken up with this activity and after more than 3 hours of work, each Group submitted their concept notes.

### **Discussion and Way Forward**

The closing plenary was a short one after each group submitted their concept notes. The facilitators explained to the participants that the 5 concept notes would be consolidated together as a National Programme during the next working session and when completed, we will apply for funding as soon as there is an opportunity.

### **Closing Remarks**

Prior to the closing remarks, the participants were asked to fill in the workshop evaluation form and hand them to the facilitators. Mrs. Boodhram thanked all participants for their active contribution on behalf of the Director General of FARC, Mr. Ramkissoon. She encouraged the participants to keep in touch through emails or the wiki until the next working session.

## Annex I – List of Participants

Name	Institution	Job Title	Tel	Fax	Email
Mr. Charles Whitfield	Natural Resources Institute (NRI)	PhD Student and Research Technician	+44 1634 883793		<a href="mailto:c.whitfield@gre.ac.uk">c.whitfield@gre.ac.uk</a>
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Mr. Danesswar Sarjua	Conserverie Sarjua Ltd	Director			<a href="mailto:sarju@intnet.mu">sarju@intnet.mu</a>
<b>Mr. Devanand Limbeea</b>	Rose-Belle Sugar Estate	Agronomist	6274545	6274764	<a href="mailto:d.limbeea@rbseb.mu">d.limbeea@rbseb.mu</a>
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Mrs. Saraspadee Subramaniam	AREU	Research Scientist	670 8249		<a href="mailto:smyovana@gmail.com">smyovana@gmail.com</a>
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Mr. Dharam Bachraz	Greenworld Ltd	Consultant			<a href="mailto:dybachraz@intnet.mu">dybachraz@intnet.mu</a>
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**Annex II – Workshop Programme****Agenda 8<sup>th</sup> August 2012**

<b>Time</b>	<b>Activity</b>
09:00 – 09:30	Registration of participants
09:30 – 09:35	Welcome Remarks by Lead partner of the consortium
09:35 – 09:45	Address by Director General of FARC
09:45 – 10:00	Introduction to PAEPARD and objectives of workshop
10:00 – 10:30	Tea Break
10:30 – 10:45	Introduction of participants
10:45 – 11:00	Programme of the Day
11:00 – 11:15	Group Allocation
11:15 – 12:30	SWOT Analysis Group Activity and Presentation
12:30 – 13:30	Lunch
13:30 – 14:00	Project Planning Tools
14:00 – 14:45	Logical Framework Analysis (Group Work)
14:45 – 15:00	Tea Break
15:00 – 15:30	Group Presentations
15:30 – 16:00	Lessons learnt and implications for partnership teams

**Agenda 9<sup>th</sup> August 2012**

<b>Time</b>	<b>Activity</b>
09:00 – 09:15	Recap of Day 1
09:15 – 10:00	Funding opportunities and developing indicative budget for proposed project
10:00 – 10:15	Tea Break
10:15 – 12:30	Group Work – Development of Concept note
12:30 – 13:30	Lunch
13:30 – 14:30	Group Work – Development of Concept note
14:30 – 14:45	Tea Break
14:45 – 15:15	Group Presentation
15:15 – 16:00	Final evaluation and way forward

### Annex III – SWOT Analysis

**SWOT:** Group 1

**Members:** FARC, AREU, NRI, Agricultural Services - Horticulture (MAIFS)

**Research Topic:** Enhancing breadfruit production in Mauritius through supply of breadfruit planting material derived from conventional and in vitro propagation methods.

**SWOT Analysis:**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>▪ Work already in progress</li> <li>▪ Support from Government</li> <li>▪ Increasing demand for planting material</li> <li>▪ Rising interest from Growers</li> <li>▪ Mauritians are acquainted with breadfruit</li> <li>▪ Can be processed into many value added products</li> <li>▪ Facilities already available (Human resources, Infrastructure etc)</li> <li>▪ Already in Collaboration with other international institutions for sourcing of new varieties</li> <li>▪ 3 varieties of breadfruit with different harvest period have been identified</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited availability of land for field evaluation</li> <li>▪ Crop being a perennial, requires a long period for field evaluation</li> <li>▪ Ex vitro acclimatization results in low survival rate</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>▪ Possibilities for extension of production season:               <ol style="list-style-type: none"> <li>1. From introduction of new varieties with different harvest periods</li> <li>2. From exploitation of various agro-climatic conditions in Mauritius</li> </ol> </li> <li>▪ Land release from sugarcane plantation under the sugar reform</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prone to Cyclones and adverse agro-climatic conditions for field evaluation of planting material</li> </ul>

**SWOT:** Group 2

**Members:** AREU, Conserverie Sarjua Ltd

**Research Topic:** Identification and development of appropriate technologies for reducing post harvest losses along the breadfruit supply chain in Mauritius

**SWOT Analysis:**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>▪ Work has started on:               <ul style="list-style-type: none"> <li>(a) Identifying optimum maturity index for breadfruits for export and local markets for existing local germplasm</li> <li>(b) Characterization of fruits locally produced</li> <li>(c) Shelf-life evaluation of cold stored, cling filmed mature green breadfruit</li> <li>(d) Minimal processing of breadfruit into cubes and slices under vacuum pack, stored at 5 degrees Celsius</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of trained labour</li> <li>▪ Consumer acceptance of fresh breadfruit consumption on a regular basis – slow</li> <li>▪ Lack of professional harvesting equipment for quick and efficient harvest of breadfruits</li> <li>▪ Lack of refrigerated transport at harvest of fruits</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>▪ Tapping of new promising markets, on export and local front</li> <li>▪ A larger area of land will be placed under breadfruit production</li> <li>▪ Improved treatment through waxing, packing and storage. This will lead to               <ul style="list-style-type: none"> <li>(a) Rise in breadfruit business deals,</li> <li>(b) contribute to food security program,</li> <li>(c) increase area under breadfruit production,</li> <li>(d) development of infrastructural support</li> </ul> </li> <li>▪ Employment of people in business</li> <li>▪ Green Mauritius</li> </ul>	<ul style="list-style-type: none"> <li>▪ Seasonality of fruits (availability of fruits for a restricted period of time)</li> <li>▪ Climate disorders (cyclones, droughts) limit our supply of fruits (loss of fruits, fruit drop, loss in fruit quality)</li> </ul>

**SWOT:** Group 3

**Members:** AREU, RBSE, Greenworld Ltd

**Research Topic:** Evaluation of impact of tree management on breadfruit yield at different densities.

**SWOT Analysis:**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>▪ Strong government policy</li> <li>▪ research already started at various localities</li> <li>▪ literature available</li> <li>▪ high regeneration capacity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited logistic in research organization</li> <li>▪ Limited human resources</li> <li>▪ Skills, labourers</li> <li>▪ Limited breadfruit tree orchards</li> <li>▪ Currently limited funds</li> <li>▪ Limited orchards in research institutions</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>▪ Release of sugar cane land</li> <li>▪ Allocation of the 2000A scheme for orchards</li> <li>▪ Transformation potential</li> <li>▪ Collaborative works with private orchards</li> </ul>	<p>Adverse climatic condition may influence trials Cyclone, drought</p>



**SWOT:** Group 4

**Members:** AREU

**Research Topic:** Evaluation of solar dryers in breadfruit processing for flour production

**SWOT Analysis:**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>▪ Production season coincides with summer season (longer hours of sunshine/day)</li> <li>▪ Technology can be adapted by women and vulnerable groups on small scale for own consumption</li> <li>▪ Solar energy is free source of energy</li> <li>▪ Low investment cost (reduce price of end product)</li> <li>▪ Eco-friendly</li> <li>▪ Technology available for flour production</li> <li>▪ Experiment done on solar drying of herbs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Drying takes about 2-3 days (lengthy + costly)</li> <li>▪ Need space to handle large batches (trays loaded horizontally)</li> <li>▪ Temperature fluctuations during the day – quality of product (colour)</li> <li>▪ Processing – start early (loading)</li> <li>▪ Climate change</li> <li>▪ High Relative Humidity</li> <li>▪ Weather conditions unpredictable</li> <li>▪ Applicable to certain regions only (North, West)</li> <li>▪ Large scale production can be difficult: due to large space required</li> <li>▪ Weather dependent (short v/s long hours of sunshine, rain) and breadfruit is a product with a moisture content of more than 80%</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>▪ Successful in Uganda (small cabinets operated by individuals/group of women)</li> <li>▪ Niche market</li> <li>▪ Use of breadfruit flour as supplement with wheat flour and consolidation of food security</li> <li>▪ Breadfruit flour is gluten-free (for celiac patients)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prone to cyclonic conditions</li> <li>▪ Climate change influence weather conditions</li> </ul>

**SWOT: Group 5****Members:** APEXHOM, FARC. Agricultural Services – NPPO (MAIFS)**Research Topic:** Assessment of consumer attitudes on fresh and processed novel breadfruit derived products along the existing marketing channels at national, regional and international levels**SWOT Analysis:**

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>▪ Local market / demand for fresh and processed (chips, etc) already exists</li> <li>▪ Demand for breadfruit flour on local market already exists</li> <li>▪ Awareness already initiated – good response</li> <li>▪ Nutritional value and gluten-allergy free status of breadfruit bring value-added to consumer acceptance</li> <li>▪ Wide range of products can be developed from breadfruits</li> <li>▪ Export market already exists</li> <li>▪ Can be used in times of hardship – disaster-relief food</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cost of product is expensive</li> <li>▪ Lack of information on consumption possibilities (recipes)</li> <li>▪ Lack of information on nutritional value and gluten-allergy-free status of fresh &amp; processed breadfruits</li> <li>▪ Poor storability of fresh breadfruits for local consumers</li> <li>▪ lack of information on optimum storage, packing and transport conditions of fresh breadfruits for export</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>▪ Nutritional value and gluten allergy-free status can be promoted</li> <li>▪ Need to study regional and international market; need to see export opportunities in countries where breadfruit production is counter-seasonal &amp; where the product is already known by consumers (India)</li> <li>▪ Tourist industry – hotels can use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Insufficient amount of fresh breadfruits may impact on production of processed products supply</li> <li>▪ Stringent SPS / food safety requirements for fresh and processed breadfruit may impede export opportunities</li> <li>▪ Lack of funds to do research and studies</li> <li>▪ Poor acceptance of derived products</li> </ul>

<p>breadfruit in their cuisine</p> <ul style="list-style-type: none"><li>▪ Can develop marketing and public awareness on breadfruits' nutritional value and gluten-allergy free status</li><li>▪ Need to find solutions to decrease cost of production</li><li>▪ Develop awareness programmes in schools on local fruits and vegetables including breadfruits and on best way to consume</li><li>▪ Develop tv programmes on breadfruit recipes</li><li>▪ Research in storage, packing and transport conditions for optimum keeping conditions for fresh breadfruits</li><li>▪ Need a filiere analysis to study cost of production</li></ul>	<p>by local consumers</p> <ul style="list-style-type: none"><li>▪ Strong local consumer preference for potatoes and consumers may not be willing to use breadfruits as a replacement to potatoes</li></ul>

### Annex IV: Logical Framework

#### Group 1

**Log Frame for Research Topic:** Enhancing breadfruit production in Mauritius through supply of breadfruit planting material derived from conventional and in vitro propagation methods.

<b>Intervention logic</b>	<b>Objectively verifiable indicators</b>	<b>Means of Verification</b>	<b>Assumptions</b>
<p><b>GOAL:</b> To adequately supply growers with suitable plantlets to increase the production of breadfruit in Mauritius.</p>	<p>Breadfruit production has increased within 5 years of the start of the project. Number of plots established Number of accession and types planted Number of new varieties introduced</p>	<p>Annual reports on breadfruit production.</p>	<p>Records of breadfruit production are accurate and available. Growers have access to land and finance. There is increased demand for breadfruit produce. Government commitment translates into real support.</p>
<p><b>PURPOSE:</b> To meet the demand from growers for breadfruit plantlets that are appropriate for their region and market within 5 years of the project starting.</p>	<p>1. The output of breadfruit plantlets from FARC meets growers' demands (~10,000 plantlets). 2. Growers are able to request the most suitable varieties for their region and market (e.g. fresh, processed, domestic, foreign).</p>	<p>1. FARC records (specifically, 'grower requests' compared to 'number of plantlets supplied') 2. Growers' questionnaire (primary stakeholders survey)</p>	<p>1.1 Records are accurate and up to date. 1.2 Grower's demands are accurate. 2. Growers are willing and able to complete the questionnaire.</p>
<p><b>OUTPUTS (EXPECTED RESULTS):</b> 1.1 Survival rate of tissue cultured breadfruit is increased (year 1) 1.2 Breadfruit plantlet production is increased (years 2-4). 2.1 Breadfruit varieties suitable for the growing conditions and</p>			

markets are identified (years 1-4). 2.2 Breadfruit technical sheets for each variety (year 4)			
<b>ACTIVITIES:</b> 1.1 To identify the factors that affect the survival of tissue cultured breadfruit plantlets. 1.2 To overcome the factors affecting breadfruit plantlet survival. 1.3 Mass production of breadfruit plantlets. 2.1 To evaluate local and imported breadfruit varieties in 3 agro climatic regions in Mauritius. 2.2 To evaluate the suitability of each variety for potential markets (fresh, processed, domestic, foreign etc). 2.3 To produce technical sheets on each variety showing harvest time, and physiological characteristics.	1. The survival rate for tissue cultured plantlets is increased from < 10% to > 90% within the first phase of the project. 2. Completion of technical sheets for each variety. 3. The completion of a catalogue for the varieties within the second phase of the project.	1. FARC's plantlet production records. 2. Number of technical sheets developed. 3. Number of new orchards set. 4. Availability of a 'variety catalogue' for growers.	1. Protocols, facilities, and staff are available to identify and overcome the factors causing the low plantlet survival rate. 2. Varieties can be imported and tested within the time frame of the project. Protocols, equipment, and staff necessary for the evaluation are available.
<b>INPUTS:</b> Funding and support from local and international organisations will be applied for. The necessary skills are available locally but extra support is available from EU partners. Materials and facilities are available locally.			

Additional breadfruit varieties will be imported.			

**Group 2**

**Log frame for Research Topic:** Identifying and developing appropriate technologies for reducing post-harvest losses along the breadfruit supply chain in Mauritius

<b>Intervention logic</b>	<b>Objectively Verifiable indicators</b>	<b>Means of verification</b>	<b>Assumptions</b>
<p><b>Goal:</b></p> <ul style="list-style-type: none"> <li>- To increase the amount of quality breadfruit for export and local markets</li> </ul>	<ul style="list-style-type: none"> <li>- Assessment of shelf life of fruits during storage trials</li> <li>-Characterization of fruits</li> <li>-Sensory Evaluation of stored fruits</li> </ul>	<ul style="list-style-type: none"> <li>-Final report on post-harvest trials carried out</li> <li>-Publications</li> <li>-Surveys on consumer acceptance of breadfruit</li> </ul>	<ul style="list-style-type: none"> <li>- Technologies applied will improve breadfruit quality, shelf-life during storage and export</li> </ul>
<p><b>Purpose:</b></p> <ul style="list-style-type: none"> <li>- To provide growers and exporters with improved post-harvest management practices for breadfruits for local and export markets</li> </ul>	<ul style="list-style-type: none"> <li>- Training of growers and exporters</li> </ul>	<ul style="list-style-type: none"> <li>-Number of growers and Exporters trained</li> <li>-Number of panelists undergoing sensory evaluation</li> </ul>	<ul style="list-style-type: none"> <li>-&gt;80% adoption rate of technologies</li> <li>- Growers and exporters will adopt improved post-harvest technologies</li> </ul>
<p><b>Expected Results:</b></p> <ul style="list-style-type: none"> <li>- 75% adoption rate of post-harvest improved technologies by breadfruit growers and exporters</li> </ul>	<ul style="list-style-type: none"> <li>- Increase in shelf life of exported breadfruit by 10-14 days through better post-harvest treatments, packing and storage</li> <li>- Reduction of post-harvest losses of exported breadfruits by &gt;5%</li> </ul>	<ul style="list-style-type: none"> <li>- Identification of optimum maturity stage for harvest of breadfruits for local and Export market</li> </ul>	
<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>- Characterization of local germplasm, imported germplasm from different agro climatic zones</li> <li>- Determination of optimum fruit maturity for storage and export</li> </ul>	-		

<p><b>Activities (Continued)</b></p> <ul style="list-style-type: none"><li>-Shelf life evaluation of waxed, clingfilmed with the use of ethelene scrubbers packed breadfruit</li> <li>-Sensory Evaluation of cold stored breadfruits</li> <li>-Shelf life evaluation of minimally processed breadfruits under different packing and storage conditions, using organic anti-browning agents such as fresh lemon juice</li> <li>-Training of growers and exporters</li></ul>			
<p><b>Inputs:</b></p> <ul style="list-style-type: none"><li>-From Food Security Fund</li> <li>-Other funding agencies</li></ul>			



**Group 3**

**Log frame Matrix for Research Topic:** Evaluation of impact of tree management on breadfruit yield at different densities.

<b>Intervention logic</b>	<b>Objectively Verifiable indicators</b>	<b>Means of verification</b>	<b>Assumptions</b>
<b>Goal:</b> - to improve knowledge on breadfruit management			
<b>Purpose:</b> -provide growers/breadfruit tree owners with appropriate techniques	-improvement in yield of marketable fruits -extension of harvest period	-weight & no. of fruits obtained -records per tree kept	-tree management has an impact on productivity
<b>Expected Results:</b> - tree management techniques optimize -Dissemination of techniques to growers	-recommendation sheets issued -training of growers	-no of growers train -no. of publication distributed	-adoption of techniques by growers
<b>Activities:</b> - setting up of trials. -development of pilot orchards -data collection -interpretation of results/report writing -preparation of training materials -training of growers	-		
<b>Inputs:</b> -Funds -planting materials -tools and equipment for pruning and harvesting -land			

**Group 4**

**Log Frame Matrix for Research Topic:** Evaluation of solar dryers in breadfruit processing for flour production

<b>Intervention logic</b>	<b>Objectively verifiable indicators</b>	<b>Means of verifications</b>	<b>Assumptions</b>
<b>Goal:</b> use of cheap renewable source of energy for breadfruit flour production			
<b>Purpose:</b> development of user friendly and economically viable solar dryers	After 3 years 50T of breadfruit flour produced using solar energy	No. of adopters Production figures	
<b>Expected results:</b> models of successful solar dryers developed	No. of adopters	No. of growers Agro-processors trained Documentation	
<b>Activities:</b> -Literature search on solar dryers -Design models of solar dryers -Evaluation of the dryers for flour production -Assessment of flour quality and shelf-life -Set up trials for evaluating the dryers at identified sites with potential adopters -Training material prepared -Training of growers/agro-processors Assistance to technology adopters and follow-up			

**Group 5**

**Log Frame Matrix for Research Topic:** Assessment of consumer attitudes on fresh and processed novel breadfruit derived products along the existing marketing channels at national, regional and international levels

<b>Intervention Logic</b>	<b>Objectively verifiable indicators</b>	<b>Means of verification</b>	<b>Assumptions</b>
<p><b>GOAL:</b> To assess local and international consumer attitude for breadfruit consumption</p>			
<p><b>PURPOSE:</b> To provide a better understanding of consumer preferences with respect to breadfruit and breadfruit products</p>	Development of product lines tailored from consumers preferences	Surveys from point of sales	Raw material readily available for fresh and processed breadfruit products
<p><b>EXPECTED RESULTS:</b></p> <ol style="list-style-type: none"> <li>1. Awareness creation among consumers</li> <li>2. Consumers preferences and requirements better understood</li> <li>3. Potential markets will be identified (Local, Regional and International)</li> </ol>			
<p><b>ACTIVITIES:</b></p> <ol style="list-style-type: none"> <li>1. Awareness campaign</li> <li>2. Survey on consumer preferences</li> <li>3. Sourcing of potential markets (Niche markets)</li> </ol>			

Focus	Resources	Activities	Outputs	Outcomes	Impact indicators
Awareness campaign	Staff from AREU, Ministry, APEXHOM, related Stakeholders.	<ul style="list-style-type: none"> <li>• Development of awareness materials (Pamphlets, Information sheets, Advertisements</li> <li>• Public Lectures, Lectures at schools, Breadfruit day, World Food Day, Degustation, TV programmes</li> </ul>	Awareness created among consumers		% Increase in sales over a period of time
Survey on consumer preferences					
Sourcing of potential markets (Niche markets)					