Processing and Marketing FSD Strategies Review Report

Consultancy Report No 13

by

Dr. J.H.D. Ludwig

Ha Noi

May 1997

1 Introduction

2 Analysis of Findings and Recommendation in Technical Reports Considering Marketing and Processing Options

2.1 Findings in Technical Reports

2.1.1 Soil Conservation and Soil Improvement

2.1.2 Vegetable Crops and Tree Fruits

2.1.3 Animal Husbandry

2.1.4 Extension Services

2.1.5 General Farming Systems Development

2.2 Recommendations in Technical Reports

2.2.1 Potential List of Crops, Livestock, Fish and Produce for Processing

2.2.2 Selection Criteria for Determination of Economic Potentials

2.2.3 Criteria for Determination of Commercial Success

2.2.4 Definition of Development Opportunities

3 Approaches for Promotion of Processing and Marketing of Agricultural Products

3.1 The Actual Situation of Marketing and Processing

3.1.1 Production and Market Supply

3.1.2 Consumption and Market Demand

3.1.3 Agroprocessing
3.1.4 Post-Harvest Situation
3.1.6 Market Prices
3.1.5 Markets, Participants and Market Channels
3.2 Market Oriented Approach for the Promotion of Marketing and Processing
3.2.1 Post-Harvest Loss Reduction
3.2.2 Economically Viable Loss Reduction
3.2.3 Post-Harvest Improvements and Marketing System
3.2.4 Marketing System Improvement
3.3 Recommendations
3.3.1 Product Selection
3.3.2 Agricultural Economics
3.3.3 Assessment and Forecasting of Economic Potential
3.3.4 Installation of Collection Points at Commune Level
3.3.5 Processing Activities
3.3.6 Agricultural Market Information System (AMIS)
4 Technical Proposal for the Study on Setting up a Pilot Agricultural Market Information System
4.1 Introduction
4.2 Appreciation of Terms of Reference and Scope of the Study
4.3 Objectives of the Study and the MIS
4.4 Approach and Methodology
4.5 Workplan
4.6 Time Schedule
4.7 Reporting
4.8 Staffing

Appendices
Appendix 1 Terms of Reference FSD-STE "Processing & Marketing FSD Strategies Review"
Appendix 2 Mission Itinerary and Persons Met
Appendix 3 Literature
1. INTRODUCTION

This report about the marketing and processing of agricultural products, originating from improved crop developments in the project area, forms part of the envisaged elaboration of a comprehensive study on the project's future Farming System Development (FSD) Strategy. It incorporates, in accordance with the terms of reference (see Appendix 1), the analysis of the findings and recommendations of the technical reports about animal husbandry development, food and tree fruit development options and strategies, soil conservation and soil improvement extension, increase the efficiency and effectiveness of extension services and general farming systems development strategies. In addition a proposal for a pilot agricultural market information system has been formulated in the context of marketing improvements.

The findings and recommendations of the various technical and economic reports can serve as the basis for the formulation of a detailed plan of operation for the future project phase, specifying those activities to be carried out by the project as well as those to be carried out by involved sector agencies on regional and field level. The recommendations, if implemented, have much wider implications for the development in the two Provinces and the Song Da Watershed area, while primarily focusing on Yen Chau and Tua Chua districts in this report and the major provincial markets, including the large market outlet of Hanoi.

Methodologically the report is following the congenital pattern of describing and analyzing the market environment (product supply and demand), post-harvest activities (standardization, grading, storage, packaging, processing, transport, etc.), marketing channels and pricing (producer-, wholesale- and retail prices, yearly and seasonal fluctuations, costs, margins, returns, etc.) in order to achieve defined recommendations. A major focus of the consultancy has been the collection and interpretation of price information since the availability, processing and analysis of such data was shortcoming in the project so far.

Many of the recommendations presented are the result of the interviews carried out with producers during the FSD-mission carried out in January 1997 in Yen Chau and Tua Chua districts and observations in the field with respect to marketing and processing. In the course of price data collection in Hanoi several interviews were carried out with representatives from the Ministry of Agriculture and Rural Development, state enterprises for agricultural and livestock produce and other private market participants (see Appendix 2).

2. ANALYSIS OF FINDINGS AND RECOMMENDATION IN TECHNICAL REPORTS CONSIDERING MARKETING AND PROCESSING OPTIONS

In accordance with the first task of the TOR (see Appendix 1) the findings and recommendations of the various short-term experts assigned to the FSD have to be analysed in the context of integrated FSD, considering practical processing and marketing options. In particular the following reports were analysed:

a. Report on Soil Conservation, Soil Improvement and Extension for the Social Forestry Development Project Song Da and Care (Bunch, R.; March 1997)
c. Animal Husbandry Development (Gibson, T. A.; April 1997)
d. Proposals to Increase the Efficiency and Effectiveness of Extension Services Supported by SFDP Song Da in the Districts of Yen Chau and Tua Chua (Kaiser, K.; February 1997)

Since food crops such as paddy, maize, cassava, groundnuts, soy bean, and foodstuff, such as sugar, tea, coffee, cotton, silk/mulberry and fish, have not been investigated under technical aspects, other information sources presented in reports of literature (45), (49), (50), (52), (53) and (54)(see Appendix 3) were incorporated in the analysis.

2.1 Findings in Technical Reports

For consideration of practical options with respect to marketing and processing each of above reports had a different value of statements. The most useful findings were included in the comments on strategies for vegetable crops and fruit trees.
2.1.1 Soil Conservation and Soil Improvement

General considerations with respect to soil recuperation stated that farmers could significantly improve the soil-fertility through cultivating cassava instead of 2 for 3 years staying in the fields. After employing such a practice, rice, soybeans or maize could once again being cultivated in the third year on the cassava field, resulting in an additional yield of such food crops.

Under the aspect of specific technologies to be applied, such as the use of green manure and cover crops, the cultivation of such cover crops should be of multiple use and not only increasing the soil fertility.

Experience from other trials proved that the provision of additional benefits, such as income generation by cultivating "green beans", human food production by cultivating "lablab beans" and animal fodder provision by cultivating "tiger beans" could be of importance. Additional species with a high potential are "rice beans", "swordbeans" and "jackbeans" as food crops.

With respect to the improvement of the production of horticultural crops the requirements of less toxic chemicals is mainly concentrating on the cultivation of cabbage, Chinese cabbage, carrots and various leaf vegetable, which are already grown in the project area.

2.1.2 Vegetable Crops and Tree Fruits

The step by step methodology used identified 16 different species of fruit with a good potential for commercially successful development which have already or will have market windows when grown under upland conditions. Similarly 22 all year vegetables, 9 wet season vegetables, 6 cold season and 8 hot season vegetables have been identified which are already sold in villages and towns, when produced in access, or having market opportunities in future. Pre-condition are their availability of market windows, good road conditions and transport times to the markets, improved post-harvest management and packaging, pre-cooling, storage and availability of cool chain transport or freezing. As soon as the road and transport infrastructure has been improved, the development of vegetable crops in the uplands will quickly outstrip the fruit tree production in terms of financial returns.

There is a need for simple home processing and storage of 16 species of fruits and cool storage and collection points for fruits and vegetables in order to assist with orderly distant marketing, quality maintenance and surpluses.

The methodology for selecting fruits and vegetables for economically successful developments in the project area provides important factors which have been listed under three major headings, namely commercial and consumer potential and product marketing characteristics. Specific criteria for determining commercial success of tree fruits are including socio-economic indicators. Details are presented in chapter 2.2.

2.1.3 Animal Husbandry

Since the native cattle is very well adapted to the harsh environment of the upland area the governments long-term programme of improving this breed by crossing it with the Indian milk breed of Red-Hindi has to be satisfactorily demonstrated under the conditions existing in the project area before replacement. Under improved feeding conditions the native cattle is very capable of high productivity (80% increase of body weight).

On the other hand the Red-Sindhi x native cross breed has good potential in the upland areas as the basis of a dairy animal. The cross-bred when inseminated with Friesian semen results in a suitable dairy cow for smallholder farmers. In addition it should be highly profitable by producing dairy heifers solely for sale (approx. 3 mill. VND).

By promoting the adoption of permanent contour strips of leguminous shrubs (Leucaena leucocephala) in upland cultivation fields, high quality livestock feed will be assured with increases of milk yield up to 22%.

The supplementing or replacing natural weed fallow land with sown forage legumes (e.g. Imperata cylindrica)
the yields of maize after fallow can be doubled and those of cassava increased by over 80%.

The government's active programme of extending the Bac Thao improved breed of goat seems promising to be promoted since as well its meat and blood as its milk is in high demand.

Disease problems with improved breeds of pigs and poultry have to be solved before any further development can be supported.

2.1.4 Extension Services

Agroforestry hedgerow trials based on the experience of Action Aid in the neighbouring districts resulted in a promising technology to address the problem of maize and soybeans yield decline due to declining soil fertility.

The successful results of demonstration trials with new maize and rice varieties and the planting of maize during the spring season as a second crop can be directly attributed to the trials carried out by the project.

The results of the fruit tree activity development (especially the grafting of mango and tangerine and the planting of newly selected apricot, mango and longan trees) were not too promising since the partner organisation did not fulfill its contractual obligations. The achievements in seedling products of apricot, pomelo, longan and mango were satisfying.

The extension activities on beekeeping and planting tea plots went according to plan. Details with respect to marketing and processing will be presented in another report.

2.1.5 General Farming Systems Development

The smallholder farms in Tua Chua district operate generally on a subsistence basis. After securing the subsistence requirements with staple food (crops and livestock products), some marketable surpluses are sold, such as rice, soybeans, other beans, forest tubes, banana, cows, pork and chicken. The sales of beans normally concerns the surplus quantities obtained from the second crop on paddy plots.

The most important source of farmer's cash income is animal husbandry, whereby chicken (70%), pigs or pork meat (60%) and cows are the major marketed produce. Fruits and vegetable from home gardens and fish are normally part of the subsistence food. Occasionally banana in surplus are sold.

Marketing of agricultural produce is mainly oriented towards small village markets and by-passing traders. Since the distance to the district market in Tua Chua is an average 2-3 hours walking effort, only rare market visits are reported.

The market involvement of the farmers in Yen Chau district is more distinct than the one of Tua Chua district despite the fact that all households in Yen Chau district still operate on a subsistence basis. The majority of farmers are selling maize, some occasionally rice. Grapefruits, tangarines and mangoes are sold regularly. Farmers with larger fishbonds are selling fish in surplus.

Next to maize, the sales of livestock, mainly buffaloes (live), pigs, pork and chicken is regularly carried out. Occasionally cows and ducks are sold.

Since most of the villages in the project area are located closely to the national road no.1, marketing is no bottleneck and mostly the produce is brought by ox-carts to the markets located along the road.

The main findings within the farm systems development sector with respect to marketing and processing concentrated on measures to improve food crops and foodstuff crop varieties to secure food availability and to increase cash income. The introduction of additional livestock (especially cows and goats) is supposed to increase meat and milk surpluses for the market. The improvement of the home garden cultivation is aiming for an increase in fruit and vegetable production.
2.2 Recommendations in Technical Reports

The broad development strategy as outlined in the individual reports will apply equally to food crops, fruits, vegetables, livestock, aquaculture, soil conservation and small-scale agro-processing. Selecting individual crops, livestock/fish and produce to be processed with respect to commercially successful development in Yen Chau and Tua Chua districts involves a number of sequential operations, such as:

a. Generation of a potential list of crops, livestock/fish and produce to be processed,

b. Application of selection criteria to determine an economic potential of promising species,

c. Development of specific criteria for determining the commercial success of suggested crops, livestock/fish and produce to be processed,

d. Definition of development opportunities for crops, livestock/fish and produce to be processed most likely to be commercially successful in Yen Chau and Tua Chua districts.

2.2.1 Potential List of Crops, Livestock, Fish and Produce for Processing

Various potential food crops/foodstuff, fruits, vegetable, other produce, livestock, fish and produce for processing have been identified as follows:

(a) Food Crops

- Paddy/Rice
- Soy Beans
- Maize
- Groundnuts
- Cassava (Yen Chau only)
- Other Legumes (e.g. beans, lablab, etc.)

(b) Tree Fruit Crops

- Apple
- Apricot
- Asian Pear
- Avocado
- Banana
- Grapefruit
- Guava
- Jack Fruit
- Japanese Apricot
- Lemon
- Mulberry
- Nectarine
- Orange
- Papaw
- Pear
- Rough Lemon
- Santol
- Sapodilla
- Sweet Bamboo
- Tahiti Lime
- Blueberry
- Carambola
- Cherimoya
- Chestnut
- Custard Apple
- Grape
- Longan
- Loquat
- Lychee
- Mandarin
- Mango
- Peach
- Persimmon
- Pineapple
- Plum
- Pomegranate
- Pummelo
- Tamarind
- Tangelo
- Tanger
- Passionfruit
- Walnut
- Macadamia
(c) Vegetables, Spices & Herbs

- Arrowroots  
- Asparagus  
- Baby Carrots  
- Baby Corn  
- Beetroots  
- Broccoli  
- Brussel Sprouts  
- Bush Beans  
- Butterhead Lettuce  
- Cabbages  
- Candaloupe  
- Capsium  
- Carrots  
- Castor Bean Seeds  
- Cauliflower  
- Celery  
- Chillies  
- Chinese Mustard  
- Chinese Redish  
- Chinese Cabbage  
- Choko  
- Citronella Grass  
- Cos Lettuce  
- Cucumber  
- Derries Roots  
- Egg Plants  
- Endive  
- Fennel  
- French Beans  
- Garlic  
- Ginger  
- Globe Artichoke  
- Gourdo  
- Green Beans  
- Head Lettuce  
- Japanese Onion  
- Japanese Cucumber  
- Kohl Rabi  
- Leaf Mustard  
- Leek  
- Luffa  
- Melons  
- Okra  
- Onions  
- Papaw Leafs  
- Pepper  
- Potatoes  
- Prime Cabbage  
- Prime Cabbage  
- Butterhead Lettuce  
- Head Lettuce  
- Japanese Onion  
- Mushroom  
- Spinach  
- Squash  
- Sweet Corn  
- Sweet Potatoes  
- Taro  
- Tomatoes  
- Tumeric  
- Turnip  
- Vegetable  
- Soybean  
- White Balsam  
- Pear  
- Yard Long Bean  
- Zucchini  
- Bay Leaf  
- Chives  
- Dill  
- Mint  
- Rosemary  
- Sage  
- Tarregon  
- Thyme
2.2.2 Selection Criteria for Determination of Economic Potentials

After compiling the comprehensive list of potential crops, livestock/fish and agroprocessed products it has to be decided which of those commodities have a commercial (economic) potential for development. The factors important in assessing this potential may be summarised as follows:

a. Consumer potential
b. Product marketing characteristics
c. Economic potential
d. Other uses

It is suggested to further sub-divide these factors into broad categories as follows:

(a) Consumer potential

- Quality
- Buyer confidence
- Market development
- Competition with other produce
- Place in dietary chain
- Ease of consumption
- Ability to promote
- Ability to sell on particular markets
- Processed product market

(b) Product marketing characteristics

- Fresh product
  - Product life
  - Product storage
  - Standardization and grading
  - Packaging
  - Transport
  - Trade barriers
  - Marketing chains
  - Product pricing

- Processed product
  - Type of supply
  - Type of processing, packaging and transport
  - Processing plant siting
  - Marketing
  - Product pricing

- Economic potential
  - Likely returns for producer
  - Capital investment
  - Integration with established crops

- Other uses
  - Pharmaceutical potential
  - Processing of discarded parts
  - Cottage production

At the present time there are many constraints to commercial production and marketing. As circumstances change, infrastructure improves, better information becomes available, cool chain transport, processing and postharvest management improve, most of above mentioned commodities may be developed for commercial marketing and small-scale processing in Yen Chau and Tua Chua districts and other locations in the Song Da Watershed.
2.2.3 Criteria for Determination of Commercial Success

When the following specific criteria for determination of commercial success are applied to the long-list of commodities compiled in chapter 2.2.2 the short-list of commodities obtained will most likely be substantially reduced.

The socio-economic criteria to be applied may be summerized as follows:

- Future market potential (local, domestic, export) forecasting
- Presence and/or absence of market-niches or out-of-season market (competition with other areas or produce)
- Import substitution opportunities
- Infrastructure requirements for production, post-harvest management, processing, distribution and marketing
- All season road access
- Incentives for development
- Development policy and government strategies
- Investment support and credit availability
- Producer-, wholesale- and retail-prices
- Number of years to break-even on investment
- Comparative regional advantage
- Gross margins and return to capital and inputs
- Consumption patterns and market demand
- Current production and market supplies
- Direct costs of distribution
- Politics of trade and protectionism
- Importance of produce for food security
- Importance of crop as cash income for farmers

2.2.4 Definition of Development Opportunities

For 11 fruits development opportunities were identified for the project region (Longan, pummelo, sweet bamboo, lychee, sour and sweet tamarind, banana, jack fruit, macadamia, persimmon, peach, nectarine and avocado). Such opportunities will serve to highlight the issues to be addressed by extension and socio-economic interventions to ensure commercial success and may be listed as follows:

- Good processing demand for fresh, canned and dried products
- Good domestic and export market demand
- Established markets
- Product easy to handle, transport and market
- Marketing window when growing in uplands
- Attractive returns
- Good post-harvest life and handling characteristics
- High returns and low cost of production
- Simple trying technology can be used to overcome fresh produce marketing constraints

3. APPROACHES FOR PROMOTION OF PROCESSING AND MARKETING OF AGRICULTURAL PRODUCTS

The identification of practical approaches for the promotion of marketing and processing of agricultural products originating from improved farming systems in the project area - as described in chapter 2 - implies the availability of specific and updated marketing data, about system components such as production (supply), consumption (demand), prices, post-harvest infrastructure, etc., for relevant commodities. Unfortunately the only project documents about that subject, prepared in December 1993 (Market Study) and March 1994 (Agro-Economic Farm Household Survey) were not updated in the past three years and the description of important post-harvest activities in the project area such as storage, transport, small-scale
processing, etc. is lacking (see literature 52 & 53).

Logically the authors of the market study stated in the chapter of introduction that the purpose of such a study was to gain an understanding of the markets of the main commodities produced in the project area, the market potentials and constraints in order to facilitate project planning for the promotion of marketing. Impacts from technical project activities can only be sustainable when the market conditions of the commodities produced are taken into consideration.

Considering the short period of only two weeks available to address such an extensive subject the consultant decided to update at least commodity price development during the past years and to compile the available information about the other marketing and processing subjects in order to obtain are approximately comprehensive picture of the situation nowadays which is necessary to achieve basic recommendations. Nevertheless the content of this chapter should not be judged as an in-depth assessment but more likely as just "scratching the surface" of the marketing and agroprocessing problems to be solved.

3.1 The Actual Situation of Marketing and Processing

The recent development of the main marketing system components such as production, consumption, post-harvest situation, marketing channels, prices and agroprocessing are described for the provinces, districts and selected project community areas, where available, within the Song Da Watershed (SDW).

3.1.1 Production and Market Supply

The development of food crops, foodstuff, industrial crop and livestock production in Lai Chau and Son La province and, where available, in Tua Chua districts between 1985 and 1995 are compiled in Table 1.

**Paddy**

Since paddy production depends heavily on climate conditions yearly yields fluctuated during the past ten years in Tua Chua between 3.700 and 6.100 tons, in Yen Chau between 4.700 and 9.800 tons. Since generally the productivity is below national average the slight increase of production at the provincial level indicates certain technical improvements (high yielding varieties, fertilizers, pesticides, crop rotation, etc.).

**Maize**

Maize is the second important food crop. While maize cultivation has been more or less stable in Lai Chau Province with fluctuations between 2.500 and 5.800 tons in Tua Chua, Son La province and Yen Chau district have experienced a continuous extension of area, yields and production by nearly 100% over the past ten years. Possibly the increasing demand of the feedstock industry is one of the reasons for this improvements.

**Sweet Potatoes**

The production of sweet potatoes in both provinces is in the range of a few thousand tons and especially in the project area negligible.

**Cassava**

Even tough the overall productivity lacks a significant development in Lai Chau and Tua Chua and ranges below national average productivity, the production in Yen Chau district has been moderately extended.

**Vegetable and Beans**

While in Son La province a distinct increase of vegetable production from 20.000 to 30/45.000 tons can be observed during the last three years the development in Lai Chau province indicates a decline from 26.000 ton (1986) to 14/18.000 tons recently. The production of beans has been more or less stable over the past ten years.

**Soy Beans**
The production of soy beans has more than doubled in Son La and Yen Chau over past years, while in Lai Chau province and Tua Chua the output is stable over the years but the quantities are still very low despite that soy bean became a cash crop which has gained an increasing importance within the crop rotation system in recent years.

**Groundnuts**

The groundnut production of 400 to 700 tons in each of the two provinces is of minor importance for the farming systems of the project area.

**Sugar Cane**

Since cane cultivation has been largely confined to marginal land, lacking fertilizing and irrigation with planting material of inferior varieties the production in Lai Chau province declined in past years. An increase of cane production observed since the early 90ies in Son La province might become reincubated when the newly constructed factory will start operation.

**Cotton**

Despite that the SDW is Vietnam's second important cotton growing area (40-50% of national production), the overall production is very low with 500 to 700 tons in respective provinces with an annual decline of 7-8% per year.

**Coffee**

Since most of the plantations and individual plots have been established only in recent years, the productive phase is only starting and mainly in Yen Chau some tens of tons have already been harvested. Compared to the national coffee production the output of the project area is still negligible.

**Tea**

In recent years the expansion of the area under tea cultivation and the production followed a slight upward trend in Lai Chau province and Tua Chua districts. The tea cultivation in Son La province is stagnating or even slightly decreasing.

**Fruits**

As a result of the specific climatic conditions a variety of fruits such as mango, banana, oranges, longan, apricot, plum, peach, apple, jackfruit, lychee, papaw, guava, etc. are grown in the project area with higher yields and better qualities than in low land provinces. The production for the four most important fruits increased in over the past years to 200 tons (mango and pineapple in Lai Chau province) and up to 8.000 tons (banana in Son La province).

**Meat and Milk**

Livestock production provides in most mixed farming systems of the project area 30 to 40% of cash income. The number of livestock rearing increased over the past ten years on provincial level remarkably for buffaloes (from 77.000 to over 100.000 per province), pigs (from 134.000 resp. 244.000 to 170.000 resp. 311.000 per province) and for poultry (from 580.000 resp. 985.000 to 716.000 resp. 1.8 million per province). The available district data for 3 years (1989/1991) indicate a stagnation of the size of livestock. Cattle rearing has also been stagnating in past years. The role of large ruminants is to provide draft power for cultivation and transport as well as manure for crop production and is eventually a source of cash income. Pigs, utilize crop and household by-products to provide cash income and manure, while poultry provides meat and eggs for household consumption and a source of cash income. Additionally goats for meat and milk and horses for transport are reared in Tua Chua and Yen Chau district.

Production data for meat are not available on district or provincial basis. It is estimated that during the past ten years an annual rate of production increase within the range of 7-8% occured. Some 75% of meat produced is in form of pork, 15% poultry and duck meat and the rest red meat, predominantly from cattle, buffalo, goat and sheep.
Since the milk processing plant in Moc Chau started operation and VINAMILK is becoming very active in collecting milk from distant producer areas the production of fresh milk increases in Son La province by yearly 5 to 10%. Production data for Tua Chua and Yen Chau are not available but the Moc Chau dairy increased production up to 3.000 tons per year by the mid 90ies.

Fish

Fresh water fish aquaculture is widely practiced in the project area in fresh water ponds, large ditches and floating river cages. Fish production yields approximately 80 to 90 kg per cubic meter water and year.

Summary

The estimated supply of major food crops, foodstuff, industrial crops and livestock in the project area, the SWD and Vietnam is compiled in table 2. Apart from silk supply, which is very small, the actual supply situation for rice, cassava, soy bean, coffee, cotton and milk is small and for the remaining commodities medium. There is a very large supply potential in the project area for maize, some fruits and milk. The regional potential for very large or large supplies includes food crops (except cassava), industrial crops (except cotton) and all fruits and livestock (except goats).

3.1.2 Consumption and Market Demand

The consumption of the estimated consumption levels 1980-1995 (see table 3) and the calculated individual commodity in Vietnam 1993 (see table 4) and the demand of major produce in the project area (see table 2) mirrors, in general, the development of production and supply as described in the previous chapter.

Per Capita Consumption

Since rice is the major staple food in Vietnam its per capita consumption, increasing from 141 kg/capita/year to 183 kg/capita/year between 1980 and 1995, implies 55 to 60% to the total food basket. It is followed by vegetable, fruit, tubers, fish, meat, vegetable oil and other foodstuff.

The average yearly development of consumption changes indicated in the past a moderate increase for cereals (1.5 to 2.8%), tubers (-0.9 to 3.4%) and vegetable and fruit (5.1 to 6.2%). The consumption of sugar, vegetable oil, soy bean and eggs decreased considerably.

Food Crop Consumption

Despite that food security is measured in rice security, other staples such as maize, cassava, sweet potato, taro and arrow root serve as substitutes, since most of the upland farm households experience rice scarcity for one to three months per year. Local produce surpluses enter the inter-communal trade and are sold mainly in provincial or district towns. Hardly any cereal production, with exception of maize, is leaving the SWD region. On the contrary, since the regional covers only some 50% of the requirements of rice equivalents, there is a need to import such staples (mainly rice) from low land surplus provinces. Demand growth will be driven by population growth and moderate increasing incomes from the regions rural population. Income elasticities for rice in the project area will be still over proportionally high, compared to urban Vietnam.

As already indicated, about half of the regional maize production was transported in recent years to low land provinces for food consumption and the supply of feedstuff processing units.

Cassava plays an important role in the diet of the upland farmers who do not have sufficient rice and/or maize to meet their subsistence needs. Cassava is meeting approximately 20 to 30% of the food subsistence requirements. The remaining production is generally fed to livestock, in particular pigs. Cassava leafs as by-product are used for fish-feeding. Most of the production meets the farmers demand for feed and food.

Foodstuff Demand

Since soy bean produced in the project region is of very good quality the demand from processing enterprise is high. Only small quantities of soy beans are used for home consumption as a result of the valuable cash prospects.
The majority of the fruit production in the project area traded as surplus to the major urban markets in Hanoi or Haiphong or to China (especially banana), depending on the species of fruit, since only small quantities are consumed by the producing households. The main retail markets in Hanoi are by far the main outlet for fresh fruit and the overall rising incomes will increase the demand of fresh fruit in the next future. The demand varies considerably among fruits. Quantities of oranges, apricots, lychees, longan and plums purchased depend heavily on income levels of buyers. On account of high price elasticities the risk of market saturation is limited for most fruits suggested in the recent report of the fruit expect.

Industrial Crop Demand

Cotton clothes have ever been like silk and textile dyes an indispensable part of the upland minorities' tradition. Therefore the entire cotton production of the project area is used for home consumption (processed in cottage-type way) and only very small surpluses are sold locally to neighbouring processors. The finished products are offered in the town markets, after the demand of own clothes, mattresses, bed covers and shoulder-bags are satisfied. The low production level does not even meet the local demand which is complemented by imports, mainly from China.

Green tea consumption has a high preference in demand since it plays a very important role in the daily life of the people, both as beverage and for ceremonial purposes. Black tea has only a minor share in domestic markets. More than 40% of the produced tea is in demand by low land provinces and major urban markets, 10% is consumed within the SDW region and about 50% exported. Since the income elasticity of the tea demand is presumingly close to zero the domestic future consumption is estimated to grow only moderately, depending on the growth of population.

Livestock, Meat and Milk Demand

It is expected that the demand for buffaloes from the project area is going to continue having a moderate growth. Meat demand is expected to rise with increasing rural and urban income. This affects also the type of meat in demand and its higher quality (such as expensive cuts). On a long run beef will substitute pork and poultry will gain importance. The entire surplus milk production is highly demanded by the expanding market for milk and milk products. A large growth-potential for demand of livestock products is forecasted since the current consumption level is low and livestock products have a high income elasticity.

Fish Demand

Fisheries make a greater contribution to the demand situation than livestock. Domestic consumption is nearly as important as those of livestock products and fisheries also supplies one of the few sources of protein in livestock feed (fishmeal). With rising income an increasing demand of pond- and river-cage-fish is forecasted.

3.1.3 Agroprocessing

In the SDW region agroprocessing is composed of many small-scale operations and some medium-scale industries with varying capacities. There are 16 main enterprises located in the provinces of Lai Chau and Son La:

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tea company Tam Duong</td>
<td>Lai Chau</td>
</tr>
<tr>
<td>Black-tea factory under the To Hieu State Farm</td>
<td>Mai Son</td>
</tr>
<tr>
<td>Sugarcane factory</td>
<td>Mai Son</td>
</tr>
<tr>
<td>Animal feed processing company</td>
<td>Mai Son</td>
</tr>
<tr>
<td>Black tea factory Kim Chung</td>
<td>Yen Chau</td>
</tr>
<tr>
<td>Tea company Moc Chau</td>
<td>Moc Chau</td>
</tr>
<tr>
<td>Fruit processing company</td>
<td>Moc Chau</td>
</tr>
</tbody>
</table>
Technical and economic data about these factories are at the moment not available to the project staff. The main processed products for these enterprises and other small-scale operations are rice, maize, grain- and cassava-flour/starch, noodles, canned and dried fruit, fruit juice, animal feed, sugar, coffee, tea, silk, cotton material, fresh milk, other milk products and livestock products.

The further development of agroprocessing suffers from a high degree of constraints, such as:

- weak transportation system which prevents long distance transport of fresh and processed commodities,
- limited availability, distribution and continuous supply of electricity,
- obsolete or low-level technology which causes high processing losses and results in low-quality products,
- inadequate hygiene, packaging material, grading and standardization also contributes to poor quality,
- inadequate management skills,
- severe shortage of technical and market information,
- low consumer income is limiting the demand for processed food.

The following description of processing operations concentrate on medium and small-scale operations relevant to the SDW region.

Most of the equipment of small-scale agroprocessing plants is largely locally designed with little infusion of improved technology (e.g. made in China).

**Grain Milling**

The problems of rice or maize milling are starting with the quality of the grain as delivered to the mills. Threshed paddy or maize cobs are usually sun-dried and the corn-moisture content is supposed to be reduced from up to 20% at harvest to 13% before delivery for procurement. In fact the moisture content of delivered grain is often as high as 17%. Summer and autumn crops which are harvested during the rainy season are particularly difficult to dry. Dryers are scarcely used due to cost considerations.

Medium-scale mills have a capacity of 5-20 tons/day and the majority of small-scale mills manage to mill up to 5 tons/day depending on the horse-power of the engines available. Finally milling is also carried out in farm households using manual means. The rice recovery rates for local small-scale mills are with 64% and for manual processing with 71% far below the normal standard.

Due to inadequate drying and storage and to a lesser extent poor equipment the quality of milled rice is with 45% broken generally low. Most of the small-scale mills are of the Engleberg type with cast iron hullers, other brands are using rubber roll shellers.

**Flour, Starch and Noodle Processing**
In the project area where rice, cassava, maize and arrowroots are abundant the processing of these produce to flows, starches and noodles is an important sideline for farm households. Besides of the use of a grinder all other operations being carried out manually.

The value added to root crops by processing compensates for the high transport costs and makes the development of such processing operations particularly attractive for upland farm-economy.

Apart from the large-sized sugar refinery in Mai Son the local processing of sugar cane is carried out by artisanal methods, extracting a thick paste from the cane with an extraction rate of 44-52% sucrose (compared with 60-85% in large refineries). The sucrose yields of sugar cane in the SDW region is with 9% low, compared to 9-14% of normal cane quality. If the time-span between harvesting and processing exceeds two weeks a loss of 5% of sucrose is not unusual.

**Cotton Processing**

Since the regional production is comparatively low the ginning of cotton seed is carried out with the help of water-driven small-scale mills by individual farm households.

**Coffee Processing**

The particular weakness of coffee processing is the pre-processing manually done by farmers where through faulty drying and hulling the product appearance is downgraded. Recently a coffee (arabica) processing enterprises has been started to operate in Son La town which is in the vicinity of the Yen Chau coffee growers.

**Tea Processing**

Green tea is often processed by tea cultivating farmers in small-scale cottage operation. Larger tea factories are located in Moc Chau and Lai Chau and their technology is of Russian or Chinese design.

**Fruit and Vegetable Processing**

In the past fruit processing outlets were mainly limited to the public owned VEGETEXCO. In the meanwhile its market share is reduced to 40-60% since private competitors with small-scale processing facilities entered the market. VEGETEXCO is managing 15 processing plants throughout the country and is planning to install a factory in Son La with a capacity of 5,000 t/year. The company operates a large fleet of refrigerated trucks and organizes purchasing in each province through own agents and with the help of the provincial staff of the Commercial Departments. The marketing of fresh vegetable and vegetable processing is very limited. The companies provincial operations include canning, freezing and drying.

Given the general form of privatisation, the poor state of operating processing equipment and the extent that the growth prospects of fruit and vegetable processing will continue to be determined primarily by external demand, its expansion is likely to be inhibited by the relatively poor quality of its products. The upgrading of out-dated processing facilities and the introduction of modern technology is a must for further development of this sector. At another level it will also necessitate measures, to ensure the delivery of high quality fresh fruits and vegetables to the processing plants. The processing industry itself will increasingly have to adopt a direct role in promoting the supply of first class raw materials by helping the farmers to choose appropriate plant varieties, disseminating improved cultivation practices and to establish an incentive-based pricing structure.

On the other hand there is also a market niche for the development of a cottage industry by introducing proper sun-drying or oven-drying technologies in the uplands. The domestic market and export market for dried lychee and longan (e.g. to China) has a large demand and its prices are attractive. At the moment only a few farmers take part in drying fruits since the demand for fresh fruit is large and they prefer the immediate return of selling the fruits to higher returns at a later date.

**Meat and Dairy Processing**

Meat processing is limited at present to slaughtering, butchering and freezing and is undertaken on a wide range of scales of operation which span from small rural households to large public owned enterprises. The main constraints in meat processing is the inadequacy of the available livestock, consisting of indigenous breeds which have a low genetic potential for the production of meat, milk and eggs as well as a small body size and slow growth rates. In addition pigs produce a too high proportion of fat.
The genetic unsuitability of most animal stock as raw material for modern commercial meat processing is exacerbated by the continued application of traditional low-productivity livestock management techniques. These are characterized by high feed conversion rations (i.e. low volumes of saleable outputs relative to the volumes of inputs utilized), low dressing rates and poor product quality. In the case of ruminants, the slaughter is estimated at 7%, largely because farmers prefer to expand the size of their herds, even when their existing animals are poorly fed. This in turn, results in thinner animals with low meat quality and relatively low dressing rates average 35% for cattle and 40% for buffaloes. In the case of pigs, the present slaughter rate is estimated at 78.4% which reflects a period from farrow to finish 2-3 times the commercial European average. The poultry slaughter rate is approximately 130% well below the international norm of 300%.

In addition to this problems meat processing as also hampered by the inadequacy of the available processing facilities. Provincial slaughterhouses do not generally meet international standards of technical efficiency and hygiene.

Increases in the number of available livestock and improvements in their quality remain particularly important prerequisites for the successful development of the meat processing.

Given the low genetic suitability of the existing animal stock for this purpose, the achievement of this goal will necessitate an extensive upgrading of the available animal varieties through large crossbreeding programmes, or will have to be based on imported breeds. The gains in livestock numbers and quality obtained by these measures will have to be maintained moreover, by the adoption of more animal husbandry techniques. This will involve a significant shift from the traditional patterns of livestock farming being practised at present. In particular, it will require the provision of more nutritious and balanced feed crops and dietary supplements, improved veterinary services and more conscious efforts to optimize stocking rates in order to ensure adequate supplies to the slaughterhouses while at the same time preventing an erosion of the average quality indicators of the remaining herds and flocks.

Until recently the domestically produced milk provided only 5-10% of the demand. Most of the milk and milk products consumed derived from imported skim milk powder and butter oil for reconstitution. Aside from the small size of available dairy animals and the difficulties in increasing the fodder basis, the main limitation on developing domestic processing is the distance and isolation of dairy producers in upland areas from major domestic markets (such as Hanoi), which all but precludes the distribution of fresh milk.

The milk processing plant in Moc Chau (Son La province) is the only enterprise in the SDW region with medium-scale processing facilities. In the early 90ies the plant accounted for approximately 20% of the national production. Nowadays it mainly supplies VINAMILK in Hanoi with fresh milk and semi-processed products, since the quality of its own products is lacking.

The monthly output of fresh milk by VINAMILK was in January 1997 two million litres, which is an 11% increase within one year. The company is also producing yoghurts, fruit and soy milk, condensed milk, powder milk, butter, soft cheese and ice-cream (see table 9). Most of these products have a yearly increase of output in the range of 40 to 90%. The radius of milk collection exceeds 300 km and the refrigerated trucks of 3 to 4 ton capacity (200 ltr. containers) are collecting the milk from agents in provincial/district towns after checking the quality standards (VND 3.500/Ltr. for good quality). Increasingly small-scale processing enterprises are competing with VINAMILK (especially in the south of the country) and sharing the challenging market for fresh milk.

Fish Processing

In addition to the large-scale industrial processing facilities the fish processing sector also comprises a network of cottage sized enterprises owned mainly by private businessmen, producing in pond culture, cage and pen rearing. They are engaged in the preliminary cleaning and sun drying or fish for delivery to the industrial fish drying plants. As even more important activity carried out by these farms is the production of fish sauce. This involves mixing the otherwise unusable parts of the fish catch with salt in a ratio of 2:1, and allowing the resulting mixture to cure in the sun and ferment for several months before draining off and filtering the liquid so produced. The total output of fish sauce produced in this manner by small-scale privately owned enterprises is estimated to amount to approximately 100.000 tonnes/year.

3.1.4 Post-Harvest Situation
Post-harvest marketing and processing of agricultural products is mainly constrained by shortcomings imposed through storage, past-harvest losses, transport and electric power issues in the agricultural sector.

**Storage and Losses**

Most storage facilities within the public and private sector located in provincial/district towns are not specifically designed for storing agricultural produce. They are poorly maintained and an obvious source of losses caused by rats, insects and moisture. Facilities to be build for specific storage purposes are rare to find. As a result the estimated total post-harvest losses of grains are as high as 16% taking the following individual losses into account (FAO estimate):

<table>
<thead>
<tr>
<th>Loss Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses at harvesting (grain left in the field)</td>
<td>1.5%</td>
</tr>
<tr>
<td>Losses at threshing (unthreshed or scattered)</td>
<td>1.5%</td>
</tr>
<tr>
<td>Losses at drying (1.5% in coop yard, 2.5% at roadside)</td>
<td>2.0%</td>
</tr>
<tr>
<td>Transport loss to storage</td>
<td>1.0%</td>
</tr>
<tr>
<td>Storage losses (highly variable)</td>
<td>5.0%</td>
</tr>
<tr>
<td>Milling losses</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

Losses up to 27% may occur if grain is processed manually and retained for household consumption. Not all losses are absolute. Foraging animals (chicken, ducks) depend significantly on field losses and much grain spoiled in storage or lost to the bran at the mill also ends up as livestock feed. Loss of grain quality, which translate to differences of 20-40% in market value of final product, could well outweigh the physical loss of product.

**Transportation, Electric Power and Water Supply**

Transport bottlenecks are especially in the uplands and mountainous areas of the project location. One main obstacle to the development of specialized production, processing and marketing capabilities. This pertains not only to perishable products. During the rainy season many road sections to villages are blocked for weeks by slope-slides or large rocks blocking the traffic.

Another obstacle are the fast increasing transportation costs. Since the project area is not accessible by train or waterways only trucks can be used for the transport of larger quantities, which means straight away an increase of 300% of transport costs compared to the other carriers. In addition for transportation on poor roads in mountainous regions extremely high charges are applied, especially during the raining season. An example of transport costs in Ha Bac and Lang Son stated for beginning 1994 8.500 per ton-km, compared to 500 VND per ton-km under normal road conditions.

For the transport of small quantities horses, ox-carts, bicycles or motorbikes are used in the project area but the calculated transport charges are not much lower. The transport of one bag of cement (50kg), for example, over a distance of 3 km by trekking is charges with VND 3.500.

In the more remote villages lack of water for human and livestock use or irrigation is often a good constraint. In such areas there is often adequate underground water but water cannot be pumped due to lack of electrical power.

**3.1.5 Markets, Participants and Market Channels**

Since crop cultivation or livestock rearing for the market is a relatively recent innovation in the project area, particularly in the villages somewhat further from the main roads, farmers are still fairly passive with respect to produce-marketing. Mostly they are waiting for traders or collectors to come to the village to purchase their products. Besides of lacking marketing skills they also have very little influence over suggesting the price-levels. Decreases in producer prices are commensurating with the distance and difficulties involved in reaching more distant villages. At the township markets in Tua Chua and Yen Chau only small quantities of produce are sold (mainly by younger women), rarely with value added, and little of this fruits, vegetable,
chicken, meat, rice, cotton cloth, maize, cassava, etc. are produced expressively for the market. The only crop produced primarily for the market are beans and sticky rice which are sold by men.

The market orientation of the different farming systems are very similar whereby the paddy based farms of the lower valley areas are more involved in market production than the upland farmers. Livestock production is generally more market-oriented than crop production and fish cultivation has also a higher market share with the farms in the lower valleys. Some estimates on market involvement (in relation to subsistance economy) can be summerized as follows (Farm Household Survey):

<table>
<thead>
<tr>
<th>Marketing</th>
<th>Yen Chau Farmers</th>
<th>Tua Chua Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop produce</td>
<td>9%</td>
<td>1%</td>
</tr>
<tr>
<td>Livestock produce</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>Fisheries produce</td>
<td>26%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Market characteristics, such as distance to markets, frequency of market visits, products sold to and inputs bought from can be down from the Farm Household Survey (see literature 52) as follows:

<table>
<thead>
<tr>
<th>Market Characteristics</th>
<th>Mixed Permanent Farmer</th>
<th>Upland Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average distance to next market</td>
<td>13 km</td>
<td>18 km</td>
</tr>
<tr>
<td>Market visits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>often</td>
<td>28%</td>
<td>14%</td>
</tr>
<tr>
<td>occasionally</td>
<td>20%</td>
<td>32%</td>
</tr>
<tr>
<td>rarely</td>
<td>52%</td>
<td>54%</td>
</tr>
<tr>
<td>Products sold to: next market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>traders</td>
<td>9%</td>
<td>--</td>
</tr>
<tr>
<td>government</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>within village</td>
<td>40%</td>
<td>28%</td>
</tr>
<tr>
<td>Inputs bought from: next market</td>
<td></td>
<td></td>
</tr>
<tr>
<td>traders</td>
<td>7%</td>
<td>73%</td>
</tr>
<tr>
<td>government</td>
<td>3%</td>
<td>--</td>
</tr>
<tr>
<td>within village</td>
<td>82%</td>
<td>26%</td>
</tr>
<tr>
<td>within village</td>
<td>8%</td>
<td>1%</td>
</tr>
</tbody>
</table>

The survey results clearly indicate that upland farmers are less integrated into the market infrastructure available.

The example of marketing channels for selected products in the project area (see chart 1) indicates that there are six major market participants besides the producers and consumers, namely the collectors, wholesalers, trading middlemen, transporters, processors and retailers. The produce marketing follows different patterns depending on the type of commodity and market.

**Food Crops**

The local rice surplus is offered by farmers on communal markets in provincial/district markets and sold to traders who had made contracts of delivery in advance. Despite the liberalization of the market a relict of the centrally planned economy has been revived in 1992 by installing CEMMA funds for upland minorities which supply staple food, salt, medicine and fertilizer in pre-determined volumes and subsidized prices to upland
farming minorities (see also price-table 7).

Private traders dominate the maize market with a share of 90%. Producers transport the dried maize-grain in bags to collection points at roadside where by-passing traders collect the produce to sell it to livestock keeping farmers and feedstuff processing enterprises.

Due to its bulky properties and low prices the traded volume of cassava is small. A few private traders engaged in this market set up contracts with farmers and buy the standing crop. Yields are estimated and negotiated in advance and dates of harvest and delivery defined according to transport possibilities and demand. In this way farmers minimise the risk of storage loss. 10% of the traded volume of cassava is used by food processing industries (supplements for noodles and biscuits), 50% distilled to alcohol and 40% processed by feedmills are directly used by livestock readers.

Soy Beans

The soy bean harvests are collected from the farmers and sold either to private wholesalers (50%), the State Trading Organisation (25%) or local retailers (25%) before it is moved to processing enterprises.

Only small quantities are used for home-consumption. 50% of the production is channeled through private trade. The main products processed are soy curd, soybean milk and animal feedstuff.

Tea

Most of the private tea producers sell the harvested fresh tea leaves directly to the processing enterprises. During exporting there is no further middleman involved in trading. Quantities which are used for domestic consumption are sold to wholesalers before reaching the retail market. Some producers which are engaged in small-scale home processing are selling the tea either on the local market or to private collectors who deliver the tea either to wholesalers or retailers.

Fruits

Over the past few years, inter-regional trade of fruits has increased significantly. According to current government estimates some 70-80% of the fruit production is destined to the cities in the low land provinces, mainly Hanoi and Haiphong. The producers sell their fruit surpluses to a small extent to the local communal market or directly to village traders. The majority of the production is sold directly to private buying agents traders, wholesalers, collectors, etc. Often traders visit the producers well in advance of the harvest, estimate the production and negotiate a unit-price. An advance payment of 20-30% of the estimated harvest is given to confirm the deal. The traders determine the harvest date and return to the contracted farmer at a definite date to collect the fruit. Sometimes harvesting is actually done by the trader, the farmer would only stand by and check the harvest quantities. The traders are often well known to the farmers, who have been dealing with the same representative for many years. The fruits are then either sold to intermediate forwarding agents or directly to wholesale markets in Hanoi and low land provincial capitals.

A special trade can be observed with bananas from Lai Chau province. Private exporters buy the fruits from the collectors and sell the bananas to China. 90% of the provincial production is said to be destined to the Chinese market.

Plans to increase fruit production in the SDW have always to take into account the transport difficulties. There are reports of large plum production in far away Lao Cai province which could not be marketed due to transport bottlenecks. Transport facilities have been improved, but there are still difficulties during the rainy season, when landslides block the main or minor roads are closed to traffic. During these times regional producers face difficulties to sell their fruits in time.

3.1.6 Market Prices

Price formation is nowadays determined by supply and demand. For agricultural, livestock and fish produce two important factors determine the demand, the (retail) price and the income of the consumer. Market prices are important when they can be related to quantities purchased or demanded. It is of particular significance to know whether a drop or rise in price for a particular commodity will result in a more or less than proportionate change of quantity purchased. In the case of inelastic demand a decrease of the price will not be
compensated by the proportional increase of demand, resulting in lower returns to the seller and lower expenditures to the buyer. Many agricultural commodities are known to be inelastic because they fulfil basic needs.

Since for the project under study more recent price information for the project area (Yen Chau and Tua Chua district), the SDW provinces of Lai Chau/Son La and the major market of Hanoi were missing, the consultant collected several types of price series of the past 3 years and compiled it as follows:

Table 5: Wholesale (Tua Chua) and Retail Prices in Yen Chau, Tua Chua and Hanoi, May 1997
Table 6: Weakly Common Rice Retail Prices of Lai Chau and Son La Market Centres, Jan. 1996-March 1997
Table 7: Weekly Retail Prices for Food Crops, Food, Foodstuff, Livestock and Fish, Hanoi Market, Jan. 1994-March 1997
Table 8: Average Monthly Retail Prices for Food Crops, Food, Foodstuff, Livestock and Fish, Hanoi Market, Jan.1994-April 1997
Table 9: Retail Prices for Milk and Milk Products, Hanoi Market, April 1997

The results of this extensive work of collecting and compiling price information are not supposed to be analysed and evaluated in the context of this consultancy. It might become the basis of the cost-benefit and gross margin calculations to be carried out by the agricultural economist and should be regularly updated.

Glancing through the different price quotations it becomes obvious that monthly price-averages are not a mirror of the real situation in the market. Almost daily changes in supply (seasonality) and demand (expenditure pattern) for major staples are asking for - at least - weekly collection of retail prices subdivided by maximum and minimum price ranges according to product quality (see table 6).

Unfortunately information on marketing margins is very rare and only an example from the Farm Household Survey (see literature 52) can be presented to demonstrate the importance of such information. For most of the produce marketed the margins between farmgate price and retail price are almost double or more than double.

Large profits are being made by the traders, despite high transport handling - and loss reduction-costs, which can be explained by the lack of transparency of the market and a demand for produces that is much larger than the supply. A market information system in place could improve the market transparency especially for the producers.

3.2 Market Oriented Approach for the Promotion of Marketing and Processing

As a result of the findings and recommendations of the various technical reports (see chapter 2) in the context of an integrated farming system development and the findings in the description of the actual market situation in the project area, suggestions for the promotion of marketing and processing of agricultural products can be presented.

All activities undertaken throughout the marketing system are aimed at meeting the needs of the consumer and all actors in the system must make a profit. This implies that changes to existing marketing or post-harvest techniques will only be viable when they provide the necessary profit incentive to all participants in the system. Finally a marketing system is an integrated whole and changes to one part cannot be planned in isolation from the total functioning of the system.

Improved post-harvest management can often be brought about by relatively small actions at several stages in the production/marketing chain. A willingness to examine the existing and planned farming and food systems is thus a precondition for successful post-harvest.

Since relatively few people can now be considered beyond the influences of the market even the subsistence
farmers have some limited cash requirements which normally engages them to market a part of their output. Furthermore farmers in countries of transition from a planned economy to market economy increasingly realising the potential of diversification away from the traditional subsistence economy towards production of commercially attractive food crops such as fruits and vegetables and dairy products. An increasing involvement in food marketing by the private sector implies the need for post-harvest improvements to be conducted within a market framework.

3.2.1 Post-Harvest Loss Reduction

Food losses stem from overproduction and from poor post-harvest handling. In order to avoid wasteful overproduction (as it might become in the case of plum production in the project area) loss reduction activities should begin even before the crop/tree are planted or livestock/fish reared. If there is limited consumer demand for a product then production should only be undertaken if the market has been clearly identified. On the occasions when total harvest and marketing costs are likely to exceed the market returns the best thing to do is to dig the crop back into the ground or use it as animal feed.

Production decisions which have an impact on post-harvest management and food losses relate to:

- selection of crops to grow or livestock to raise
- selection of varieties
- selection of volumes to grow
- time of production
- time of harvesting
- location of production

All these decisions have to be related to the capacity of the market to provide a reasonable return for the farmers efforts.

Crop and Livestock Selection

Few farmers are likely to take the risk of growing an entirely new crop in the hope that it will meet the consumer acceptance. When this is done it is usually on a trial scale and the farmer can afford to take the loss if the product proves unacceptable. Most farmers are limited in their choice of which crops to grow or livestock to raise to the same as other farmers in their area. High prices in one year encourage overproduction in the next resulting in gluts which lead to lower production and higher prices in the following season which, in turn, lead to yet more gluts. Improved marketing information and knowledge by extension workers as well as improved post-harvest technologies might help to overcome the problem gluts and surpluses.

Selection of Varieties

The effects of seasonal gluts can be reduced by the production of a range of varieties through applying early and late types extending the season and increasing returns. Some varieties also have more acceptable post-harvest characteristics (e.g. longer storage) which can be used to lengthen the period the crop is available to the consumer. However the price for year-round availability of crops might lack the necessary power.

Selection of Production Volume

Production planning in relation to market demand and in relation to what is known about the crop production and livestock raising by other areas is essential. Since most of the recommendations implemented by the project in future will apply equally well, with some local modifications, throughout the SDW area this can lead to produce gluts and, finally, to significant losses.

Time of Production

One approach to avoiding production gluts, especially for perishable produce, is to stagger planting dates. Without the benefit of plastic tunnels, etc., out-of-season production can result in lower yields, but it can result in significantly higher returns and may well be more economical than long-term storage.
Time of Harvesting

Farmers have some scope to delay harvest although this way reduce post-harvest life. Produce which does not ripen after harvest cannot be harvested early to take advantage of demand unless it is commercially mature. In more sophisticated environments growth-regulating chemicals, which permit staggered harvesting, are available.

Location of Production

The decision on where to produce is probably as important as what and when the produce. While transport services can be suddenly disrupted it is far more likely that losses stem from the organisation of production in areas with inadequate transport. Poor marketing facilities can rarely be expected to be good in remote areas far removed from urban markets. Few farmers would venture to produce perishable crops in such areas. The project recommendations therefore should not fail to address questions of marketing costs and availability of suitable marketing channels and infrastructure.

3.2.2 Economically Viable Loss Reduction

The guiding principle of all loss-reduction activities should be that the assumed benefits through reduced losses, higher quality or higher prices must exceed the costs of the proposed improvements by a factor sufficient to justify the risk. As actors in the post-harvest system, whether farmers or traders, are usually economically rational, any attempt to maximise loss reduction without reference to economic criteria will be doomed to failure.

Estimates of costs of improved handling, storage, etc. is perhaps compared with estimates of benefits, easier to carry out. Care must however be taken to ensure that estimates of likely usage of improved facilities are reasonable.

An analysis of seasonal price patterns should be used to identify the advantages of medium to long-term storage in terms of higher prices. However, the impact on seasonal price variations of a large number of farmers or traders start storing for longer periods should be considered.

Post-harvest improvements should be relatively simple and low cost, ensuring that farmers rather than technology supplies receive a significant proportion of the consumers' expenditure.

A particular problem facing those trying to improve post-harvest handling by small farmers is that those farmers often see no correlation between improved handling and market returns. An individual small farmer practising improved techniques will receive no benefit if his produce is going to be bulked up into a larger consignment with the crops of others, particularly if the trader is not applying any form of quality control.

Benefits of improved post-harvest management must be capable of being demonstrated to those who are actually doing the marketing. Improvements which are introduced at the top end of a consumer market are more likely to achieve success in the short term and demonstrative benefits to the marketing system.

These may be occasions when the social benefits from post-harvest improvements may overweight purely economic calculations. At the subsistence level standard cost/benefit analysis might not always be applicable. A family's response to high food losses may be to eat less. On the same basis reduced losses may lead to increased consumption, with positive nutritional benefits rather than increased sales to market which produces economic returns.

3.2.3 Post-Harvest Improvements and Marketing System

Improvements of the marketing system can take place through implying produce standards, grading, storage, agroprocessing, packaging and securing of input supply.

Produce Standards and Grading
Except for grain drying, efficient post-harvest handling cannot usually compensate for poor initial produce quality. The control of produce quality before it enters the marketing system is therefore vital. One way to encourage farmers to improve the quality of their production is through the enforcement of buying standards.

A related issue is the question of grading. Grading never improves quality, it merely separates qualities and only on the basis of size. It is common and recurring belief that technology will in itself solve problems. Greater improvement can perhaps be achieved through improved management and more attention to initial produce quality.

**Storage**

There is a tendency to see technological solutions to post-harvest problems, while failing to consider economic, social and management aspects, is all-too-apparent in the case of storage.

In times of oversupply produce can be held in storage and marketed when price rises occur, but some produces are only suitable for short-term storage periods, e.g. a few days. This time is rarely long enough for prices to rise and when the produce is brought out of store it may have lost freshness, quantity and has to compete with fresh produce.

Successful use of stores of any type requires an ability to integrate them into a working system that maximises market return but minimises costs.

Storage location is a vital aspect. Poorly located stores can result in higher transport costs or increased damage to produce transit, offsetting the benefits of storage.

Storage of produce for marketing to district towns can be carried out in rural areas, but care must be taken to ensure that stores are located close to all-weather roads so that stocks can be transported during the rainy season.

Storage is an area which particularly repays attention to management aspects. With increasing liberalization in marketing, many of the larger stores constructed by or for government marketing agencies are now inappropriate. Most small-scale traders are presently unable to utilise efficiently large stores. Few traders have the capital to undertake long-term storage or to contemplate the necessary investment in good-quality storage facilities.

**Agroprosesing**

The degree of agroprocessing can vary tremendously as the following compilation shows:

<table>
<thead>
<tr>
<th>Levels Processing Activity</th>
<th>Illustrative Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Cleaning, Grading</td>
<td>Fresh Fruit/Vegetable, Eggs</td>
</tr>
<tr>
<td>2: Ginning, Milling, Cutting, Mixing</td>
<td>Grains, Meats, Spices, Feedstuff, Cotton</td>
</tr>
<tr>
<td>3: Cooking, Pasterization, Canning Dehydrating, Freezing, Weaving, Extraction, Assembly</td>
<td>Dairy products, Fruits/Vegetables, Meats, Sauces, Textiles, Oils, Sugar</td>
</tr>
<tr>
<td>4: Chemical Alteration Texturization</td>
<td>Instant Food, Textured vegetable products</td>
</tr>
</tbody>
</table>

Agroprocessing is defined as involving individuals and institutions engaged in the production, processing, transport, storage, inputs/outputs, financing, marketing and regulating of agricultural products (see chart 2). The importance of transport, storage, inputs and outputs is clearly indicated in the chart.

Profitable agroprocessing cannot be based on the occasional supply of raw material when the fresh produce market is glutted. Processing requires expensive investment in machinery. Idle time at the processing site must be minimized and this cannot be achieved if produce supply is seasonal. Moreover, to be successful the processing plant must have a guaranteed supply of raw material at a price which will enable it to compete on the market.

No agroprocessing activity should be established unless the demand for the processed product is clearly
identified and the product can be sold profitably. Market assessment is usually the least thoroughly elaborated element of a feasibility study. Calculation to ascertain the likely financial rate of return are often carried out with demand assumptions which are based more on wishful thinking than on any realistic analysis of sales potential.

Attention has to be paid to the development of village-based processing. Improved processing of root crops and more efficient and labour-saving methods of grain milling have been developed. Rural processing of fruits and vegetables in form of jams, chutneys, tomato-puree, etc. has also been developed. Where such processing is designed solely to preserve crops which could otherwise be discarded few problems can be envisaged. If village-based processing is seen as a way of developing cash incomes for rural areas then market surveys are needed every bit as much as they are needed by factory-size operations.

**Packaging**

New packaging should not be introduced without considerable research into the role of packaging within the marketing system. It should not automatically be assumed that packaging improvements can reduce losses economically.

Many factors need to be taken into account in developing appropriate packaging. These relate to the type of produce to be marketed and the effect of packaging on it, to any post-harvest treatments to be applied, to the distance market, the type of transport and the weather conditions during transport, to the type of consumer aimed at and to the wholesaling and retailing methods.

Containers produced from locally available materials will normally be more appropriate than those depending on imported supplies. Cardboard cartons may not be suitable for most domestic markets at the moment. Plastic containers are generally considered ideal for fruit and vegetable marketing but they are only economically feasible if the marketing system can be organized to return them for multi-re-use.

It is rarely desirable to try to introduce new packaging throughout the entire marketing system in one go. An approval which is more likely to be awarded with success is to first work with leading farmers and traders. A pilot operation with the more dynamic members of the trading community will be picked up by those traders and copied by others in the marketing system.

**Input Supply**

There is the need to ensure that the supply of inputs (packaging, fertilizer, pesticides, etc.) is uninterrupted. Encouragement to farmers and traders to adopt such inputs is pointless unless there is a marketing system in place which can assure timely delivery to rural areas. If the introduced technology is totally dependent for success on the availability of inputs, post-harvest losses could actually increase if inputs cease to be available.

Inputs also include simple building materials such as cement, galvanised sheeting, wire netting, etc. From an early stage it is desirable to establish contacts with input traders. The same applies to manufacturers of equipment such as portable threshers. A concern of any post-harvest improvements activity is to ensure that there is a suitable capacity to produce and market such equipment and that the benefits to farmers for using it are such that they are able to pay a commercially viable price.

**3.2.4 Marketing System Improvement**

In chapter 4 of this report a detailed proposal for setting up a pilot agricultural market information system is presented and the individual components described.

**Marketing Extension**

Subsistence farmers, selling only small surpluses to the market, have limited requirements in terms of understanding how that market works. However, as farmers increasingly concentrate on the production of commodities to supply other markets they need to be much more aware of market forces and post-harvest practices.
Extension services, whilst usually trained to provide advice on technical production aspects normally lack knowledge of marketing or post-harvest aspects. This is a situation which needs to be rectified if farmers are to be provided with the sort of commercially oriented advice which is necessary when producing for the market.

**Transport and Road Improvement**

The quality of roads are normally representing the major constraint to improved marketing and a significant cause of post-harvest produce losses, especially in uplands areas. Approaches to the improvement of road networks are beyond the scope of this report. In addition to problems in road quality there is also the lack of having sufficient transport vehicles available and the shortage of spare parts.

### 3.3. Recommendations

Many of the recommendations will apply equally well, with some local modifications, finally throughout the SDW area after having succeeded in the pilot areas of the project.

#### 3.3.1 Product Selection

In accordance with the recommendations of the STE reports emphasis should be given to concentrate the promotion of marketing and processing of rice, maize, cassava, soy beans, legumes (mainly beans), fruits, vegetables, dairy products and fish.

#### 3.3.2 Agricultural Economics

For the selected crops and livestock/fish products gross margin calculation (crops) and cost/benefit analysis (perennials, livestock) should be carried out, including cash flows and financial rates of return.

#### 3.3.3 Assessment and Forecasting of Economic Potential

Factors important in assessing and forecasting the economic potential of individual agricultural produce and products include the consumer potential and the product marketing characteristics which have to be elaborated. Details of subjects to be assessed are compiled in the report about technical options and strategies for vegetable crops and tree fruits but have to be applied to all products selected.

The main economic criteria for determining the commercial success of crop production and livestock/fish raising have to be assessed and, where applicable, forecasted. The following criteria are recommended to be looked after:

- Forecasts for future local, domestic and export market potentials
- Presence and/or absence of out-of-season markets including competition with other produce in other areas
- Import substitution opportunities
- Infrastructure requirements for production, post-harvest management, processing and marketing
- Post-harvest management requirements
- Farmgate, collectors, middlemen, wholesale, ex-factory and retail price development during past three years for selected crops and livestock
- Break-even point calculations on investment
- Comparative regional advantages
- Consumption patterns, market demand and purchasing power of consumers
- Production and market supplies during past three years for selected crops and livestock
- Distribution costs
- Trade policy and protectionism
- Importance of produce for food security
- Importance of produce as cash income for farmers

#### 3.3.4 Installation of Collection Points at Commune Level

As described in chapter 3.2 it is recommended to support the development of post-harvest management in a
few selected communes in form of collection points which are managed by outstanding personalities of the farming community. The major function of this collection points could be the revolving centre for delivery of produce surplus by farmers, purchase of produce by traders, taking care of all post harvest activities including the construction of simple stores and equipping them with simple small-scale pre-/processing equipment. The center could also be the focal point for agricultural and marketing extension activities.

3.3.5 Processing Activities

It is recommended to minimise the agroprocessing activities as described in chapter 3.2 to a minimum possible. Some simple cleaning, grading, packaging, milling or mixing activities could be carried out.

3.3.6 Agricultural Market Information System (AMIS)

The recommendations with respect to the approach and workplan of an envisaged AMIS are described in the proposal (see chapter 4). The indicators and activities, as foreseen in the project document, should be scrutinized with respect to the restricted claim of including exclusively the producer as sole users of information.

4. TECHNICAL PROPOSAL FOR THE STUDY ON SETTING UP A PILOT AGRICULTURAL MARKET INFORMATION SYSTEM

4.1 Introduction

The management of the Social Forestry Development Project (SFDP) Song Da intends to support a study on the establishment of a pilot Agricultural Market Information System (AMIS) for food and non-food crops, tree crops, vegetable, livestock, aquacultural produce and inputs. The SFDP will make a sufficient number of staff members available for study-implementation over a period of 2.5 months. The provision of technical guidance to the SFDP team is required in order to secure the quality of the fieldwork and study results. The study will be carried out under the responsibility of the head of SFDP and/or his designated representative.

This proposal is based on the TOR (see Annex 1) for the study and outlines the suggested schedule of work for the SFDP staff and the assistance to be provided by the consultants.

The proposal consists of six sections. Section two contains an appreciation of the terms of reference and scope of the study. Section 3 describes the objectives of the study and the AMIS. Section 4 provides details of the approach and methodology for the implementation of the study. The workplan, time schedule, reporting details and staffing are presented in section 5,6,7 and 8 respectively.

There is currently no AMIS operational in Vietnam. Retail and wholesale price information for limited and selected produce on provincial basis is available with:

1. MARD: Monthly Rice Price Situation Update

4.2 Appreciation of Terms of Reference and Scope of the Study

The terms of reference as specified in Annex 1, provide the starting point of the proposal. The terms of reference are clear and straightforward with regard to background information, problem statement and justification of the study, it being understood that:

- in view of the ongoing liberalisation of agricultural markets, there is a need for more market transparency through an improved and comprehensive AMIS;
- to improve services, the number of commodities currently covered by the above mentioned information is to be expanded with additional categories, such as tree crops, vegetable, agricultural inputs, etc.;
- it is expected that - next to the removal of marketing restrictions through market liberalisation - the
existence of more market transparency will further enhance market efficiency which will be to the overall benefit of producers, consumers, traders, policy makers and researchers;  
- the objective of the study is to finally set up a Pilot AMIS for food crops non-food crops, tree crops, vegetable, livestock, aquacultural produce and agricultural inputs within the SFDP;  
- to achieve this objective, the study is to make an assessment of the capacity, the capability and functioning of the existing reporting systems of the SFDP and based on this assessment, to design the most appropriate mechanism for data collection, analysis and dissemination;  
- the study should furthermore determine the possibility and merits of setting up an AMIS for all commodities -in order to make optimum use of available resources - and to determine the investment and operational costs of the proposed system.

4.3 Objectives of the study and the MIS

The objective of this study is to make a proposal for setting up a Pilot AMIS for food and non-food crops, tree crops, vegetable, livestock, aquacultural produce and agricultural inputs. The existing price information for food crops and livestock collected from Government Agencies (see 4.1) should be incorporated in the Pilot AMIS. The operational costs and demand for human resources should be kept as low as possible, in view of the limited resources available in Vietnam. The AMIS should be focused on key data, which can be collected and disseminated at relatively low costs. Also the reliability of data is an important criteria for inclusion into the AMIS.

The envisaged Pilot AMIS will have two objectives:

- to enhance transparency of the markets for food and non-food crops, tree crops, vegetable, livestock, aquacultural produce and agricultural inputs, by disseminating market information to producers, traders, processors and consumers;  
- to provide essential information about the markets to MARD, agricultural services and agricultural organisations.

4.4 Approach and Methodology

Lack of adequate information about differences in the price, supply and quality of produce is a common complaint in developing countries. The establishment of market information services will, in principle, reduce the area of uncertainty for farmers, traders, consumers, policy makers and providers of agricultural services. Its implementation, however, faces two main problems: how to obtain reliable information; and how to present it in a format which fits with the needs of the users.

There are therefore a number of basic questions to be answered when setting up an effective AMIS:

- who needs the information and what kind of information do they need?  
- where can that information be collected and by whom?  
- how should the information be centralised?  
- in what form should the information be disseminated to the users?  
- what kind of analytical capacity is needed to analyze the collected information and to transfer the information into a format which fits the requirements of the users?  
- how should the information be disseminated to the users?  
- what are the investment and operational costs of the entire systems?

Thus, the major activities to be undertaken are:

- identification of the various users of the envisaged AMIS and assessment of their need for market information;  
- assessment of how and which information could be collected, taken into account the financial and human resources required for collection, analysis and dissemination, and in view of the expected reliability of available data;  
- assessment of the most efficient way of collecting and centralizing the information;  
- assessment of the needed analytical capacity to analyze the data and transform the data into a format needed by the users;
identification and assessment of the most efficient way of disseminating the information.

The existing market information should be integrated into the AMIS. Therefore, the work should start with an inventory and analysis of the existing market information collected by MARD and other organizations. This assessment should provide an insight into, and clear understanding of the performance of those data in terms of information gathering, information processing and information utilization.

Another important task at the beginning of the assignment is to make an inventory and analysis of information needs among market participants, policy makers and agricultural organizations. Methods to be used should include analysis of records and reports as well as interviews with key persons active in the field of information gathering, processing and utilization. Interviews should also be carried out with market participants such as producers, traders (input and output), processors and exporters. At this stage the information gathering could be limited to Hanoi, but at a later stage the provincial headquarters in Son La and Lai Chau should be covered as well.

Based on these analyses a first concept of the Pilot AMIS can be made. Subsequently questionnaires should be made for a more detailed survey among producers in the Yen Chau and Tua Chua Districts (project area) and users of information in the Song Da Watershed region and the main urban markets in the vicinity (example see Annex 2). Those field surveys should focus on information needs, as well as identifying and checking possibilities for data collection, centralization and dissemination.

It is recommended to develop a two-track questionnaire: (i) one specific part for key informant in the field of information gathering and processing (see Annex 2 part A. & B.), and (ii) another part for information utilizes such as traders, producers, policy makers and researchers (see Annex 2 part C. & D.). Much attention should be given to the manner and scope of collecting views from information utilizes, as the design of an AMIS will very much be influenced by the responses of these (final) utilizes.

It is suggested to organize a workshop to present the results of the analytical work done so far. The workshop could be attended by representatives of the MARD and other information suppliers and users. Using the results of this workshop, a provisional design of the Pilot AMIS can be made and presented at a second workshop. Subsequently the design can be finalised.

The AMIS should consist of seven subsystems: food and non-food crops, tree crops, vegetable, livestock, aquacultural produce and agricultural inputs. A systems guide should be made for each subsystem.

### 4.5 Workplan

Five phases can be distinguished:

1. **Preparation**
2. **Conceptualisation of AMIS**
3. **Regional Fieldwork**
4. **Analysis of Fieldwork**
5. **Provisional and Final design**

These phases are described in more detail in the next paragraphs.

#### Phase 1 Preparation

The consultants will prepare a detailed proposal for the implementation of the study (the present proposal) based on the terms of reference. The SFPD staff, assisted by the local consultant should start collecting information on the available data, including statistical records, reports and information format used. A start can be made with drafting analytical notes about the existing systems. Drafting of questionnaires for fieldwork can also be started.
Phase 2 Conceptualisation of the AMIS

During this phase a number of activities will have to be carried out:

- Assessment and evaluation of existing market information;
- Assessment of information needs of future users of AMIS;
- Design of the first concept of AMIS;
- Preparation of questionnaires for fieldwork.

Existing data and reports should be reviewed and discussions held with key persons (government and private sector) active in the various sub-sectors involving crops, produce, livestock and agricultural inputs. Based on data and information collected at this stage, a first concept of a Pilot AMIS system should be created. This preliminary design is essential in order to enable the team to develop a list of questions which are meaningful and to the point, and to cover all issues with regard to the merits of an AMIS system in Vietnam.

A next step during this phase should be the preparation of questionnaires, interview schedules and preliminary outlines for the reports on the seven sub-systems. If possible - in order to facilitate data collection in the field, data compilation and analyses - the team should strive to develop general questionnaires which can be used for all commodity categories (see sample in Annex 2).

It is envisaged that the SFDP staff members, assisted by the two consultants, will form four sub-teams, each of them focusing on two of the product categories.

Phase 3 Regional Field Work

Information from the field should be collected through structured interviews with producers, traders (input and output), processors, exporters, regional, provincial and district officers and other agencies. The interviews should focus on determining information needs and identifying and assessing possible methods of data collection.

Each of the four sub-teams will visit 1% of all district households (approx. 40 HH) in Yen Chau and Tua Chua villages. During the fieldwork, the sub-teams should not limit their work to the product category they are specifically responsible for (see previous section) but they have to cover all product categories.

Phase 4 Analysis of Fieldwork

During this phase the information collected should be compiled and analyzed. The analyses should be carried out in two stages: (i) individual analyses of each district/commune and village visited and; (ii) an overall analysis with commodity differentiation.

Based on the overall analysis made, principal findings and recommendations should be prepared by the team to be presented during a workshop with MARD staff and other representatives of information suppliers and users.

Phase 5 Provisional and Final Design

Based on the results of the workshop a provisional design of a Pilot AMIS system can be developed, covering all seven commodities. The provisional design could be presented at a second workshop. Observations and comments obtained from this workshop, should be used for the development of the final design of the AMIS and the system guides for each commodity.

4.6 Time Schedule

The proposed timing of the above mentioned phases is as follows: (table 1)

Table 1 Study on Pilot AMIS system; proposed implementation schedule
The proposed manpower input of the team members, for each phase, is as follows (table 2):

### Table 2 Study on Pilot AMIS system: proposed manpower input of team members (in weeks)

<table>
<thead>
<tr>
<th>Team members</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff members SFDP (8 persons)</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>64</td>
</tr>
<tr>
<td>Marketing economist (foreign consultant) Agric. economist</td>
<td>0</td>
<td>1.5</td>
<td>3</td>
<td>2</td>
<td>3.5</td>
<td>10</td>
</tr>
<tr>
<td>(local consultant)</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2</td>
<td>1.5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>15</td>
<td>21</td>
<td>20</td>
<td>17</td>
<td>82</td>
</tr>
</tbody>
</table>

### 4.7 Reporting

The final report including the proposal for the establishment of an AMIS will be written by the SFDP staff, supported by the consultants. The teamleader should coordinate this work. The consultants will contribute to the drafting of the final report and will review the report.

The consultant will make a brief progress report at the end of phase two, containing their observations and recommendations regarding the progress of the work. The consultants will also make a debriefing report at the end of the assignment with a justification and evaluation of the work carried out.

### 4.8 Staffing

The staff members for this study have to be selected and assigned by the SFDP management. The consultants will recommend the SFDP to nominate one of the assigned staff members as the teamleader of the study.

It is proposed that the SFDP team will be supported by the remaining project office staff.
APPENDIXES

APPENDIX 1 Terms of References FSD-STE "Processing & Marketing FSD Strategies Review"

Name: Dr. J.H.D. Ludwig

Duration of Assignment: 1,0 person-month

Responsibilities: The short-term expert will be directly working under the SFDP teamleader and his deputy

Language: The SPDP's working language is English. For field-work the Project will provide the necessary interpreter.

Reporting: The final report is to be written in English language As word-processing programme MS-Word- for Windows 2 or 6 is required.

Objectives: The consultant's work will cover the following main area: Identify suitable technical and organisational approaches for the promotion of processing & marketing of agricultural products.

Tasks: 1. To analyse the findings and recommendations of the various STE assigned to FDS in the context of integrated FSD, considering practical processing & marketing options.

2. To identify in close co-operation with the appointed national expert and relevant counterpart and project-staff practical approaches for the promotion of processing & marketing of agricultural products originating from improved FSD in the project area.

3. To formulate a proposal for a test market information system.

APPENDIX 2 MISSION ITINERARY AND PERSONS MET

ITINERARY

5.-8.5.1997 Preparation and design of proposal for a market information system
9.-10.5.1997 Flight to Vietnam
11.-22.5.1997 Fieldwork in Hanoi (Data collection, interviews, etc.)
23.-28.5.1997 Report design additional interviews
29.5.1997 Presentation of results
30.-31.5.1997 Flight to Cyprus
1.-3-6.1997 Final draft report design

PERSONS MET

Guenther Meyer Teamleader, SFDP
Paul van der Poel Social Forestry Expert, SFDP
Nguyen Tuong Van Project Coordinator, SFDP
APPENDIX 3 LITERATURE

GENERAL DOCUMENTS (Marketing & Agro industry)

(1) Abbott, J.C. et al.


(2) Abbott, J.C.


(3) AFMA/FAO


(4) Austin, J.E.


(5) Bourne, W.


(6) Bourne, W.


(7) Bourne, W./Wood, C.

(8) Frendy, J.H./Blicher-Mathiesen U. (ed.)


(9) George, A.P.


(10) IRRI


(11) Karash, Th.


(12) Mittendorf, H.J.


(13) Mittendorf, H.J.


(14) Mittendorf, H.J.


(15) Oomen, H.A.P.C./Grubben, G.J.H.


(16) Ramm,G. et alias


(17) Shepherd, A.W.


(18) Schubert, B. et alias


(19) Smith, L.D.

(20) Vock, N. (ed)


VIETNAMESE DOCUMENTS

(21) FAO


(22) FAO

Follow up to the Agriculture and Food Sector Review Vietnam. Rome, September 1996.

(23) Government of SR Vietnam


(24) LUWG/IIED


(25) MARD


(26) Smith, G.A.


(27) Stockholm School of Economics


(28) UNDP/SPC


(29) UNIDO


(30) Watts, M.


(31) World Bank

Vietnam Economic Report on Industrialization and Industrial Policy. Washington, October 17,
1995.

(32) World Bank


(33) World Bank


(34) WFP


STATISTICS

(35) Department of Agriculture, Forestry & Fishery


(36) Department of Trade and Price Statistics


(37) Government Pricing Committee


(38) Government Pricing Committee


(39) General Statistical Office


(40) General Statistical Office


(41) MARD


PROJECT DOCUMENTS

(42) Bui Quang Dang/Vu Manh Hai


(43) Bunch, R.

44) Chapman, K.R./Le Dinh Danh


45) Gebert, R./Nguyen Thi Hang


46) Gibson, T.A.


47) Kaiser, K.

Proposals to Increase the Efficiency and Effectiveness of Extension Services Supported by SFDP in the Districts Yen Chau and Tua Chua, Hanoi, February 1997.

48) Le Dinh Danh et alias


49) Littooy, S. (ed.)


50) Littooy, S./Tam


51) Ludwig, J.H.D.


52) Rake, Chr.


53) Rake, Chr./Meyer, G. et alias


54) Van der Poel/P.


DOCUMENTS ABOUT MARKET INFORMATION SYSTEMS

55) FAO

(56) Imiata, G. et alias


(57) Ludwig, J.H.D.


(58) Ludwig, J.H.D.


(59) Ludwig, J.H.D.


(60) Ludwig, J.H.D.


(61) Poon, B.


(62) Schubert, B. et alias


(63) SGV Consulting


(64) Shepherd, A.W.


(65) Shepherd, A.W./Scholke, A.J.F.


(66) Zhang, Q.