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EVALUATION OF SELECTED PROJECTS UNDER THE TERM OF REFERENCE:

PLAN OF ACTION FOR THE GENDER RESPONSIVE DEVELOPMENT OF COMMUNITY-BASED, MICRO FOOD PROCESSING ENTERPRISES IN JAMAICA

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World Food Programme

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PREFACE

UNIDO/WFP EVALUATION OF SELECTED PROJECTS UNDER THE TERM OF REFERENCE:

PLAN OF ACTION FOR THE GENDER RESPONSIVE DEVELOPMENT OF COMMUNITY-BASED, MICRO FOOD PROCESSING ENTERPRISES IN JAMAICA

PROJECTS EVALUATED:

1. WAKEFIELD: AGRO-PROCESSING CENTRE **(A-P C)**
   The Pilot Small-Scale Agro-Processing Centre
   established by the FAO and managed by
   Rural Agricultural Development Authority (RADA),
   in Wakefield, Trelawny

2. OLGA TURNER: INDIVIDUAL ENTREPRENEUR **(IE)**
   Small-Scale Agro-Processing Entrepreneur:
   of Hopewell District, Highgate, St. Mary

3. LONG ROAD CO-OP: DRIED SPICE PROCESSING UNIT **(DSPU)**
   Coordinated by St. Mary Rural Development Project
   Annotto Bay (St. Theresa's Church), St. Mary

4. LIME TREE GARDEN: PEANUT PROCESSING UNIT **(PPU)**
   Coordinated by RADA
   Lime Tree Garden, St. Ann

5. UNITED FARMERS: MULTI-PURPOSE CO-OP FOOD PROCESSING PROJECT **(M-P CO-OP FPP)**
   United Farmers Multi-Purpose Co-operative Ltd.
   Coordinated by the Roman Catholic Church
   Supported by WFP/HEART-NTA/NGO non-formal vocational training and community-based training and economic development initiatives under the "Skills 2000" Programme
   Elim, Braes River, St. Elizabeth

ACKNOWLEDGEMENT

The evaluation team wishes to thank everyone who willingly provided answers to our many questions, shared their ideas and personal opinions, expectations and concerns about the various enterprises. We hope that the outcome will represent a practical assessment of requirements and technical assistance needs that will provide valuable guidelines for implementation and/or modification of new or existing enterprises, leading to sustainable development of future and present small-scale agro-processing enterprises.

GLOSSARY OF TERMS & ACRONYMS.

Agro-processing (A-P)
This may be considered as the processing of materials and by-products of plant and animal origin into food for human consumption.

Small-scale Enterprises
This may be considered as enterprises employing less than twenty (20) workers.

UNIDO - United Nations Industrial Development Organization.

FAO - Food and Agricultural Organization of the United Nations.

NIP - National Industrial Policy.

JAMPRO - Jamaica Promotions Corporation.

WFP - World Food Programme.

RADA - Rural Agricultural Development Authority.

RADA SS/HE - Social Services/Home Economics Programme (of RADA).

HEART/NTA - Human Employment and Resource Training/National Training Agency.

IICA - Inter-American Institute for Cooperation on Agriculture.

IDB - Inter-American Development Bank.

FTI - Food Technology Institute (of the Scientific Research Council).

WID - Women in Development.

JSIF - Jamaica Social Investment Fund.

PIOJ - Planning Institute of Jamaica

CARDI - Caribbean Agricultural Research and Development Institute.

NGO - Non-Governmental Organization.

AC Bank - Agricultural Credit Bank.

1. INTRODUCTION AND BACKGROUND

Micro-enterprises in agro-processing (A-P) have been seen as presenting opportunities for poor rural women, many single parent household heads, to earn income in a home/community setting and a means of reducing poverty among women. International organizations like the United Nations Industrial Development Organization (UNIDO) and the Food and Agricultural Organization (FAO) of the United Nations, have supported the development of A-P towards this end.

In the Jamaican context, the recently developed National Industrial Policy (NIP), has identified Agro-processing as a key component of the strategic industry sectors, stating possible linkages and specific products as well as constraints. A number of policy initiatives have been suggested including a role for JAMPRO in the "marketing thrust".[1]

This study, commissioned by UNIDO and the World Food Programme (WFP), and supported and coordinated by Jamaica Promotions Corporation (JAMPRO), is an opportunity to look at the micro-enterprise segment of the A-P sub-sector. It rests on identifying from previous studies, principally the Gillings study[2] done for the FAO, the possibilities which these micro-enterprises hold for the development of the sub-sector.

It calls for examination of what is currently being done and proposed by other agencies involved in developing agro-processing among women. These include the Rural Agricultural Development Authority (RADA) of the Ministry of Agriculture and the link organizations operating in the Skills 2000 Programme, namely, the World Food Programme, Human Employment and Resource Training/National Training Agency (HEART/NTA) and the Ministry of Labour, Social Security and Sport.

The aim of the present exercise is therefore not to produce another study. It is to isolate from a gender perspective, the strengths, weaknesses, threats and opportunities that attend the development of Agro-processing as revealed from previous studies locally and internationally, and from current field observations.

The direction is towards assisting the network of agencies interested in and active in A-P development among women, to collaborate through JAMPRO in developing a mechanism embodying practical information, technical inputs and strategies through which projects can be developed among women. This mechanism is to be tested in pilot projects under Skills 2000 and by other agencies.

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[1] See Government of Jamaica, Office of the Prime Minister, **National Industrial Policy: a Strategic Plan for Growth and Development**, March 1996, p. 139.

[2] Scarlette Gillings, May, 1995. FAO Report: Sustainable Agro-Processing For Rural Women (TCP/JAM/0154)

1.1 Terms of Reference

The Terms of Reference (TOR) invites discussion on the small scale agro-processing sector from the perspective of:

a) whether and under what conditions further investments in this sector and for the purposes defined, are justifiable;

b) where and how best to proceed to actually develop such industries on a micro scale for targeted women entrepreneurs, taking their particular requirements and constraints into consideration under current and foreseeable circumstances; and

c) what specific inputs by type and scale and from what specific sources would be most appropriate to achieve the intended employment and income benefits on a sustainable basis. These inputs are to include the acquisition of technology, micro-enterprise credit, management, marketing and other commercial supportive services and training in any and all aspects of the food processing industry that is particularly well suited to prevailing conditions in Jamaica and to the needs of intended beneficiaries.

This analysis was to be informed by a gender-sensitive development perspective.

On the basis of this analysis, specific considerations were to be presented on the following:

Specific Issues to be Addressed

i. the critical factors that account for the strengths and weaknesses of food processing;

ii. the ways in which constraints can be overcome and realistic options pursued;

iii. how best with the fullest possible involvement of intended beneficiaries themselves, specific cost effective strategies can be pursued;

iv. the training needs for pursuing the proposed micro-businesses on a sustainable basis; and

v. the content of a three year programme of development focussed on treating with the opportunities and constraints identified (i - iii) and meeting the needs for training and empowerment of women as intended beneficiaries.

These issues are being considered from different perspectives, namely on economic and technical considerations including product, pricing, marketing, technology application, as well as from the socio-cultural aspects.

Methodology

: evaluation started on May 16, 1996, with the field work ending on
.y 18. The main team consisted of:

. **Pete V.E. Scott** - Consultant: Food Technologist
s. **Linnette Vassell** - Consultant: Gender sensitive, socio-economic
alysis and popular participation.
ss **Sharon Northover** - Industrial Auditor, JAMPRO.
ss **Kathleen Goldson & Miss Lovina Henry** - JAMPRO Coordinators.

e methodology focussed on the following three main elements:

the review of documentation;
.. field visits;
.i. inter-agency consultations.

ocumentation from UNIDO's field work particularly in Africa and Latin nerica, has informed the background of the evaluation.

rom the Caribbean region, there has been a paucity of information. The tudy on Jamaica sponsored by the FAO and conducted by Scarlette illings is the one that treats the issue most explicitly. Sketches of ural women's lives are presented in the Ministry of Agriculture's roject for the Strengthening of the Rural Farm Family, 1988, and in the ecent Inter-American Institute for Cooperation on Agriculture/Inter-American Development Bank (IICA/IDB) study on Women Food Producers in Jamaica done by Faith Innerarity. The field experience of the Rural Agricultural Development Authority (RADA) of the Ministry of Agriculture has been an invaluable information source.

The evaluation team examined the current status, characteristics, strengths and constraints and reviewed (where applicable and available) the project documents and subsidiary data within the general framework indicated in the TOR. Major emphasis was placed on the involvement of women and gender-specific issues, and on the technical aspect of agro-processing, particularly, the technological and unit operations processes.

The study is by no means comprehensive, given the limited time for field activities, analysis and documentation. It has not attempted to cover all types of agro-processing activities carried on in Jamaica. Home and social group processing (church, women's groups, 4-H clubs, etc.) activities, although mentioned, have not been examined and evaluated in detail.

Agricultural raw material production practices, post-harvest treatment and handling of crops did not receive in-depth attention although they are recognized as major constraint to the development of a sustainable agro-processing sector. The role of marketing and associated sales activities were mainly mentioned as pre-cursor activities to project formulation and implementation. Packaging and labeling and their connection with satisfying the consumer, successful marketing, and technological implications, is considered briefly.

Field Visits:

The team of JAMPRO staff and the two consultants made two rounds of visits within the period May 16, 1996 to July 18. Discussions were held with groups involved in agro-processing as well with individual entrepreneurs. The groups visited were: the Warminster 4-H Training Project, St. Elizabeth; United Farmers Multi-Purpose Co-operative Limited, ELIM, St. Elizabeth; Wakefield Project, Trelawny; Flower Hill Bammy Project, St. James; Lime Tree Garden Peanut Production and Processing Unit, St. Ann; the Long Road Co-operative, St. Mary. Two individual entrepreneurs were also consulted.

Inter-Agency Consultations

Through these consultation, JAMPRO, UNIDO and the WFP have been able from the beginning, to participate in the conduct of the process - receiving reports, making proposals and decisions - all of which will influence the implementation of the findings.

Other agencies including RADA, the Food Technology Institute (FTI) were brought into the process to appraise the findings and the proposed strategies.

The first inter-agency consultation advised that the following projects should be followed-up for the study and for recommendations:

1. WAKEFIELD AGRO-PROCESSING CENTRE
2. OLGA TURNER - INDIVIDUAL ENTREPRENEUR
3. LONG ROAD CO-OP - DRIED SPICE PROCESSING UNIT
4. LIME TREE GARDEN - PEANUT PROCESSING UNIT
5. UNITED FARMERS MULTI-PURPOSE CO-OP FOOD PROCESSING PROJECT

The second inter-agency consultation on September 11, resulted in agreement on the priorities which were to be pursued in the three-year development plan for the sector.

1.3 Report format

Chapter 2 (Executive Summary) presents the main findings and lessons learned, along with recommendations of the evaluation team.

Chapter 3 contains an analysis of the projects/enterprises, based on observations during the field studies. Here individual analysis of the respective enterprises are recorded for the five (5) projects.
The methodology was guided by the outputs as stated in the Term Of Reference for the assignment.

Chapter 4 contains the main lessons learned from the field studies.

Chapter 5 covers the specific recommendations at individual project level.

Chapter 6 contains proposals towards a 3-year programme for realizing opportunities for women's development through selected agro-processing projects. Here a framework for its implementation is given along with elements of the work plan.

Chapter 7 covers key factors that accounted for the **weaknesses** of existing or past micro-enterprises/projects involved in agro-processing.

Chapter 8 includes the justifications for the chosen paths towards project implementation in the light of the experiences and observations in the field.

Chapter 9, based on the key factors that accounted for the **strengths** of existing or past projects/enterprises - ways in which constraints to small-scale agro-processing may be overcome and realistic options pursued, are covered in this chapter. These include: training, quality control, improvements in solar drying, and exploration of new marketing approaches.

Chapter 10 presents a broad list of **recommendations**, some being general and others linked to specific projects.

Chapter 11 contains a synopsis of the main **conclusions.**

The ANNEX - Contains relevant data which includes:

- **Projected Production Costs and Revenue for Bammies** (Annex 3); (For Olga Turner)

- **Projected Production Costs & Revenue For Peanut Production** (Annex 5,6) (For Lime Tree Gardens & United Farmers M-P Co-Op).

2. EXECUTIVE SUMMARY - Findings and Recommendations

2.1 Background

Under the Terms of Reference, **Plan of Action For The Gender Responsive Development of Community-based, Micro Food Processing Enterprises in Jamaica**, the following five (5) enterprises/projects were subjected to detailed evaluations:

1. WAKEFIELD AGRO-PROCESSING CENTRE
2. OLGA TURNER - INDIVIDUAL ENTREPRENEUR
3. LONG ROAD CO-OP - DRIED SPICE PROCESSING UNIT
4. LIME TREE GARDEN - PEANUT PROCESSING UNIT
5. UNITED FARMERS MULTI-PURPOSE CO-OP FOOD PROCESSING PROJECT

2.2.1 WAKEFIELD: AGRO-PROCESSING CENTRE

Pilot Small-Scale Centre; managed by women - originally nine (9), reduced to inadequate number of two (2); Problems/Constraints:- marketing; (product concepts: technology-oriented implementation, rather than market-responsive), no sustainable market niche; project cannot absorb R&D & marketing required for sales promotion; project now constrained financially; project may collapse completely; problems rooted in project design (implementation); ineffective solar driers; group dynamics problems; no clear path to eventual ownership; project must be re-oriented; emphasis on market-determined concepts; Recommendation: participants to discuss the report in light of experiences and decide on future path, giving attention to the following issues: market (including test marketing) for bulk/retail in-season fruit purees, nectars, juices (for the School Feeding Programme, hotels, restaurants); other products, e.g. sorrel jelly, fruit-based salad dressings, mango dressing(s); urgent technical, financial support required. Need for investigation of experiences of women who left the project.

2.2.2 OLGA TURNER: INDIVIDUAL ENTREPRENEUR

Small-Scale Entrepreneur; sun drying of fruits; traditional bammy making; low productivity & unsuitable facilities; inappropriate technology application, e.g. solar drier, stove/oven; packaging & labeling poor; shortage of capital; Recommendation: the overall needs of the project must be assessed with a view to discussion and negotiation on how it will be financed.

2.2.3 LONG ROAD CO-OP: DRIED SPICE PROCESSING UNIT

Coordinated by St. Mary Rural Development Project; two (2) women involved with spices, potpourri; raw materials obtained from CO-OP; facilities inappropriate; inappropriate technology and process; low remuneration, unstable employment; relocation imminent. Economic and social feasibility to be assessed by participants and host of project.

2.2.4 **LIME TREE GARDEN: PEANUT PROCESSING UNIT**
RADA Area Development Project in peanut processing among ten (10) women, one (1) man; some raw materials produced by women; part-time employment of women; low wages; strong sense of ownership facilitated by their involvement; concern with working environment; women work longer hours, little help with reproductive aspects; dynamic group processing and sales; integrated linkage of processing-community-farm-school; solar drier and gas oven peanut processing; unit operations problem: inefficient solar driers, sheller/stripper only shells; Recommendation: investigation of value-added, bulk, vacuum packaged crushed peanuts for ice cream sundaes and pastry toppings; need for gender-sensitive integrated community development approach.

2.2.5 **UNITED FARMERS: MULTI-PURPOSE CO-OP FOOD PROCESSING PROJECT**
Co-operative; supported by WFP/HEART-NTA/NGO non-formal vocational, community-based training, under "Skills 2000" Programme; integrated linkage with community-farm-training; seven (7) young women, one (1) man involved in solar oven ("sun baked") peanut processing & gas oven peanut drops; in process of training; difficulties with family and domestic responsibilities; need for day care, basic school and continuing education; unit operations problem - sheller/stripper only shells; Recommendation: Participants to discuss report and decide on priorities in light of their three year plan.

The enterprises shared some common features, some of which were:

- products are done mainly for sale on the local market although some products are exported by Jamaicans taking them as gifts overseas or by tourists who have purchased them from distributors;
- the focus was on rural development employing mainly traditional, un-sophisticated technologies and utilizing home-scale to small commercial equipment;
- an emphasis on the involvement of women and the promotion of income-generating agro-processing activities;
- all require a mechanism for adapting and channeling technical assistance in the areas of marketing, on-going training, production and process control, quality control, and access to small-business credit;
- all require explicit strategies for promoting involvement of women in agro-processing activities.

2.3 Recommendations:

i). That the development of agro-processing be based on a integrated, gender-sensitive community development model, emphasizing the fullest involvement of participants/beneficiaries in all aspects of the project.

ii). That a Inter-Agency Network, coordinated by JAMPRO be established among organizations involved with, interested in, and committed to small-scale agro-processing. This Network will be responsible for the implementation of the Three Year Development Plan as outlined in this report.

iii). Within the **Three Year Development Plan**, attention should be focussed on some of the following:

- Marketing support and assistance with packaging and labelling. Exploration of new approaches to marketing, inclusive of inter-sectorial and inter-project linkages with tourism and the School Feeding Programme, and collaborative efforts around a single and/or marketing name.

- Explicit strategies for addressing gender issues and promoting group dynamics associated with the involvement of women in agro-processing.

- Implementation of **UNIDO's Training Programme for Women Entrepreneurs in the Food-processing Industry**.

- Implementation of **RADA's Area Development Projects** - raw material production incentives.

- Fostering **backward linkages** (farmers/beneficiaries, community) for raw material support.

- Raw material and small-scale equipment **database** support.

- Technical assistance and support in the areas of **processing technology (making maximum use of available local ingredients), quality control (QC), standardization, ongoing research and development (R&D) activities and training in small-scale equipment fabrication and maintenance**, using competent personnel.

- Require urgent appropriate mechanisms for addressing access to **small-business credit**.

- Development of **efficient, effective, commercially proven, solar drying system(s)**.

iv). That the findings of this study be discussed by the participants/beneficiaries and promoters of the individual enterprises with a view to decisions being taken at that level on the future direction of the projects. These decisions will constitute the main aspects of the **Three Year Development Plan**.

v). That a Focal Point be established within JAMPRO to be responsible for the coordination/implementation of the **Three Year Development Programme**.

Table 1. INTER-RELATED FEATURES; ADVANTAGES/CONSTRAINTS INFLUENCING THE VIABILITY AND SUSTAINABILITY OF THE FIVE (5) SMALL-SCALE AGRO-PROCESSING ENTERPRISES THAT WERE EVALUATED.

KEY: 1 = Wakefield (A-P C), 2 = Olga Turner (IE), 3 = Long Rd. CO-OP, 4 = Lime Tree Garden (PPU), 5 = United Farmers (M-P CO-OP FPP)
● = characteristics present; N/A = not applicable;
B = referring to bammy

	ENTERPRISES EVALUATED				
	1	2	3	4	5
	WAKE.	O.TU	LR-C	LTG	UF-C
PRODUCT:					
Concept(s) technology-oriented	●				
Market-responsive/determined		●	●	●	●
Concept(s) with indigenous origin		●	●	●	●
MARKET/MARKETING:					
Major problem(s) with marketing	●				
Poor marketing			●	●	●
TECHNOLOGY/EQUIPMENT:					
Solar drier(s) ineffective/inappropriate	●	●	●	●	N/A
Heat processing equipment inappropriate		●	N/A		B
Process control problems/constraints		●	●		B
Tedious unit operations/low productivity		B	●		B
PROCESSING FACILITIES:					
Inadequate and inappropriate		●	●		B
MAJOR AGRO-BASED RAW MATERIALS:					
Source: Community/Beneficiary; integrated		●	●	●	●
Some adversely seasonally influenced	●	●			
GROUP MOTIVATION/DYNAMICS:					
Strong sense of "ownership"		N/A		●	●
"Ownership" problems	●				
Group/Individual highly motivated		●		●	●
Threat to project's sustainability	●		●		
PROJECT/ENTERPRISE STATUS:					
Sustainability in jeopard	●		●		

3. FIELD STUDIES
Gender Sensitive Indicators and Individual Project Histories

3.1 Considering Women and Development

The study is based on a number of assumptions, among them that:

a). that agro-processing can "significantly expand employment" among poor rural women, many of them single mothers; and

b). that as a consequence, "income benefits" can be expanded within families and communities. Income benefits, are not specified but can be assumed to include goods and services like food, shelter, clothing, utilities, health services, and the like; and

c). that the above are sufficient to significantly address the problem of poverty among women.

These assumptions are reflective of a women in development (WID) perspective and approach to addressing "women's issues". Basically, the WID approach has been based on a goal of 'integrating' women into development. It has sought to address the problems facing women mainly by channelling to them resources mainly through women's only projects. Therefore, the focus has been on economic and technical indicators and devices - how many women employed, how much credit made available, etc. Hence, the uncritical assumption that poverty can be effectively tackled by opportunities for micro-enterprises in agro-processing with little questioning of the nature of the opportunities that can be provided, under what conditions, etc.

3.2 Gender and Development Approach

The gender and development perspective asks such questions. It pays attention to the structural constraints, differences in resources and activities that women and men in any group may experience, recognizing that those constraints and differences are rooted also in the social experiences of being male or female. Those differences would determine for example, whether and how women and men would access and benefit from the resources provided.

The terms of reference for this project, while based on WID assumptions also called for "gender sensitive, socio-economic analysis and participation", reflecting the understanding that the structural constraints on women play a decisive part in their life chances for development and therefore, need to be analyzed. Such an analysis can begin by examining the nature of poverty itself; not only to examine the fact that the majority of the poor are women, many of whom are heads of households and therefore bear disproportionate responsibility for children - another large category of the poor in Jamaica.

A gender analysis of poverty also takes into account that poverty is not only a lack of gainful employment and income, but in the context of rural women's lives in particular, refer as well to the lack of infrastructural elements like water, electricity, roads, transportation; and deficiencies in other social goods like health and educational facilities.

Further, analyses of poverty include examination of negative attitudes and behaviours towards women, for example, that undermine their confidence and the expression of their fullest potential. This analysis must embrace consideration of the limits that exist in women's access to power, including the fullest opportunity to effect changes in society, for example, in the inequities in gender relations. These inequities arise and persist in a context where biological differences between the male and the female are used to determine not only how labour is distributed, but how power is perceived and distributed in society.

In Jamaica as in most societies although women are largely responsible for the reproductive roles (e.g. child and family care), they play a central role in production as well as in community management, mainly through volunteerism. Less value is placed on their social contributions, vis a vis that of men. Because of the force of gender, women will, for example, receive less wages than men in production, exercise less political and social power than men, and in general hold a subordinate status, vis a vis men in society. Gender discrimination limits women's access to resources including time, skills, markets, etc. and these have wide impact on their life chances.

Practical and Strategic Gender Interests

Gender as an issue of development therefore points to two distinct but integrally linked areas of need for the development of women and of society. The first relate to needs that women have which arise from their reproductive and productive roles, their role in the division of labour. These are called **practical gender needs** and are, for example, the provision of basic services like water, fuel, health care, wages, housing, etc. Practical gender needs are shared by men and other members of the household and would include what are generally regarded as 'income benefits'.

The second area - **strategic gender needs or interests** - arise from women's subordinate status in society. To address women's strategic gender needs is to challenge the unequal and inequitable relations between men and women both in the family and in society and should lead to a change in the division of labour. Meeting women's strategic gender needs or interests alter the position of women vis a vis men to remove women's gender subordination.

The call for '**gender sensitive socio-economic analysis**' of agro-processing therefore extends the assessment of these micro-enterprises from consideration of women's practical needs (e.g. employment and income) to examination of how they challenge or reinforce existing unequal relations between women and men whether in the household, the community or the work place, and consequently and essentially, whether they assist or retard sustainable human-centered development.

One of the implications of approaching the project from a gender perspective therefore, was that the issues about products, technology, markets and prices, could not be separated from other questions, for example:

- whether income earning meant longer working hours ?
- whether employment outside of the home meant that the women had developed supporting community networks within the home or within the

community that assisted them ? were the partners, if present, doing more domestic work ?

- whether income earning had affected the relationship with the partner, if there were any ? did they have control over the income ?
- what were the working conditions like ? were there, for example, facilities for rest? did women have to stand for long hours ? (standing for long hours can induce varicose veins, and women can have children with low birth weights, it is said).
- were more employment choices and new opportunities being opened up for women and were there opportunities for integration into other occupations ?
- what provisions were there, if any, for child-care facilities ?
- were women involved in the decision-making process of the projects and were their particular needs discussed and addressed ?
- were the training and educational programmes increasing women's overall capacities and were they able to move to higher levels, thereby increase their options?

Considerations such as those stated above are summarized in the following gender-sensitive indicators. These indicators alert us to the fact that gender-sensitivity compels attention to women's practical and strategic gender interests, must raise the **condition** and **position** of women. This means, inter alia that this requires a process approach to development, a process in which, at all levels and in all stages, the assessment of the impact of projects and programmes on the **condition** and **position** of women in relation to men is fundamental.

The indicators below, guided the assessment of the field experience and the analysis of the main issues with which this study is concerned.

3.3 Gender-sensitive Indicators

Development planning from a gender perspective takes into account the impact of projects and programmes on the **condition** and **position** of women in relation to men. Consideration is given to the following issues:

i). **Basic Needs:** attention to better provision for women's basic needs; food, water & fuel, health care and housing; equitable distribution of basic resources between men and women.

ii). **Control over productive resources:** focus on women's access to and control over employment and income, land, credit/financing, production and marketing of goods, experiences in management, etc.

iii). **Sexual division of labour:** promoting changes in what women and men do in the private and public areas of their lives; looking at the number of hours worked daily by the average working woman as against the average working man.

iv). **Education and training:** promoting women's rights and access to education and training; developing skills that enhance women's

productive capacity, including self confidence.

v). **Consciousness raising**: stimulating awareness among women and men about gender inequities; bringing issues of gender and development into public focus; encouraging and assisting women to challenge inequities in the private sphere.

vi). **Participation, leadership, and decision-making**: providing opportunity for women's participation in assessing women's and the communities' needs; in occupying leadership positions; in the decision-making process; strengthening local and national networking between and among women.

The reference in the terms of reference (TOR) to the need for gender sensitive analysis and **participation**, directed consideration and practice of involving women and men in assessing the issues (as they were investigated and as they are presented by the evaluators), in defining appropriate strategies to address these issues, and in working through the directions collectively agreed upon.

Personal and community empowerment lay at the heart of the practice and the goal which the evaluation seeks to validate.

3.4. ANALYSIS OF PROJECTS

3.4.1 WAKEFIELD (A-P C)

The Pilot Small-Scale Agro-Processing Centre established by the Food and Agriculture Organization (FAO) of the United Nations and Managed by Rural Agricultural Development Authority (RADA), Wakefield, Trelawny

This project which trades under the name: JAMMY Food Processing Unit was established through a partnership between the Government of Jamaica/Ministry of Agriculture (MOA) and the Food and Agriculture Organization (FAO) in 1992 with the objectives:

- the establishment of pilot small-scale agro-processing enterprise, managed by rural women.
- the training of extensionists and some identified rural women groups in small-scale agro-processing industries, including the marketing aspects.

Project financing and capital financing was provided by FAO, under its Technical Cooperation Programme (TCP/JAM/0154), with assistance from RADA who assumed responsibility for overall project management.

The original target beneficiaries were a group of nine (9) women who were selected to host this pilot commercial experience (with assistance from a RADA SS/HE officer). They were to derive income out of the processing activities. Prior to their selection, they had received basic training (from previously trained extensionists) in agro-processing techniques.

Operational History:

Processing activities were started in April, 1992. This involved the processing of whole and crushed tomatoes, mango and guava bars, and pickled beet. Over the years the main products have changed to include solar dried fruits: mango, jackfruit, pineapples, papaya, and otaheite apple.

By the end 1995 the number of women beneficiaries in the group had shrunk to four (4). That number has now been reduced to two (2) at present. This decline poses a serious threat to the viability of the project and makes it difficult to fill the smallest of processing orders that are received.

Problem Analysis:

3.4.1.1 Weakness in Project Implementation, Including Marketing

The project, like many other small-scale agro-processing enterprises can not absorb the expenses of research and development activities, and the required marketing activities necessary to sell certain product concepts at volumes which will enhance the project's economic viability and eventual sustainability.

Very early in the project it was recognized that the main problem affecting the viability and sustainability of the project, was marketing (which includes associated promotional and sales activities). Hence, this problem has plagued the project from its inception and appears to be rooted in the design of the project.

For example, the Market Study Report which was done to support the start-up activities, was primarily focussed on the potential market for the major initial products processed by the project, that is: dried fruit, whole peeled tomatoes, crushed tomatoes and pickled beetroot. In relation to two of the main products - tomatoes and beetroot, caution was expressed that market demand may not have risen substantially; that the crushed tomatoes concept should be re-examined especially with respect to the consistency of the product and that attractive incentives were needed for store owners to stock and promote the product. Note: the Market Study Report was available February 1993 (approximately ten months after start-up activities).

Related to the above was the fact that project implementation activities were more technology-oriented, rather than market-responsive, with the result: properly processed products did not find a sustainable market niche.

In retrospect, the observed weaknesses of the project stems from a failure in the design of the project, which underestimated and therefore, made no accommodations for the risks associated with the implementation of the project, without first establishing clear market demand patterns and associated specifications for the products to be processed to meet consumer expectations, especially in the initial stages of the project - and the resulting adverse effects on the sustainability of the project.

3.4.1.2 Low Involvement of Participants - Experiences of Some Women

Reporting on her experience, one of the two women remaining in the Wakefield Project, retraced her history with the project since 1992, including her one week training programme at Twickenham Park where she learnt about processing tomato, mango juice and mango bars; for this training bus fares were provided. Later she had entrepreneurial training from the College of Arts, Science and Technology (now the University of Technology).

At first, the participant reported, she received J$808 per fortnight (J$404 per week); later this was reduced to J$704 per fortnight (J$352 per week). Problems became really grave when 6 women left; 2 became security guards, 1 went into domestic work, and 3 sunk back into unemployment.

A problem largely associated with project design, also adversely affected the enterprise and became worse when the view was expressed, that the women themselves were expected to 'take over' the project. The market and marketing were weak; sourcing and transport of raw materials were problems; and the women had not been prepared to assume these responsibilities and to tackle such challenges.

The two (2) women presently in the project live in a nearby district. Each person now earns J$2,176 per fortnight (J$1,050 per week). When orders come in there is need for two (2) more persons, but this presents a vicious circle of - no funds to employ - no employment no further production.

RADA is still in charge and continues to help with procurement of raw materials and marketing. Marketing the women assert, has been the main big challenge.

From the experiences of the women it is clear that:

i). The pathway to eventual ownership of the project was never clearly outlined to the participants at the start of the project and proposals made in late 1994 to deepen involvement and promote a sense of ownership among participants, were not effectively implemented. Hence, mention of 'ownership' in the past few years, appeared to de-motivate rather than stimulate participants.

ii). The instability of the project presents the main concern. The persistent decline in the project however raises many issues regarding the project design - for example, the top-down-approach as well as the monitoring and evaluation. The first major evaluation did not include any information to suggest that the participants' opinions had been solicited, yet it had been recommended that the Wakefield Model be replicated and a document, 'Sustainable Agro-Processing Enterprises Managed by Rural Women's Groups', was reported to have been prepared to guide the process[3].

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[3] Technical Cooperation Programme, **Agro-Processing Activities for Rural Women, Jamaica**; Terminal Statement prepared for the Government of Jamaica by the Food and Agricultural Organization of the United Nations, Rome 1993, p.5.

The fact that the evaluation team did not h ssion (SDC), Fooc
with women who had left the project pre me.
assessment of the project on gender- a co-operative
perspective. a and papaya)
f: low wages
and the
ve effort.

3.4.1.3 Project Achievements

iii). The acquisition of the skills yment at
products and the fact that they can imp tory in
others, is an important achievement.
The Project Supervisor also displays comp
keeping and general knowledge of the production rket
has been no on-going programme of training, for examp at
group - maybe because the main focus has had to be on proje n,

3.4.1.4 Project Status

The project is likely to collapse completely if support (financial and technical) are not provided as soon as possible.

3.4.2 OLGA TURNER (IE)
Small-Scale Agro-Processing Entrepreneur:
Of Hopewell District, Highgate, St. Mary

Summary of her activities

Olga Turner has been formally involved with agro-processing activities since the 1970's. She is now working from her home, with part-time contractual assistance, for the past three (3) years.

Products processed

Based on market demand (customer orders, sales activities) and fruits in season.

SUN DRIED PRODUCTS: fruits (some diced and sold as "raisins" and raisin substitutes). Dried: chocho, papaya, banana figs, hot peppers;
WINES: e.g. seville orange, camranga, otaheite apple;
JAMS, JELLIES & MARMALADES: guava, seville orange, orange, pineapple;
CANDIED PRODUCTS: citrus peel, papaya;
PICKLES (traditional, fresh-packed): from hot peppers and mixed vegetables.
CASSAVA: used for bammies. Present production of bammies ranges from 200 to 400 bammies per week.

3.4.2.1 Raw Materials

Local farmers produce the bulk of her raw materials, but at present she produces some of her raw materials, e.g. otaheite apples, guava, limes, seville orange. Lime and seville orange juices are used to provide the required acidity for other processed products, hence, reducing the requirement for commercial grade anhydrous citric acid.

3.4.2.2 Operational History

She received basic training from the 4-H movement, attending seminars

and workshops sponsored by Social Development Commission (SDC), Food Technology Institute (FTI), and the RADA-SS/HE Programme.
She sought to extend this training and production through a co-operative among women. The aim was to produce "raisins" (e.g. banana and papaya) for the baking trade. This was not successful because of: low wages (J$150 per day), the unstable employment prospects, and the unwillingness of women to put their money into a co-operative effort. The Women sought alternatives - self-employment and employment at Highgate Food Products Ltd. (chocolate and confectionery factory in Highgate, St. Mary).

She collects and transports most of her raw materials as well as market her processed products to housewives in the surrounding communities, at craft fairs, exhibitions, agricultural shows (e.g. Denbigh, May Pen, Clarendon; Devon House, Kingston; Harmony Hall, St. Mary). Her photo studio in Highgate also acts as an outlet for these products.

Problem Analysis:

3.4.2.3 Present home-processing Operations are Sub-optimal

Processing activities are carried out under less than acceptable conditions, incompatible with processing high quality, safe products, and responding to increasing market demands. A suitable building and appropriate equipment are required for processing activities.

These constraints are linked to shortage of operating capital and limited access to credit. This situation restricts the purchase of equipment, vital to increase productivity, and accommodate improved technologies.

3.4.2.4 Inappropriate Technology Application

Her present use of charcoal pots for all heat processing activities, are not appropriate for processing operations and present market demands. This technique does not offer the flexibility and temperature control necessary for consistent production of high quality heat processed products which meet customer expectations.

> E.g. Jam making - during boiling operations - care is required to avoid localized over-heating which is likely to lead to burning and colour change.

The use of charcoal pots is also time consuming. Preparation (igniting coal and adjusting to required temperature output) is unpredictable and varied, and charcoal pots require continuous attention during operations.

3.4.2.5 SUN DRYING ON GALVANIZED TRAYS

Used in producing dried fruits, e.g. papaya, otaheite apple, banana figs, etc. When diced they are referred to as "raisins", which are used in buns, cakes, etc., and as import substitutes for raisins and other dried fruits.

Although this method of drying is relatively inexpensive in capital cost, and the energy cost is zero - it has a number of disadvantages including:

- potential contamination (microbial, insect),
- need to cover during periods of rain,

- possibility of drying being uneven,
- little or no control over drying rates and
- possibility of spoilage occurring during rainy periods because of long drying periods,
- not very efficient technique hence, less cost-efficient.

3.4.2.6 BAMMY PROCESSING

The processing operations are conducted in unsuitable surroundings, using traditional, very basic, home-scale technology and equipment. The "**grating**" and "**wringing**" unit operations are manual and tedious, but are essential steps in bammy processing. When practiced on a semi-commercial scale there is loss of productivity as predominantly manual procedures are employed. Hence, it is not only labour intensive and low in output, but also subjects the end products to potential breaches of required good manufacturing practices (GMPs)

GMPs are essential for processed products offered for sale, which must satisfy basic hygiene and quality standards (e.g. safeguarding against exposure to insects and microbial contamination).

Following this procedure, the yield obtained is: 45.36 kg (100 lbs) fresh cassava roots, resulting in approximately 100 bammies.

NOTE: Olga Turner has recently placed an order with a local fabricator to supply her with a **hydraulic press** (used to express the water from grated/milled cassava). Specifications for this piece of equipment was provided by RADA SS/HE Programme.

This acquisition will remove the labour intensive and time consuming step of manual wringing in cotton (or gravity pressing with heavy objects) to eliminate water - prior to air/sun drying, one of the essential steps associated with bammy flour production.

However, the adaptation of improved technology has its risks. The loss of productivity now experienced may be insignificant compared to the under-utilization and high investment costs of acquiring equipment designed for larger output. The market demand and implied increased production, must justify such investment.

(See **Annex 3**: (i). Olga Turner's - Projected Production Costs and Revenue for Bammies; (ii). Suggested Equipment Details)

3.4.2.7 FRUIT WINE PRODUCTION

Local fruits are sometimes employed in making wines which serve as ingredient raw material for baked products (puddings, cakes, etc.) which are sold at Devon House (Hope Road, Kingston).

Absence of appropriate wine making technology, makes wine making efforts unpredictable, as "vinegars" are often the result of uncontrolled fermentations.

3.4.3 LONG ROAD CO-OP (DSPU)

Coordinated by St. Mary Rural Development Project
Annotto Bay (St. Theresa's Church), St. Mary

3.4.3.1 Background

The Long Road Co-operative is one of four (4) Co-Op groups in the St.

Mary Rural Development Project (SMRDP).
The major aspect of this Co-Op's work is the marketing of members' agricultural products and in providing an organizational framework for representing the community's interests, e.g., re: roads, water supply, telephone, etc. Long Road has a membership of 75 persons, some 50% of members are women. It is the only Co-Op involved in agro-processing, which it started in 1992. This activity is carried on in the Long Road hills.

The agro-processing aspects are centered around the drying and packaging of herbs and spices. Products dried and packaged include:

Leaves and sticks of pimento and cinnamon; nutmeg (packed with and without a grater); peppermint, cerassee, lemon grass ("fever" grass); cola nut ("bissy", for medicinal and beverage use); irish moss and sarsaparilla (for drinks, "roots wines"); khus khus grass (dried roots used as potpourri).

3.4.3.2 Operational History

Six (6) women were originally involved with the production of grapefruit marmalade. The sales were considered fair and a small, but committed market appeared to be emerging. However, a decision was taken to discontinue the marmalade production about two (2) years ago.
The enterprise now employs **two (2) women** and operate **four (4) days per week**, drying and packaging herbs and spices.

Training
At the start of processing activities on-location training was received from the Scientific Research Council (SRC)/Food Technology Institute (FTI), which also provided the formulation for the grapefruit marmalade. The two members of the group were facilitated to attend a seminar/workshop conducted by SRC/FTI, during the period of our evaluations ("Fundamentals of Food Processing Training" - July 8-10, 1996).
Assistance has been received from JAMPRO's Design Services Division, and from an individual attached to RADA and from Caribbean Agricultural Research and Development Institute (CARDI); (plant protection and integrated pest management). There are linkages and collaboration with the Hillside Agriculture Project (HAP), which will end in Dec. 1996.

Problem Analysis

3.4.3.3 Facilities and Equipment Inadequate

The present processing facility and associated equipment is inadequate. It lacks space and is in need of repairs and modifications which will bring it in compliance with acceptable good manufacturing practices. This is aggravated by the project's inability to acquire suitable processing equipment, processing aids, and associated ingredients.

3.4.3.4 Processing Unit Operations Time-consuming.

Potpourri
The technology employed in the production of **Khus Khus Grass Potpourri**: sun drying, scraping and tying precursory activities, which occurs over a period of several days - is labour-intensive and does not appear to be cost-effective, as the unit production is low and the value-added is

small.
Meaningful and appropriate processing and yield data were unavailable, this did not permit calculation of production estimates.

Nutmeg processing operations
Primarily a drying operation - takes between four (4) to six (6) weeks, depending on the drier in use and the prevailing weather conditions. This is followed by a further three (3) to four (4) days drying after a bleaching/disinfection step.
The nutmeg is attacked by an insect ("borer"). Hence, it requires fumigation and application of other post-harvest control measures.

Peppermint
This product sometimes darkens unacceptably during the drying process in the direct-mode solar driers being used. Here the product is directly exposed to the sun's rays. This exposure may result in excessive darkening of the colour in some foods (also loss of vitamins). This darkening may be desirable for some products, but for some light coloured products it is a problem.

3.4.3.5 Sub-optimal Control of Solar Drying Technology

Solar drying is essential to the present operations, which currently utilize two **direct-mode**, agro-crop/food driers - one built into the roof of the processing building and the other in an improvised window box unit. A third drier of the **indirect** type is in a state of disrepair. These are all **home-made driers** with a low level of efficiency, being slightly more effective than exposed sun drying. With these simple solar driers there is relatively poor control over drying conditions compared to that of sophisticated solar driers, fuel-fired or electric driers. This imposes a disadvantage, as these simple driers are **largely unsuitable for high-value products such as spices and herbs**, where an improvement in quality does generate higher income.

3.4.3.6 Low Economic Returns - Specific Concerns of the Women

i). Concerns relate first to the project as a reliable income source. The two (2) women involved in this project, work a maximum of six (6) hours daily for four (4) days per week and earn from J$480 to J$600 (supervisor) weekly. The wages, compare unfavorably with potential earnings from picking coffee berries, for which they can earn J$1,600 for four (4) days work. However, this option requires travelling outside of the parish and present greater challenges for child care - both women have young children under their charge.

ii). There are also difficulties with their small, confined, poorly equipped work area and the production process itself, which is tedious.

iii). Women have a keen interest in any opportunities for training, but there is no sense of being trained specifically for the development of the project, since the main concern is with the marketing of existing products.

3.4.4 LIME TREE GARDEN (PPU)
Coordinated by RADA,
Lime Tree Garden, St. Ann

RADA Area Development Project (**ADP**)
The peanut processing operation which was started in December 1995, is actually the **second phase** of RADA's **ADP**. The **first phase** was the cultivation of the Cardi Payne variety of peanuts by farmers in the area.

The linkage of peanut cultivation to its processing, represents a good base of integration. Originally, of the approximately 24 farmers cultivating 12.14 ha (30 acres), it was reported that 8 to 10 were women. Of 45 farmers at present, 20 are women and this includes 6 of the 10 women involved in the agro-processing project. According to the RADA Field Manager ....."women are more genuine in their ambition as farmers".....

The project is also strongly supported by the Lime Tree Gardens All Age School, which supplies institutional/infrastructural as well as personnel support. The project - both the production and processing components - are under the direction of a Management Committee composed of representatives of RADA, (2); the JAS branch, (1); the School, (1); the processors (3); and growers (3) - denoting a fairly high level of beneficiaries' participation in decision-making, including decisions on wage levels, to the purchase of uniforms, etc. The basic framework for a co-operative is being nurtured.

Lime Tree Garden All-Age School gave permission for the factory to operate on the premises. RADA, the implementing agency, has contributed over one half of the estimated project cost, in the form of equipment.

For the processing component, women were sent to Twickenham Park, St. Catherine, for 4 days of training in areas which included - making peanut products, personal hygiene, how to operate projects, e.g. record-keeping. Training has continued through the responsible RADA officer.

3.4.4.1 Operational History

The products are: roasted peanuts (salted and un-salted), peanut drops/cakes; with peanut cookies to be produced soon. Roasted peanuts are packaged in 30 gram units (consumer sizes) in polyethylene bags. Several individual packets (25) can be enclosed in a bulk pack for wholesale merchandizing.

3.4.4.2 Unit Operations - Solar Drier/Gas Oven Roasting of Peanuts

Production is by two teams, each of which works two weeks each month. There are 5 women and one man (the peanut thresher) on each team.
Starting with receipt of whole raw peanuts, the processing operations center around unit operations which start with the utilization of a locally fabricated electrically powered peanut sheller. The present sheller has a stripper attachment which is in need of repairs and/or calibration. The stripper is designed to effect the mechanical remove of the outer red/pink skin from the shelled nuts.
Shelled peanuts are:

EITHER
(a). placed in solar drier(s), 20-30 minutes, to facilitate removal of excess moisture, after which they are transferred to gas-fired (domestic) oven for a short period where they are subjected to 177°C (350°F), which completes the drying and subsequent roasting (baking) process. This imparts colour and roasted flavours and also facilitates easy removal of the outer skin of the nuts;
OR
(b). shelled nuts may be placed directly in the gas-fired oven at 177°C (350°F) for 10-15 minutes, which accomplishes water removal and roasting (baking).

The choice of steps (a) or (b) above, is largely dependent on the volume to be processed, and is influenced by the prevailing weather conditions, which may or may not facilitate the solar drying step. Procedure (a) however, saves energy (cooking gas) as residence time in the gas-fired oven is considerably reduced.

> NOTE: The **solar driers** used to remove excess moisture, are of **similar design to those encountered at Wakefield**, hence, are not very efficient.

Although procedure (a) saves energy, procedure (b) increases productivity as batches can be completed in 10-15 minutes, increasing output or roasted nuts per hour. In summary, approximate yields of roasted (un-stripped) peanuts following procedures (a) and (b), are as follows:

(a). solar drier/gas oven: 99.8-163.3 kg per hour (220-360 lbs/hr);
(b). gas oven only: 181.4-272.0 kg per hour (400-600 lbs/hr).

Packaging
After stripping, the salted (or unsalted) nuts may be packaged for sale or form starting material for other peanut products. (e.g. peanut cakes). A hand-operated, electric heat sealing machine (impulse sealer), is used to seal products which are packaged in polyethylene bags.

> (See **Annex 5**: For (i). Recommended Vacuum Packaging Equipment; (ii). Projected Production Costs & Revenue For Peanut Production.)

Problem Analysis

3.4.4.3 Manual Stripping of Peanuts Constrains Overall Productivity

Fast, mechanical stripping of the nuts is required, but this will only be possible when the present stripper attachment is repaired and/or calibrated by the manufacturer. Thus, eliminating the time-consuming manual stripping, which slows down the entire processing operation as it created a process flow "bottle neck".
The overall productivity is constrained and severely reduced by the necessity to manually remove the outer skin from the roasted/baked nuts when they have cooled to a temperature that will permit such handling.

Apart from slowing down the operations, this manual stripping and excessive exposure of the heat-processed nuts to contamination is not conducive to hygienic operations and is inconsistent with established

Good Manufacturing Practices (GMPs).
GMPs have a requirement for minimum exposure to an unprotected processing environment, and reduced unprotected hand-contact.

After the manual stripping operation, it is sometimes found necessary to return the stripped nuts to the gas-fired oven for approximately 5 minutes, at 177°C (350°F), to "freshen" and obtain even colour, prior to packaging of the cooled product.

3.4.4.4 Women's Working Conditions

The food processors work for eight (8) hours daily, with half-an-hour lunch, for J$750 per week (each worker earning J$1,500 per month).

The majority of the six (6) participants interviewed are mature women; their twenty seven (27) children range in age from forty five to four (45-4) years and they care for seventeen (17) children and grandchildren ranging in ages from seventeen to three (17-3) years. The majority had husbands/partners at home, whom they reported were supportive of the work and their involvement.

Their concerns were with the working conditions - work areas and seating were not comfortable; there was no facility for rest in case of illness; they had to use the children's toilet facilities; there was a problem with running water. They spoke of the plans for their own small building which was to be constructed and of the facilities they wanted to see included.

3.4.4.5 Challenge of the 'Double Day'

Many admitted that working outside the home meant that they had to wake up earlier and work harder to do the domestic work - washing ironing. etc., in conditions where there was no running water in the homes. The children they said, helped with the housework and child-care; there were strong support networks of friends and neighbors. Although it was all challenging, and the money was not large, the women expressed satisfaction that they saw some progress in their lives.

They said they were making a more independent and visible (meaning 'valued') contribution to the family, they could use their money as they wished. Help was coming from the men, especially with the farming, and the view was expressed that meetings should be held with the men also.

3.4.4.6 Need for Continuing Education and Training

The two project leaders seemed to have good control over the financial aspects of the operations. Project participants spoke mainly of the need for general educational upgrading and broadening of their skills base. One member had done a correspondence course towards the Jamaica School Certificate (JSC) with the Brown's Town Community College and wished to continue. Others expressed interest in generally continuing education and in broadening their social links. Some women were members of the local JAS Branch (some 50% of members are women, it was reported); others knew of and were associated to MEKWEHSEH, an organization active in promoting communications/animation skills, and organic farming among rural women in Prickley Pole and Lime Tree Gardens itself.

3.4.4.7 Project Achievements

- There is a strong sense of 'ownership' of the project among women and good cohesiveness within the group.
- There is integration developing within the project between the production and processing aspects and this strengthens the basis for women to increase earnings and for the project to be sustained.
- The inter-agency network working in service of the project - RADA, JAS, the School, with strong beneficiaries participation, presents a good model on which to build.
- The active involvement of men in the project, mainly as farmers, gives support to the agro-processing initiative and opens the way for dealing with some of the specific issues raised by the women.

3.4.5 UNITED FARMERS (M-P CO-OP FPP)

United Farmers Multi-Purpose Co-operative Ltd.
Supported by WFP/HEART-NTA/NGO non-formal vocational training and community-based training and economic development initiatives under the "Skills 2000" Programme
Elim, Braes River, St. Elizabeth

3.4.5.1 Background

This co-operative enterprise has been evolving over three (3) years largely out of the initiative of the social outreach worker attached to the Roman Catholic Church and with support from the Elim Agricultural College. In 1994 the Co-operative was formally constituted bringing together members from seven (7) communities - Elim, Braes River, Seven Corners, Leeds, Goshen, Northhampton and Georges Valley.

Project development has gone hand-in-hand with the evolution of the Co-operative and has built on existing skills of women and men as well as on the interest demonstrated by members. A sustained training programme to support the co-operative has been fundamental to the process and these and other inputs into the activities come from various development agencies and from members in the Co-operative.

3.4.5.2 Operational History

The Co-operative is involved with the activities which are listed in Table 2, below.

Table 2. PROJECTS OF THE UFMC[4].

KEY: F = female(s); M = male(s); T = total

ACTIVITY	F	M	T
Agriculture (Organic Farming)	8	3	11
Food Processing:			
Peanut	7	1	8
Bammy	4	-	4
Bee-keeping	1	2	3
Garments	8	-	8
Building Skills	-	3	3
Total	28	9	37
	76%	24%	100%

There is a fair level of linkage within the projects; for example, peanuts are supplied by farmers, approximately 50% of whom are women and are themselves members of the co-operative. The enterprise is run by a Board of Directors 60% of whom are women. A manager - male, is responsible for day-to-day operations.

3.4.5.3 Agro-processing

Sun baked peanuts (salted and unsalted) and peanut drops.
The peanuts are baked in locally made, simple, box-construction, **direct-mode** solar ovens. Products to be baked must be exposed directly to the sun's rays.
Gas-fired stove (domestic type) is used to process **peanut drops** which are made from solar-oven-baked, stripped, peanuts, along with the addition of brown sugar, ginger, cinnamon, and other spices.

> (See **Annex 6**: For (i). Solar Oven Description & Peanut Drops Manufacturing Outline, (ii). Projected Production Costs & Revenue For Peanut Production)

[4] The Bammy Project involves four (4) women at Seven Corner/Leeds District. The team visited the site, which confirmed the need for much infrastructural and technological upgrading, but did not have an opportunity to speak to any of the women. The leader of the project is reportedly a former leader of a RADA bammy project. It is said that a project proposal has been sent to the WFP on behalf of the group.

3.4.5.4 Food Processing

Subsidiary Processing of Bammies

At 7-Corner, Leeds District, St. Elizabeth, four (4) women Co-Op members are involved with bammy processing using traditional, very basic, home-scale technology and equipment.
This activity is carried out at a private house which belongs to a Co-Op Board Member. The evaluation team visited the site (un-announced) and was able to inspect the facilities, but was unable to interview the participants as they were away making bammy deliveries in the nearby town of Santa Cruz.

Peanut Processing

The peanut products (sun baked peanut, peanut drops) project involves seven (7) women and one (1) man. Participants have been focussed around the necessary training within the project. Two (2) days a week, 4 hours weekly, they go to classes for mathematics, english language and business; three (3) days they do processing of peanuts, from 9:00 am to 3:00 pm.
This phase was due to end in August 1996 after which the women are expected to combine individual production at home, with packaging and marketing of products on a collective basis, through the co-operative.

Problem Analysis

3.4.5.5 Technology Application Constrains Productivity

Peanut Processing

As was the case for Lime Tree Peanut Processing Unit, this project utilizes a locally fabricated electrically powered peanut sheller, which has a stripper attachment (to effect the mechanical remove of the outer red/pink skin from the shelled nuts). This equipment is also in need of repairs and/or calibration, hence manual stripping is done. Hence, the productivity is constrained and severely reduced by this necessity to manually remove the outer skin from the sun baked nuts.

Here as in the case of Lime Tree Garden PPU, there will be excessive exposure of the processed nuts to contamination which is not conducive to hygienic operations, and is inconsistent with established Good Manufacturing Practices (GMPs).

Bammy Processing

Bammies are processed in unsuitable surroundings, using traditional, very basic, home-scale technology and equipment. The manufacturing process is similar to that being pursued by Olga Turner, and therefore, draws similar criticism and comments.

3.4.5.6 Women's Concerns Need Attention

Working Co-operatively and Individually

While the women in the peanut processing project say they want the Co-Op to work, they say also that they would like to complete their training and set up their own little business. This way they can combine the home production with domestic work. Many also expressed the view that their earnings will be more under their control by this arrangement, once an

active marketing thrust is developed and maintained.

The exact arrangements for individual home production and co-operative packaging and marketing, have implications for the production process, for example, quality control. This will require fuller discussion and planning.

3.4.5.7 Care and Upbringing of Children.

Care of children does pose a problem. Five (5) of the participants range from twenty one to thirty seven (21-37) years of age, with a total of thirteen (13) children, had daily responsibility for nine (9) children, the majority being under ten (10) years of age (including babies). Three (3) of the women reported that they would sometime take their youngest children to work and a minority of mothers report having a 'hard time' dealing with child care.

There is presently a Basic School with some twenty five (25) children, in Elim, located at a Community Centre. However, there is no electricity, no water or kitchen facilities. It is felt that a Day Care Centre attached to this facility would greatly assist the women and be of great service to other members of the Co-operative as well as other parents in the area. Women expressed the hope that the Basic School and other facilities will be in place with Government's assistance in 1997 and that the Basic School can be registered.

In terms of conjugal status, three (3) of the five (5) participants were single parents while the other two (2) were in common law unions. Among the latter, it was stated that the men would 'help' with the housework since the women were operating outside of the home. Overall, the women spoke of 'good cooperation from the men'.

There was also a problem reported of many children not going to school regularly and the low level of authority that parents, many young single women, had in ensuring their children's proper upbringing.

3.4.5.8 Issues of Health

Initiatives towards a Wellness Clinic have been taken by the main leader and organizer of the UFM-P CO-OP, with one Doctor coming from Westmorland once monthly and addressing the needs of both women and men. There is scope for extending this programme, it is said.

3.4.5.9 Transportation

High transportation costs are also a source of concern. The UFM-P CO-OP has put together a development plan which includes the proposal for a truck and other capital investments to address some of the issues cited.

3.4.5.9.1 Continuing Education and Training.

In addition to the project-centered training mentioned above, sponsored by HEART/NTA and the WFP, the participants in the food processing project, along with other Co-op members are exposed to training coordinated by the UFM-P CO-OP with agencies like CARDI and OXFAM in areas like: pest control, HIV/AIDS, Drugs, land issues, Women and Gender issues.

Both women and men expressed interest in other areas of education and training as follows:

- Family Life and Gender Issues - this issue is 'hot' it was reported, because it was felt that 'women are becoming too vocal'. Areas to be covered should include man/woman expectations in relationships and marriage;
- Promoting the importance of children going to school;
- Violence and sexual abuse, with reference to rape, incest and carnal abuse;
- Healthy life-style against drugs;
- Sports and culture.
- Promoting Cooperation
  - what we can get from working together
  - communication
  - building trust
  - conflict resolution
  - building and strengthening community organizations.
- Promoting national and regional networking through exchanges at level of community/group members.

3.4.5.9.2 Project Achievement, Impact and Sustainability

i). A Communities Network Structure is in place and functioning like a Co-operative;

ii). The Planning process seems deliberate - people understand and seem to operate within the framework of linkages within the network;

iii). Group building and training are fairly constant, on-going, from reports;

iv). The agro-processing project has been able to attract outside support and the interest of the women has been sustained to date;

v). There is a 'family of projects approach', with integration, e.g., between farming and production, as well as among the agencies to a large extent;

vi). Knowledge of UFM-P CO-OP exists fairly widely;

vii). Organizational sustainability in terms of leadership, is somewhat problematic. There is strong reliance on the main organizer. Within the agro-processing sub-project, the test of cohesiveness is still to come and the challenge will be to marry individual and co-operative elements. Although there is some attention to succession planning, it is difficult to judge whether there is enough strength of management structures to deal with these issues of human resources development and management.

Sustainability a therefore, a big issue.

4 LESSONS LEARNED FROM THE FIELD

The lessons learned from the field, which are also validated by other studies, can for convenience be grouped under **technical process observations** and those relating more to **human resources development**. These two aspects must be clearly interlinked and interdependent, if the objective of addressing poverty among rural women through their involvement in micro-enterprise agro-processing, is to realize the prospects that exist.

4.1 Agro-Processing Projects Should Be Market-Sensitive

One of the main lessons from the field studies is that project implementation should be preceded by comprehensive market study, inclusive of test marketing to fine-tune product specifications and inform the product(s) and process (technology choices) to be employed in processing activities. The acquisition of early market information allows for the examination of opportunities and constraints of different products and technology choices for small-scale agro-processing, and the technical aspects associated with them, e.g.:

method of preservation, facilities, equipment specifications, quality control, good manufacturing requirements and associated training needs.

This would inform the design of the main phase of the project and implementation activities, thus enhancing the chances of viability and sustainability.

Relevant and current marketing/sales information are important for decision-making, as success will be ultimately dependent on what can be sold. In several cases in the field there were **good products evidently 'waiting' on a market.**

4.2 Raw Material Component of Projects Vital

The Wakefield experience in particular has shown that the absence of a predictable and reliable raw material source is an obstacle to project stability and viability.

Crop Database

In spite of the abundance of fruits, vegetables, and nut raw materials within most parishes, it is apparent that an **organized collection system** which benefits the farmers and small-scale agro-processors is required. The system adopted by the Long Road CO-OP should be studied.

An effective system would have to be based on an accurate and up-to-date information on raw materials availability, which incorporates:

i). aspects of their collection, pricing and delivery to processors, as well as;

ii). allowing for accurate forecasting on available raw material supplies, its quantity and location.

This timely information would facilitate, or make it possible to develop and maintain equitable pricing structures.

The absence of appropriate agricultural raw material pricing policies for the agro-processing sector is another problem which has resulted in high cost of raw material and low productivity, serving to re-enforce the lack of trust that exists between farmers and processors.

Farmer-Processor Link

Another important approach to providing the vital raw material input is demonstrated from the field where participants in the Lime Tree Garden peanut project are also peanut farmers. Farmers in the United Farmers: (M-P CO-OP FPP) also supply peanuts to the agro-processing component of the Co-operative. These developments are to be encouraged because they help to instill enthusiasm and feelings of "ownership" of the project.

Strategic Role for RADA

The role of RADA as a lead agency in dealing with the long-term raw material needs is vital, and it is encouraging that **RADA's Area Development Projects (ADPs) proposals for 1996/97** include plans for the establishment of crops which include ackee, breadfruit, hot peppers, mini-sett yams, cassava, dasheen, number 11 mango and peanut.
Looking at agro-processing, the plan must be extended to include the grafting of desired guava varieties and top-working of existing mango trees and establishing orchard crops in other varieties like jackfruit, cashew, otaheite apple and june plum.

Strengthening the links in this chain of activities towards developing a regular supply of locally produced raw materials at reasonable cost and an adequate regular supply, will help to overcome a long-standing limitation to the development of our local food processing industry, and will impact equally on small-scale agro-processing activities.

4.3 Technology/Equipment Selection. A Challenging Issue

For small-scale agro-processing enterprises the technology and equipment employed should be **effective and commercially proven.**
Wakefield, for example, having been equipped with an electrically heated drying cabinet and solar dryers - have turned to operating mainly with the electrically heated drying cabinet, which was primarily used to produce only the dehydrated fruit bars (guava/mango).

The use of this type of drier (electrically heated drying cabinet), allows for good control over drying conditions and therefore, has the potential to produce a high quality product. It can be operated at all times of the day (and year), and in most cases will produce a high rate of drying. These benefits must be evaluated against the **higher operating (and capital) costs associated with the extensive use of this dryer.**

Experience with Dehydration Technology and Solar Driers

The efficiency of the solar driers which were in use at Wakefield and similar ones in use by Lime Tree Garden Project and other projects in Jamaica, can at best be described as "experimental", and have proven to be ineffective commercially. Their performance has adversely influenced the economic viability and contributed to the failure and subsequent closure, of the solar drying projects which were coordinated by the University of Technology (U-Tech.), Entrepreneurial Extension Centre.

(See **Annex** 1: Description of Solar Driers in use by some projects; Solar Drier Selection - Issues for Consideration)

An efficient and effective solar drying system could provide a cost **effective alternative energy solution** that could and should be utilized when suitable for drying other products.

The desired transfer of solar drying technology from the supporting institution (FTI) to the target beneficiaries was seriously affected by the **use of unproven equipment and its associated technology**, inclusive of pre-treatment procedures which necessitated in-field process development activities on the part the beneficiaries, who were ill-equipped to take on process/product research and development activities.

The services of **Dr. Oliver St. C. Headley** should be requested to provide the necessary technical and hands-on input that will lead to the selection and development of **appropriate, cost effective and commercially viable** solar dryer(s), and the associated **transfer of appropriate, proven technology** to meet the varying needs of small-scale agro-processors.

Working towards these features highlights the need for:

- access to a **database** with inventory of available small-scale, appropriate processing equipment, along with price information;
- project participants/beneficiaries to receive training in basic **equipment maintenance**, with the option of selecting someone who will be responsible for the day-to-day cleaning/sanitizing, servicing and maintenance of processing equipment.
- **processing activities and technology choices** to be made with due consideration of **educational level and learning curve**. They should always be within the competence of the targeted beneficiaries.

4.4 Quality Control (QC) Needs Attention

With consumers becoming more sensitive to issues of food standards, pesticide contamination, nutrition labeling and current technological options e.g., low sodium, high fibre, minimally precessed, less or no preservatives and the use of exotic herbs and spices - quality must necessarily be at the core of any strategy developed for improving the contributions of the agro-processing sector to socio-economic development.

In may instances, considerations on quality control and on good manufacturing standards did not seem to have taken a high priority in the production process.

This can have varying results; for example, where similar product concepts adhere to different standards (or show wide variations from batch-to-batch), this may have an advantage in conferring uniqueness to products processed by different enterprises. But, where these differences:

either, result in non-conformance with local standards of identity

or, do not meet consumer expectations, then problems will be encountered in marketing these products. Therefore, there is a need to standardize products, and improve the quality control aspects of their processing.

The absence of unifying standards will also frustrate efforts to "**group market**" such products, as each agro-processing group (or individual) will have different ideas about the acceptable quality profiles of a particular product.

The Jamaica Bureau of Standards (JBS) clearly has a role in the dissemination of product standards information and in providing analytical and general quality control laboratory testing services. The JBS should be encouraged to initiate a process of accreditation of local schools' laboratories and other institutions (e.g. Lime Tree All-Age School and Elim Agricultural College), which can provide basic QC testing services for these small-scale projects.

Packaging & Labelling

Considerations in relation to poor levels of quality control, extends in general to experiences with packaging and labelling. Where packaging was found to be appropriate, it was often not available at reasonable prices, therefore, could not readily be utilized by small-scale agro-processors. The establishment of a central facility for locating, importing and retailing required packaging materials would facilitate small agro-processors in their efforts to acquire appropriate packaging.

4.5 Gender-Sensitive Indicators Reveal Need for Holistic Integrated Human Development Approach to Women in Micro-enterprise Agro-processing:

a). **Agro-processing and women's basic needs** - food, water & fuel, health care and housing; for equitable distribution of basic resources between men and women, the lessons from the field revealed the following:

> **" The first assumption underlying the study, namely that agro-processing can 'significantly expand employment and income benefits' does so far not hold true in the Jamaican context."**

i). Women are drawn to the possibility that micro-level agro-processing activities can be a source of employment and income because there are few barriers to entry in these activities. Further these activities seem compatible with the fulfillment of family responsibilities. Women in the United Farmers: (M-P CO-OP FPP) and Lime Tree Gardens stressed this. It is evident that under present conditions the features that make agro-processing attractive to women are among those that make this sub-sector so vulnerable and therefore unable within the present framework, to meet women's practical gender needs. This experience has been confirmed from extensive research in Africa.[5]

For the same reasons women generally do not see agro-processing as an avenue for sustained and secure income. It is therefore not regarded as the preferred area for self employment. In the Gillings sample for example, most women (26% of sample) preferred poultry rearing; only 7% expressed interest in small scale agro-processing.

In the field in this present evaluation there was no record of increase of women in employment in the projects, but a contraction. For example in Wakefield, women moved out into other areas and into unemployment. Even in Lime Tree Gardens which has so many positive features, women are

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[5] See for example, Marilyn Carr, " Women in Small Scale Industries- Some Lessons from Africa", in **Gender, Small Scale Industry and development Policy**, (Ed. I.S.A. Baud & G.A.de Bruijne, I.T. Publications, 1993, pp.109-115.

occupied only on a part-time basis and seem wil... below the minimum wage because they have a sense ... process. The Long Road experience is particularly ...

ii). The ranking of agro-processing is influenced by ... among them the level of returns, the time and effor... experiences of participants. An important aspect of the ... women in Lime Tree Garden which encouraged a positive atti... the low income was their ability to increase their income by ... peanut producers and processors. There are no data on earnin... these combined activities, but the women expressed optimism that ... were prospects for advance 'down the road'.

iii). Available documentary information, including the Gillings' study on Jamaica, has concluded that the majority of micro-enterprises have failed to make any significant impact on women's lives. The first assumption underlying the study, namely that agro-processing can 'significantly expand employment and income benefits' does so far not hold true in the Jamaican context. It follows that the feasibility of achieving income related outcomes is also low. In other words, assessed on the criteria of 'the market', the expectations established for agro-processing are not realistic.

The condition of life of the women both in the Lime Tree Gardens and the United Farmers: (M-P CO-OP FPP) is one in which there is a problem with basic amenities - no running water, poor road conditions, difficulties with transportation, etc.

To organize women for production without taking these aspects into account, result in the workload of women being increased. This also underscores the importance of labour saving devices within the household as within the work place to reduce the work-load of women.

b). Agro-processing and women's access to and control over resources: employment and income; land, credit/financing, production and marketing of goods; experiences in management, etc.

Low Incomes, Unstable Employment

i). Income from agro-processing is low, yielding income for only 4% of women sampled in the Gillings' study. These were women mainly from Kingston and St. Andrew and RADA groups. Only one respondent in the sample said that agro-processing was her only source of income.

The recent field studies confirm this trend. Incomes have been low in all instances. In the Wakefield experiences, incomes have actually fallen over the life of the project; in the Long Road project, the estimated cost of lunch took up 33% of the day's pay.
Many factors directly affected the projects and therefore the incomes they could sustain.

ii). Field studies in the targeted areas did not reveal any case where women did not have control over their incomes. Indeed, especially in the Lime Tree Gardens project, the women took particular pride in the fact that they were able to use their earnings without their men having the authority to question their expenditures.

Little Increase in Asset Base

iii). There were no indications from the field ... men individually had been able to increase directly their ... credit. However, within the context of co-operative ow... experience of Lime Tree Gardens, women had increased the... and also increased their potential to participate in any credit programmes for extending peanut production. In the ca... United Farmers: (M-P CO-OP FPP) project, the women held out ... individually acquiring equipment from the Scientific Research Co... (SRC) and credit from the Co-operative to develop their indivi... enterprises. Whether this has happened is still to be assessed.

iv). There was evidence of women in an enabling environment, gaining experience in leadership and management and being equipped for greater levels of entrepreneurship.

c). **Agro-processing and changes in the gender division of labour**; in what women and men do in the private and public areas of their lives.

Low Level of Domestic Responsibility by Men

i). In the field survey, the majority of women had partners and children, hence they saw their relations with their men as a very important aspect of their lives. Discussions which related to their partners served to highlight this aspect of gender relations especially in discussing whether and to what extent, men had assumed more domestic responsibility, for example for cooking, child-care or washing in light of women's increased presence in productive work outside the home. From responses, it was clear that in general, men had not taken on more domestic responsibility.

In Lime Tree Gardens the children were reported to be doing more, especially with child-care; some husbands would occasionally 'help' with the cooking. Partners' help was not as fully noted by women from the Elim community of the United Farmers: (M-P CO-OP FPP) project. This may have to do with the fact that most of the women in the A-P project in that community were not in stable unions with men.

Women Working Longer Hours

ii). In Lime Tree Gardens, women said that they were working longer hours in order to keep up with the domestic tasks, especially washing and ironing. The Elim women did not complain about this aspect, but more about the difficulty of child care. In most cases however, what was happening was that women were increasing their number of hours of work related to family and reproduction as well as to activities outside of the home. This was also a finding of the Gillings' study.

In no instance did the women express the expectation that the men should assume more of the domestic duties in response to their (the women's) expanded responsibilities as workers, nor did they report any consciousness on the part of the men that this should be the case.

It is interesting to note that a 1993 **IICA/IDB** study on **Women Food Producers** in Jamaica found that " reproductive activities remain the domain of women in spite of their high level of involvement in productive activities". This observation was linked to an earlier 198 study which had observed 'very minimal involvement of men in food preparation and house-keeping tasks such as washing, ironing an

cleaning[6]. Data generated from the 1993 study involvement of men in domestic work as is reflected

g men over ge nd s

Table 3

Family Members' Participation in Reproductive Activities, Jamaica,

Reproductive	Respondents	Other Women	Men
Prepare Food	141	15	10
Gather Firewood	48	7	55
Carry Water	47	9	16
Wash Clothes	132	22	5
Iron Clothes	110	11	4
Clean House	93	16	2
Child Care	42	4	1
Shopping	109	9	9
Repair House & Furniture	11	3	16
Sew/Mend Clothes	34	1	2
Pay Bills	54	2	18
Clean Yard	41	5	22
Tend Garden	26	2	11
Transport Children/Others	1	0	1

Source: **Women's Food Producers Survey - Jamaica, 1993** in Inter-American Institute for Cooperation on Agriculture & Inter-American Development Bank, **Women Food Producers in Jamaica: Assessment and Policies** by Faith Innerarity; p.116.

[6] Inter-American Institute for Cooperation in Agriculture, Inter-American Development Bank - **Program for the Analysis of Agricultural Policies vis a vis Women Food Producers in the Andean Region, the Southern Cone and the Caribbean.**
See: Faith Innerarity, " Women Food Producers in Jamaica; Assessment and Policies", Feb. 1996.

Gender Relations, Issue of Development

Considering that people who act outside of their gender roles (e.g mei washing) might in a small community face ostracism ("maama-man") it is not to be expected that men will 'automatically' rush to take ove: what are perceived as women's tasks, or that the women will encourag them to do so. This underscores the importance of policies an programmes which explicitly address these patterns of gender relation as issues of development through various measures.

d). Agro-processing and the development of women's skills an productive capacity; the promotion of women's rights and access to al forms of education and training.

Some New Skills Being Transmitted

i). Training in the projects under review has generally involve introducing women to food processing skills, the extent and variety o which are based on the projects. For example, the nature of thei operations have meant that women in the Wakefield Project were expose to a wider range of technical knowledge than those in peanut processing In all instances new skills were being learned, for example, in book keeping, management, and not in related higher status skills an occupations.

The introduction of new skills is also limited by the cultural level o project participants, the range of tasks that are required to b fulfilled, and by the framework within which the training i implemented. For example, in the United Farmers: (M-P CO-OP FPP) projec training is offered under the Skills 2000 Project by HEART/NTA, and al the women have been able to participate in training in basic productio and in book-keeping. However, in Lime Tree Gardens, a more limite number have been exposed to basic management and bookkeeping. There i no information that training has been provided in marketing, a mos critical area.

Basic Education - The Foundation of Training

ii). The objective of inducing poor women, many often with low levels o formal education into projects cannot be tackled without attention t first providing basic literacy skills. This underscores the holisti approach to training and education that is needed for moving women int sustainable economic ventures. Both the women in the Lime Tree Garde project and the United Farmers: (M-P CO-OP FPP) project, pointed to thi aspect, when they spoke to aspects of their personal educationa development that they hoped to accomplish, and of the areas of broa awareness that they would like to see addressed in community education

Valuing Women's Time

iii). Training is an area of significant costs by agencies and a important investment of time by women. Women, especially more matur persons with family responsibilities are not going to be attracted int training unless a subvention is provided. In the Wakefield experience transportation and accommodation costs were covered for the training i Twickenham Park and in the United Farmers: (M-P CO-OP FPP) project, $25 are provided to each participant for lunch and transportation for th two days of training per week. Discussions on the subventions shoul therefore form part of the general participants' assessment of projects

Need For New, Holistic Training

iv). Consideration needs to be given to training women for new occupations and for achieving the highest levels possible within any project or family of projects. This must include training in technical skills related to the application of technology, including making and repairing of machinery and equipment.

The recommendations made by Innerarity relating to appropriate technologies as these relate to Food Processing are relevant here. She proposed inter alia:

> " carrying out socio-economic surveys to identify women's constraints and potentials and to ensure that new technologies will not disrupt the balance in male and female labour inputs";
>
> "Training men and women at the local level in the maintenance and repair of locally produced or imported equipment";[7]

v). A gender perspective must therefore inform the assessment of and planning for training needs at the project level, the institutional level, as well as at the national policy level.

At the level of the projects, programmes of continuing education in agro-processing have not been in evidence. This is an area that can be corrected through the adaptation of existing training materials produced by UNIDO-**Training Programme for Women Entrepreneurs in the Food Processing Industry - Vol. 1 & 2.** Covering a wide range of content, for example, Entrepreneurial Awareness, Technology Choice, Technology Skills, Management, and presented in simple, clear language on a work-book modular format. The content can be easily adapted to meet the levels of students and their needs.

Also at the project level, programmes in gender analysis and planning must be integrated into the overall training programme.

At the agency/institutional level, (for example, within the inter-agency network) training in gender analysis and planning is going to be necessary to support the design and implementation of policies and programmes.

e). Agro-processing as entry point for women to assess their own and their communities' needs; in promoting women's leadership and strengthening local and national networking.

'Top-Down' Approach to Development Persists

i). The 'top-down' approach to project development was very much in evidence in the field. Because the fullest involvement of the intended beneficiaries has not been encouraged from the project formulation phase, opportunities for women to define their own and their communities' needs have been limited. The information gained from their early involvement in determining and agreeing on the essential elements of the project, would strengthen their ability to use their skills and information for problem solving in relation to the day-to-day management of the enterprise.

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[7] Innerarity, pp. 139-140.

The extent of 'ownership' that women experience and express for the projects is directly related to the level and extent of their involvement at all stages.

Women in Leadership, but Limited Training

ii). In all the projects under review women were reported to be in the governing bodies but there is little that can be said on the patterns of decision-making and management within those bodies. Because the projects were developed from a women in development perspective and not from one of enlarging women's all-round capacities and contributions, specific attention had not been paid to either assessing women's needs or in training women in leadership. At the same time women's leadership, especially at the operational level of projects, has been enhanced.

Some of the challenges involved in encouraging women's leadership are worked out in the context of efforts to bring women together in work collectives. For various reasons, not fully explored, some women in the project expressed some apprehension with working in groups and the obstacles to the exercise of women's leadership have to be considered also in this context.

Experiences in the exercise of leadership by women need to be assessed as part of efforts at group building and raising the influence of women.

f). Agro-processing as means of **raising awareness among women and men about gender inequities**; putting on the national agenda issues of gender and development; helping women to challenge inequities in the private sphere.

Without conscious inputs, micro-level agro-processing, because of its characteristics can reinforce traditional gender relations. However, because women were making adjustments to their livelihood situations, it was easy for them to interpret what was happening in their lives, once the issues of gender were explicitly raised.

i). In both the United Farmers: (M-P CO-OP FPP) project and in Lime Tree Gardens women called for opportunities for public discussion on issues related to gender relations. In Lime Tree Gardens they expressed the view that the men's support could be stronger if they (men) understood the nature of the pressures on women and hence, the importance of sharing domestic responsibilities, for example. In the United Farmers: (M-P CO-OP FPP) project, men expressed concern that they were being 'challenged' by women and that these issues needed to be aired since they created conflict in the family.

It was in this context that proposals were made by the United Farmers: (M-P CO-OP FPP) for information/educational programmes that would deal with many issues. The thrust of the proposed programme is to confront gender equity in a manner that seeks to change behaviours and relations for the strengthening of the family and the broader community.

ii). The opportunity for women to develop their consciousness lies in their greater organization at the community level. Already this is being facilitated through the projects, but for reasons already explored, coming together is not easy. It is especially difficult for the poorest women to whom A-P development is supposed to be directed, but who are by

no means the main participants in the projects and who do not have much of the precious resource - time.

This raises the need for special strategies to be utilized to attract the interests of the poorest women and to mobilize them at the village/community level. It requires further that: women's capacity to decide for themselves, to participate in both assessing their needs, evaluating their experiences as well as in organizing to address their interests, must be respected and validated.

Addressing issues of gender and development is therefore, fundamental to the thrust towards bringing micro-enterprise agro-processing development onto the national agenda. It is therefore, critical that planning of the implementation of the National Industrial Policy be informed by the discussion of the specific indices which should be used to design, implement, monitor and evaluate gender-sensitive programmes.

4.6 Supporting Organizational Framework Vital for A-P Development

The field study revealed the strong supporting role played by government and non-government organizations in the design and maintenance of micro-enterprises in agro-processing among rural women. This has been a historical role played by social service groups, and by women's organizations in particular.

A number of organizations were involved - among government agencies there were the Social Development Commission (SDC), RADA SS/HE Programme, HEART/NTA, and other educational institutions; from the non-government sector, the 4-H Clubs, church organizations and individuals, the Jamaica Agricultural Society (JAS), and women's groups.

The analysis of the gender-sensitive indicators as well as the entities mentioned above, help to underscore the fact that a wide range of assistance - social and technical - is needed for effective development of micro-level agro-processing.

Technical Assistance Support

Technical assistance support should be available, especially in the early stages of the project when such support should be readily accessible to fine-tune processes and procedures. Beneficiaries should not have to undertake product/process development and research activities. Such activities should be carried out by competent supporting organizations and institutions with the capacity to research, develop, adapt and transfer, product/process development/modification to the project.

To be effective, there must not only be an integration of the required activities and the supporting institutions, but also of all the processes and operations involved - farming, post-harvest handling, processing, distribution and marketing activities.

4.7 Extension Services Are Vital

Some of the existing projects have benefitted from the Rural Agricultural Development Authority's (RADA) Social Services/Home Economics Programme in the rural parishes. RADA has provided extension and marketing services to some extent and their contribution has kept

alive indigenous processing methods and products. Extension activities must be further strengthened to assist with the establishment of sustainable business operations.

4.8 Summary of Constraints of Recent/Past Projects

The foregoing identifies a number of the factors which militate against the effective development of agro-processing at the level of micro-enterprises. These include:

- insensitivity to the value of inputs from market studies and analysis in informing project design, implementation options, product concepts, processing and technology options;
- instability in raw material inputs;
- weaknesses in the application of appropriate technologies;
- scant attention to issues of quality control and good manufacturing practices;
- inattention to the broad socio-economic and political context within which women, as targeted beneficiaries operate. Hence, project design and implementation are not sensitive to the gender specific all-round needs of women beneficiaries;
- 'top-down' planning by 'experts' which does not take into account the views and experiences of the intended beneficiaries or the communities. Hence, requirements relating to design, raw materials, technology, marketing and management, are outside of the influence and control of the women and men for whom the development is justified!

4.9 Summary of Strengths

At the same time, it is evident that there are specific features that account for the areas of strength, which to varying degree, each project exhibits. These include the following:

i). **The Co-operative Framework**
The co-operative framework within which most of the projects/enterprises operate offer a framework which encourages individuals to make effort, to persist in training, in making some effort in the search for solutions to the challenges they face together. As a group, beneficiaries can more easily access training and other facilities including financial grants and credit which are generally not available on an individual basis.

ii). **Linkages Into Broader Community Development Efforts**
The link of the agro-processing project within a community thrust, however underdeveloped, can lend vital support - for example, technical assistance. The linkages within a supporting social network from the community and through to the national level - for example, with agencies, help to build commitment to the process and broaden the network of those who have an interest in a positive outcome for such projects.

iii). **Experience With Indigenous Technologies**
Where relevant indigenous food preservation technologies of locally grown crops are incorporated into processing activities - directly or after appropriate adaptation or modification - the participation of the beneficiaries in the various unit operations of processing is encouraged, and learning appears to be enhanced. This may in part be due to familiarity with the basic product concept, as well as an understanding of quality parameters which are acceptable.

With newly acquired skills and their past experiences, participants readily engage in problem solving activities to cope with the day-to-day operations.

iv). **Farmer/Processor Linkages**
The feelings of "ownership" and "responsibility" for the success of the enterprise is strengthened and one of the constraints to productivity (raw material supply) is alleviated, where the processing enterprise beneficiaries are involved in the production of raw materials for processing activities. There may be varying degrees of involvement, directly or indirectly, e.g. by husbands or other family members, or the project may involve farmers of the immediate community or neighboring community.

It is clear that the objective of interventions to develop micro-level agro-processing cannot be seen only in economic terms and that the potential for agro-processing to be an entry-point to wider processes of development at the community level needs to be centrally considered.

4.9.1 New Approaches to Development

It is clear that the objective of interventions to develop micro-level agro-processing cannot be seen only in economic terms and that the potential for agro-processing to be an entry-point to wider processes of development at the community level need to be centrally considered.

This will require, among other things, that the individual and oftentimes fragmented 'projectized' approach, of development agencies (which in the main pursue their individual agenda without collaboration with others) has to give way, to a more holistic partnership approach among agencies and with project participants.

5 RECOMMENDATIONS ON INDIVIDUAL PROJECTS

In light of the issues raised above, including the critical factors of strengths and weaknesses, the following recommendations are being made in respect of the individual projects.

All recommendations are made on the understanding that the responsibility and authority to decide on the direction of the projects rest with the project participants and partners themselves in the final analysis. Recommendations relate to both technical aspects as well as to issues of process relating to the immediate actions that are proposed following acceptance of this report by the sponsors.

One critical consideration from a 'process' perspective is that decision-making should be 'bottom-up', resting on the fullest involvement of the project participants/beneficiaries and the community framework which supports the project.

5.1 Wakefield Project - Trelawny

1). The project will need much technical and financial assistance if it is to be retained as a processing concern. Technical issues of ownership and the associated legal framework will have to be addressed. Further, it will be necessary to initiate improvements based on appropriate technologies, for example, on aspects of the commercial efficiency of the solar drying component as well as treat with raw material inputs in a strategic manner.

2). The project could be re-oriented with an emphasis on processing/producing products based on market information which is fine-tuned by **test marketing** of product prototypes and not only on demand forecasting of product categories.

3). Strategies for viability should be explored, for example, the market for bulk packaging and retail dispensing of in-season fruit purees/pulp, nectars and juices through schools (e.g. Schools Feeding Programme), restaurants and other institutional trade areas. This approach can also entail the utilization of cheaper packaging.

These investigations must include test marketing of prototypes, to fine-tune end product specifications.

(See **Annex 2**: Description of Juice Dispenser & Supporting Packaging)

4). If this venture proves successful, consideration should also be given to offering **franchise arrangements** to hotels, shops, restaurants, health centres, etc. to carry the line of in-season fruit juices, in dispensing units specified by the project and operating under the control of the processing unit, which would be in a position to promote these products under a registered brand name.

Other product concepts that may be investigated for use by foodservice institutions include Sorrel jelly (used like cranberry sauce) and low-fat, low-calorie, fruit based salad dressings, e.g. mango salad dressing(s).

5). Monitoring, evaluation and reporting, should be treated as integral aspects of the project cycle and should be continuous.

6). In order to decide on the path forward, a network of related interests in the area should be brought together through a workshop to discuss the future direction in the project using this present study as the main input, but looking more closely at the history.

Participants in the workshop should include RADA - the Agricultural Extension and SS/HE Divisions, the JAS Branch, schools in the area, former workers, the nearest clients, churches nearby, NGOs in the area, political parties' representatives, FAO, UNIDO, WFP and JAMPRO.

The purpose of this would include:
- assessing the lessons of the evaluation experience;
- soliciting views on the future of the project;
- identifying participants for a network for the rehabilitation of the project - that is, creating the inter-agency network at the community level as is vital to the development model as proposed for the United Farmers (M-P CO-OP FPP) and as exists in Lime Tree Gardens.
- deciding on what actions should be taken in the short and medium term and who will be responsible for such actions.

5.2 Olga Turner - Individual Entrepreneur

Note: Miss Turner's perspective is towards expanding her enterprise, stabilizing bammy production, and banana and papaya "raisins". With investment in buildings, facilities, training for women, and stable marketing, she sees the possibility of employing ten (10) persons, six (6) women and four (4) men, at least at minimum wage level.

1). Acquisition of appropriate solar drier(s), appropriately modified for the processing environment and products to be dried.

2). Training: in aspects of small-scale agro-processing of fruits and vegetables, inclusive of small-scale fruit wine technology. Participation in the recommended **UNIDO Training Programme for Women Entrepreneurs in the Food-processing Industry.**

3). Assistance in marketing, packaging and labeling.

4). The full requirements and feasibility of the project must be assessed with emphasis also placed on how the community is to benefit in specific terms. Such an assessment of requirements for implementing a sustainable project needs to include marketing, land [8], finance, capital, equipment, as well as required statutory and social development requirements, that as an employer of labour she would haver to meet.

(See **Annex 3**: Olga Turner's (i). Suggested Equipment Details; (ii). Projected Production Costs and Revenue for Bammies)

5). The assessment should include an investigation of whether and under

[8] Miss Turner owns the property on which operations are presently located.

what conditions Highgate Foods Ltd. or other enterprises could become a purchaser of products and therefore, a sponsor for the project. Other issues include how to ensure sustainability in terms of ownership, leadership, and community support.

There is not much information available in the literature on the individual enterprise model in agro-processing. Therefore, many issues are raised with different implications, for example, terms and conditions of credit, meeting the obligations as an employer of labour, and women's needs; and overall project sustainability.

5.3 Long Road CO-OP (DSPU)

1). The feasibility of the existing project needs to be assessed from the perspective of the women involved and with inputs from the broader community of interests. The following issues should be taken into account:

in the short term - modifications to the existing driers, which would improve their effectiveness and efficiency, and facilitate the hygienic production of dried products currently produced.

in the long term - acquisition of appropriate solar drier(s), appropriately modified for the processing environment and products to be dried and with similar descriptions to that proposed for other small scale agro-food processing enterprises (e.g, Olga Turner).

2). Effect modifications to the existing processing facilities to bring it in compliance with acceptable good manufacturing requirements.

(See **Annex 4**: Process Room Fixtures, Furniture and Associated Equipment That May Be Required)

3). Technical assistance is required in areas of:
(a). small-scale dried spice processing technology, with emphasis on production, process optimization, quality control and good manufacturing practices;
(b). packaging and labelling.

4). Training is vital in areas of post-harvest techniques, with specific attention to crops being utilized as raw materials by the agro-processing group. Further, extension service providers of the Co-op could benefit from being trained as trainers under the proposed **UNIDO Training Programme for Women Entrepreneurs in the Food-processing Industry**. This would enable and equip them with the necessary skills to train members (present and future) of the agro-processing unit.

5.4 Lime Tree Garden (PPU)

1). The project has just completed its first year of operations for which a specific programme - with targets, time lines, etc., was developed. RADA, the Management Committee and the beneficiaries, should do an evaluation of the process, and based on this, develop a follow-up plan of action for the medium and longer term. This should be done with effective community participation.

2). The evaluation and forward planning should be considered in the context of the Integrated Rural Community Development model and the

overall plan of action should seek to strengthen community capacity, including:

(a). extending partnership with the Lime Tree All-Age School in community development projects, including continuing education programmes;

(b). implementing a sustained community education programme;

(c). building a partnership programme with mutually beneficial objectives, with the local JAS Branch;

(d). assessing, designing and implementing programmes for strengthening the functioning of the management structures, where necessary;

(e). extending relationships with like-minded groups, for example, the United Farmers Multi-Purpose CO-Op Ltd.

3). Speedy, mechanical stripping of the outer skin of the shelled peanuts, will only be possible when the present stripper attachment is repaired and/or calibrated by the manufacturer. This should be pursued to eliminate the time-consuming manual stripping - which slows down the operation as it creates a process flow "bottle neck".

This will also reduce the potential for contamination which may result from un-protected long exposure and manual handling of processed peanuts.

> In this connection contact was made with the manufacturer of the equipment[9], who assured the evaluation team that what was required is a "minor adjustment and calibration" of their present equipment to accommodate both functions effectively.

4). Investigate the feasibility of producing new products:-
E.g., if supported by marketing intelligence, a value-added product line targeting foodservice institutions, could be pursued, for example, **crushed, roasted peanuts.**

> (See **Annex 5**: For (i). Recommended Vacuum Packaging Equipment - that will be required, (ii). Projected Production Costs & Revenue For Peanut Production)

5). The management should investigate the possibility of securing funding under the proposed Jamaica Social Investment Fund.

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[9] Mr. Lawrence Johnson - Fabricator.
Manufacturer of the Peanut Sheller/Stripper.
Santa Cruz, St. Elizabeth. c/o Mr. Hardy, proprietor of:
Advanced Refrigeration Service & Sales, Market Street,
Santa Cruz, St. Elizabeth. Tel.: 966-9659, 966-3584

5.5 United Farmers Multi-Purpose Co-operative Ltd. (UFMC) Food Processing Projects: Sun Baked Peanuts & Peanut Drops; Bammy Processing.

1). Issues related to the stability and effective management of the UFMC in the immediate and into the longer term, need to be addressed. Some contact needs to be established with the UFMC Management to discuss the evaluation and to gain its perspective on the overall direction within the UFMC itself.

(It should be noted that there is the undercurrent of concern about the status of the present UFMC organizer which needs sensitive attention. The prestige of the inter-agency network - HEART/NTA, WFP, UNIDO, JAMPRO and CARDI - including the UFMC Management and other parties, need to sensitively explore how related issues can be resolved to the benefit of the UFMC as a whole).

It might be necessary, for example, to propose 'outside' management support to facilitate the integrated community development process which is underway through a Caribbean UNV posting.[10]

2). The start made by the UFMC towards an integrated rural community development process should be strengthened. Note in the UFMC experience the inter-agency network began in the community - with the citizens, the Roman Catholic Church and Elim Agricultural College, and extended to include other agencies like - CARDI, HEART/NTA, WFP, etc. These aspects must be nurtured in the process, and rest on the foundation of openness and accountability to the community, as a whole, and most assuredly to the members of the Co-operative.

3). Speedy, mechanical stripping of the outer skin of the shelled peanuts, will only be possible when the present stripper attachment is repaired and/or calibrated by the manufacturer (as was mentioned for Lime Tree Gardens project above). This should be pursued to eliminate the time-consuming manual stripping - which slows down the operation as it creates a process flow "bottle neck". As in the case for Lime Tree Gardens project - this will reduce the potential for contamination which may result from un-protected long exposure and manual handling of processed peanuts.

4). In the short term, appropriate standards and guidelines from the Jamaica Bureau of Standard and the local Public Health authorities should be applied to bring the bammy-making facilities in compliance with acceptable manufacturing practices.

5). The requirements for efficient, streamlined, process flow operations of the UFMC must also be addressed.

6). Measures to strengthen marketing, for ongoing training in areas like credit, saving and money-management, and issues in community education are critical.

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[10] The World Food Programme's proposals for United Nations' Volunteers postings should be discussed as a model for strengthening personnel in the project activities that follow this report.

7). Attention should be placed on group-building among the women in the Peanut processing unit, as well as those in other areas (e.g, organic farming). This women's group can be seen as the nucleus of a women's group within the UFMC itself.

8). The women could undertake as a responsibility, the spearheading of proposals for the child care services which they have identified as an area of need. On this basis they can expand their organizational outreach to include women who are not in the production network and bring the benefits of the UFMC to the broader community.

9). Focus on the development plan for the peanut processing unit and the bammy-making project, should be integrated within this broader development programme for the UFMC.

10). The major critical needs of the UFMC, must be assessed and sources of financing sought within the present three-year development plan which has been proposed. A suitable vehicle has been identified as a main requirement.

> (See **Annex 6**: For (i). Solar Oven Description & Peanut Drops Manufacturing Outline, (ii). Projected Production Costs & Revenue For Peanut Production)

5.6 OTHER GENERAL RECOMMENDATIONS

1). Training should be ongoing and involve all levels of persons involved in projects' design and implementation. Hence, participants should range from: community leaders and members to personnel of agencies/organizations in the support networks at the local and national levels; officers of the RADA Social Services/Home Economics Program (SS/HE) of the Ministry of Agriculture (MA) in the respective parishes, who provided extension services to rural groups and individuals involved in agro-processing, craft, etc., and who as well - need to be trained in integrated gender-sensitive community development.

The form and content of the training would depend on the target group, but the principle of **training of trainers** should be integral to the approach.

2). **UNIDO's Training Programme for Women Entrepreneurs in the Food-processing Industry**, based on the concept of "learning by doing", is important resource material which can be easily modified to meet the needs of the Jamaican situation. Important principles to guide the design and implementation include the following:

- Training must be on-location as much as practicable;
- Training must take into account the educational status of participants, and must go hand in hand with measures for continuing education, where participants express this interest;
- Training, while being product/process oriented and responsive to the dynamics of the market, must incorporate a holistic human-development approach and content.

- As much as is possible and practicable, expertise should be local, with strong background in the socio-cultural and socio-economic background of the targeted beneficiaries.

3). Educational content to support community cohesion and address wide concerns would also be part of any programme.

4). Issues of gender and development present an important area of new content. Some of the basic issues to be addressed in this area include:

- exploring development,
- understanding gender,
- exploring the social construction on gender in the Jamaican context,
- gender issues in development - in family and community and nation,
- identifying gender issues,
- ways to study the different gender effects on women and men (tools of gender analysis),
- how to use the tools of gender analysis matrix.

These areas would be explored through role playing, case studies and with other participatory techniques and tools.

5). Implementation of the projects' specific recommendations as well as the more general issues addressed, require a stable organizational framework - the development of which is addressed in the proposals for the Three Year Development Plan.

6 PROPOSALS TOWARDS A THREE YEAR PROGRAMME FOR REALIZING OPPORTUNITIES FOR WOMEN'S DEVELOPMENT THROUGH SELECTED AGRO-PROCESSING PROJECTS.

Purpose

To utilize micro-enterprise agro-processing among women as an entry point and model of a process of integrated gender-sensitive community development, towards breaking the cycle of poverty among women and their families. This will serve as a framework of implementing the thrust towards micro-enterprises development envisaged in the National Industrial Policy which is aimed at national sustainable development.

Integrated Community Development

Agro-processing for women at the micro-enterprises level will be developed within a integrated community development framework based on communities' needs assessments and the involvement of women and man in all stages of design, to execution and management, including monitoring of projects.

Community Leadership

It will be community driven and will therefore rest on the foundation of what is happening in the five project areas identified in this study, and on the responses and plans for development that stakeholders determine, through effective consultations.

A Community Management Team Approach, using linkages for development, as in the experience of Lime Tree Gardens, is recommended for study, refinement and application, in all selected areas.

While the specifics of the enhancement of the existing projects must be based on decisions at the community level, every effort must be made to include in programmes an element which focusses on children, in the spirit of commitment, to break the cycle of poverty and to unite the community around a shared vision of the children as the future.

Inter-Agency Collaboration

It will rest on effective inter-agency collaboration based on the existing framework of cooperation between UNIDO, WFP, HEART/NTA, JAMPRO, RADA, Food Technology Institute, Agricultural Credit Bank, and others, as will be determined by the core agencies.

The network will be an expression of the commitment of the agencies to agro-processing development; in a practical and sustainable manner, the agencies will combine their resources and expertise in the service of the sub-sector, and provide all round support, monitor, and evaluate the evolution of the projects, to isolate the lessons learned for the benefit of the individual agencies.

The network will serve to point a way towards integration in service delivery to men and women in the communities by like-minded entities, and represent a departure from the present practice where numerous agencies are working, presumably to the same goal, but in an un-coordinated way.

As a way of conducting its work in relation to these particular agro-processing projects, the network will negotiate a protocol to guide

operations of collaborating agencies, so that cohesion is maintained and objectives pursued.

Gender-Sensitive Empowerment Process Approach
Sensitive to the dynamics of underdevelopment and the varied needs of men and women in the communities, as well as the imperatives of the community empowerment approach itself. The model will rest on a process approach.

Explicit commitment to gender equity should be interwoven into all aspects of policy and programmes - their design, implementation, monitoring and evaluation. This is consistent with the findings of the study and the principles of the National Industrial Policy itself.

Backwards & Forwards Economic & Social Linkages
Project success will be pursued through backward and forward linkages, in economic and in social terms, to promote economic viability and towards sustainability, for example, through co-hosting relations with other enterprises.

An important aspect of such linkages will be a model where raw material producer and processor will be co-joined in the development process.

Training and Holistic Continuing Education
A programme of training should be implemented at the level of the inter-agency network, at the institutional level (e.g., within RADA and JAMPRO), and at the projects level.

IMPLEMENTATION FRAMEWORK:

Inter-Agency Network Coordinated by JAMPRO

1). A small focal point for the development of the model as proposed, should be established within the existing structure of JAMPRO. This will have to be through negotiation with the Ministries and agencies. The skills required are:
organizational/coordinating; technical knowledge of the sub-sector and its requirements.

The responsibilities will include:

- spearheading and coordinate discussions of the report among project members and documentation of the areas of agreement, in respect to the future of each project;

- developing a coordinated implementation plan for the family of projects for the 3 years. This is the tool for planning and monitoring at the national inter-agency level and for programme implementation at the local level;

- coordinating the implementation of training programmes at the inter-agency and institutional levels, for example, on gender and development;

It is going to be important that field staff, e.g, of RADA, JAMPRO and other agencies, share a general body of knowledge and develop a level of expertise in relation to the approach recommended, in particular,

regarding gender analysis and planning. It is also important that there be a sharing of skills and knowledge within the network, e.g, in food technology, in how to organize communities, how to construct a business plan, etc.

- assisting the local project management teams to implement their programmes of training and education by identifying resources, etc.;

- designing for implementation, models for effective linkages between projects and with projects and product-users.

Sponsoring of market research on local products will of necessity have to be coordinated from the agro-processing development focal point. Building partnership, for example, among producers and selected hotels, could be facilitated.

2). The work of the focal point should be financed through collaboration among the agencies, and the international agencies should be asked to specifically seek technical and financial support for the programme in the communities.

3). At the community level, development plans should be assisted to seek financing from government and private sources.

ELEMENTS OF WORK PLAN.

Under the leadership of JAMPRO:

1). Implementing the recommendations relating to the individual projects and developing a more detailed plan of action reflecting the decisions 'from the ground'.

The aim should be to offer holistic support to existing projects in terms of:

a). Processes
- quality control
- product (Research & Development)
- costing
- feasibility analysis

b). Marketing & Distribution

There is need to explore new and creative ways of marketing and distribution. This does not mean that JAMPRO itself will be taking on this aspect, but will be responsible to ensure that this critical area is addressed. There is need, for example, for market studies of particular products to be done, e.g., Bammy. (On what basis is bammy productive, feasible and profitable in Jamaica ?)

Other longer term perspectives on collaborative and dynamic marketing within the sector and through linkages between processing groups & individuals, as well as linking across sectors, need to be explored, for example, linking micro-processing with the tourism sector.

c). Financing

There is need to re-evaluate the issue of financial feasibility towards responsiveness to economic and social indicators. This should mean that

the provision of equipment, for example, by funders is an important input into projects where this is aimed at bringing more women and men into independent activity. There is need also to look more at sustainability, linkages and impact and not solely at profitability. Hence, capital investments in day care and basic educational facilities are to be regarded as vital to the development process.

d). **Research and Development**
There must be focus towards maximizing the use of by products ("waste products"), modifying existing/new products, developing new products, and exploring the use of new and innovative packaging.

Identifying new sources of supplies and equipment, including encouraging local manufacture of equipment, is another critical area.

2). Consolidating the Inter-Agency Network, including the following participants:

- UNIDO/WFP
- FAO
- UNICEF
- Canadian International Development Agency (CIDA/CCO)
- Organization of American States (OAS)
- CARDI
- IICA
- Agricultural Credit Bank
- RADA/MOA
- Scientific Research Council & Food Technology Institute

The Inter-Agency Network must focus in the immediate period, on:

i). securing funding in line with the requirements of the detailed work plan.

ii). Identifying and securing technical assistance to address specific issues as identified from consultations on the ground; e.g., follow-up with Professor Headley re: solar drying technology.

iii). Facilitating exchanges locally and internationally, between individuals and communities dealing with similar areas of development.

3). The establishment of performance indicators and evaluation as well as documentation of the process as it develops in all aspects from this stage, are vital elements of the implementation plan over the next three years.

7 FACTORS THAT MILITATE AGAINST MICRO-ENTERPRISE AGRO-PROCESSING

- Poor Marketing

One of the main problems that afflict food processing enterprises is weak marketing (which includes associated distribution, delivery, promotional and sales activities).

The value of the inputs from market studies and analysis in the early phase of project formulation and implementation, is not often recognized as a logical and essential precursor activity, to inform:

> the design of the main phase of the project and implementation options, with respect to product concepts, processing, and technology options.

- Lack of Access to Technical Assistance

Absence of appropriate mechanisms for adapting and channeling technical assistance in the areas of marketing, on-going training, production and process control, and access to small-business credit.

- Project Implementation - Technology Oriented

Project implementation activities (and product concepts) are often technology-oriented, rather than being market-responsive, with the results (and predicament) - properly processed products can not find a sustainable market niche. Small-scale agro-processing enterprises do not usually have the resources and in-house skills which would enable them to undertake promotional and associated marketing and distribution activities (product market-placement activities), required to generate sales of these product concepts at volumes which will enhance the project's economic viability and eventual sustainability.

- R&D Constraints

Small-scale agro-processing enterprises can not absorb the expenses of product research and development (R&D) activities necessary to undertake gross modifications of product concepts to meet consumer expectations. Therefore, they have to rely on assistance from Supporting Agencies with the technical expertise in R&D.

- Quality: Meeting Consumer Expectations

Quality must be assured ("guaranteed"), as demand and repeat sales, will depend a lot on this factor.
The absence of unifying standards among small-scale processors will frustrated efforts to "group market" products, as each processing group (or individual) have different ideas about the acceptable quality profiles of particular products (e.g. jams and marmalades):
what variations are tolerable, and what ingredients are permissible.

- Improvised Technology

When processing operations are conducted using traditional, very basic, home-scale technology and equipment, the unit operations tend to be manual and tedious (e.g. in bammy processing), when practiced on a semi-commercial scale. There is consequential loss of productivity as predominantly manual procedures are employed. Processing will not only be labour intensive and low in output, but frequently subjects the end products to breaches of required good manufacturing practices (GMPs).

- Shortage of Capital and Limited Access to Credit

Small-scale agro-processing enterprises are generally constrained by shortage of operating capital, which is usually linked to their limited access to credit. This situation restricts the purchase of equipment, vital to increase productivity, and the adaptation of up-graded or new technology which could solve the problems associated with labour intensive, low output, activities. The market demand and implied increased production, must justify and inform investment in improved or new technology options.

- Failure to Capitalize on Indigenous Technology Information

Failure to capitalize on the advantages that can be gained from employing, adopting, or modifying relevant indigenous food preservation technologies of locally grown crops to inform production and processing options. Options with which workers are familiar tends to motivate and encourage broader participation in problem solving endeavors. The success enjoyed with small-volume production, by enterprises capitalizing on indigenous product concepts is encouraging. E.g. bammy, peanut drops, fresh-packed mixed vegetable hot pickles, pepper sauces and jerk sauces - the latter two have successfully crossed over from the ethnic to the gourmet market overseas.

- Beneficiary: Competence and Educational Status

Processing activities and **technology choices** should be made with due consideration of **educational level and learning curve**. They should always be within the competence of the targeted participants or beneficiaries. Where **labour intensive activities** cannot be avoided or overcome, such activities **should be cost-effective** to justify their inclusion in the processing cycle.

- Early Involvement of Beneficiaries

The fullest involvement of the intended beneficiaries must be encouraged from very early in the project formulation phase.
An environment should be created in which the **beneficiaries feel responsible for the benefits they get out of the project**. This may be achieved by encouraging beneficiaries to **play active roles in all aspects of the project cycle**. This is necessary and will contribute towards instilling and **encouraging responsibility for, and "ownership" of their project.**

The information gained from their early involvement in determining and agreeing on the essential elements of the project, will be useful in stimulating their ability to use their present and acquired skills and information (outputs of the project) for effective problem solving in executing the real life day-to-day management of the enterprise.

By their involvement they will be enabled to **recognize their strengths and weaknesses and the necessity of improving management skills.**

- Technology/Equipment Selection

For small-scale agro-processing enterprises the technology and equipment employed should be effective and commercially proven. With reference to the solar driers - adopting proven and commercially effective equipment and associated processes, rather than experimental equipment and procedures, will be more conducive to the enterprises attaining sustainability.

- Solar Drying Technology Transfer

The desired transfer of solar drying technology from the supporting institution - Food Technology Institute (FTI) to targeted beneficiaries, has been seriously affected by the use of **unproven equipment** and its associated technology, inclusive of pre-treatment procedures. This resulted in beneficiaries attempting in-field process/product research and development activities, for which most were ill-equipped.

- Access to Raw Material at Competitive Prices

In spite of the supply (sometimes in abundance) of fruits, vegetables, and nut raw materials within some, if not most parishes, it is apparent that an **organized collection and pricing mechanism** which benefits the farmers and agro-processors is required.

The absence of appropriate agricultural raw material pricing policies for the agro-processing sector has been a long-standing limitation to the development of our local food processing industry, and will impact equally on small-scale agro-processing activities. It has resulted in high cost of raw material and low productivity, serving to re-enforce the lack of trust that exists between farmers and processors.

A supply of locally produced raw materials, at reasonable cost and adequate, regular supply is therefore, very important to all parties concerned with the production and processing cycle.

- Packaging and Labeling

Poor packaging and labelling will not encourage consumer acceptance and contribute towards the successful marketing of products.

8 JUSTIFYING CHOSEN PATH(S) FOR PROJECT IMPLEMENTATION

Before implementation of the project the criteria for choosing the path for its implementation may be complex and inter-related but may be guided and justified by consideration of the following:

- Demand a full and complete listing of expectations, recommendations, risks, constraints, short-comings, assumptions, etc., regarding the technical, commercial and marketing feasibility of processing activities to be conducted by individuals or small-scale agro-processors.

- The requirement for commercial feasibility in the project document must not be satisfied by the presentation of a compilation of individual product costing, with suggested selling prices based on arbitrary mark-ups, instead of competitive target market prices for similar and/or identical product concepts.

If projects are to be commercially viable and sustainable, while satisfying social welfare needs - they must be subjected to financial examination, checks and "what-if" scenarios, encountered in other real-life project proposals - before implementation, and during the life time of the projects.

- When examined as indicated above - parameter to ensure or enhance prospects of viability can be determined e.g.:

  minimum production per day/week,

  maximum production costs to ensure price competitiveness (repeat sales).

Other areas to be addressed will be based on the response to the above parameters, e.g.

Raw material supply:
(how much, when required).

Technology options:
equipment and their specifications, e.g. type and output (solar baking of peanuts versus use of gas-fired oven, etc., etc.).

Target market:
if local/community sales only or must other markets be tapped;
will this require a wholesale distributor(s) and/or transportation ?

9 WAYS IN WHICH CONSTRAINTS TO SMALL-SCALE AGRO-PROCESSING CAN BE OVERCOME AND REALISTIC OPTIONS PURSUED.

Lessons Learned From Issues at Project Level

9.1 PREPARING PROJECT DOCUMENT

At the project identification and formulation stage (preparation of the project document) all efforts must be made to address the following terms of reference, which will provide information which will guide and focus the project identification and formulation on the major elements of the project, that is, **goal, purpose/objective, outputs, sustainability**.

The preparatory phase must involve surveys of the food processing sector and the market possibilities for various food products, assessment of the access of small-scale agro-processors to raw materials, packaging materials and an analysis of traditional and new, sustainable production processes.

The following must be addressed:

- Are the major critical assumptions at **output** and **purpose** levels relevant and realistic ?
- Are the **outputs** sufficient to achieve the **objective** ?
- What **risk factors** might affect the **continued provision** of necessary **outputs** ?
- Will **inputs** be available on a **sustained** basis ?
- The training needs of the beneficiaries must be assessed.
- Do beneficiaries posses the **economic resources** and **socio-cultural background** necessary for **sustained management** and **maintenance** of the project ?
- Are **gender-specific issues** being addressed ?
- What are the **constraints** to be overcome by the aid agency ?
- What are the **indicators** that will assure objectives are being met ?

9.2 ESSENTIAL STEPS TOWARDS SELECTING PRODUCT/PROCESSING CONCEPT

As a precursor to project preparation activities:

- Investigate relevant indigenous food preservation technologies of locally grown crops (e.g. Bammies, peanut drops, cakes, grater-cake, fruit wines, jams, jellies, cornmeal and sweet potato puddings, etc.) and seek advice on their potential - employment, adaptation, or modifications.

- Identify the range of products suitable for processing by small-scale rural groups from a marketing point of view.
To justify this approach chart the success of bammies, peanut

cakes/drops, fresh-packed mixed vegetable hot pickles, jerk sauces (which has now crossed over from the ethnic market to general gourmet market overseas).

9.3 EXPLORING NEW APPROACHES TO MARKETING

Investigate the market potential and opportunities for marketing products produced by small-scale agro-processors, e.g.:

a) Inter-sectorial linkages
Consider strengthening inter-sectorial linkages with the tourism and small-scale agro-processing sectors of the economy.

b) School Feeding Programme
The School Feeding Programme offers opportunities and outlets for some of the products of small-scale agro-processors.

c) Use of single brand/marketing name ("group marketing")
Collaborative efforts among small-scale agro-processors using a single brand name and a few distributors may greatly enhance marketing activities by presenting increased volume as well as sharing in the combined inputs of promotional activities at the national (and even international) level, and tourism sector marketing.

> (To this end a meeting was convened with the evaluation team, representatives of JAMPRO and a local agro-products marketer to discuss the above. This initial discussion was encouraging, but this idea will require further exploration.)

e) Linkages with other projects/enterprises
Investigation of Chris Blackwell's Eco-Tourism plans for St. Mary, to determine if his project can:

(i) provide an outlet for marketing products produced by home and small-scale agro-processors,

(ii) provide a site for group activities in St. Mary.

9.4 OVERCOMING CONSTRAINTS AND PURSUING REALISTIC OPTIONS

- Interested parties combining resources and insight to tackle challenges from strategic, long-term perspective;

- Approaches to be governed by confidence in the capacity of women and men to contribute to the solution of the challenges that are encountered.

It is on the basis of these principles that specific recommendations are made relating to each agro-processing project under review.

9.5 Pursuing Effective Strategies with Beneficiaries' Participation

In general the following are to be noted:

- Think of 'beneficiaries' in a broad sense as all those who stand to benefit from the process, from project participants to users of the products, to the community itself;

- There needs to be a 'ranking' of beneficiaries, and stakeholders in order for appropriate strategies to be devised for/towards each;

- Cohesion, to build involvement, loyalty to the process by women, men, children (of different ages, interests, background, etc.)

- Think on whether there are joint projects that can be developed in any community - say with the Jamaica Agriculture Society (JAS); between producers and buyers, e.g. between the revived Wakefield Project and specific hotels - a co-host programme.

- Strategies must be varied - short, medium and longer term.

- Strategies must be developed for the functioning of the inter-agency network, if this model of collaboration is desired and is going to be continued.

- What are 'effective' strategies ? How will 'effectiveness' be measured ?

9.6 In-House Marketing Skills

Small-scale agro-processing projects and enterprises do not have the resources and in-house skills which would be required to undertake the recommended promotional and associated marketing and distribution activities, required to generate sustainable sales of their product concepts. Hence, assistance must be made available to adequately address this area, inclusive of training and technical support.

9.7 Women and Group Dynamics

The management-worker concept, and the women's group dynamics, need to be analyzed, if self-motivation is to be achieved and maintained. Owner-employee concept, needs to be rationalized, so that the needs of individuals can be met while contributing to the success of the group.

9.8 Adaptation of Up-Graded or New Technology

In trying to find solutions to constraints faced by small-scale enterprises, it is tempting to suggest that - adaptation of up-graded or new technology will solve the problems associated with labour intensive, low output, activities. This suggestion will only be helpful if it is modified and prefaced with examination of other factors that impinge on small-scale processors. These factors are often complex and inter-related but are likely to include:

- the persistent shortage of working capital, limited access to credit,

- and other risks associated with managing agro-processing operations.

For sustainability, consideration must be given to financial viability
- **will it increase net income** ?

The loss of productivity being experienced may be insignificant compared

to the financial consequences of under-utilization of high output equipment, which have been acquired at high investment costs.
The market demand and implied increased production, must justify and inform such investments. Hence, the requirement for financial analysis to aid in assessing feasibility and the potential for sustainability, to guide investment in technology options.

9.9 Financial Examination

If projects are to be commercially viable and sustainable, while satisfying social welfare needs - they must be subjected to financial examination, checks and "what-if" scenarios, encountered in "real-life" project proposals - before implementation and during the life time of the projects.

9.9.1 Beneficiaries Being Responsible for Project Benefits

During the implementation phase of the project an environment should be created in which the beneficiaries feel responsible for the benefits they get out of the project. This may be achieved by encouraging beneficiaries to play active roles in all aspects of the project cycle. This is necessary and will contribute towards instilling and encouraging responsibility for, and **"ownership" of their project.**

The information gained from their early involvement in determining and agreeing on the essential elements of the project, will be useful in stimulating their ability to use their present and acquired skills and information (outputs of the project) for effective problem solving in executing the real life day-to-day management of the enterprise.
By their involvement they will be enabled to recognize their strengths, weaknesses and the necessity of improving management skills.

9.9.2 Proven, Commercially Effective Technology

Adopting proven and commercially effective technology, equipment and associated processes, rather than experimental equipment and procedures, will be more conducive to the enterprises attaining sustainability.

9.9.3 Technical Assistance

Competent technical assistance support should be available, especially in the early stages of the project when such support should be readily accessible to fine-tune processes and procedures.

9.9.4 Supporting Organizations & Individuals

The role played by social services, women groups, 4-H Clubs, Social Development Commission (SDC), RADA SS/HE Programme, NGOs, religious organizations and individuals (e.g. Sister Shirley: United Farmers Multi-Purpose Co-Op Ltd.) is very important. In some respects indispensable, especially at the project implementation stage.
Their links with cultural and social programmes and established government policies, make them ideal agents for channeling social and technical support to the target beneficiaries, particularly those in rural areas.

9.9.5 Information Technology

If projects have access to accurate and up-to-date information on raw materials availability. **(E.g. via the proposed computerized AP/RM-dataBase, which would be operated and maintained by RADA.)** This would allow for accurate forecasting re:

available raw material supplies, its quantity and location.

This timely information would facilitate, or make it possible to develop and maintain equitable pricing structures.

9.9.6 Employment and Backward Linkages

Activities that can generate employment and foster backward linkages in communities, should be encouraged. This strategy could contribute towards maintaining and instilling enthusiasm and feelings of "ownership" of project, as was exemplified by the beneficiaries of Lime Tree Garden: (PPU), and farmers supplying raw materials to the United Farmers: (M-P CO-OP FPP).

9.9.7 Linkages for Raw Material Production

By strengthening the links in the chain of activities:

farming, production, post-harvest handling, processing, distribution, and marketing activities,

and encouraging backward linkages, we will be able to overcome most of the difficulties now experienced in developing a supply of locally produced raw materials, at reasonable cost and adequate, regular supply.

This has been a long-standing limitation to the development of our local food processing industry, and will impact equally on small-scale agro-processing activities.

9.9.8 Small Farmers and Rural Co-operatives

The contributions of small farmers and rural co-operatives to the development of small-scale agro-processing activities is essential, and serves to underline the agro-processing industry's potential to contribute to the economy in terms of backward linkages.

9.9.9 RADA's Area Development Projects (ADPs)

If adopted and effected, RADA's Area Development Projects (ADPs) would go a long way towards addressing the general problems associated with raw material supply which afflicts the agro-processing sector. These include:

- their availability to effect economical and sustainable processing activities and
- suitability to meet required raw material quality specifications.

10. LIST OF RECOMMENDATIONS

10.1 Unsuitable Processing Facilities

Where processing facilities (building, and fixtures) are unsuitable, (e.g. as was encountered in traditional bammy processing).

In the short term, regard the present processing facilities as temporary. Procure the services of a competent Food Technologist who can (working with the Public Health authorities and/or the Jamaica Bureau of Standards) provide guidelines that will enable economical modifications, and effect repairs - to bring the facilities in compliance with acceptable good manufacturing practices.

In the long term, an alternative location must be sought which can accommodate increased productivity, any additional equipment, and which will provide a layout that is compatible with efficient, streamlined, process flow operations.

10.2 Labour Intensive Activities

Where labour intensive activities cannot be avoided or overcome, such activities should be cost effective to justify their inclusion in the process cycle. Creative solutions must be sought which will not sacrifice the enterprise's economic viability, to the detriment of its long term goal - sustainability.

10.3 Small-Scale Equipment Database

To facilitate Technology/Equipment Selection, small-scale agro-processing enterprise could benefit by having access to appropriate database, which has an inventory of available small-scale, processing equipment - along with price information and information that will guide as to their appropriateness to accomplish the desired tasks.

10.4 Training in Equipment Maintenance

Small-scale agro-processing beneficiaries should receive training in basic equipment maintenance, with the option of selecting someone who will be responsible for the day-to-day cleaning, sanitizing, servicing and maintenance of processing equipment. This should be incorporated as part of the project design and implementation input. Training in the fabrication of small-scale equipment should also be given priority.

10.5 R&D Activities

Competent Technical Assistance Support.
Beneficiaries should not have to undertake product/process development and research activities. Such activities should be carried out by competent supporting organizations and institutions with the capacity to research, develop, adapt and transfer, product/process development/modification to the project.

10.6 Training Recommended for All Projects

UNIDO's Training Programme for Women Entrepreneurs in the Food-processing Industry, with the concept of "learning by doing", and course structure aimed at reducing the gap between the artificial learning situation and the countries' real life business environment. This course will provide the participants with the skills and confidence necessary to establish and run an enterprise within the agro-processing sector.

10.7 Staff Training
- training must be on-location as much as practicable,
- beneficiary-dependent taking into account educational status and group learning curve,
- product oriented and responsive to the dynamics of the market.

10.8 Expertise
To the extent that this is possible and practicable, expertise should be local, with strong background in the socio-cultural and socio-economic background of the targeted beneficiaries.

10.9 **A Computerized Crop Database** should be established, maintained, and updated at RADA's Head Office. This AGRO-PROCESSING RAW MATERIAL DATABASE (**AP/RM-dataBase**) should provided:
accurate and up-to-date Information on raw material availability (quantity, location/farm, price quotation, etc.) and should allow for forecasting.
This **AP/RM-dataBase** can be updated via RADA's current field data gathering and reporting system.

For its implementation RADA will require assistance in acquiring hardware, software and staff training.

10.9.1 **RADA's Assistance to Farmers in Processing Communities**
RADA must be equipped to provide farmers with technical assistance and raw material production incentives, to encourage the production of the specific raw materials that will be required to support agro-processing enterprises within the farming communities. This assistance from RADA must include extension services and where applicable must include the planting and resuscitation of tree crops, e.g.:
jackfruit, cashew, number 11 mangoes, grafting of desired guava varieties and top-working of existing mango trees.

10.9.2 **RADA and the Hillside Agriculture Project (HAP)** needs to intensify their efforts in resuscitating and establishing orchard crops in varieties suitable for processing, e.g., guava, pineapple, mango, and tree crops which are not normally cultivated, e.g. jackfruit, otaheite apple and june plum.

10.9.3 **Feasibility Assessments and Financial Analysis Procedures**
The requirement for commercial feasibility assessment, in project documents, must not be satisfied by product costing, with suggested selling prices based on arbitrary mark-ups, instead of competitive target market prices for similar or identical product concepts.

If small-scale projects are to be commercially viable and sustainable, their feasibility analysis must be subjected to financial examination, checks and "what-if" scenarios, encountered in "real-life" project proposals.

10.9.4 **Exploring New Approaches to Marketing**
Project implementing agencies, aid organizations and project supporting agencies, must put in place the mechanisms that will allow for the investigation of the market potential and opportunities for marketing products which are produced by small-scale agro-processors.
Consideration must be given to strengthening inter-sectorial linkages with the tourism and small-scale agro-processing sectors of the economy.

The marketing of products under a single and/or marketing name. The **School Feeding Programme** also offers possibilities for marketing products from small-scale agro-processors.

10.9.5 Standards

The Jamaica Bureau of Standards (JBS), must be consulted to assist in the dissemination of product standards information; which should contain clear and precise information about the use **local ingredients**. Where practicable, the use of local ingredients should be encouraged, and addressed in the relevant standards.

10.9.6 Solar Driers

An efficient and effective solar drying system could provide a cost effective alternative energy solution that could and should be utilized when suitable, in the preservation of foods.

11 CONCLUSIONS

The extent to which the agro-processing sector at the level of micro-enterprises can contribute to the nation's socio-economic development and specifically to promote rural employment, is generally assumed to be extensive, but is not really known. What is known is that there are numerous constraints afflicting the growth and development of this sub-sector and that as agro-processors women are often observed - patiently carrying out activities which are labour-intensive and low in productivity.

What is also known is that the goals of creating, providing income and income benefits from agro-processing, cannot be pursued by themselves. That a **gender-sensitive and multi-sectorial approach** is needed to channel economic, social and political resources to the rural sector and to its most marginalized section - women and their families.

The approach to this must be one which avoids duplication by integrating relevant resources, beginning with those of the communities and marrying these with expertise from a network of agencies who hold an explicit bias towards integrated community development.

It is only on this basis of community empowerment that the objective of sustainable national development, built on the foundations of growth and equity, can be realized by and for, the majority of women and men of the country.

Pete V.E. Scott

Linnette Vassell

October 1996.

ANNEX No. 1

1). DETAILED DESCRIPTION OF SOLAR DRIER IN USE BY SOME PROJECTS
Solar Drier Description and Relevant Data
(Source: S. Gillings[11] / Pete V.E. Scott)

2). SOLAR DRIER SELECTION - ISSUES FOR CONSIDERATION

1). The driers in use at Wakefield: Agro-processing Centre, Trelawny; Lime Tree Garden: Peanut Processing Unit, Lime Tree Garden, St. Ann; RADA's Farmer's Training Centre, Twickenham Park, St. Catherine; and that undergoing testing at the Dutch Sponsored, Rio Grande Rural Development Project (RGRDP), Portland; are of similar design to those which were originally acquired by the University of Technology (U-Tech) Entrepreneurial Extension Centre, the coordinating agency for the Solar Dried Fruit Ventures, for use by participants in this venture (now defunct), which included the Sunshine Bankra Project. This basic drier design was later modified by the coordinators of the Sunshine Bankra Project, in an attempt to attain greater efficiency of operation, inclusive of greater product output.

Below is a brief description of the original drier and the modified version:

THE ORIGINAL DRIER
Indirect mode solar drier with an air entry duct leading to the solar collector which receives the sun's radiation. The solar collector is connected to a drying chamber (cabinet) containing the product. The drying chamber is fitted with a chimney which has a wind-activated (and convection current) extractor fan.

Drier Trays & Drying Surface
Each drier cabinet accommodates twelve (12) drying trays, six (6) on each side of the partitioned cabinet. They are equipped with expanded aluminum drying surfaces. These trays are inserted into slots in the cabinet.

The drying surface (expanded aluminum) had to be replaced with plastic mesh when it was found to be incompatible with the products being dried. There were chemical reactions at the point of contact, this resulted in a coating of the products at the point of contact.

Solar Collector Angle
The solar collector panel is angled (at a fixed angle). The solar collector (and attached drying cabinet) is mounted on a frame, equipped with wheels to allow for positioning and relocation, so that the collector can face towards the equator (in the northern region this means south), at a fixed angle to the horizontal.

THE MODIFIED DRIER
An electrically operated blower is mounted at the point of air entry to the solar collector, to provide active air current. At the air entry

[11] Scarlette Gillings, May, 1995. FAO Report:
Sustainable Agro-Processing For Rural Women (TCP/JAM/0154)

point (duct) to the solar collector, there is a manually controlled damper (sheet inserts), to control the air flow into the solar collector.

A gas-fired heating plate is attached to the solar absorber plate, to heat the air on its way to the drying cabinet. It is equipped with manual control settings for high and low flame. This artificial heating system can be used to supplement solar radiation in the absence of adequate sunlight, or it can be used at night. It makes possible, continuous drying of products for up to 24 hour cycles.

The heated air can pass via convection and/or active air current over the solar absorber plate (and its attached artificially heated plate), and is conveyed to the drying cabinet, to be extracted via the chimney to the atmosphere.

To boost this extraction process, an electrically operated extractor fan is mounted at the base of the chimney (inside the drying cabinet), this supplements the action of the chimney's wind-activated (and convection current) extractor fan.

2). SOLAR DRIER SELECTION - ISSUES FOR CONSIDERATION

The criteria that will help in deciding what solar drying technology to recommend are similar to those for deciding on other technologies. They are complex and often inter-related but may include the following:

- technical effectiveness (will the equipment do the job required at the indicated scale of production ?),
- capacity to quickly dry reasonable quantities of fruit materials, to effect maximum preservation and storage life,
- require little attention during drying operation,
- the training and skill level required for operation, maintenance and repairs,
- simple design such that it can be built (and repaired/maintained) by local technicians,
- flexibility/versatility to accommodate more than one product or process,
- operating costs and overall financial profitability (minimal energy cost if supplemented by other forms of energy),
- compatibility with other processing operations.

Risks factors

The humid climate, and/or frequent rainfall in some localities may make the use of solar energy for drying by conventional methods impracticable. Information about climatic resources as they relate tc

the potential for solar drying at processing locations must be obtained.

There should be monitoring of weather data at the proposed drier location to allow for the effective use of solar energy. This should include:

solar radiation and/or hours of bright sunshine, relative humidity, frequency of rain, temperature and wind.

Driers based only on the use of solar energy suffer from the following (McGaw, 1980)[12]:

(i) The available energy varies considerably during each day and from day to day.

(ii) Large collection areas are usually necessary to harness even moderate amounts of energy.

(iii) There is little control over the drying process.

Supplementing Solar Energy

To allow more effective drying while using solar energy, means of supplementing solar energy with other forms may have to be utilized. The use of **Combined Driers** which are fitted with both a solar collecting chamber and a heater unit is a possible option. When there is plenty of sunshine, the solar collector can be used, but the heater can also be used in poor weather conditions and at night.

Full consideration must be given to the drying and handling characteristics of the product/s to be dried, as well as about available energy sources and the manner of their use, if a correct choice of a drying system is to be made.

It is an advantage when the drier selected is versatile and can be used to produce a wide range of dehydrated food products.

Additional information that should be obtained or investigations that should be conducted, include the following:

(a) determination of the drying characteristics of the fruits to be dried (and other produce which may be identified).

(b) To specify the limiting conditions for temperature, humidity, air flow, etc., within which acceptable quality products are produced.

(c) To set up appropriate Quality Control and Quality Assurance procedures.

(d) To compile a report on the results of the determinations, for the

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[12]McGaw, D. R. (1980). An Approach to the Choice of Drying Systems. Caribbean Alternate Energy Programme. Report of the workshop on SOLAR CROP DRYING, Barbados, 21-23 July 1980. Published by Commonwealth Secretariat. CSC(80)AER-10.

establishment of a database and documentation center by the relevant coordinating and implementing agencies involved with solar drying technology.

Use of Biogas

Where practicable consideration should be given to Biogas: a non-conventional energy source, to supplement the solar energy and/or the artificial heating system. Biogas could be produced from agricultural waste materials (farm manure, etc.). Biogas production would utilize appropriate technology which is available in Jamaica.

RECOMMENDATION RE: SOLAR DRIER

It is proposed that the services of **Dr. Oliver St. C. Headley** be requested, to provide the necessary technical and hands-on input that will lead to the selection and development of **appropriate, cost effective and commercially viable** solar drier(s), and the associated **transfer of appropriate, proven technology** to meet the varying needs of small-scale agro-processors.

ANNEX No 2

Project : Wakefield (A-P C)

Contents:

Description of Juice Dispenser and Supporting Packaging:

(a) **Juice Dispenser** (2x5 gal. jet sprays)

Appliance Traders Ltd.
2 Bowl (5-gal. each): Beverage Dispenser

J$75,000 + (Tax $11,250) = **J$86,250**

OR

Hubert 1996 Food & Retail Merchants' Source Book. p 413
Tel.: 1-800-543-7374
Cincinnati USA Tel.: (513) 367-8767
Fax.: (513) 367-8603
Order only FAX 1-800-527-0128

3-Bowl (5-gal. each): "Jet Spray Beverage Dispenser"
Dimension: W 24.5" D 17" H 26-5/8"

US$1,200

(b) From local Suppliers/Manufacturers:

Disposable Drink Cups (with lids for straw insertion)

Drinking Straws

ANNEX No 3

(Project : Olga Turner)

Contents:

1). Suggested Equipment Details
2). Olga Turner's Projected Production Costs and Revenue for Bammies.

Suggested Equipment Details

Gas-fired, commercial stove/oven; small-scale/commercial processing equipment (e.g. slicing and dicing equipment), utensils (e.g. stock pots, stirring spoons, knives and small kitchen hand tools, all of stainless steel material).
Suitable fermentation kegs or jars, equipped with fermentation locks or similar device to prevent contamination and to maintain the integrity of the fermented products (wines, vinegars).

Bammy processing: RADA's suggested equipment (Mrs. L. Gooden)

NOTE: Ms Olga Turner has recently placed an order with a local fabricator to supply her with a hydraulic press (used to express the juice from grated/milled cassava).

Specifications for this piece of equipment was provided by RADA SS/HE Programme.

1 grater (stainless steel)	$120,000	(Alframec Ltd, Mandiville)
1 hydraulic press	45,000	(Alframec Ltd, Mandiville)
2 hot plates	48,000	(RMC Equip. The Springs)
100 bammy rings	1,000	(Control Eng. Lissant Rd.)
1 freezer	25,000	(RMC Equip. The Springs)
cooling rack	15,000	(local carpenter)
1 platform scale	15,500	(Appliance Traders Ltd.)
TOTAL	J$269,500	

ALFRAMEC LTD, Hatfield Grvl. Tel.: 963-0627

Additional equipment:
Source: Appliance Traders Ltd. Kingston, Jamaica.

2 "Aquatemp" single burner open range
1 stainless steel table (approx. dimensions: W 0.762m x L 1.828m)
3 stools
wall cupboards for storing small equipment and utensils
2 stainless steel (s/s) stock pots 37.854 l (40 quart), with cover
2 s/s stock pots 17.0 l (18 quart), with cover
s/s cooking spoons
2 s/s colanders
2 22.86 cm (9-inch) chinese strainer
2 236.59 ml (8 fl. oz.) ladle
2 473.18 ml (16 fl. oz.) ladle
2 1.27 cm (0.5 inch) polyethylene cutting board
6 s/s boning knives

Possible Source for the following testing equipment:

Industrial & Technical Supplies (Ja.) Ltd.
22 West Kings House Road, P.O. Box 27, Kgn. 10
Tel.: 929-3890, Fax.: 929-3089
Using FISHER Scientific Apparatus Catalog (covering 1992)

(a)

1	FISHER Hand Refractometer,	range 0-30% (Cat./Part.No.	13-946-60A)
1		range 28-62% (	-60B)
1		range 58-92% (	-60C)

(b)

FISHER Accumet No. 1002 pH metre with A/C adaptor

Electronic top-loading scale, capacity, e.g.: 2,000 x 1g

PACKAGING:

To be identified after market survey of similar products (fine-tuned by test marketing of product prototype(s)).
E.g.
Jars & Caps/Lids for Jams/Jellies/Marmalades
Tamper-evident seals for jars
Bins for Bulk storage
Kegs/buckets 18.927 litre (5 US Gal.), plastic, with covers.
Poly bag liners for kegs/buckets,
42cm x 61cm (16.5" x 24")

ANNEX III

OLGA TURNER'S PROJECTED COSTS AND REVENUE FOR BAMMIES

CAPITAL COST(JA$)

ITEMS	UNIT	RATE/ UNIT	NO.OF UNITS	96/97 YEAR I	97/98 YEAR II	98/99 YEAR III	TOTAL
Toledo Scale		44,050	1	44,050			44,050
Freezer		25,000	1	25,000			25,000
Shafting Machine		65,550	1	65,550			65,550
Bammy Press		270,000	1	270,000			270,000
Battery(12Volt)		3,393	1	3,393			3,393
Charger		7,941	1	7,941			7,941
Commercial Oven		75,000	1	75,000			75,000
Bammy Rings		100	72	7,200			7,200
Stainless Steel Table		20,000	1	20,000			20,000
Crates		300	6	1,800			1,800
Pallets		500	1	500			500
Sub Total				520,434			520,434
Conting.5%				24,772			24,772
TOT CAP.COSTS				545,206			545,206

OPERATING COSTS

Raw Material							
Salt	kg.	91	15	1,365	1,365	1,365	4,095
Cassava	kg.	90,910	9	818,190	818,190	818,190	2,454,570
Calcium Porpionate	kg.	121	132	15,972	15,972	15,972	47,916
Plastic Bags (6*8)	bx.	46	243	11,178	11,178	11,178	33,534
TOTAL MAT. COSTS				846,705	846,705	846,705	2,540,115

MS	UNIT	RATE/ UNIT	NO.OF UNITS	96/97 YEAR II	97/98 YEAR II	98/99 YEAR III	TOTAL
RATING COSTS CONT'D							
lities							
er	mthly.	350	12	4,200	4,200	4,200	12,600
ctricity	mthly.	500	12	6,000	6,000	6,000	18,000
-Total				10,200	10,200	10,200	30,600
tal	mthly.	1,500	12	18,000	18,000	18,000	54,000
es:							
upervisor	wkly.	1,500	50	75,000	75,000	75,000	225,000
orkers(2)	wkly.	1,200	50	60,000	60,000	60,000	180,000
-Total				135,000	135,000	135,000	405,000
nection				12,419	12,419	12,419	37,257
nsportation				12,419	12,419	12,419	37,257
Cylinders	mthly.	1,490	24	35,760	35,760	35,760	107,280
ining Seminars	yrly.	14,975	2	29,950	29,950	29,950	89,850
orkshop							
ial Services	yrly.			10,000	10,000	10,000	30,000
)-Total				100,548	100,548	100,548	301,644
TAL OPERATING COST				1,110,453	1,110,453	1,110,453	3,331,359
iting. 10% Oper.Costs				112,904	112,904	112,904	338,712
TAL PRODUCTION COST				1,223,357	1,223,357	1,223,357	3,670,071

ITEMS	UNIT	RATE/ UNIT	NO.OF UNITS	96/97 YEAR II	97/98 YEAR II	98/99 YEAR III	TOTAL
OPERATING COSTS CONT'D							
Utilities							
Water	mthly.	350	12	4,200	4,200	4,200	12,600
Electricity	mthly.	500	12	6,000	6,000	6,000	18,000
Sub-Total				10,200	10,200	10,200	30,600
Rental	mthly.	1,500	12	18,000	18,000	18,000	54,000
Wages:							
Supervisor	wkly.	1,500	50	75,000	75,000	75,000	225,000
Workers(2)	wkly.	1,200	50	60,000	60,000	60,000	180,000
Sub-Total				135,000	135,000	135,000	405,000
Promotion				12,419	12,419	12,419	37,257
Transportation				12,419	12,419	12,419	37,257
Gas Cylinders	mthly.	1,490	24	35,760	35,760	35,760	107,280
Training Seminars & Workshop	yrly.	14,975	2	29,950	29,950	29,950	89,850
Social Services	yrly.			10,000	10,000	10,000	30,000
Sub-Total				100,548	100,548	100,548	301,644
TOTAL OPERATING COST				1,110,453	1,110,453	1,110,453	3,331,359
Conting. 10% Oper.Costs				112,904	112,904	112,904	338,712
TOTAL PRODUCTION COST				1,223,357	1,223,357	1,223,357	3,670,071

SALES REVENUE ITEMS				YEAR I	YEAR II	YEAR III	
BAMMIES	pkts.	32	45,455	1,454,560	1,454,560	1,454,560	4,363,680
TOTAL REVENUE				1,454,560	1,454,560	1,454,560	4,363,680
GROSS REVENUE				231,203	231,203	231,203	693,609
DEPRECIATION (33 1/3%)				181,717	181,717	181,717	545,151
NET PROFIT				49,486	49,486	49,486	148,458

OLGA TURNER

ASSUMPTIONS

* The supervisor is a skilled worker. She will be responsible for training her employees in bammy making.

* Promotional material such as flyers will be use to advertise the project.

* A member of JAMPRO staff will conduct the seminars bi-annually. The costs are computed as follows:

(1 Lecturer)	
(8 hrs @ $1,200/hr)	9,600
Room - 2 nights @ $1,800/nght.	3,600
Meals $500/day	1,000
Mileage 80 mls @ $16/hr	775
	14,975

* Social Services include the cost to operate a day care centre. The total cost is $10,000 yearly. (4 x $500 x 50). It is assumed that each worker has two (2) children. Ten thousand dollar ($10,000) has been allocated to this service (10% of $1000,000).

OLGA TURNER'S

SUMMARY OPERATING STATEMENT

	YEAR I	YEARS II	YEAR III
	$	$	$
Total Revenue	1,454,560	1,454,560	1,454,560
Total Prod.Cost	1,223,357	1,223,357	1,223,357
Gross Revenue	231,203	231,203	231,203
Depreciation	181,717	181,717	181,717
Net Profit	49,486	49,486	49,486

Detailed costs and revenues for this project are presented earlier in the Annex. The total production cost is $1,223,357, while sales revenue is projected to be $1,454,560 and depreciation cost of $181,717, realizing a profit of $49,486, which remains constant in Year I - III.

The payback period to recover the capital cost of $545,206 is expected to be 11 years (545,206 / 49,486) while the return on investment (ROI) is 9.1%. (ROI = 49,486 / 545,206 x 100%)

ANNEX No 4

Project : Long Road CO-OP (DSPU)

Process Room Fixtures, Furniture and Associated Equipment That May be Required.

TO EFFECT MODIFICATIONS TO THE EXISTING PROCESSING FACILITIES, THE FOLLOWING WILL BE REQUIRED.

The following furniture/equipment are suggested:

- 2 work tables,
W 60.96cm x L 182.88cm x H 91.44cm (W 2'x L 6'x H 3'),
with product contact surface of material that will permit effective cleaning and sanitizing operations (ideally form aluminium or stainless steel);

- storage bins/pails with covers,
E.g. capacity 18.927 litres (5 gallons);

- 2 large plastic/polyethylene drums, with tight fitting covers, for fumigation of nutmeg. E.g. capacity 170.343 litres (45 gallons);

- wall-mounted storage cabinets,

- wall shelving,

- nylon screen meshing for windows,

- stools.

ANNEX No 5

(Project : Lime Tree Garden)
LIME TREE GARDEN: PEANUT PROCESSING UNIT (PPU)

Contents:

1). Recommended Vacuum Packaging Equipment
2). Projected Production Costs & Revenue For Peanut Production.

The possibility of producing new products, e.g. **crushed, roasted peanuts**, requiring investment in vacuum packaging equipment and associated packaging, which would enable vacuum packing (institution-size) of **crushed, roasted peanuts**.
(e.g. 1 kg packs) which can then be stored for several weeks without loss of flavour, quality or colour. This product is also an import substitute with the target market:

Ice cream parlours, restaurants and hotels, for use as **topping on sundaes**, etc. and pastry shops for **cake and pastry decoration**.

RECOMMENDED VACUUM PACKAGING EQUIPMENT

Possible source:

Hubert 1996 Food & Retail Merchants' Source Book. p 141
Tel.: 1-800-543-7374
Cincinnati USA Tel.: (513) 367-8767
Fax.: (513) 367-8603
Order only FAX 1-800-527-0128

Counter-top vacuum packaging machine
Small, seal bar length 12-5/8", chamber size 13" x 13" x 5-1/2"
Stock No. 77487

US$3,995.00

Vacuum food pouches
Nylon, poly, and EVA laminated pouches, 3 mil thickness
6" x 12" (15.24 x 30.48 cm), 500 per cs
Stock No. 88378

US$32.89 per 25 cs

LIME TREE GARDEN PROJECTED PRODUCTION COSTS AND REVENUE FOR PEANUT PRODUCTS

CAPITAL COSTS ($JA)

ITEMS	RATE	NO.OF UNITS	96/97 YR. 1	97/98 YR. 11	98/99 YR.111	TOTAL
Commercial Gas Stove	170,000	2	340,000			340,000
Sheller/Stripper	50,000	1	50,000			50,000
Stripper	60,000	1	60,000			60,000
Cellophane Sealer	5,000	1	5,000			5,000
Kitchen Scale	65,500	1	65,500			65,500
Baking Trays	500	2	1,000			1,000
Dutch Pots	2,500	3	7,500			7,500
Stainless Steel Spoons	559	6	3,354			3,354
Pudding Pans	500	4	2,000			2,000
Stainless Steel Table	20,000	1	20,000			20,000
Sub-Total			554,354			554,354
Contingencies (5%)			27,718			27,718
TOTAL CAPITAL COSTS			582,072			582,072

OPERATING COSTS

ITEMS	UNIT	RATE	NO.OF UNITS	96/97 YR.1	97/98 YR.11	98/99 YR.111	TOTAL
SALTED PEANUTS							
Raw Material							
Peanuts	kg.	77	6,364	490,028	490,028	490,028	1,470,084
Salt	kg.	22	7	154	154	154	462
Labels	100	140	1,250	175,000	175,000	175,000	525,000
Plastic Bags	bx.						
(4 1/2 x 2 3/4)	bx	25	491	12,275	12,275	12,275	12,275
(3 1/2 x 2 1/2)	bx	2	1,577	3,154	3,154	3,154	3,154
Sub-Total				680,611	680,611	680,611	2,010,975
PEANUT DROPS							
Peanuts	kg.	77	2,273	175,021	175,021	175,021	525,063
B.Sugar	kg.	25	1,364	34,100	34,100	34,100	102,300
Water	litre	33	568	18,744	18,744	18,744	56,[illegible]
Vanilla	litre	5	596	2,980	2,980	2,980	8,940
Fresh Ginger	kg.	88	85	7,480	7,480	7,480	22,440
Labels	100	140	150	21,000	21,000	21,000	63,000
Plastic Bags (5x8)	bx.	8	1,618	12,944	12,944	12,944	38,832
Sub-Total				272,269	272,269	272,269	816,807
PEANUT COOKIES							
Peanuts	kg.	77	43	3,311	3,311	3,311	9,933
Flour	kg	22	255	5,610	5,610	5,610	16,830
Eggs	doz.	50	42	2,100	2,100	2,100	6,300
Brown Sugar	kg.	25	114	2,850	2,850	2,850	8,550
Lecithin	kg.	2	84	168	168	168	504
Labels	100	140	45	6,300	6,300	6,300	18,900
Plastic Bags (5x8)	bx.	1	1,618	1,618	1,618	1,618	2,850
Sub-Total				21,957	21,957	21,957	63,86[illegible]
TOTAL RAW MAT. COSTS				974,837	974,837	974,837	2,924,5[illegible]

OPERATING COSTS CONT'D.

ITEMS	UNIT	RATE	NO.OF UNITS	96/97 YR.1	97/98 YR.11	98/99 YR.111	TOTAL
Utilities							
Water	mthly.	350	12	4,200	4,200	4,200	12,600
Electricity	mthly.	150	12	1,800	1,800	1,800	1,800
Sub-Total				6,000	6,000	6,000	14,400
Rental	mthly.	1,200	12	14,400	14,400	14,400	43,200
Labour:							
Supervisor	wkly.	1,500	50	75,000	75,000	75,000	225,000
Workers (5)	wkly.	6,000	50	300,000	300,000	300,000	900,000
Peanut Thresher	wkly.	600	50	30,000	30,000	30,000	90,000
Sub-Total				405,000	405,000	405,000	1,215,000
Promotion		2000	3	6,000	6,000	6,000	18,000
Gas Cylinders	mthly.	1200	24	28,800	28,800	28,800	86,400
Training Seminars & Workshop	yrly.	14,975	2	29,950	29,950	29,950	89,850
Social Services	yrly.			15,000	15,000	15,000	45,000
Transportation	mthly.	500	12	6,000	6,000	6,000	18,000
Sub-Total				85,750	85,750	85,750	257,250
TOTAL OPERATING COST				1,485,987	1,485,987	1,485,987	4,454,361
Contingencies (10% of Oper. Costs)				148,599	148,599	148,599	445,436
TOTAL PRODUCTION COST				1,634,586	1,634,586	1,634,586	4,903,757

SALES REVENUE

ITEMS	UNIT	RATE	NO.OF UNITS	96/97 YR.1	97/98 YR.11	98/99 YR.111	TOTAL
SALTED PEANUTS	pkts.	10	125,000	1,250,000	1,250,000	1,250,000	3,750,000
PEANUT DROPS	pkts.	80	15000	1,200,000	1,200,000	1,200,000	3,600,000
PEANUT COOKIES	pkts.	12	4500	54,000	54,000	54,000	162,000
TOTAL REVENUE				2,504,000	2,504,000	2,504,000	7,512,000
GROSS REVENUE				869,414	869,414	869,414	7,674,000
DEPRECIATION(33 1/3%)				194,001	194,001	194,001	582,003
NET PROFIT				675,413	675,413	675,413	2,026,240

LIME TREE GARDEN

ASSUMPTIONS

* A shelter/stripper is at the location. However, the stripper is not functioning, hence the inclusion of the cost of a stripper.

* Promotional material such as flyers will be used to advertise the project throughout the year.

* Training Seminars and Workshops will be conducted by a member of staff from JAMPRO twice yearly. The costs are computes as follows:

Lecturer	-	8 hrs. @ $1,200/hr	=	$ 9,600
Hotel/Room	-	$1,800/night	=	3,600
Meals	-	$500/day	=	1,000
Mileage	-	8 km @ $6/km	=	775
				$14,975

Social Services include the cost to operate a day care centre. The total cost is $300,000 yearly. It is assumed that each worker has two children. Fifteen thousand dollars ($15,000) has been allocated for this service (5% of $300,000). Each worker is expected to contribute $20 per day per child and the balance to be funded by an aid agency.

LIME TREE GARDEN

SUMMARY OPERATING STATEMENT

	96/97 Year I	97/98 Year II	98/99 Year III
	$	$	$
Total Revenue	2,504,000	2,504,000	2,504,000
Total Production Cost	1,634,586	1,634,586	1,634,586
Gross Revenue	869,414	869,414	869,414
Depreciation	194,001	194,001	194,001
Net Profit	675,413	675,413	675,413

Detailed costs and revenues for this project are presented earlier in the Annex. The total production cost is $1,634,586 while sales revenue is projected to be $2,504,000 and depreciation cost of $194,001 realizing a profit of $675,413, which remains constant in Years I - III.

The project is viable as the capital cost can be recouped during the first year of the project. Funding is recommended as the project will provide employment and provide a better life for persons within the community.

ANNEX No. 6

United Farmers: Multi-purpose Co-Op Food Processing Project.

Contents:

1). Solar Oven Description
2). Outline of Peanut Drops Manufacture.
3). Projected Production Costs & Revenue For Peanut Production

1. SOLAR OVEN

The solar ovens are constructed from sheet aluminium and wood - are insulated, and have a transparent light-transmitting (hard plastic) cover, which encloses a black-painted tray/box, which acts as an absorbing surface (solar collector) and also functions as the baking chamber - as it accommodates the shelled, raw peanuts to be baked. The baking chamber is accessed via a small door in the side of the chamber.

Solar oven capacity is approximately 3.63 kg (8 lbs) of shelled, raw peanuts, per batch. Depending on the prevailing weather conditions, roasting will be completed in 4-12 hours. During periods of bright sunshine temperatures in the baking chamber averages 121°C (250°F).

2. PEANUT DROPS MANUFACTURING PROCESS

Gas-fired stove (domestic type) is used to process peanut drops which are made from solar-oven-baked, stripped, peanuts, along with the addition of brown sugar, ginger, cinnamon, and other spices.

These ingredients are combined with water in a 7.1 litre (2 gallon) dutch oven (pot), and heat processed on a stove top, to obtain a candy-like product called "peanut drops". The boiling/cooking operation takes approximately 1 hour per batch. The hot molten mixture is removed from the pot with a large spoon and dispensed ("dropped") as individual units, onto waxed paper, where it solidifies on cooling.

UNITED FARMERS MULTI-PURPOSE CO-OP LIMITED PROJECTED PRODUCTION

COSTS AND REVENUE FOR PEANUT PRODUCTS

CAPITAL COSTS (JA$)

ITEMS	UNIT	RATE /UNIT	NO.OF UNITS	96/97 YR. I	97/98 YR. II	98/99 YR. III	TOTAL
Solar Ovens		2,500	8	20,000			20,000
Sheller		45,000	1	45,000			45,000
Stripper		60,000	1	60,000			60,000
Cooling Trays		1,147	16	18,352			18,352
Bag Sealer		17,825	3	53,475			53,475
Pot(5gal)		2,848	2	5,696			5,696
Cooking Spoons		589	8	4,712			4,712
Kitchen Scale		5,060	1	5,060			5,060
Commercial Gas Stove		170,000	1	170,000			170,000
Sub Total				382,295			382,295
Contingencies - 5%				19,115			19,1'
TOTAL CAPITAL COSTS				401,410			401,410

OPERATING COSTS

SUN BAKED PEANUTS

ITEMS	UNIT	RATE /UNIT	NO.OF UNITS	96/97 YR. I	97/98 YR. II	98/99 YR. III	TOTAL
Raw Material							
Peanuts	kg.	77	6,984	537,768	537,768	537,768	1,613,304
Labels (Crack & Peel)	bx.	3,738	3	11,214	11,214	11,214	33,642
Cellophane Bags -							0
(4 1/2 x 2 3/4)	bx.	1,345	3	4,035	4,035	4,035	12,105
(3 1/2 x 2 1/2)	bx.	491	3	1,473	1,473	1,473	4,419
Sub-Total (Sun Baked)				554,490	554,490	554,490	1,663,470
PEANUT DROPS							
Peanuts	kg.	77	6,984	537,768	537,768	537,768	1,613,304
B.Sugar	kg.	25	3,491	87,275	87,275	87,275	261,825
Nutmeg	kg.	344	40	13,760	13,760	13,760	41,280
Vanilla	litre	67	48	3,216	3,216	3,216	9,648
Mixed Spice	kg.	213	40	8,520	8,520	8,520	25,560
Fresh Ginger	kg.	88	291	25,608	25,608	25,608	76,824
Cinnamon Powder	kg.	213	40	8,520	8,520	8,520	25,560
Sub-Total (Peanut)				684,667	684,667	684,667	2,054,001
Total Raw Material Costs				1,239,157	1,239,157	1,239,157	3,717,471
Other Operating Costs							
Utilities:							
Water				1,350	1,350	1,350	4,050
Electricity				1,650	1,650	1,650	4,950
Rental				2,500	2,500	2,500	7,500
Salaries & Wages:							
Administrator	wkly.	1500	50	75,000	75,000	75,000	225,000
Workers (8)	wkly.	9600	50	480,000	480,000	480,000	1,440,000
Other:							
Transportation	mthly.	9,000	12	108,000	108,000	108,000	324,000
Promotion	mthly.	2,000	3	6,000	6,000	6,000	18,000
Gas Cylinders	mthly	1200	24	28,800	28,800	28,800	86,400
Training Seminars & Workshop	yrly	14975	2	29,950	29,950	29,950	89,850
Social Services				80,000	80,000	80,000	240,000
Total Other Operating Costs				813,250	813,250	813,250	2,439,750
Total Raw Material Costs				1,239,157	1,239,157	1,239,157	3,717,471
Contingencies (10% of operating costs)				205,241	205,241	205,241	615,722
TOTAL OPERATING COSTS				2,257,648	2,257,648	2,257,648	6,772,943

SALES REVENUE ITEMS				YEAR I	YEAR II	YEAR III	TOTAL
SUN BAKED PEANUTS							
PEANUTS (25g)	pkts.	10	217,728	2,177,280	2,177,280	2,177,280	6,531,840
PEANUTS (50g)	pkts.	20	36,288	725,760	725,760	725,760	2,177,280
TOTAL REVENUE				2,903,040	2,903,040	2,903,040	8,709,120
GROSS REVENUE				645,392	645,392	645,392	1,936,177
DEPRN.(33 1/3%)				133,803	133,803	133,803	401,410
NET PROFIT				511,589	511,589	511,589	1,534,767

UNITED FARMERS MULTI-PURPOSE CO-OP LIMITED

ASSUMPTIONS

* Yearly lease is $10,000. 25% of the total cost has been allocated to the project as other activities take place within the building.

* 25% of the total electricity & water costs have been allocated to the project.

* Workers are presently being trained in the preparation of the products as well as record keeping for the business.

* Transportation cost is based on the rental of a pick-up, used three times monthly.

* Promotional material such as flyers will be provided within the first three months of each year.

* An administrator will be selected from the co-operative to oversee the project. This person will be responsible for scheduling the workers, arranging transportation etc.

* A member of JAMPRO staff will conduct the seminars bi-annually. The costs are computed as follows:

1 Lecturer (8 hrs. @ $1,200/hr.)	9,600
Room - 2 nights @ $1,800/night	3,600
Meals ($500/day)	1,000
Mileage 80 mls. @ $6/km	775
	14,975

* Social Services include the cost to operate a day care centre. The total cost is $400,000 yearly.(8 X 2 X $500 X 50 wks). It is assumed that each worker has two (2) children. Eighty thousand dollars ($80,000) has been allocated for this service (20% of $400,000). Each worker is expected to contribute $20 per day per child and the balance to be funded by an aid agency.

UNITED FARMERS MULTI-PURPOSE CO-OP LIMITED

SUMMARY OPERATING STATEMENT

	96/97 Year I	97/98 Year II	98/99 Year III
	$	$	$
Total Revenue	2,903,040	2,903,040	2,903,040
Total Production Cost	2,257,648	2,257,648	2,257,648
Gross Revenue	645,392	645,392	645,392
Depreciation	133,803	133,803	133,803
Net Profit	511,589	511,589	511,589

Detailed costs and revenues for this project are presented earlier in the Annex. The total production cost is $2,257,648 while sales revenue is projected to be $2,903,040 and depreciation cost of $133,803, realizing a profit of $511,589 which remains constant in Years I - III.

The project is viable as the capital cost can be recouped during the second year of the project. Funding is recommended as the project will provide employment and provide a better standard of living for persons within the community.

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ST. ELIZABETH
Elim, Braes River
United Farmers: Multi-Purpose Co-Op Ltd. (UFMC)
Sister Shirley - Project Coordinator
Glestford Reid - Manager - Tel.: (Cellular) 919-6033
Tel.: c/o 966-2500
Morris Taylor - CARDI, UWI, Mona - Tel.: 927-1231, Fax.: 927-2099
Mr. Daley - Co-Op Member/Peanut Farmer/Bee Keeper
Members of the Warminster Training Centre Project including:
Seafort Whitley, Jackie Jones, Patricia Samuels, Canute Jones,
Bevon Bennett, Lenox Irvine, Jes Vernon.
Mr. Wilfred Small, 4-H. Clubs (National).
Members of the UFMC, including:
Sister Shirley, Miss Christine, Miss Millie, Mr. Gregory,
Santa Cruz
Lawrence Johnson - Fabricator (Peanut Sheller/Stripper)
c/o Mr. Hardy - Advanced Refrigeration Service & Sales, Market St.
Tel.: 966-9659, 966-3584

ST. JAMES
Flower Hill
Flower Hill Cottage Industry
Tel.:
RADA - St. James Parish Office, Tel.:
Flower Hill Bammy Project Participants (7 women appx.)

ANNEX No 7

PERSONS MET/INTERVIEWED

ST. MARY
Highgate
Miss Shereffa Johnson - Home Tel.: 994-2465
RADA - SS/HE Program Officer; Port Maria, Tel.: 994-2436

Miss Olga Turner - Hopewell, Highgate.
Individual, small agro-food processor.
Contact: Photo Studio - Tel. 992-2126
Miss Mattie - Trainer for HEART/NTA (craft)

Annotto Bay - St. Theresa's Church; promoters of:
Long Road CO-OP, St. Mary Rural Development Project,
P.O. Box 5, Annotto Bay

Father Jim Webb
St. Theresa's Church - Tel.: 996-2378 Fax.: 996-2410
Hillary Sherlock - Home Tel.: 996-2084
Project Participants:
Vida Forrester
Fay Fyffe

KINGSTON
St. Andrew
Mrs. Lorna Gooden - Manager of RADA SS/HE Program Office. Tel.: 977-1148/58
Ms. V. Viera - Asst. Vice President, JAMPRO - Tel.: 929-7190-5
Mr. Jean Duclos WFP - Tel.: 819-8292
Mr. Hans Gotzmann WFP
Ms. Lorenza DeTassis UNIDO - Tel.: 927-3658, 978-2390/9
Marie Casserly - Design Services, JAMPRO
Larry Chang - Distributor/Trader - Tel.: 968-0579

ST. ANN
Lime Tree Garden
Paulette Thomas - Project Officer
Home Tel.: 994-2465
RADA - St. Anne Parish Office, Browns Town
Tel.: 972-3258, 972-3288, 972-4216
Project Supervisors:
Elogene "Jeane" Edwards
Ethel Shirley
Project participants (6 women)

TRELAWNY
Wakefield
Lilleth James - RADA - SS/HE Program Officer
Project Manager - Home Tel.: 954-1240
RADA - Parish Office, Falmouth
Tel.: 954-5601, 954-3335
Project Participants:
Miss Josephs
Miss Walker

ANNEX No 8

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