A. Summary

Background: Countries within the Eastern Caribbean have been plagued with problems associated with mono-crop production. In particular, the regional banana industry, which has employed a number of small low-resource farmers, is losing its competitive international advantage. This is as a result of cheaper bananas being exported to Europe from Central and South American producers and the dismantling of preferential trading arrangements for the Caribbean under new World Trade Organisation (WTO) rules. As a result, there is a strong need within the Eastern Caribbean, in particular, to accelerate efforts towards crop diversification in order to improve the economic standing of these low-resource farmers.

As part of the diversification efforts exotic tropical fruit crops including mango, guava, passion fruit, soursop, sorrel and papaya have shown significant potential in terms of production and marketing within and outside of the region (Table 1). Several low resource farmers within the Eastern Caribbean are already producing these crops. With adequate technical assistance backed by sound research to improve production and post-production systems and support for them to access local, regional and international markets, there will be economic incentives to diversify their efforts into these commodities.

Location: Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines

Date: 1 January 2001 – 31 December 2003

Overall Objective: To improve the income and well being of low resource fruit farmers in the Eastern Caribbean and develop a sustainable fruit industry.

Purpose: To develop and apply appropriate fruit production, post harvest and marketing systems for low resource farmers in the islands of Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and The Grenadines.

Activities:

(i) Introduce, propagate and supply planting materials for selected species of passion fruit, mango, guava, soursop, sorrel and papaya.

(ii) Design, test and introduce improved production, post harvest handling and marketing systems for selected fruit crops for the benefit of low resource farmers.

(iii) Prepare and disseminate information on improved production and post harvesting system models for low resource farmers.

(iv) Assess the impact of the improved production, post harvest and marketing systems on the targeted population.
Farmers will be involved in the design, implementation and result application of the partnership. Five farmers who are already involved in the IFAD funded Rural Enterprise projects will be selected per country per fruit species in the design and testing of production, post harvest and marketing systems.

The project will be carried out within the Caribbean Fruit Network (CARIFRUIT) which is part of the Caribbean Agricultural Science and Technology Networking System (PROCICARIBE). This means that there will be political commitment of all partners to develop a long-term partnership for the development of a sustainable fruit industry in the Eastern Caribbean. A commodity chain approach will be utilised involving interactions with other PROCICARIBE networks (Figure 1).

Area: Commodity Chain
Region: Latin America and the Caribbean

B. Stakeholders

1. Targeted beneficiaries are approximately 80 low resource farmers in St. Kitts, Dominica, St. Lucia, St. Vincent and the Grenadines and Grenada. Marketers and processors will also benefit from the results of the project. There will also be capacity building and training for extension officers.

2. Research Partners

<table>
<thead>
<tr>
<th>Entities</th>
<th>Role in the Project</th>
</tr>
</thead>
</table>
| Ministry of Agriculture (MoA) in Collaboration with the Rural Enterprise Projects (REPS) | - Fruit production information and technological packages  
- Marketing & Marketing Linkages  
- Agribusiness Development  
- Extension Services/Transfer of Technology  
- Identifying Farmers  
- Assisting in commodity systems analysis  
- Supply of planting material |
| IICA | - Assist in identifying and accessing appropriate germplasm  
- Fruit production information  
- Assisting in commodity systems analysis |
| Small Farmers | - Provide information on current crop production systems  
- Reproduce planting material  
- Assist in the development and implementation of improved production and post harvesting systems  
- Provision of Land  
- Assist in developing market linkages and market Protocols |
CARDI/CARIFRUIT
- Identifying and accessing appropriate germplasm
- Marketing
- Provision of specialist skills (socio-economic, biometrics and impact assessment)
- Reproduction of Planting Material
- Development and implementation of production, post harvesting and marketing systems
- Assist in the development of information products
- Co-ordination and Linkages to other resources/partners
- IPM practices for sound production systems
- Post harvest methodologies consistent with high quality of marketable fruits

University of the West Indies
- IPM practices for sound production systems
- Post harvest methodologies consistent with high quality of marketable fruits

3. Proposed Budget (US$x1000)

<table>
<thead>
<tr>
<th></th>
<th>Yr1</th>
<th>Yr2</th>
<th>Yr3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff</td>
<td>107</td>
<td>107</td>
<td>107</td>
<td>321</td>
</tr>
<tr>
<td>Specialist Skills</td>
<td>45</td>
<td>45</td>
<td>76</td>
<td>166</td>
</tr>
<tr>
<td><strong>Production, PHT and Marketing Models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursery Infrastructures</td>
<td>90</td>
<td>-</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>Equipment</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Operational Expenses</td>
<td>397</td>
<td>382</td>
<td>382</td>
<td>1,131</td>
</tr>
<tr>
<td><strong>Dissemination of Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops</td>
<td>37</td>
<td>37</td>
<td>37</td>
<td>111</td>
</tr>
<tr>
<td><strong>Administration and Co-ordination</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transaction Costs</td>
<td>93</td>
<td>-</td>
<td>-</td>
<td>93</td>
</tr>
<tr>
<td>Network Technical Meeting</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>51</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>801</td>
<td>603</td>
<td>604</td>
<td>2,008</td>
</tr>
</tbody>
</table>

Potential donor is IFAD (already contacted).

C. Expected results and impact

(i) Improved production, post harvest and marketing system models for low resource farmers

- 1 model that is economically and environmentally sound is produced per crop.
- 20 farmers in targeted area successfully implementing the models.
- A 10% improvement in farm productivity within target area.
- 25 of the low resource farmers sampled are directly linked to markets for crops
(ii) Dissemination of information regarding new production system models.  

- 100 extension officers and farmers trained in the production model.  
- 600 production flyers produced.  
- Each production, post harvesting and market system is evaluated by an independent source.  
- Germplasm introduction and evaluation is assessed by an independent source.  

(iii) Increased productivity, production levels, quality and marketability of specific varieties of fruit produced by low resource farmers in the targeted area.  

Each production, post harvesting and market system is evaluated by an independent source.  

A Social Scientist with a background in Economics and experience in agriculture will be utilised to assess the projects’ effectiveness of developing appropriate production, post harvest and marketing models for low resource farmers, upon completion of the training workshops. The consultant will examine all components within the project, including:  

- Environmental impact  
- Achievement of project goal, objectives and targets  
- User participation and effectiveness of technology transfer  
- Sustainability of the systems  
- Appropriate technology  
- Social impact.  

This assessment will take approximately six months and will be conducted during the third year of the project.  

D. Partnership  

(Please refer to B(2) above).  

After the commodities have been test marketed, CARDI will collaborate with the Rural Enterprise Projects to provide assistance in the development of new enterprises amongst low resource farmers and to assist in identifying markets. CARIFRUIT’s national fruit committees will further assist in creating an effective and integrated production and marketing platform amongst small producers in the target countries. CARDI and EDADU will provide the technical assistance required by the Rural Enterprise Project as it relates to the production, post harvest and marketing of fruit through the subject project.
E. Conclusion

At the end of three years, adaptive research will have to continue in some of the fruits identified. It may be decided that only some countries and farmers engage in selected fruit crop production. The impact assessments implemented towards the end of the project should help to identify shortfalls, highlight successes and provide a good indication of priority areas for future developments in research and in the best approaches to fruit production amongst low-resource farmers. The outcomes of the impact assessments will assist CARDI and other agricultural organisations in developing and setting research priorities.

Table 1: International Market Demand for Caribbean Non-traditional Fruits

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Market Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soursop</td>
<td>Production is often geared for processing facilities in Venezuela, Puerto Rico and Costa Rica. Products are pulps, nectars, juices and marmalade. In the Caribbean region, there has been a considerable huckster trade in Trinidad, which, together with the extra-regional trade exceeded 1000t annually in the mid-1980s. The European market had declined, however, the US imports 140-250t annually. Most imports are in the frozen form because of phytosanitary restrictions. The “mountain soursop” is regarded s the best variety in the region.</td>
</tr>
<tr>
<td>Passion fruit</td>
<td>There is a continuous growing market for this fruit amongst the tourist industry in the region. The world market price has fluctuated between US$2,400 to US$6,000 per tonne EC and US$750 to US$2,000 for single strength. The major producers are Brazil, Columbia, Peru, Ecuador, Venezuela and Australia. Holland, Germany, France and Brazil (although a producer the demand exceeds local production) are major importers. The global trade in passion fruit is in the region of 15,000t fresh fruit and 40,000t pulp with the south American countries being responsible for 80% of the exports. The most important (marketable) varieties are yellow and pink.</td>
</tr>
<tr>
<td>Papaya</td>
<td>The Solo Sunrise variety is the most marketable variety with an average weight of 1lb. The US imports over 6 million-kg of papaya annually. Prices vary according to supplies, quality, packaging, market and time of year. In the US, prices range from US$9 – US$12 per 10lb carton. The European market imports over 8.2 million-kg. Valued at US$12 million per year. Prices in the UK vary from £1.70 per kg to £2.00 kg. Given papaya’s high vitamin C and A content, there is an increasing demand for these fruits.</td>
</tr>
<tr>
<td>Mango</td>
<td>In 1994, the US imported approximately 110,647t of mango. Typical prices range from US$1-1.50 kg. In 1993, Canada imported 15,000t and the UK imported 11,000t. The OECS supplies over 4% of mangoes to the UK each year. The most favoured variety in the region is the “Julie” mango.</td>
</tr>
</tbody>
</table>

Sources: OECS/ADCU, 1995-97; IICA 1993-96; Forde, 1996
Figure 1: Commodity chain approach for the production and marketing of tropical fruits in the Caribbean. Inputs of PROCICARIBE networks involving private and public sectors, marketers, processors, farmers and other stakeholders are shown below (Paul, 1999)

**TECHNICAL ASSISTANCE/INFORMATION SERVICES/STRATEGIC ALLIANCES**

- IPM practices for mango (fruitfly, anthracnose and seed weevil) soursop (pink mealybug, snowscale, citrus mealybug) guava (fruit fly) papaya (bunchy top, Erwinia, ring spot)
- Studies in fertility and water management
- Genetic Improvement
- Production Systems
- Post Harvest Technologies
- Marketing and Agribusiness

- Accession of improved cultivars
- Multiplication of planting material

- Validation of production systems in farmers’ fields (agronomic and socio-economic feasibility)
- Harvesting
- Cleaning
- Sorting & Grading
- Packing
- Storage
- Transport
- Processing
- Quality control and standards
- Rules and regulations
- Shipping
- Market intelligence
- Business Plans
- Business partnerships
- Joint ventures
- Enterprise development
- Market infrastructure and function
- Brokerage
- Export/Import rules and regulations
- Consumer requirements