

# Course on agribusiness management for producers' associations

## Module 4 – Post-harvest and marketing

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# Contents

<b>Acknowledgments</b>	<b>vi</b>
<b>Acronyms and abbreviations</b>	<b>vii</b>
<b>Introduction</b>	<b>1</b>
<b>General study guidelines</b>	<b>3</b>
<b>Post-harvest and distribution</b>	<b>5</b>
List of topics	5
Setting the context	6
Case study: Fruit Processing and Special Seedlings of Kim Bien Cooperative, Viet Nam. See also case study: Cuatro Pinos Cooperative Union	8
Case study analysis	9
The post-harvest concept	10
Importance of storage, packaging and transportation	14
Marketing channels	17
Choice of distribution channel	21
Logistical operations	24
Logistical service outsourcing and logistics operators	25
Traceability requirements	27
Conclusions on the case study	29
Group exercise	30
Summary	31
Unit assessment	33
<b>Quality as a factor of market differentiation</b>	<b>35</b>
List of topics	35
Setting the context	36
Case study: Darjeeling Tea	38
Case study analysis	40
Different quality concepts	40
Quality as a prerequisite for competing in markets	43
Quality assurance tools and standards	44
Quality labels	49
Conclusions on the case study	55

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Group exercise	56
Summary	57
Unit assessment	58
<b>Exploiting new information and communication technologies</b>	<b>59</b>
List of topics	59
Setting the context	60
Case study: ITC e-Chaupal (Information System for Rural Business Development)	62
Case study analysis	65
Potential of NICT	66
Basic guide to information searches on the Internet	70
Conclusions on the case study	74
Group exercise	75
Summary	76
Unit assessment	77
<b>Glossary</b>	<b>79</b>
<b>Bibliography</b>	<b>83</b>
<b>Appendixes</b>	<b>87</b>
1. Storage conditions for fresh fruit and vegetables and their ethylene sensitivity or production	87
2. Optimum storage temperatures, relative humidity and expected storage life	91
3. Respiration rate and heat production of selected perishable fruit and vegetables during storage at different temperatures	93
4. International market requirements regarding the appearance of fruit	95
5. A selection of marketing sites on the Internet	97

## List of figures

- |   |    |
|---|----|
| 1. Types of marketing channel for agricultural and agro-industrial products | 18 |
| 2. Marketing channels   | 22 |

## List of tables

- |  |    |
|--|----|
| 1. Most important import and export partners for agricultural commodities 2004 (8)                             | 7  |
| 2. Cooperative's production  | 21 |
| 3. Principal reasons for the detention, rejection and destruction of foodstuffs exported to the United States. | 44 |

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# Acronyms and abbreviations

AMUL	Anand Milk Union Limited-India
APMC	Agricultural Produce Marketing Committee-India
BSNL	Bharat Sanchar Nigam Limited-India (IT organisation)-India
COC	Cost of Organic Certification
CNR-Italy	Stands for: National Research Centre in Italy
CDC-USA	Centers for Disease Control - USA
DO	Designation of Origin
E-Chaupal	An IT set up in a village-India
EUREPGAP	Quality Management System of Euro-Retailer Produce Working Group
FDA-USA	Food and Drug Administration of USA
FLO	Fairtrade Labelling Organization
FTO	Fair Trade Organisation
GI	Geographical Indications
GAP	Good Agricultural Practices
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Points
ICA	International Cooperative Alliance
INAO	stands for: National Institute for Designations of Origin
IFFCO	Indian Farmers Fertiliser Cooperative Limited
ITC-India	Indian Tobacco Company
ITC	International Trade Centre
IQF	Individual Quick Frozen Freezer
IFAT	International Federation for Alternative Trade
IFOAM	International Federation of Organic Agriculture Movements
ISO	International Organization for Standardization
JA	Stands for: Japanese Agricultural Cooperatives
NICT	New Information and Communication Technology
OECD	Organisation for Economic Co-operation and Development
PRA	Pest Risk Analysis
USDA	United States Department of Agriculture

UNCTAD	United Nations Conference on Trade and Development
WHO	World Health Organization
WTO	World Trade Organization



# Introduction

*Post-harvest and marketing* is the fourth of four modules of the course entitled *Agribusiness management for producers' associations*. The **purpose** of the module is to learn more about post-production activities such as processing, preservation and packaging. This module also gives an insight into the role of new information and communication technologies. The objectives of this module are:

- to learn about post-harvest operations and distribution channels, as well as how to comply with food safety standards and systems;
- to identify and promote special characteristics for product positioning in certain market segments, and to know in which ways quality labels can be used to add value to agricultural products;
- to demonstrate the usefulness of new information and communication technologies in improving information compilation and management in support of producers' associations.

To this end, the conceptual content of this module has been organized into three units:

- **Unit 1 – *Post-harvest and distribution*** discusses the concepts of post-harvest, distribution channels, logistics and traceability, as well as outsourcing and quality management;
- **Unit 2 – *Quality as a factor of product differentiation*** highlights the ways in which market niches can be assessed and how quality labels work in these markets;
- **Unit 3 – *Exploiting new information and communication technologies*** explains and promotes the use of information technologies to collect, analyse and manage information.

In terms of **methodology**, the units have been organized to give you the opportunity to discover each unit's specific course content and the skills you will attain. Each has been structured to help you to identify in advance what you already know, thus enabling you to combine your existing knowledge with the course content to optimum effect. The aim is together to build our capacities by accumulating new knowledge in a pro-active and participative way.

In terms of **assessment**, we start from the principle that assessment is of most value when it is used to take decisions for improving the teaching/learning process. The three phases of assessment are:

- Initial assessment: this enables facilitators or tutors to analyse and predict your real capacity for learning. It will give you an idea of what each unit is about and what it aims to achieve in terms of increasing your self-motivation, updating your existing knowledge and preconceptions, and planning your own learning process fully.
- Formative assessment: this enables facilitators to take decisions to improve the teaching/learning process (regulation) and will enable you to take decisions to improve your own learning process (self-regulation).
- Summative assessment: this enables you to link together the key ideas, to find out what progress you have achieved and to see where you stand as regards a new learning process.

The assessment instruments in this manual can be supplemented with any others that facilitators may consider appropriate to ensure that assessment becomes a group process and allows you to offer your constructive critical assessment of the validity of the course material and the way in which it is taught.

Accordingly, the manual contains the following sections:

Section	Aim
➤ General guidelines	To promote the learning-to-learn process
➤ List of topics	To present the specific content of each unit
➤ Points to remember	To memorize what you have learned. Initial assessment
➤ Key competencies	To detail the key competencies you will learn
➤ Setting the context	To put into context the subject to be discussed, and update thinking on it
➤ Case study	To remember prior knowledge. Initial and formative assessment
➤ Explaining key issues	To present the priority course content and analyse it in detail
➤ Conclusions on the case study	To provoke thought on the real issues. Formative assessment
➤ Practice exercises	To put into practice the proposed course content
➤ Summary	To help to link, integrate and memorize the key ideas
➤ Unit assessment	To provide an opportunity for self-assessment of the material learnt
➤ Glossary	To clarify ideas on the meaning of selected terms and acronyms
➤ Bibliography	To provide information for personal research

**Particular attention is drawn to the glossary, which helps to clarify some concepts not explained in the text. The terms included in the glossary are marked with an asterisk (\*) the first time they appear in the text.**

# General study guidelines

To help you make optimum use of this material, a few hints and suggestions for planning and managing your own learning process are presented below:

- Organize your time so that you complete the assignment deadline. You are advised to study regularly outside the classroom to optimize the teaching/learning process.
- Before starting work on a unit, try to remember what you already know about the subject, as this will help you to link new knowledge with your existing knowledge and will allow you to recognize the added value of everything you learn for your personal development.
- Complete the self-assessments, as well as the topics and proposed case studies, as they will help you to understand the course material and reinforce your learning.
- You may underline, construct graphic organizers, write summaries or use any other method to help you to understand the course material fully.
- You will get a chance to ask questions and clarifications to enable you to exchange views with your fellow students and with the facilitator. An opportunity will be provided for airing different points of view. The aim is not for us all to think in exactly the same way.
- Do your own research. The proposed bibliography is only a guide. Do not forget that you can also find instant, up-to-date information on the Internet.
- Use the objectives and content of each unit to develop your own assessment instruments. Taking control of your own learning process will allow you to make decisions to improve it.
- Although studying is challenging and you will come across obstacles, in the end all the effort, sacrifice and time will be rewarded with greater knowledge and enhanced skills, aptitudes and abilities.
- As you are the key player in the teaching/learning process, you will need sound arguments and in-depth thinking to carry out the proposed activities, coupled with strong motivation and critical and analytical abilities.
- You will find definitions for the words marked with an asterisk (\*) in the glossary.

*You can do anything you set your mind to.  
Get started now, and have fun.*

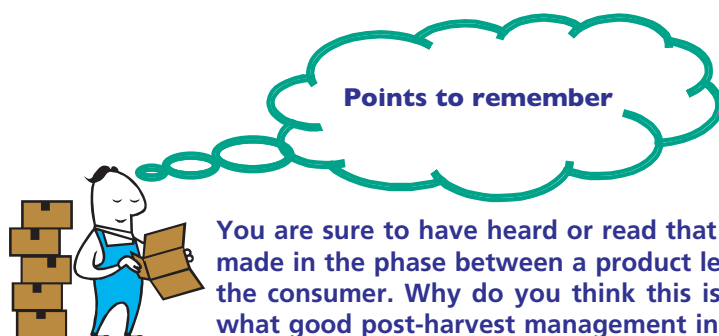


# Post-harvest and distribution

## UNIT ONE

### LIST OF TOPICS

1. Setting the context
2. Case study: Fruit Processing and Special Seedlings of Kim Bien Cooperative, Viet Nam. See also case study: Cuatro Pinos Cooperative Union
3. Case study analysis
4. The post-harvest concept
5. Importance of storage, packaging and transportation
6. Marketing channels
7. Choice of distribution channel
8. Logistical operations
9. Logistical service outsourcing and logistics operators
10. Traceability requirements
11. Conclusions on the case study
12. Group exercise
13. Summary
14. Unit assessment



#### Points to remember

**You are sure to have heard or read that the biggest profit margins are made in the phase between a product leaving the farm and it reaching the consumer. Why do you think this is? Do you have a clear idea of what good post-harvest management involves? Do you know whether your enterprise or other enterprises have sustained losses because of poor post-harvest management of products? Where do you think the points of greatest risk are, and which controls should be implemented?**

Specialized concepts, operations and services have been developed for these activities in recent years, and these are now generally referred to as logistics. What do you understand by the term logistics? Has your organization developed a logistics strategy? Do you know any providers of logistics services?

By the time you complete this unit  
you will be able to:

- 🔗 Identify from your own experience post-harvest activities that your association has implemented or should implement.
- 🔗 Understand the economic and social implications of poor post-harvest management\* of foodstuffs and appreciate the benefits of good post-harvest management, not only for preventing product losses, but also for smoothing out peaks in supply and demand.
- 🔗 Know something about the post-harvest impact of temperature\*, humidity, packaging and preservative treatments.
- 🔗 Recognise the importance of logistics as a specialized activity for rationalizing product delivery to consumers.
- 🔗 Appreciate the importance of setting-up monitoring systems to facilitate compliance with hygiene and food safety regulations, and traceability systems.
- 🔗 Know and differentiate the various marketing channels\*, as well as identifying criteria for establishing appropriate channels for a producers' association.



### Setting the context

Module 1 *Agrofood systems and chains* highlights different actors in the value chain, their functions and relationships. It also shows that producer-consumer relationships and markets in general are in constant change. Many consumers for example now spend less time to purchase, prepare and eat food, and many eat outside the home.

Food systems can be classified into two categories. The first system produces more processed foods and requires more technical inputs; such as washing, sorting, grading, milling, mixing, packaging, preserving and processing. Quality control standards are applied and the shelf-life of processed foods is usually quite long. The second system includes cereals, grains and pulses, as well as perishable goods such as fruit, vegetables, root crops and tubers. While certain post-harvest operations need to be undertaken, technical inputs are fewer and product differentiation limited.

Trends in global Agrofood systems include:

- A dramatic growth in world trade in agricultural products<sup>1</sup>:

Whilst agricultural trade was worth US\$53 billion in 1970, by 1990 world agricultural exports exceeded US\$326 billion and in 2000 they totalled nearly US\$410 billion.

- Concentration of food distribution in supermarkets:

In the major capitals of Asia, supermarkets are estimated to distribute between 40 percent and 80 percent of all foodstuffs. This phenomenon has accelerated with the arrival of multinational firms in almost all countries of the region (Table 1).

- Cooperatives in the region have also established their own outlets:

These include: the National Consumers Cooperative Federation and National Agricultural Cooperative Marketing Federation, in India; A-Coop supermarkets of JA Group in Japan; and the Fairprice Chain in Singapore. Government initiatives are also common in South Asia through public distribution systems under different schemes.

All this highlights the importance of logistics as a means for coping with such market dynamics. The impact of logistics is so great that almost 50 percent of product retail cost is spent on it. However, no precise estimates exist for Asia.

TABLE 1  
Most important import and export partners for agricultural commodities 2004 (8)

Countries	Imports 2004				Exports 2004			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
China	US	Brazil	Australia	Argentina	Japan	US	Korea	Germany
India	Indonesia	Malaysia	Brazil	Argentina	US	Bangladesh	Saudi Arabia	United Arab
Indonesia	Australia	US	India	Thailand	US	India	Japan	China
Japan	US	China	Australia	Canada	US	China	Korea	Thailand
Malaysia	Thailand	Indonesia	Australia	China	China	Singapore	Holland	US
Pakistan	Malaysia	US	Indonesia	Australia	United Arab	Afghanistan	Saudi Arabia	Iran
Philippines	US	Argentina	Australia	New Zealand	US	Japan	Holland	Korea
Sri Lanka	India	Australia	New Zealand	Argentina	Russia	United Arab	Japan	Turkey
Thailand	US	Australia	Brazil	Argentina	Japan	US	China	Malaysia

Source: FAO. [www.fao.org/Statistics/Yearbook/Vol.1-1](http://www.fao.org/Statistics/Yearbook/Vol.1-1)

<sup>1</sup> OECD (1998) The Future of Food: Long-Term Prospects for the Agrofood Sector.

### Case study: Fruit Processing and Special Seedlings of Kim Bien Cooperative, Viet Nam

#### INTRODUCTION

Luc Ngan is a mountainous district in Bac Giang Province in Viet Nam, with a total area of around 1 011 sq km. The people of Luc Ngan have developed forestry skills and fruit growing, as well as breeding cattle of a superior type. The total cultivated area is 19 600 ha. and this includes 5 500 ha of litchis. Litchis are grown throughout the district and in 1997 total production was 5 000 tonnes. Fruit processing and special seedling production were established by the Kim Bien Cooperative in April 1997. The cooperative members are small farmers with a land holding of 1.5 to 2 ha. The focus has been on research and investment for litchi processing, as well as overseeing efforts to ensure stable prices for its members. Through the development of processing, output has been diversified to encompass a wide range of litchi products, including fresh litchis; dried, boxed litchis; fruit juice; liquor and wine.

#### DISCUSSION

At present litchis are cultivated in 20 countries. Major producers are:

China	Area: 161 681 ha.	Production: 223 680 tonnes
India	Area: 23 442 ha.	Production: 15 000 tonnes
Australia	About 1 million trees.	Production: 35 000 tonnes

About 16 000 tonnes of the fruit is consumed in fresh form, and only 6.4 percent is processed. There has been a noticeable growth in the production, consumption and export of litchis in most countries of the region. The litchi is difficult to preserve, and in South-East Asia several countries – including China, Taiwan and Thailand – are applying scientific techniques to prepare fruit for export and home consumption. Viet Nam has also made a significant entry into the export market for litchis by exporting fresh fruit, as well as canned and dried fruits, to Japan. In order to enhance local production and consumption, the Vietnamese government has initiated efforts to curtail the import of fruit from China. Incentives are also being given to process the fruit for export purposes. Luc Ngan litchis are widely accepted because of their high quality arising from the mild climate where they are grown.

The Cooperative imports seeds of selected varieties in order to produce the trees necessary to yield the future quantities stipulated in signed contracts agreed with members. In coordination with the Cooperative's head office, the



manager plans transportation of fresh fruit to the processing plant in sealed non-refrigerated trucks. Once the fruit arrives at the processing plant, it is subjected to post-harvest operations such as: pre-cooling, selection, cleaning and grading. Storage is at a temperature of around 4°C, with a relative humidity of between 80 percent and 90 percent.

## CONCLUSION

The Cooperative owes its success to: i) efficient procurement from farms; ii) centralized processing, grading and packing; iii) optimal management of logistical operations, and iv) good administrative management. This has enabled the Cooperative to fulfil its pre-sale contracts to the satisfaction of its customers in Asia.

### Case study analysis

Consider the following questions on the proposed case:

1. Which post-harvest activities does Kim Bien Cooperative carry out? Identify the control variables used and indicate at which level they operate. Are some of them developed and implemented in your associative enterprise?
2. The transport service is essential to the Cooperative. What is it needed for? How do you compare these requirements with those of your associative rural enterprise?
3. Draw a diagram depicting the phases, actors and functions described in the case study, highlighting the post-harvest and logistics aspects. How would the diagram look for your associative enterprise?
4. In your view, which values, principles and attitudes should be upheld to ensure the success of an organisation like the Cooperative described in the case study?

**Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.**

### The post-harvest concept

Post-harvest management is a set of post-production practices that includes: cleaning, washing, selection, grading, disinfection, drying, packing and storage. These eliminate undesirable elements and improve product appearance, as well as ensuring that the product complies with established quality standards for fresh and processed products. Appendix 4 lists some foreign-market requirements for fruit and vegetables.

**By processing the products at the localities, planting litchi trees is encouraged and this helps to cover the barren mountains and hills; protect the ecological balance, and attract hundreds of under-employed workers: significantly contributing to the elimination of hunger and alleviation of poverty.**

*Source: Nguyen Que Anh, (Course 14) 2000*

Post-harvest practices include the management and control of variables such as temperature and relative humidity\*, the selection and use of packaging\*, and the application of such supplementary treatments\* as fungicides.

#### Temperature control

Raising or cooling the temperature is the primary and most effective means for extending an agricultural product's storage life and improving its quality.

Chilling processes are normally used for perishable goods. As this must be done as soon as possible after the product is removed from its natural environment, the first phase is usually pre-cooling. The final cooling method (by air, water, vacuum, or ice) will depend on the type of product and packaging, market requirements, cost and other factors.

Efficient use of refrigeration is therefore the most useful means for prolonging the storage life of perishable fruits and vegetables, as well as preserving their quality. Generally speaking, for every 10°C increase in the temperature of plant tissues, their respiration increases by two to three times, whilst their storage life is reduced by a factor of two to four.

For example, the storage life of iceberg lettuce under optimum temperature conditions (0°C and 95% relative humidity) is between 14 and 30 days. If the

lettuce were to be stored at 10°C, its storage life would be reduced to between 7 and 14 days. If it were kept at ambient temperature (20°C), its maximum storage life would be 3 to 7 days.

### Control of relative humidity

This calls for the use of misters or sprayers, temperature control by evaporators in cold rooms or refrigerated trucks, the use of coatings, wetting floors, and control of air movement in coolers, cold rooms and transport vehicles.

### Packaging

The main purpose of packaging is to protect products from the environment and reduce contact with harmful elements. Packaging can serve one or more of the following purposes: i) to preserve products from gases such as CO<sub>2</sub>, O<sub>2</sub> and ethylene\*; ii) to shield them from light and harmful temperatures, and iii) to prevent physical damage and compression.

### Supplementary treatments

These can be chemical (spraying, aerosols, microns powder) or physical (irradiation, water, wax) – depending on the product. Gases such as ethylene can be used to promote ripening in some post-harvest phases. Inputs are used for a variety of purposes, e.g. fungicides are applied for health reasons and wax for protective or cosmetic reasons.

Some supplementary treatments have become phyto-sanitary requirements for export – especially to the United States of America – in order to prevent pests and diseases from attacking the imported product thus causing damage. Normally, a pest risk analysis (PRA) needs to be conducted before a fresh product can be exported to the United States – generally by the United States animal and plant health authority, or by people or bodies accredited for the purpose in the country of origin. In addition, there are pest-free areas, which can be either areas within countries or entire countries. Products from such areas do not require such treatments.

A range of different refrigeration systems exist – from cold rooms which work in the same way as conventional refrigerators to cooling tunnels with controlled atmospheres. There is also a range of systems for freezing\* foodstuffs; from conventional slow or fast freezing equipment using traditional cooling systems to Individual Quick Frozen (IQF) freezers, or freezers with indirect heat transfer based on a heat exchange system which re-circulates and cools the air using liquid nitrogen or injects it straight into the product.

The cost of refrigeration and freezing systems varies, depending on the capacity of the equipment, the cooling technology used and the country where it is manufactured. Prices range from US\$15 000 for the simplest system for refrigerating a 1.5-tonne-capacity cold room, to US\$1.5 million or more for an IQF plant with a number of processing alternatives.

*Source: Technical Team of the Inter-American Institute for Cooperation on Agriculture Office in Colombia*

### Packaging as a percentage of the cost of agricultural and agro-industrial commodity production

Packaging costs vary depending on the material used. For example, cardboard and plastic polyethylene packaging is comparatively cheap and widely available, whereas laminated packaging is costlier and has to be imported.

The relative importance of packaging within the cost structure varies, with packaging representing a significant proportion of the final cost for industrialized products and a lesser proportion for fresh commodities. Below are two examples that illustrate this (the values are expressed as a percentage (%) of the total product cost):

Product	Raw material	Inputs & energy	Labour	Packaging	Transportation
Mango jam	27	14	9	24	26
Fresh cheese	46	1	8	1	44
Chorizo sausage	56	5	3	0.4	36
Tinned peaches	39	8	9	25	19

*Source: Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA), Mexico*

Fresh product	Seedlings	Land	Labour	Chemical and organic inputs	Packaging	Transportation
Tree tomato(export)	2	16	38	32	1	11
Husk tomato(export)	1	7	43	33	2	14
Potato(local market)	9	4	38	40	6	3

*Source: Observatorio de Agrocadenas, Colombia.*

*Note:* In Asian countries, a variety of packing material is used e.g. wooden cases, bamboo splinter boxes, cane boxes, coir fibre boxes and sacks or jute bags. The original material is available in plenty in different Asian countries e.g., jute in India, Bangladesh and Myanmar; bamboo throughout the Asian region, and coir in a number of coconut growing countries.

You can find out about various post-harvest technologies on the Web site [www.apeda.com](http://www.apeda.com) and [www.nafed-india.com](http://www.nafed-india.com) and request quotes from a number of firms supplying equipment [for refrigeration, freezing, control of relative humidity, dehydration, drying, etc.]

## Importance of storage, packaging and transportation

Storage requirements vary widely – from a few hours to several days. Facilities for storing agricultural products can be simple or highly sophisticated, but in all cases they must take into account the marketing\* system, the compatibility of products kept together, and the entrepreneur's individual needs.

A firm uses storage to:

- Prevent physical and quality losses in:
  - agricultural inputs;
  - raw materials for use in a value-added process;
  - intermediate goods (in process) or final products (already finished).
- Smooth-out supply and demand peaks in the producer-to-consumer marketing chain over a period of time.

Storage helps to prevent deterioration as its function goes beyond simply warehousing products to include:

- spraying to control pests;
- laying traps and specially adapting storage facilities to control rodents, birds and other animals;
- control of internal humidity;
- temperature regulation.

Where possible, only one crop should be stored in each storage area, in order to optimize the specific storage conditions for that particular variety. Using the same storage area for different products can result in product damage because of incompatibility of temperature and relative humidity conditions, chilling and ethylene<sup>1</sup> sensitivity, odour contamination and other problems affecting shelf life and quality.<sup>2</sup>

As a general rule, a product can be stored in more than one way and for longer when, instead of storing it naturally or in the field, it is kept in purpose-built facilities – especially those with refrigeration and/or controlled atmospheres.

<sup>1</sup> Gas emitted by fruit and most vegetables as they ripen. Some produce a lot of ethylene to trigger and complete their ripening process, whilst others are sensitive to ethylene, which accelerates ageing and wilting when they come into contact with it (see Appendix 'C'). this is why ethylene is used in storage and packaging processes to control ripening.

<sup>2</sup> FAO. Manual for the Preparation and Sale of Fruits and Vegetables.

Warehouse design is important, with a square spatial distribution being thermally more efficient than a rectangular one. The roof is the most important part of the entire structure, as it protects products from rain and radiant heat. If the warehouse is filled throughout the harvest period, it must be organized in such a way as to ensure that products are dispatched on a “first in, first out” basis.

During transportation, it is crucial to avoid mechanical damage to products from impacts, vibrations or temperature changes, as these can cause water condensation. Whilst products are being transported, they must be shielded from the elements and, where appropriate, should be refrigerated to prevent contamination or deterioration.

### Some indications on cold storage costs

The operational costs of refrigerated warehouses vary widely depending on a number of factors. For example, the cost structure for an average-sized storage facility, in use almost all year, would look like something like this:

Investment costs	25%
Energy	40%
Maintenance	15%
Labour	10%

Energy is always a major component of the operational costs. Saving energy has an impact not only on costs, but also on the source, availability and type of energy used. Energy savings can be made in a refrigerated warehouse by:

- Reducing the refrigeration load of warehouses.
- Increasing the efficiency of the refrigeration equipment.
- Using other energy sources.

*Source: Regional Office for Latin America and the Caribbean of the Food and Agriculture Organization of the United Nations (1989).*

Products must be loaded only into completely clean, disinfected and dry transport vehicles. Loading and unloading should be carried out during the daytime (because at night artificial light attracts insects that can get into the packaging) in areas shielded from the elements and from potential contamination, and away from the area where the product is processed.

As the majority of trucks are fitted with refrigeration equipment without the capacity to chill products in transit, but only to keep them at a low temperature, it is important to guarantee that perishable goods are properly pre-cooled before they are dispatched to consumers.

### A few indications on sea shipping costs

Transport costs depend on a number of variables like: means of transport (sea, air, land), type of product, destination and service provision (logistics companies). The following Web sites can provide helpful information:

Alibaba.com; intl movers.com; interworldcargo.com; excessbaggage.com; purebusiness.com; fuzing.com; wisecargo.com; azfreight.com; en.szvns.com; airsealogistics.com



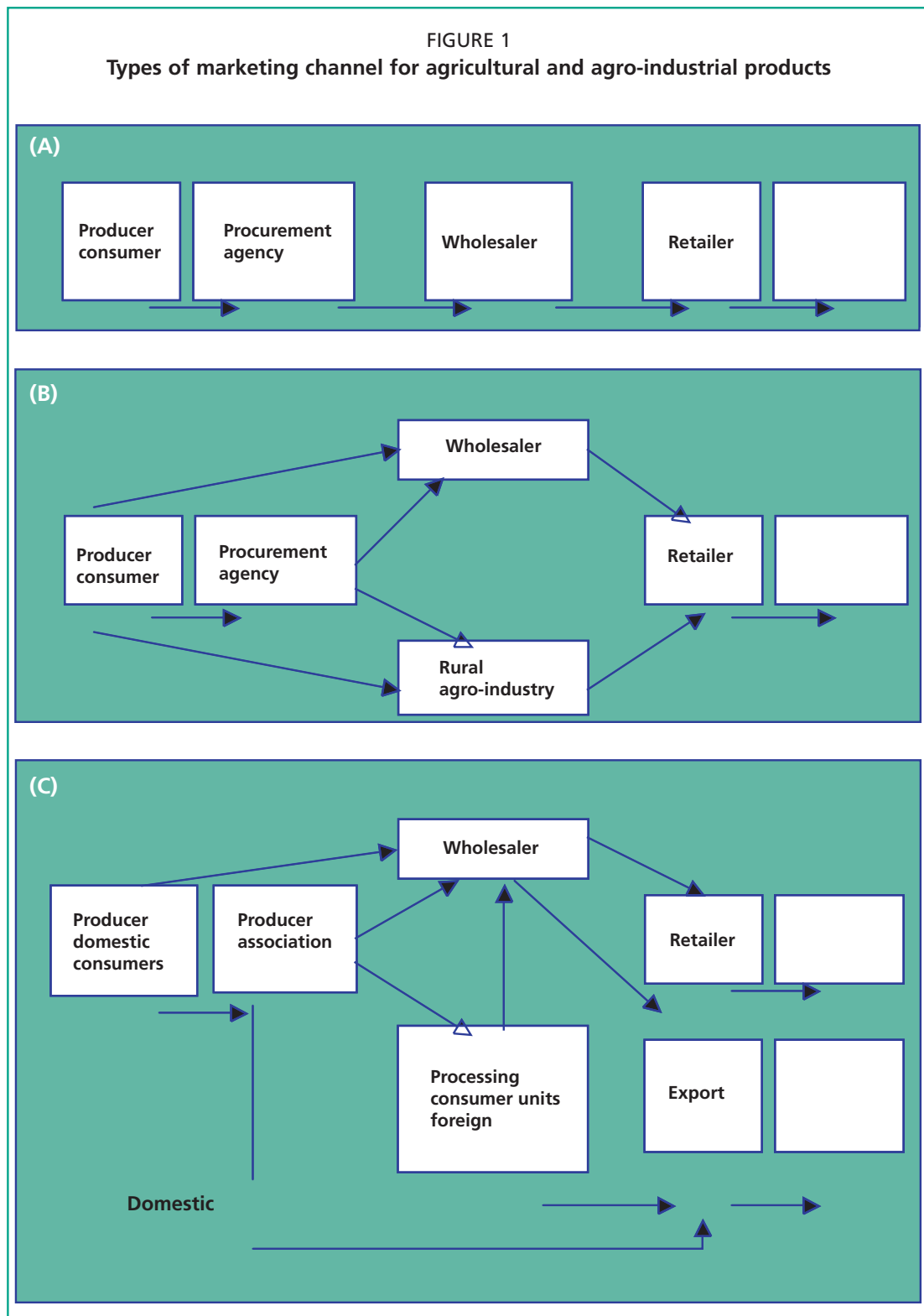
## Marketing channels

The requirements and facilities for carrying out post-harvest activities depend very much on the marketing channel, which a firm chooses for delivering its products to the target market. A marketing channel (also called distribution channel) is defined as, “the phases through which goods must pass in the process of transferral from producer to end consumer”. The term ‘end consumer’ is used to differentiate them from intermediary purchasers and intermediary consumers (such as agroprocessing industries).

There is a wide variety of marketing channels, ranging from the most direct form (from producer to consumer) to multiple-level channels involving a number of intermediaries, as explained below:

- **Producer – consumer channel:** this is the shortest and fastest route for delivering products to consumers. The most commonly used forms are: i) sale at the farm or agro-industry; ii) door-to-door selling; iii) mail order selling; iv) telemarketing and telephone selling. There are no intermediaries with this system.
- **Producer – retailer – consumer channel:** this is the channel most visible to the end consumer, and most people make a large number of purchases this way. In this type of channel, the producer has a sales force responsible for contacting retailers, which in turn sell the products to the end customer.
- **Producer – wholesaler – retailer – consumer channel:** this type of channel is used to distribute mass-produced commodities, since producers do not have the capacity to get them to the entire consumer market. One example is staple grains, where the wholesaler buys large volumes during the harvest season and later distributes them via retailers.
- **Producer – intermediary – wholesaler – consumer channel:** this is the longest channel and entails a wide network of contacts. It is used for perishable foodstuffs, where the intermediary buys products from a number of small producers and sells them in wholesale markets.

Figure 1 shows how a number of different marketing channels work. Part A of the diagram depicts one of the most common marketing channels in Asia, the **producer–wholesale–retailer–customer channel**. Part B depicts a similar channel, except that it also includes agroprocessors. Part C depicts a complete marketing channel involving wholesalers, agroprocessors and producer associations, in which the producer association acts as a stockpiler or wholesaler.



Although it might seem cheaper and simpler to use a marketing channel such as the one in part A of the diagram, in practice this is not always possible because many producers do not have marketing capabilities, owing to their limited time availability or restricted access to resources like capital and transport.

Commercial intermediation has been criticized from a number of different quarters, and attempts have been made to eliminate or reduce it in order to lower consumer prices and raise prices paid to producers. However, the majority of known measures to eliminate or reduce intermediation have met with little success, because they tend to be haphazard, transitory and mechanical. Moreover, intermediation fulfils specialized tasks like transportation, storage, promotion and developing new markets. However, this does not mean that no successful cases and mechanisms exist. One such success story is AMUL – the milk cooperative in India.

Marketing channels like those in part C of the diagram are those most recommended for increasing producer involvement in marketing. This adds more value to production; not by producers themselves but via the producer organization, which is able to carry out more specialized tasks.

Another marketing channel, which many firms are now starting to use, is electronic commerce, which refers to any form of commercial transaction or exchange of information based on data transmission via communication networks using the Internet. It includes not only the electronic buying and selling of goods, information and services, but also the use of the network for activities downstream and upstream of the transaction itself – such as advertising, negotiation, customer services and associated administrative formalities.

Worldwide business-to-business electronic commerce was estimated to be worth around US\$360 billion in 2000, of which transactions by North American firms accounted for 70 percent. The use of marketing channels has also come to be adopted by the agricultural sector. Apple growers in India are now using Internet facilities to market their produce, mostly targeting the domestic market. In Asia in general the adoption of this electronic system of marketing is making rather slow headway, mainly because most firms lack communications technology.

However, many Asian firms already carry out electronic transactions, especially for buying packaging and inputs. Electronic commerce is also used for selling non-perishable goods like handicrafts. ITC's international business division, one of India's largest exporters of agricultural commodities, has conceived e-Chaupal as a more efficient supply chain aimed at delivering value to its customers around the world on a sustainable basis. For further details visit their Web site [itcportal.com](http://itcportal.com).

**A distribution channel should be more than just a sequence of marketing phases between producer and consumer; it should be a team of people working towards a common goal. It must be seen as a joint effort by all participants to achieve long-term success.**

**The Indian Farmers' Fertiliser Cooperative Limited (IFFCO)**<sup>1</sup>, established in 1967, is the world's largest fertilizer-producing cooperative. It has a membership base of over 37 000 agricultural cooperatives throughout the country. Its products (NPK/DAP/Urea) are channelled through its member-societies and its 158 Farmers' Service Centres. Its main objective is to provide quality fertilizer and appropriate technical knowledge to farmers through its member cooperatives, and also to strengthen the cooperative system. IFFCO has emerged as a fertilizer giant and the undisputed market leader in India for the supply of nitrogenous and NP/NPK complex fertilizers. It operates five large fertilizer plants located in Gujarat, Uttar Pradesh and Orissa States.

It markets nearly 10 million tons of fertilizer from domestic and overseas producers. To ensure availability of fertilizers to Indian farmers, IFFCO has established joint ventures in Oman, Senegal and Egypt. Fertilizer materials are transported to various nodal destinations – mostly by rail where IFFCO has created warehousing facilities. From the warehouses, fertilizer is delivered to the retail points on the basis of expressed demand. The logistics system also supports marketing of fertilizer by member cooperatives.

Around 450 Field Officers assist in providing marketing and technical services to member-cooperatives and farmers. IFFCO distributes its fertilizers in 29 states through the cooperative system. In order to make fertilizer available at the doorstep, the Society has hired space all over the country at 1 698 locations of Warehousing Corporations and Cooperatives. Approximately 63 percent of this space is reserved for godowns owned by cooperatives i.e., state cooperative marketing federations/village level cooperative societies.

The year 2005–06 was a historic year of accomplishments for IFFCO. The Society was ranked first in sales turnover and second in terms of net worth and profitability amongst unlisted enterprises. (*Survey conducted by the Economic Times Intelligence Group*). The current net worth of IFFCO in 2006 was around US\$7.73 billion.

The Society has steadily grown from a modest membership of 57 cooperatives in 1967–68 to over 37 000 cooperatives at present. The initial equity capital of US\$13 000 contributed by cooperatives has risen to US\$92 million. It contributes 18.4 percent to the country's total nitrogenous production and 23.4 percent to total phosphate production. Some of the key figures relating to its production and sales are given in Table 2.

<sup>1</sup> Source: IFFCO Annual Report 2005-06, New Delhi <http://iffco.nic.in>

TABLE 2  
Cooperative's production

	2003–04	2004–05	2005–06
Sales (million US\$)	816	891	1 165
Turnover (million US\$)	1 106	1 608	2 161
Total Income (million US\$)	1 346	1 626	2 177
Net Profit (million US\$)	71.7	69.5	74.2
Production (million MT)	5.7	6.15	6.43
Warehouses (No.)	2 000	1 580	1 698
Warehousing capacity ('000 tonnes)	930	971	1 000
Membership (Member-Cooperatives)	37 337	37 381	37 424

### Choice of distribution channel

As explained below, when selecting the distribution channel it will use an agribusiness must consider a range of variables relating to:

- i) the characteristics of the enterprise itself;
- ii) the product to be marketed, and
- iii) the target markets.

### Geographic location

If an enterprise is remote from major markets, it will need to use a larger number of intermediaries or to have a very good distribution capacity itself.

### Market size

A very large market calls for more intermediaries.

### Product characteristics

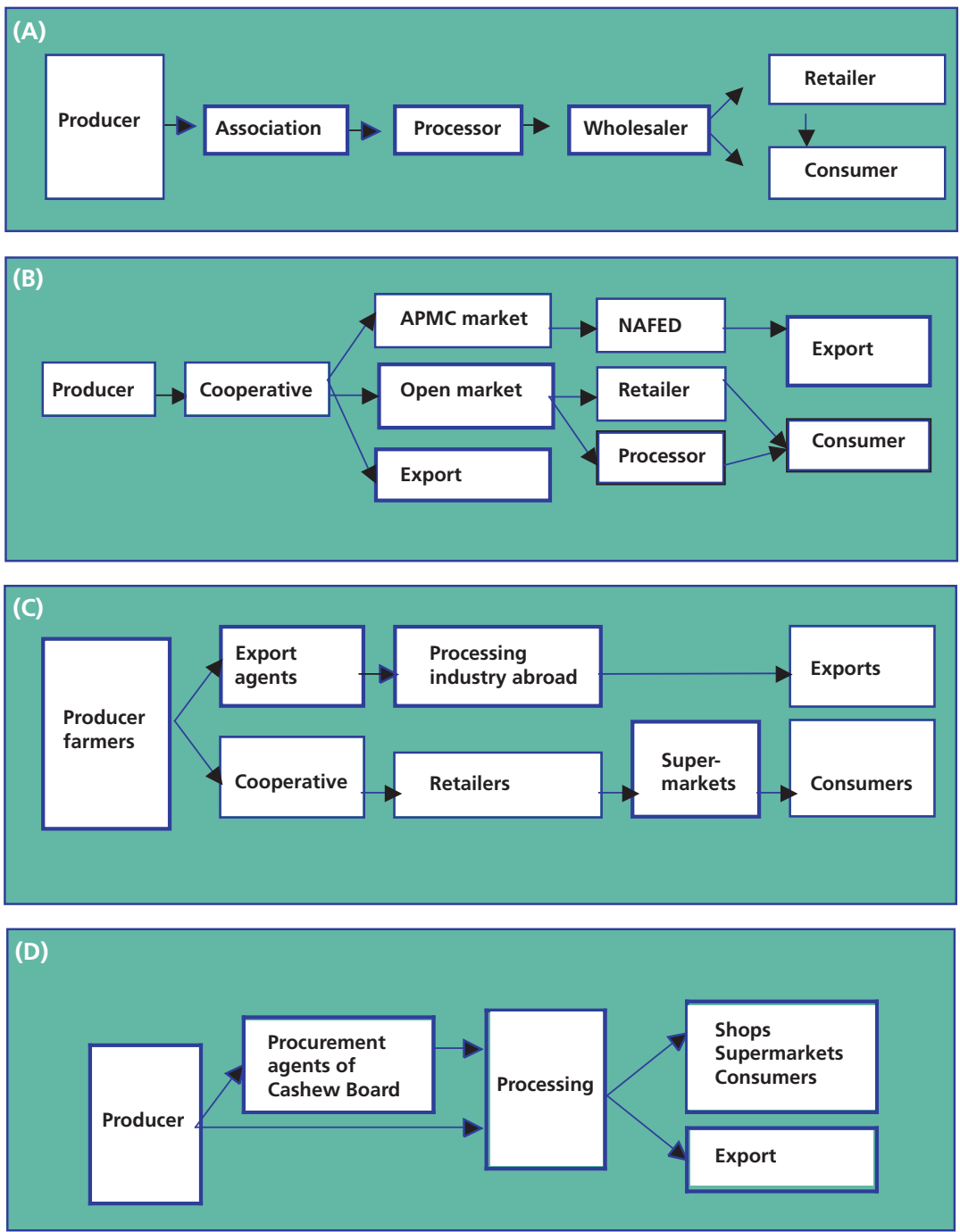
Costlier, more specialized, customized products tend to have shorter, more direct distribution channels and be marketed by agents familiar to the customer target group. In contrast, the more standardized a product is, the longer its distribution channel tends to be and the greater the number of intermediaries involved. This is the case with most fresh agricultural products.

A product's storage life is an important factor. Perishable goods with a relatively short storage life and fragile items require as little handling as possible and have the strictest packaging, transportation, storage and handling requirements. Good examples are: eggs, most milk and milk products, meat by-products, and preserves in glass jars.

**Producer factors**

Producers with extensive financial, administrative and marketing resources are in the best position to use more direct channels. They have the capacity to hire and train their own sales staff, to warehouse their products and to extend credit to customers. Smaller or less-experienced enterprises have to rely on intermediaries to provide these services.

FIGURE 2  
Marketing channels



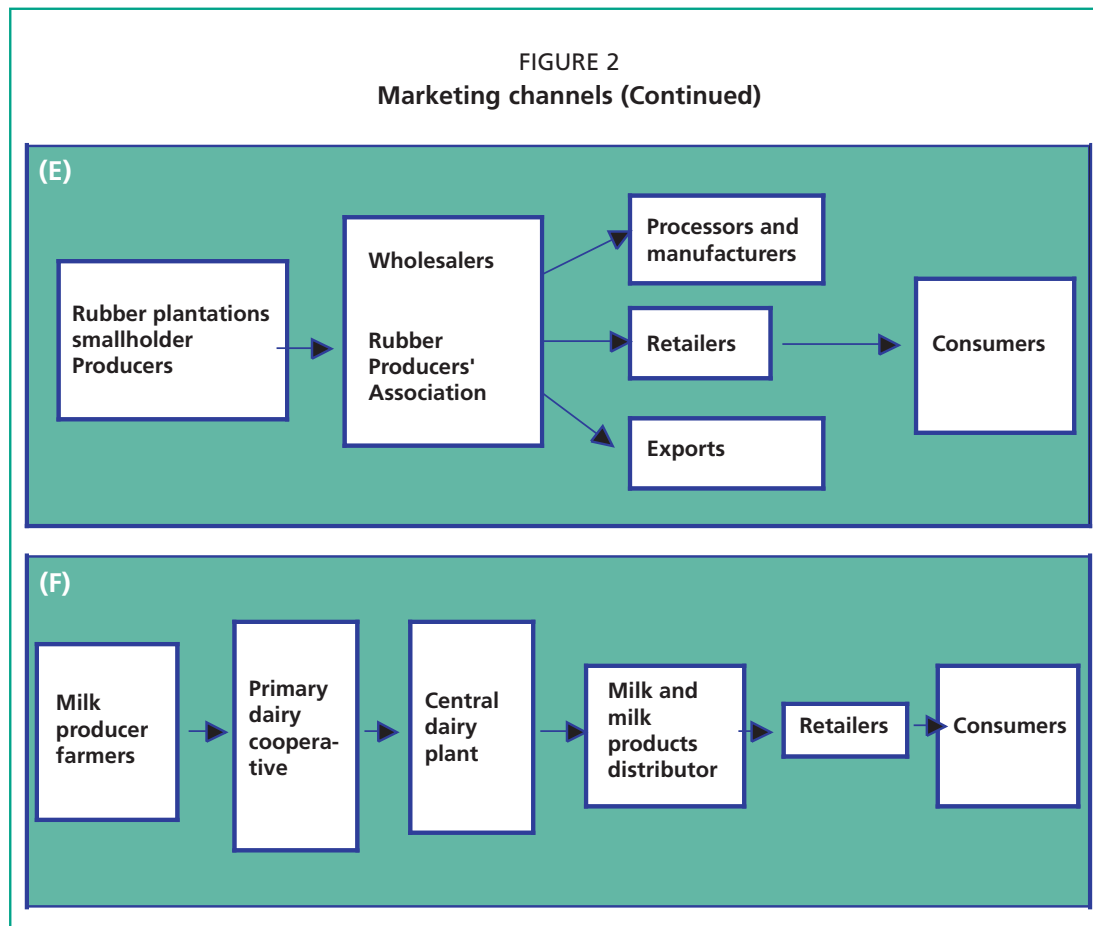


Figure 2 shows a few examples of marketing channels used by Asian agro-industries for marketing products locally and for export:

As indicated by the diagrams, in some cases it is possible to deliver products to end-consumers via a shorter chain of intermediaries – as in the case of honey marketing in India, where the more traditional channel is used (producer-wholesaler-retailer-customer), or cashew marketing in India, where the Association acts as wholesaler. In other cases, a larger number of intermediaries are involved, either because of the special characteristics of the product (rubber) or because producers participate in marketing support organisations and programmes, as in the case of milk cooperatives.

It is extremely important for agribusinesses to select their marketing channel on the basis of such variables as:

- i) costs and marketing margins;
- ii) ability to do their own distribution;
- iii) product perishability, and
- iv) the possibility of services being provided by intermediaries.

Marketing margins for fresh products vary enormously, depending on a variety of factors, including seasonal variation in supply, the distribution channel used and the type of market. In the case of supermarkets, marketing margins tend to be decided as part of each firm's internal policy and range from 5 percent to 20 percent.

### Logistical operations

Kim Bien Cooperative Union (introduced in section 1.2 of this Unit) is a good example of an agribusiness whose efficient management of logistical operations all through the chain has allowed it to break into the litchi market in Asia. Logistics can be defined as the set of activities, which entrepreneurs carry out between the time they buy inputs and raw material and the time the finished product is delivered to the customer. It includes any sort of transport as well as: production, packing, storage and distribution of products.

The growth in supermarkets and cooperative outlets as food distributors has come to modify logistical processes and make greater demands on them. There has been a change in supplier-distributor relations, involving the formation of strategic alliances and an increased flow of information in the distribution chain. For instance, suppliers can also carry out specific tasks like packing and affixing prices on products, so increasing efficiency in distribution centres and reducing overall costs. At the same time, distributors can participate in decision-making on firms' production and marketing plans and have access to their sales information.

Depending on a firm's vision, logistics may also include after sales and customer service. Transport is one of the most crucial logistics operations, since it is often the most costly item in the distribution chain. Choosing the right transport means is therefore decisive in maintaining product competitiveness, especially where products are sold on the international market.

**As the operational basis of logistics is information plus information management and updating, it is crucial to document all operations.**

Before a logistics strategy can be designed, a series of questions must be answered. For example, what is the flow of goods, money, information and decision-making from producer to customer, and vice versa? What is the level of integration or collaboration with firms with which you have dealings?



### Raw-material costs compared with other cost factors in agro-industrial processes

The mere fact of having excellent raw materials does not necessarily give a firm a competitive advantage. Items such as transport, storage or packaging can cost just as much or more. Indeed, the raw material for some industrialized products costs less than the packaging. The cost of producing a 250 g jar of blackberry jam can be US\$0.80. The jar represents 30 percent of this cost and logistics around 20 percent.

### Logistical service outsourcing and logistics operators

The multiplicity, diversity and complexity of logistics-related activities have attracted new providers specialized in such tasks which, though crucial to a firm's competitiveness, are not part of their core business. This has created a market in services, which has been dubbed "outsourcing". In addition, outsourcing has professionalized a sector whose function is to increase cost savings and operational efficiency in administering the distribution chain.

Outsourcing is often defined as the long-term contracting out or delegation of one or more non-core *processes* of a firm's business to a more specialized service provider, to increase firms' effectiveness and enable them to direct their best efforts to key needs for fulfilling a *mission*.

The services which firms tend to outsource include: transport of raw materials, packaging materials, inputs and finished products; as well as packing, labelling, storage, inventory control, affixing prices and recording import and export transactions. (Not only logistics services are outsourced, so are services such as: cleaning, catering, maintenance and computing.)

Many firms decide to outsource in order to concentrate on their core business, to reduce operating costs and to make it easier to manage functions that are difficult to control. Some of the typical reasons why firms decide to outsource are to:

- Speed up market response.
- Widen coverage.

- Remove operations that are not part of the firm's core business.
- Reduce the asset base.
- Reduce logistical costs.

It is not easy to decide whether or not to outsource logistics services. The process of selecting a logistics supplier must be highly rigorous and objective, since it is easy to overlook factors that seriously affect the cost and/or service.

**The first step in assessing whether or not it is advantageous to outsource services is to identify which activities are suitable for outsourcing to third parties; not because it is the fashion or because suppliers report that it is the trend, but because it is what will be of most value to the business. Firms are recommended to invite bids from specialists, and the selection process should include demonstrations or visits to some of their current operations. Lastly, the decision on whether or not to outsource must take into account not only the cost but also the quality of the service and the organisational harmony between the service provider and one's own firm.**

## Traceability requirements

The introduction of traceability requirements has created a special situation that makes it even more important to have a logistics strategy and efficient logistics mechanisms. Traceability is understood to mean a guarantee – provided to the authorities responsible for health control – that records and information exist detailing all the actors, inputs and steps along a foodstuff’s route from its place of origin on the farm until it reaches the consumer’s table. Traceability is now embodied in a set of international regulations that must be complied with.

This concern and the response to it have arisen in the wake of a string of food crises (such as mad cow disease in the United Kingdom, dioxin poisoning in chickens in Belgium and fungicides in Coca Cola in India and the Netherlands and avian flu in many Asian countries). These events have all caused alarm among consumers about the origin and quality of foodstuffs.

In response to consumer concerns, the European health authorities have put into operation a standard system for tracing foodstuffs. From a technical standpoint the system is “a set of pre-established procedures for tracing the history, location and route of a product or batch of products throughout the agrifood chain and at every phase in the chain”. The primary objective of traceability is to provide information that will make it easier to find solutions to potential food-related problems.

Bar codes are a useful traceability tool that allow a product to be tracked from its place of production to the eventual sales outlet. Bar codes are normally printed on sticky labels, which are then affixed to products. Using the latest laser technology the bar code is printed straight onto fruit and vegetables, which avoids the problem of labels falling off during handling with the subsequent loss of information, as well as avoiding the problem of glue residues on fresh products.

As from January 2005, the European Union has made it compulsory to establish traceability at all stages of the production, processing and distribution of human food, animal feed or any other substance to be incorporated into a food or feed.<sup>1</sup>

The United States of America has also introduced traceability requirements in the form of the Bioterrorism Act<sup>2</sup>, as a result of the terrorist attacks of 11 September 2001. This Act applies to all foodstuffs imported into the United States. Its two main components are as follows:

<sup>1</sup> Regulation EC 178/2002 of European Parliament and of the Council laying down the general principles and requirements of food law.

<sup>2</sup> For more information on the Bioterrorism Act, see Web site <http://www.fda-usa.com>

- **Establishment and maintenance of records:** persons who manufacture, process, pack, transport, distribute, receive, hold or import food to the United States are required to create and maintain any records deemed necessary by the United States Food and Drug Administration (FDA) to identify immediate previous sources and the immediate subsequent recipients of food: that is to say, where foodstuffs come from and who receives them.
- **Administrative detention:** the FDA is authorized to order the detention of an article of food if it has credible evidence or information that the said foodstuff presents a threat of serious adverse health consequences or death of people or animals.

All the actors involved in a traceability system are responsible for food safety. This does not mean that the system is enough in itself to guarantee food safety or product quality, but it is an essential tool for ensuring safety and quality. Just as a person's identity card does not prove the holder's honesty, neither does a bar code guarantee the safety of a foodstuff. However, it is crucial for identifying and locating it.

#### Outsourcing and bar code costs

Bar codes are required in most supermarket chains. Coding of products ensures better inventory control and reduces check-out times.

Outsourcing of bar codes is done via the Coding Authority, an organisation attached to each country's Chamber of Industry. Annual fees are paid for a licence to use bar codes. Firms are recommended to buy a licence to use standard bar codes (EAN-13), which are in widespread use everywhere in the world except the United States and Canada. An annual licence to use EAN-13 codes costs around US\$650 per year, with variations from country to country. A different code is required for each product presentation and flavour, and the cost does not depend on the size or type of product.

**Conclusions on the case study**

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

1. Which post-harvest activities does Kim Bien Litchi Cooperative carry out? Identify the control variables used and at which level. Are some of them developed and implemented in your associative enterprise's activities?

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2. The Cooperative's transport service is vital. What is it needed for? How do you compare these requirements with those of your associative rural enterprise?

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3. Draw a diagram depicting the phases, actors and functions described in the case study, highlighting the post-harvest and logistics aspects. How would the diagram look for your associative enterprise?

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4. In your view, which values, principles and attitudes should be upheld to ensure the success of an organisation like the Cooperative described in the case study?

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**Group exercise**

As you have seen from previous exercises, the Kim Bien Cooperative carries out a number of post-harvest, processing and conditioning activities for marketing its litchi fruit. There are two methods of preserving fresh litchis: i) spraying with SPUR to preserve colour and quality; and ii) placing in polythene bags with holes to facilitate ventilation in high temperatures and moist conditions.

To prepare litchis with sugar water: select litchis, split, remove seed and place in sugar water for a fixed time; then heat the flesh in sugar water with acid added, place in cans and close the lid. Sterilized cans are used and can be kept safely for one year.

A litchi juice processing chain consists of: fresh fruit - selection - cleaning and sorting - split pulp and brewing - squeezing - purging - fresh water - canning - sterilising - cold store chain - preserving - finished product - storing.

Litchis are packed into plastic crates and stored in a cold chamber prior to transporting to the central warehouse of a major supermarket chain, from where they are distributed.

With this information, together with the information already provided in the introduction to the exercise:

- Draw a flow diagram of the process (starting with harvesting and ending with packing the litchis into plastic crates prior to transporting to the supermarket warehouse).
- Draw a flow diagram establishing the logistical activities involved in selling fresh litchis to the supermarket chain, starting with processing purchase orders and ending with the delivery of litchis to the supermarket's central warehouse.

## Summary

- Much of the agroproduction system's competitiveness is defined in the phases of post-harvest and of managing and distributing the end product. In part this is because most of a foodstuff's value is added during these phases.
- Post-harvest management is a set of post-production practices that includes cleaning, washing, selection, grading, disinfection, drying, packing and storage.
- In addition to the above, key post-harvest operations are controlling temperature and relative humidity, packing, and supplementary treatments like fungicides and coatings.
- Poor post-harvest management has serious financial consequences for producers, sellers and consumers. Whilst in developed countries, estimated post-harvest losses of fruit and vegetables are between 5 percent and 25 percent of the volume produced, in developing countries losses range from 20 percent to 50 percent, and in some cases more.
- Storage requirements for agricultural products vary widely from a few hours to several days. Facilities for storing agricultural products can be simple or highly sophisticated. Their design or selection must take into account variables such as: the marketing system, the compatibility of products kept together and the entrepreneur's individual needs.
- Proper use of refrigeration is the most useful means of prolonging the storage life of perishable fruit and vegetables, and preserving their quality. Generally speaking, for every 10°C increase in the temperature of plant tissues, their respiration increases by two to three times, whilst their storage life is reduced by a factor of two to four.
- During transportation, it is crucial to avoid mechanical damage to products from impacts, vibrations or temperature changes, which can cause water condensation. Whilst products are being transported, they must be shielded from the elements and, where appropriate, should be refrigerated to prevent contamination or deterioration.
- A marketing channel (also called distribution channel) can be defined as "the phases through which goods pass in the process of transferral from producer to end consumer".
- There is a wide variety of marketing channels, ranging from the most direct form (from producer to consumer) to multiple-level channels involving a number of intermediaries, each for a specific product. The most traditional marketing channel is that of producer-wholesaler-retailer-customer.

- Electronic commerce is a marketing channel with great potential for all types of enterprise. Electronic commerce refers to any form of commercial transaction or exchange of information based on data transmission via the Internet.
- One of the factors, which determine the choice of marketing channel, is the target market. The channel will vary, depending on whether the firm sells to consumers, intermediaries or industrial customers. Other important variables include geographic location, market size, how easily a product can be preserved and the firm's financial capacity.
- From a technical standpoint, food traceability is “a set of pre-established procedures for tracing the history, location and route of a product or batch of products right throughout the agrifood chain and at every phase in the chain”.
- In a crisis, traceability makes it possible to inform consumers, the media or the relevant governmental agencies about the origin, route and people who have come into contact with a specific foodstuff, which facilitates the investigation and tracing of potential hazards arising from that product.
- Bar codes are required in most supermarket chains. Coding of products ensures better inventory control and speeds up check-out times. Just as a person's identity card does not prove the holder's honesty, neither does a bar code guarantee the safety of a foodstuff. However, it is crucial for identifying and locating it.
- As from January 2005, the European Union has made it compulsory to establish traceability at all stages of the production, processing and distribution of human food, animal feed or any other substance to be incorporated into a food or feed. Also, any article of food imported into the United States of America is subject to the Bioterrorism Act (13), which was introduced in response to the terrorist attacks of 11 September 2001.



**Unit assessment**

**Answer the following questions on additional sheets of paper:**

1. Have your associative rural enterprise’s activities required you to implement special post-harvest procedures to handle certain types of product or to meet market requirements?  
.....

2. In your own words, say what you understand by the following terms: (a) ethylene; (b) marketing or distribution channel; (c) logistics and (d) traceability.  
.....

3. What impact does the type of packaging you use have on the competitiveness of your products? How was the packaging selected? Do you think the quality of your packaging could be improved, or the costs reduced?  
.....

4. Can you identify the marketing channels which your associative enterprise uses to deliver products to consumers? Could these channels be made more efficient? How?  
.....

5. Is demand for your associative enterprise’s products concentrated on certain occasions or dates of the year? Is it necessary to have special logistics arrangements to cope with these peak periods?  
.....

6. Does your associative enterprise have a special strategy for managing logistical aspects? Has it ever outsourced logistical services to third parties? What advantages and disadvantages do you see in outsourcing to third parties?  
.....

7. Which values are safeguarded by applying the traceability requirements now being imposed on markets?  
.....

**While attempting to answer these questions if you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student’s handbook or contact the facilitator.**



# Quality as a factor of market differentiation

## UNIT TWO

### LIST OF TOPICS

1. Setting the context
2. Case study: Darjeeling Tea
3. Case study analysis
4. Different quality concepts
5. Quality as a prerequisite for competing in markets
6. Quality assurance tools and standards
7. Quality labels
8. Conclusions on the case study
9. Group exercise
10. Summary
11. Unit assessment

### Points to remember



As we saw in the module “Planning applied to associations and rural enterprises”, there are specialized markets for different products. However, to reach those markets it is necessary to guarantee that products really do have the stated special attributes, or that they comply with the processing conditions claimed. This means affixing labels or special quality certifications which are awarded for compliance with certain requirements.

Do you think it would be a good market-access strategy to highlight your products’ special quality attributes\*? What are those special attributes? Do you know of any labels or certifications that you could use to endorse these special attributes?

**By the time you complete this unit  
you will be able to:**

- ☞ Identify from your own experience quality labels that have been used or could be used by your associative rural enterprise.
- ☞ Appreciate that securing market recognition for quality labels calls for institutional developments that go beyond the associative rural enterprise itself.
- ☞ Define what a quality label means, differentiate between the various types of label, and appreciate how important it is to use them.



### Setting the context

Quality has become a key concern in food markets in recent years. Far from being a passing phase or fashion, this concern for quality has arisen in response to two basic trends: i) competitors are raising their standards to meet stricter requirements, and ii) consumer patterns are changing as consumers become more sophisticated and demanding; not only in terms of the health and safety of the foods they eat, but also as regards the processes used to produce those foods.

That is why it has become important for producers' associations to offer products with special attributes (value attributes) to make their products stand out. Such attributes are an important supplement to food safety and can differentiate products as superior; either because of their organoleptic qualities and composition, or because eating them is associated with certain socializing, socio-cultural or educational traditions. In the past decade, consumers have come to set increasing store by factors such as: i) respect for the environment throughout the agrofood chain (clean and organic products); ii) compliance with labour laws concerning production workers (fair trade\*), and iii) fostering traditions (foodstuffs with a local or regional identity).

An important point is that, before these special attributes can be claimed as a special quality factor, the foodstuffs in question must comply with basic safety requirements and be guaranteed as safe to consumers. In other words, a product must first be safe and only then is it possible to differentiate it by adding quality attributes.

After meeting this essential condition of guaranteeing food safety, it is also necessary for such a product to have to an appropriate indicator to inform the consumer that the product really has one of the attributes mentioned above. This is the function of quality labels, which need to be backed by a

publicly recognized body to convince consumers of their value. This means that there must be a regulatory and institutional framework to underpin the implementation of such labels, or else a framework must be developed.

There are wide differences between Asian countries in this respect. Some countries have regulations on organic products, but others are much less advanced in the areas of social labels and labels certifying a local or regional identity. In other parts of the world this is not the case. To cite an example of labels certifying a local or regional identity, France made its first attempt to classify wines on the basis of their origin in 1855; in 1905 the foundations were laid for legislation on Designations of Origin, and in 1935 France's National Institute for Designations of Origin (INAO) was created.

In the area of quality labels, developments are still in progress and the situation is evolving, with no common position on the subject. On the contrary, there are several concerns, questions and differences of opinion. In some quarters, there is concern that recognition of such attributes has been taken over by private initiatives that have made a business out of such processes. At the level of the World Trade Organization, some countries argue that attributes amount to restrictive trade practices. The current debate focuses on designations of origin, with two opposing positions in evidence: one, championed by the European Union, China and some Asian and African countries, which support such differentiations on the basis of a local or regional identity, and the other, led by the United States, Canada, Japan, Australia, New Zealand, Argentina and other South American countries, which advocate restricting such rights.

Fragrant rice of Asian origin, mainly grown in India and Pakistan and popularly known as Basmati Rice, is an appropriate example of regional identity. There were widespread protests when steps were taken to patent it in the United States.

**Case study: Darjeeling Tea****INTRODUCTION**

The first commercial “tea gardens” were planted in 1852 and all these plantations used seeds that were raised in government nurseries. Darjeeling was then only a sparsely populated hamlet, which was being used as a hill resort by the army and some affluent people. Tea, being a labour intensive enterprise, required sufficient numbers of workers to plant, tend, pluck and finally manufacture the produce. For this purpose employment was offered to people from across the border with Nepal. By 1874, tea in Darjeeling was found to be a profitable venture and there were 113 “gardens” with approximately 6 000 ha. Today there are 86 “gardens” producing Darjeeling Tea on a total area of 19 000 ha. Total production ranges from 10 to 11 million kg annually.

**DISCUSSION**

Darjeeling Tea is the world’s most expensive and exotically flavoured tea. When brewed, it has a distinctive, naturally occurring aroma and taste with light tea liquor and a distinctive fragrance that cannot be replicated anywhere in the world and has no equal. The tea pluckers, well aware of the status of their product, pick only the finest two leaves and the bud to enhance the unique flavour, which has been described as ‘Muscatel’.

The story of Darjeeling Tea started some 150 years ago when Dr Campbell, a civil surgeon, planted tea seeds in his garden as an experiment at Beechwood, Darjeeling, 7 000 ft above sea level in the foothills of the Himalayas. By 1870, the number of “gardens” had increased to 56, producing about 71 000 kg of tea harvested from 4 400 ha. During 1860–64, the Darjeeling Company was established with 4 “gardens” while the Darjeeling Consolidated Tea Company dates back to 1896. The Darjeeling Logo is the property of the Tea Board of India<sup>1</sup> and was launched in 1983. The symbol verifies that the packet contains 100 percent pure Darjeeling Tea, unblended with teas from any other growth.

The Darjeeling tea industry employs over 52 000 people on a full-time basis and 15 000 more on a part-time/seasonal basis – over 60 percent of them are women. The income of “garden” workers is received half in cash and the remaining half in kind/services. Many of the local population earn their livelihood from peripheral sector activities e.g. transport, supplies, repair, establishment, etc.

<sup>1</sup> <http://www.indiateaportal.com.secyteaboard.vsnl.net>

India remains the largest tea producer in the world, although its share of worldwide exports has declined rapidly over the last few years, while Sri Lanka, Kenya and Viet Nam have made significant gains. This loss of market share is largely a consequence of low productivity and the absence of an aggressive marketing mechanism. India's main problem is the high percentage of 'senile' tea bushes and high production costs. Studies undertaken by the Tea Board reveal that 38 percent of all tea bushes are over 50 years old and another 9 percent are in the age group of 40–50 years. Though India is still the world's largest tea producer, 80 percent of national output is consumed domestically. Neighbouring Pakistan imports 140 million kg of tea annually, but India meets just eight million kg of its neighbour's needs.

## CONCLUSION

Darjeeling Tea is acknowledged to be among the finest teas grown anywhere in the world. The tea bushes are located at an optimal altitude, and are nurtured by intermittent rainfall, sunshine and moisture-laden mellow mists. The soil is rich and the hilly terrain provides natural drainage for the generous rainfall the district receives.

Adherence to a high quality profile, results in extremely low yields. The Darjeeling planter has never succumbed to the temptation of increasing yields at the expense of quality and makes every effort to ensure the highest quality standards, despite the high costs involved.

Though Indian tea is among the finest in the world it has been losing foreign markets, mainly due to its low productivity and high cost of production.

### Case study analysis

**Based on your personal experience, consider the following questions on the proposed case:**

1. In your view, which are the special quality attributes that have allowed Darjeeling Tea to be positioned in the markets? Can you relate this case with one in which your associative enterprise is involved?
2. Which strategies made it possible to promote these special attributes and to use them as a means for accessing markets? Could the same or similar strategies be used in your associative enterprise?
3. From a business perspective, which management strategies do you think helped to achieve these results? Do you think that the same or similar strategies could be implemented in your associative enterprise? What would this require?
4. In your view, which values, principles and attitudes should be upheld to ensure the success of an organisation like the one described in the case study?

**Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.**

### Different quality concepts

To return to our analysis of the increasingly international trend in the food trade and the recognition of its importance, the need to guarantee food safety and quality to consumers has led to international instruments such as the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures adopted by 134 member countries. This sets out the basic rules on how Governments can apply food safety and animal and plant health measures. In turn, these agreements on health measures are based on the food standards\* of the Codex Alimentarius\* Commission, created in 1963 by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) to develop food standards, guidelines and other related texts.



Let us now define what we understand by food safety and quality and the impact they have on the day-to-day activities of an agribusiness. The International Organization for Standardization (ISO) defines quality on the basis of the extent to which the properties and characteristics offered by a product or service satisfy the declared or implicit needs of consumers. This makes quality a subjective notion which can change over time. In the case of foodstuffs, for example, the concept of quality has come to incorporate aspects of the production process such as:

- i. animal welfare in the case of livestock farming;
- ii. the use of agrochemicals in the case of crop farming, and
- iii. environmental protection.

For agrifood products, quality is therefore a complex, changing concept that encompasses numerous factors – including food safety, flavour and nutritional value. It also encompasses suitability for the intended use of the product, and even the relationship of trust between suppliers and customers. These different factors vary depending on the consumer's economic and social context. So, the quality of an agrifood product can be analysed from different perspectives:

- **Quality as a guarantee of safety:** meaning that the foodstuff does not harm the health of the persons consuming it. This is the basic requirement that a foodstuff must satisfy and it is generally controlled at state or national level in order to safeguard public health.
- **Nutritional quality:** this refers to the ability of foodstuffs to satisfy the needs of the human body in terms of energy and nutrients. This factor has become very important to informed consumers who are aware of the disease prevention potential of a healthy and balanced diet.
- **Quality defined by *value* attributes:** these are attributes over and above basic food safety which differentiate products on the basis of their organoleptic qualities, composition, or the fact that eating them is associated with certain socializing, socio-cultural and educational traditions.

As discussed below, quality also stems from other factors relating to consumers' use and appreciation of a product based on the extent to which it satisfies their tastes, needs and requirements:

- **Product safety:** this factor is paramount in consumers' purchasing decisions. In addition to physical and chemical characteristics it includes other variables, such as the type and size of packaging.
- **Fair price:** this is the price set by the market based on the degree of consumer satisfaction with the product, after deducting non-quality costs arising from inefficient processes and distribution channels.
- **Service:** service has become a competitive factor as it is not only involves delivering a product to consumers, but also providing the product at the exact time consumers need it in a handy and convenient form.

The combination of the above elements reassures customers as to the safety and reliability of the product, and of the firm itself.

Safety is now a market “requirement” that has come to be added to existing product quality requirements. As stated in the Codex Alimentarius, it is the “assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use”. Although safety is not a new concept, it is only recently that serious efforts have been made to ensure that marketed products comply with the safety requirement, because the main consequence of poor hygiene in food processing and handling is to put consumers at risk of food-borne diseases. The United States Centres for Disease Control and Prevention (CDC) reported that between 1988 and 1998, *Salmonella* and *Escherichia coli* were the two bacterial agents responsible for most of the outbreaks associated with foodstuffs in the United States.

**Safety is a basic requirement for a quality product. A product must first be safe and only then is it possible to seek to differentiate it by means of additional attributes like flavour, nutritional value and production area.**

## Quality as a prerequisite for competing in markets

As stated above, the traditional view of production-oriented quality, defined as “products free from defects”, has broadened considerably in recent years. Nowadays quality is market-oriented, meaning the aim is to satisfy customers, which involves much more than merely protecting them against defects. Quality is therefore seen as a prerequisite for success in an increasingly competitive agrifood market, and it is becoming a major source of competitive advantage.

Quality brings benefits to firms that implement quality management as a work philosophy. Since these firms are convinced that customer satisfaction is paramount, they establish an operational policy that allows them to successfully guarantee the quality of their products. Let us see how good and bad product quality can affect a firm:

- **Costs of production and market participation.** Firms with higher quality standards have been proven to be more productive. Costs have been found to be minimal when one hundred percent of its goods or services are free from defects.
- **Loss of image.** Firms whose products are rejected because of poor quality will lose the trust of distributors and consumers and will have to work very hard to shake off this negative image and recover their market position.
- **Claims for damages or injury.** Firms which deliver defective products or services can be made accountable and sued for damages or injury resulting from their use.

## Quality assurance tools and standards

Trade opening and the resulting expansion in the movement of foodstuffs between countries have made it increasingly necessary to assure consumers that what they are eating does not harm their health. For this reason, Governments have been obliged to develop and implement national and international legislation guaranteeing that food is safe, and these regulations are now becoming a requirement for market access. There are many reasons why the United States rejects would-be imports, as illustrated in Table 3.

Another factor that has clearly influenced the adoption of quality standards is the growth in packed food items and the change in perception of consumers in Asian countries, especially among the urban and educated population. Some of these quality assurance systems have become standard in certain countries. This is the case with good agricultural practices\* (GAP), good manufacturing practices\* (GMP) and Hazard Analysis and Critical Control Points\* (HACCP). Other quality assurance tools are needed in order to export to certain other markets, such as EUREPGAP. The most important of these are:

### Good agricultural practices (GAP)

This is a set of guidelines established to ensure the hygiene and safety of agricultural products. GAP focuses on those production aspects that can jeopardize production quality, environmental protection and working conditions, or which can affect the health of foodstuffs, including: water, soil, fertilizers, crop protection, harvesting and post-harvest management, support elements, worker health and welfare, and traceability. These practices must be properly recorded in order to monitor and facilitate the management of on-farm activities.

TABLE 3

**Principal reasons for the detention, rejection and destruction of foodstuffs exported to the United States.**

Reason for rejection	Percentage
Presence of insects, rodents, birds	32.0
Microbiological contamination and decomposition	18.5
Low acid content in preserves	12.5
Incorrect labelling	10.0
Unacceptable chemical residue levels	7.0
Presence of unauthorized additives or additives in excess of permitted levels	4.5

## Good manufacturing practices (GMP)

This is a set of minimum hygiene measures needed to prevent food contamination at the different phases of processing and marketing a foodstuff.

## Hazard Analysis and Critical Control Points (HACCP)

This is a system for identifying, assessing and monitoring food safety risks, and on this basis to control critical points as a measure for preventing such risks. Many countries have established HACCP as a compulsory requirement because it facilitates inspection by the authorities responsible for regulating food production and promotes international trade by increasing purchaser and consumer confidence.

## EUREPGAP<sup>1</sup>

Is a quality management system that began in 1997 as an initiative by retailers in the Euro-Retailer Produce Working Group (EUREP). The Group went on to set-up a producer and retailer association (Global Partnership for Safe and Sustainable Agriculture) to develop widely-accepted standards and procedures for the global certification\* of good agricultural practices. This means that firms exporting fresh fruit and vegetables to Europe via EUREP member supermarkets must implement good agricultural practices in accordance with the standards in the EUREPGAP protocol.

Technically speaking, EUREPGAP is a set of specific standards for ensuring the integrity, transparency and harmonization of world agricultural regulations. This includes food safety production requirements, for such aspects as safeguarding workers' health, safety and welfare, animal welfare and the environment.

When farmers' organizations or individual farmers receive EUREPGAP approval they are issued with a certificate by a EUREPGAP-accredited body. The certification bodies receive training and are regularly evaluated. **EUREPGAP principles** hinge on the following concepts:

- **Food safety:** based on food safety criteria stemming from the application of the general principles of good agricultural practices, good management practices and Hazard Analysis and Critical Control Points.
- **Environmental protection:** based on good agricultural practices for environmental protection, designed to minimize the adverse effects of agricultural production on the environment.

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<sup>1</sup> Effective September, 2007, renamed as GlobalGAP.

- **Worker health, safety and welfare:** establishes overall criteria for health and occupational safety on farms, as well as requirements relating to social awareness and responsibility.
- **Animal welfare (where appropriate):** lays down general criteria for management of animals.

To find out more about these and other food standards you are advised to consult the Codex Alimentarius Web site ([http://www.codexalimentarius.net/web/index\\_en.jsp](http://www.codexalimentarius.net/web/index_en.jsp)). Here you will find all the official standards listed by title and year of adoption. You can also search using key words.

In addition there are voluntary standardization systems for certifying quality assurance programmes, such as International Organization for Standardization (ISO).

### ISO standards\*

The purpose of ISO standards is to make food manufacturing and distribution more efficient, safer and cleaner; and to facilitate international trade by standardizing products. Although ISO standards are highly specific to each product category, the ISO 9 000 and ISO 14 000 series have been designed as “generic management system standards”. This means they can be applied to any type of firm in accordance with size, and to a firm’s products – making no distinction between sectors of activity or categories (private, public or autonomous).

- **ISO 9 000 standards:** these are aimed at guaranteeing the quality of a process, namely what a firm does to ensure that its products meet customer requirements. These standards are therefore designed to determine how firms carry out their work, and not as a measure of the final outcome.
- **ISO 14 000 standards:** these are linked primarily with environmental management and certify that a firm or entity has adopted the necessary measures to eliminate any detrimental environmental effects caused by its activities.

A schedule of fees for food safety management system certification against ISO-22000:2005 can be seen from Web sites of respective standard organizations of different countries in Asia. Similarly, each Asian nation has its own quality assurance management standards. Some of the fee structures are given in the table below:

### ISO 22000:2005 and ISO 9 000 certification costs for small and medium enterprises in India

					US\$
01	Application Fee	...	...	...	325.00
02	Small-Scale Industry	...	...	...	217.00
03	Certification Audit and Reassessment Fee	...	...	...	110.00
04	IS/ISO 22000:2005 Licence Fee [for three years]	...	...	...	1300.00
05	Surveillance Audit Fee	...	...	...	110.00
06	Special Visit Fees	...	...	...	110.00

Details can be obtained from the Bureau of Indian Standards Web site.

Source: [bis.org.in/cert/FSMS\\_fee.htm](http://bis.org.in/cert/FSMS_fee.htm)

### 'Agmark' Grading and Standardisation in India

The objective of granting 'Agmark' is the promotion of grading and standardisation of agricultural and allied commodities under Agricultural Produce (Grading and Marking Act, 1937).

Salient features of Agmark Certification: Quality standards for agricultural commodities are framed based on their intrinsic quality. Food safety factors are being incorporated in the standards to compete in world trade. Standards are being harmonised with international standards, keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of producer/manufacturer and consumer. Certification of adulteration-prone commodities viz., butter, ghee, vegetable oils, ground-spices, honey, wheat flour etc. is very popular. Blended edible vegetable oils and fat spread are compulsorily required to be certified under Agmark. Facilities for testing and grading of cotton for the benefit of cotton-growers are provided through six cotton classing centres set-up in the cotton growing belt of the country. A check is kept on the quality of certified products through 23 laboratories and 43 offices spread all over the country.

Parties wishing to grade their commodities under Agmark have to obtain a Certificate of Authorisation. For this purpose, they should have adequate infrastructure to process the commodity and access to an approved laboratory for the determination of quality and safety factors.

### Standards and Technical Regulations for Agro-Products in Thailand

Thailand has stringent regulatory quality systems for agro-products. Some of the contact points of Standards and Technical Regulations in Thailand are given below:

- ✓ Central Contact Point: Thai Industrial Standards Institute, Bangkok.
- ✓ Agriculture (Fertiliser, Plant Seed, Rubber Control]: Department of Agriculture – Legal Affairs Division, Bangkok.
- ✓ Agriculture (Animal Feed Quality Control): Department of Livestock Development – Bureau of Livestock Standard and Certification, Bangkok.
- ✓ Control of Tobacco Products: Department of Disease Control - Bureau of Non-Communicable Diseases, Nonthaburi.
- ✓ Food: Food and Drug Administration - Food Control Division, Nonthaburi.

*Source: <http://www.tisi.go.th>*



## Quality labels

In order to guarantee to consumers that a product has one or more distinguishing value attributes, firms wishing to certify these special attributes must adopt voluntary monitoring systems. In general, such systems are based on a protocol or list of specifications established by an external agent or by means of an agreement between the producers themselves. This serves as a reference for the certifying body, and verifies and monitors that the product really does possess the claimed value attributes that have been defined in the protocol or specifications.

The visible proof that a product has been verified is that its packaging bears what is generally known as a “quality label”. It is worth taking a brief look at the following types of quality label because of their increasing application and prospects:

### LABELS CERTIFYING ORGANIC PRODUCTION

Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people. This is accomplished by using, where possible, cultural, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system.<sup>1</sup>

Accordingly, organic agriculture is a production system that can be just as, or even more, complex as conventional production systems – even those using advanced technology. The foodstuffs obtained by means of organic production\* systems are harmless to human health, as they contain no hazardous agrochemical residues or medicinal products and they do not pollute the environment.

To market products as organic, they must be certified by an accredited firm. The aim is to protect consumers and producers from fraudulent schemes to pass-off conventional foodstuffs as organic.

At the international level, the International Federation of Organic Agriculture Movements (IFOAM) has laid down standards for the production, processing and marketing of organic products and offers an accreditation programme for certification bodies. In addition, the Governments of a number of countries have set up national standards bodies to regulate and protect organic production.

<sup>1</sup> Codex Alimentarius. Guidelines for the Production, Processing, Labelling and Marketing of Organically produced Foods. (Available at: [www.codexalimentarius.net](http://www.codexalimentarius.net))

At present, most certification bodies are private firms and each establishes its own requirements, based on IFOAM or national standards. Some of the international certification bodies operating in Asia include: ECOCERT from France, BSC from Germany, and OCIA and Oregon Tilth from the United States. There are also national certification bodies in Asia, such as: Bureau of Indian Standards (BIS) awarding ISI mark; BSN (Indonesia); SIRIM (Malaysia); JIS (Japan); TISI (Thailand); PNS (Philippines); SAC (China); SPRING-SG (Singapore); SLSI (Sri Lanka); TCVN (Viet Nam).

### Quality Testing of Food Products in Sri Lanka

An example of some of the products and their required tests to obtain SLSI Certification are as follows:

**Chilli Sauce: SLS 581:1982**

Colouring matter, total solids, total soluble solids, acidity, total sugars, benzoic acid;

**Coconut Oil: SLS 32:1979**

Colour, refractive index, relative density, matter volatile and insoluble impurities, free fatty acids, iodine value, saponification value, unsaponifiable matter, mineral acidity;

**Carbonated beverages: SLS 183:1997**

Appearance, flavour and odour, carbonation value, sugar content, sulfur dioxide, benzoic acid.

*Source: [www.slsi.lk/food-testing](http://www.slsi.lk/food-testing)*

### Costs of organic certification (COC)

Organic certification costs normally cover inspection, annual monitoring and documentation. The costs generally consist of a fixed sum payment, plus a percentage of the sales of the certified products (around 22 percent of the total production costs and between 0.3 percent and 3 percent of the gross sales value). Group certification for a local firm is cheaper (e.g. US\$50–150 per producer), while individual certification and/or certification by an international certification body could cost between US\$2 000 and US\$7 000.

The procedure for organic certification is illustrated below:

- Operators interested in certifying organic production must identify the reference standard they wish to apply, which depends on the target market.
- The operator applies for certification.
- Certification bodies draw up a certification budget.
- The budget is approved and a contract and sworn statement are signed.
- The customer instructions, certification sheets and forms for COC to draw up the tax records are submitted.
- The customer draws up the certification sheet, providing relevant tax information for certification purposes.
- First inspection visit.
- The inspection report is issued.
- The inspection report is accepted and reviewed by the certification committee.
- The committee gives its ruling and the certificate is issued, followed where appropriate by formalities for importation and business licences.

## OTHER ENVIRONMENTAL LABELS

Ecolabelling involves the use of labels to inform the consumers about the environmental status of a product. The criteria for the award of such labels call for an overall assessment of the ecological impact of any product during its life cycle; including production, distribution, use, and consumption, as well as disposal. It can not be overemphasized that information on the environmental status and impacts of products can play a major role in the making of environmentally-sound choices of products by the purchasers. In this way, Ecolabelling has potential implications for trade and the market. Several Asian countries have had some success with Ecolabelling – including Japan, India, Thailand, Republic of Korea, and Taiwan.<sup>1</sup>

## FAIR TRADE LABELS

Also known as alternative or solidarity trade, fair trade is a trade relationship between the countries of the Northern hemisphere and those of the South, based on transparency, dialogue and respect. It aims to achieve increased equity in international trade, as well as sustainable development, by offering better conditions and endeavouring to protect the rights of marginalized producers and workers. An estimated 5 million from 40 Latin American, Asian and African countries benefit from fair trade. In addition, more than 200 firms and producer organizations belong to the International Federation for Alternative Trade (IFAT).

<sup>1</sup> Source: [www.iimcal.ac.in](http://www.iimcal.ac.in). BB Chakrabarti Occasional Paper No.2

Max Havelaard created the first fair trade label and this was followed by others, such as TransFair and Fair Trade, which were granted to commercial firms that respected fair trade criteria and agreed to an external audit by a body promoting the trade mark. The Fair Trade Labelling Organization (FLO) was created in 1997 to coordinate, regulate and certify both fair trade organizations and fair trade producers. To date, FLO has confined itself to seven food products: coffee, tea, cocoa, sugar, honey, bananas and orange juice.

It must be understood that fair trade is an alternative for reaching a specific market segment, and that to access it producer organizations must satisfy a set of requirements which are assessed by FLO certification bodies, or by the distribution channels in the fair trade niche. One of the strategic (but also restrictive) features of the FLO system is that it only includes products whose established markets are large enough to pay the costs of maintaining the national initiative that supervises and promotes them.

#### **Fair Trade versus Competitive Markets (Significance of Fairtrade Labelling)**

Fair trade procures social welfare, as well as the economic and environmental welfare of producers, whilst also considering aspects of quality.

Fair Trade is a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalised producers and workers – especially in the South.

Fair Trade organisations have a clear commitment to Fair Trade as the principal core of their mission. They – backed by consumers – are actively engaged in: i) supporting producers; ii) awareness raising, and iii) in campaigning for changes in the rules and practices of conventional international trade. They can be recognised by the FTO Mark.

Fairtrade Labelling Organizations International [FLO], established in 1997, is an association of 20 Labelling Initiatives that promote and market the Fairtrade certification Mark in their countries. FLO is the leading Fairtrade standard setting and certification body. It regularly inspects and certifies about 508 producer organisations in more than 50 countries in Africa, Asia and Latin America.

FAIRTRADE Mark is an independent consumer label, which appears on products as an independent guarantee. Disadvantaged producers in the developing world are getting a better deal. For a product to display the FAIRTRADE Mark it must meet international Fairtrade Standards. These standards are set by the international certification body Fairtrade Labelling Organizations International [FLO]

## LABELS CERTIFYING A LOCAL OR REGIONAL IDENTITY

Such labels are granted to certain foodstuffs and non-food products that have original and authentic characteristics associated with social, cultural and natural resource factors. The best known are geographical indications (GI) and designations of origin (DO).

These concepts or marks are defined and governed by various national and international laws, and tend to refer to the name of a specific place, region or country. The label is used to designate a product from that place whose characteristics or attributes, quality or reputation, derive wholly or partially from the geographical environment in which the product is made, processed or manufactured – including human and natural factors.

Geographical indications promote improved product quality and the implementation of quality and traceability management systems. Geographical indications become synonymous with quality, which in many cases surpasses the basic quality required for health and safety, to become “superior quality” offered voluntarily.

The first geographical indications were awarded in Europe to wine and olive oil, and were later extended to other products such as cheese and cold meats. In Asia, the system of geographical indications is growing, with the fastest progress being made in India, where geographical indications have been awarded to rice, turmeric, tea and other products.

The process for obtaining a label of local or regional identity is complex and specialized. Furthermore, it is usually expensive and calls for special efforts to adapt the national regulatory and administrative framework, as well as to tackle the technical aspects of the products themselves. This makes it essential for interested producers to get organized, and for them to get representatives from a number of institutions and economic sectors involved in the management of national quality-label systems.

### Asian market for organic food and drink

With production and demand increasing rapidly the Asian organic food industry is reaching an advanced stage of development. Over 4 million hectares of farmland is certified organic in the region. However, a large disparity exists between producer and consumer countries. The disparity leads to a two-tier organic food industry.

The first-tier comprises producer countries in which organic crops are mainly grown for export markets. Countries like India and Thailand with large agricultural sectors are in this tier. Important organic crops include fruits, vegetables, herbs, spices, cereals and grains and tea. China leads in this tier; the country is firmly established as a global source of organic ingredients.

Demand for organic food is concentrated in second-tier countries. Countries like Singapore and Taiwan are large consumers of organic foods but not important producers. As a consequence, the markets of these country are highly dependent on imports from a number of continents. The Japanese market remains the most important in this tier.

Asia has been slow to adopt the organic trend, but in the last two or three years countries like Singapore, Malaysia and Taiwan have seen an annual growth in demand of 30–40 percent. The producer countries, which also include smaller producers like Indonesia, Viet Nam and the Philippines, are exporting more than 90 percent of their produce – largely to Europe and North America. The products are certified by more than 100 foreign agencies, giving crops like fruits, vegetables, herbs, spices, cereals and tea the credibility required for export markets. About 40 percent of organic soy used in Europe during 2005 came from China.

Demand for organic food is being driven by the perception of organic foods as being healthier. Total sales from the region are expected to reach around US\$800 million in 2006 – double that obtained in 2001.

**Conclusions on the case study**

**Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.**

1. In your view, what are the special quality attributes that have allowed Darjeeling Tea to be positioned in the markets? Can you relate this case to one in which your associative enterprise is involved?

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2 Which strategies made it possible to promote these special attributes and to use them as a means for accessing markets? Could the same or similar strategies be used in your associative enterprise?

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3 From a business perspective, which management strategies do you think helped to achieve these results? Do you think that the same or similar strategies could be implemented in your associative enterprise? What would this require?

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4 In your view, which values, principles and attitudes should be upheld to ensure the success of an organisation like the one described in the case study?

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**Group exercise**

Market research has yielded information on fair trade, and cooperative members feel this is a good opportunity to explore. The manager has therefore been commissioned to identify the requirements for accessing the fair trade market.

Based on this information:

- Draw up a table with the requirements which the producer organisation must meet in order to sell in the fair trade market. Use the following table as a basis. (For additional information consult: [www.fairtrade.net](http://www.fairtrade.net))
- Find out which institutions in your country can provide information and contacts with the fair trade movement.

**Fair trade criteria and requirements**

Criteria	Minimum requirements	Other requirements
<b>1. Generic criteria and requirements</b>		
1.1 Social development		
1.2 Farm size		
1.3 Democracy, participation, transparency		
1.4 Discrimination		
<b>2. Specific criteria and requirements</b>		
2.1 Implementation of a fair trade bonus		
2.2 Organisation's export capacity		
2.3 Organisation's economic consolidation		
2.4 Environment		
2.5 Working conditions		



## Summary

- Quality is a set of properties and characteristics offered by a product or service to satisfy the declared or implicit needs of consumers. It is, therefore, a subjective and changing notion.
- In the case of agrifood products quality includes many factors, such as: food safety, taste, aroma, colour, texture, functionality, health, cost, environment, decent working conditions, equity, traditions and culture.
- Safety is now a market “requirement” that has come to be added to existing requirements for product quality. As stated in the Codex Alimentarius, it is the “assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use”.
- Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Points (HACCP) are all tools for assuring product quality, and in some countries they have been made compulsory by law. Other tools, like EUREPGAP, are required for exporting to certain markets. There are also systems for certifying quality assurance programmes, like International Organization for Standardization (ISO) standards, although these are voluntary.
- It is possible to use special product attributes to break into certain market segments or to differentiate products in existing markets. For instance, some groups of consumers prefer to buy products with a high nutritional value; or ones that are organic, environmentally-friendly, made by traditional methods or from a specific area – and are willing to pay a premium for these special attributes.
- There are voluntary monitoring systems to guarantee to consumers that an agrifood product really does have one or more differentiating value attribute. Such systems are based on a protocol, or list of specifications, established by an external agent or by means of an agreement between the producers themselves. This serves as a reference for the certifying body, and verifies and monitors that the product really does possess the claimed value attributes which have been defined in the protocol or specifications.
- The visible proof that a product has been verified is the label on its packaging, a symbol of quality generically known as a “quality label”. Some of the more internationally recognized labels include organic labels, fair trade labels, and labels certifying a local or regional identity, environmentally-friendly labels and labels required by retailer organizations such as EUREPGAP.

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**Unit assessment**

**Answer the following questions on additional sheets of paper:**

1. In your own experience and that of your associative enterprise, do you know of any quality label that has been implemented? Has your associative enterprise used, or tried to use, any quality labels?

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2. Guaranteed food safety is a basic requirement for access to other quality labels. Do you consider your associative enterprise's quality assurance system to be adequate? How could it be improved?

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3. What, in your view, are the principal benefits of quality labels? And what are the main problems in implementing them?

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4. In your own words, define the terms: i) quality; ii) special quality attribute; iii) quality label; iv) fair trade; v) EUREPGAP; vi) labels certifying a local or regional identity

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**While attempting to answer these questions if you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student's handbook or contact the facilitator.**

# Exploiting new information and communication technologies

## UNIT THREE

### LIST OF TOPICS

1. Setting the context
2. Case study: ITC e-Chaupal (Information System for Rural Business Development)
3. Case study analysis
4. Potential of NICT
5. Basic guide to information searches on the Internet
6. Conclusions on the case study
7. Group exercise
8. Summary
9. Unit assessment



As we have stated in previous units, market knowledge is vital to enable firms to plan and orient their production and to define marketing channels and logistical needs. Firms require support services to satisfy their need for market knowledge. One special support service is information. Access to information has improved with the advent of new information technologies. Do you know what these new technologies are? Have you had access to any? Do you think you have benefitted from using them?

By the time you complete this unit  
you will be able to:

- 🌀 Identify from your own experience your enterprise's current and potential use of NICT.
- 🌀 Appreciate how programmes and projects can use NICT to provide services to support the development of producers' associations.
- 🌀 Learn about specialized databases and other resources available on the Internet which your associative rural enterprise can use as a management aid, and find out how to access them.
- 🌀 Seek and find information on the Internet using a basic browser.



### Setting the context

As you have seen, market knowledge is vital to enable agribusinesses to plan their production and sales, and for this they need more and better information all the time. In parallel there has been an impressive development in information and communication technologies (ITC), where access and use will, without doubt, be key factors in making agribusinesses competitive.

NICT stands for 'new information and communication technologies', which have emerged and developed at amazing speed in recent years in connection with the so-called "knowledge revolution". More specifically, they are tools for processing and circulating information faster, in larger volumes and for wide metagroups, facilitating communication and exchanges between diverse, geographically remote groups.

NICT include well-known telecom services such as telephone, mobile telephone and fax. Telecom services used together with computer hardware and software form the basis for a range of other services, including e-mail, the transfer of files from one computer to another and, in particular, the Internet, which potentially allows all computers to be connected, thereby giving access to sources of knowledge and information stored on computers worldwide.<sup>1</sup>

The Internet is considered to be the major driver behind this whole phenomenon. It continues to innovate and, according to Italy's National Research Centre (CNR), already has more than 377 million users worldwide.

All this is linked with the evolution towards what is called the "information and knowledge society", many manifestations of which are in evidence. Perhaps

<sup>1</sup> Taken from the European Commission definition. Available at: <http://www.ecomaccess.com>

the first manifestation was distance education, which has been operating in Latin America for more than 30 years. More recently we have seen the emergence of web-based discussion groups (e-groups), electronic forums, electronic commerce (e-commerce) and video-conferencing.

There are divergent views on the application of new information and communication technologies and related approaches to the rural world. While some critics claim that it increases the information gap because of connectivity constraints, others point to rural people's resistance to appropriating these new tools and the limited training available in the use of these technologies.

However, there are signs that this technology is becoming increasingly accessible to small-scale rural producers. One example is ITC e-Chaupal of India, which has involved installing around 6 400 Internet Centres (Kiosks) serving more than 3.5 million farmers growing a range of crops in 31 000 villages in 9 states of India. Over the next decade, the ITC e-Chaupal network aims to cover over 100 000 villages, representing 1/6<sup>th</sup> of rural India, and create more than 10 million e-farmers. One of the main objectives is to bring together India's supply of agricultural products with the potential global demand via the Internet.

**Case study: ITC e-Chaupal (Information System for Rural Business Development)****INTRODUCTION**

An initiative has been started in India to make it easier for rural producers to access information. It is the Information System for e-Chaupal<sup>1</sup>, a project launched by the ITC, which works with men and women producers and rural organizations. ITC's International Business Division, one of India's largest exporters of agricultural commodities, has conceived e-Chaupal (Chaupal means a common sitting place in an Indian village) as a more efficient supply chain aimed at delivering value to its customers around the world on a sustainable basis.

The e-Chaupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of numerous intermediaries. E-Chaupal also unshackles the potential of Indian farmers who have been trapped in a vicious cycle of low risk taking ability > low investment > low productivity > weak market orientation > low value addition > low margin > low risk taking ability. This has made both the farmers and whole Indian agribusiness sector globally uncompetitive, despite rich and abundant natural resources.

Such a market-led business model can enhance the competitiveness of Indian agriculture and trigger a virtuous cycle of higher productivity > higher incomes > improved capacity for farmers' risk management > larger investments and higher quality and productivity. Furthermore, the growth in rural incomes will unleash the latent demand for industrial goods so necessary for the continued growth of the Indian economy. This will create another virtuous cycle propelling the economy into a higher growth trajectory.

Appreciating the imperative of intermediaries in the Indian context, e-Chaupal leverages information technology to virtually cluster all the value chain participants, delivering the same benefits as vertical integration does in mature agricultural economies such as the United States of America. e-Chaupal makes use of the physical transmission capabilities of current intermediaries – aggregation, logistics, counter-party risk and bridge financing – while maintaining their physical separation from the chain of information flow and market signals.

<sup>1</sup> Web site. <http://www.itcportal.com>

## DISCUSSION

Village Internet kiosks managed by farmers (called sanchalaks) themselves, provides the agricultural community with access to ready information in their local language. This ranges from: i) weather forecasts; ii) market prices; iii) knowledge of scientific farm practices, and iv) risk management. The system also facilitates the sale of farm inputs (now with embedded knowledge) and the purchase of farm produce from the farmers' doorsteps (decision-making is now information-based).

Real-time information and customized knowledge provided by e-Chaupal enhance the ability of farmers to take decisions and align their farm output with market demand, as well as improving quality and productivity. The aggregation of the demand for farm inputs from individual farmers gives them access to a flow of high quality inputs from established and reliable manufacturers at fair prices. As a direct marketing channel, virtually linked to the 'mandi' (local market place) system for price discovery, e-Chaupal eliminates wasteful intermediation and multiple handling. It therefore significantly reduces transaction costs.

E-Chaupal ensures world-class quality in delivering all these goods and services through several product/service specific partnerships with the leaders in their respective fields, in addition to ITC's own expertise. While the farmers benefit through enhanced farm productivity and higher farmgate prices, ITC benefits from the lower net cost of procurement (despite offering better prices to the farmer) having eliminated costs in the supply chain that do not add value.

The problems encountered while setting-up and managing these e-Chaupals is primarily caused by infrastructural inadequacies; including power supply, telecom connectivity and bandwidth. In addition, there is the considerable challenge of imparting skills to the first time Internet users in remote and inaccessible areas of rural India.

Several alternative and innovative solutions – some of them expensive – are being deployed to overcome these challenges, e.g. power backup through batteries charged by solar panels, upgrading BSNL exchanges with RNS kits, installation of VSAT equipment, Mobile Choupals, local caching of static content on Web sites to stream-in the dynamic content more efficiently, 24x7 helpdesk, etc.

### ITC e-Chaupal Wins Development Gateway Award, 2005

Kolkata: ITC has become the first Indian company – and the second in the world – to win the prestigious Development Gateway Award. It won the US\$100 000 Award for the year 2005 for its trailblazing ITC e-Chaupal initiative which has achieved the scale of a movement in rural India. The Development Gateway Award recognizes ITC's e-Chaupal as the most exemplary contribution in the field of Information and Communication Technologies (ICT) for development during the last 10 years. ITC e-Chaupal won the Award for the importance of its contribution to development priorities like poverty reduction, its scale and replicability, sustainability and transparency. As the largest Information Technology (IT)-based corporate initiative in rural India, ITC e-Chaupal was chosen from 135 nominations from across the world.

The Award previously known as the Petersberg Prize, was presented today in Beijing at the Development Gateway Forum by Ms Frannie A. Leautier, Vice-President of the World Bank Institute, in the presence of Mr Austin Hu, Deputy Chief of Mission in Beijing for the World Bank, and Mr Alan J. Rossi, CEO, Development Gateway Foundation. Chairman YC Deveshwar received the Award on behalf of ITC.

E-Chaupal today reaches out to, and empowers, over 3.5 million farmers and over 31 000 villages by enabling them to access crop-specific, customized and comprehensive information in their local language. Vernacular Web sites relating to each agricultural crop that ITC deals in, have been created by the Company, and provide real-time information to even the smallest marginal farmers concerning: prevailing Indian and international crop prices and price trends; expert knowledge on best farming practices, and micro-level weather forecasts. This significantly improves farmers' decision-making ability, thereby helping to better align their agricultural produce to market demand while ensuring better quality, productivity and improved prices.

*Press release. September 16 2005*



**Case study analysis**

Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.

- 1. In your experience and that of your association, are you aware of any other information services like ITC e-Chaupal. What is your experience of using them? Do you think that something similar could be adapted for use in your rural area?

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- 2. In the case of your association, does poor Internet access act as a constraint on obtaining information?

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- 3. What prospects do you see for creating a local communication network that would complement the information available on the Internet? Could this be replicated in the area where your associative enterprise operates?

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- 4. Which attitudes and values should be reinforced in order to access new knowledge and to act as promoter and driver of a collective knowledge process?

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**Bear in mind that at the end of the unit you will be asked to answer the same questions in the light of the new knowledge you will have acquired.**

## Potential of NICT

Nowadays the development of new information and communication technologies (NICT) has given firms more opportunities to obtain information as a management aid and a means for interacting with suppliers, consumers and competitors. We refer specifically to the powerful tool represented by the Internet (WWW or World Wide Web), which gives small and medium-sized enterprises access to the entire world.

Some say that the Internet has five faces: i) it is a means of communication; ii) a marketplace; iii) an application environment; iv) a business platform and, v) a network. The Internet is all of these things, but only in combination never separately. What is more, on the web (the net) everybody from large multinationals to SMEs has equal opportunities, so all they need to do is to comply with certain rules of common courtesy.

Now let us see which Internet resources we can use to improve access to information of interest to producers' associations:

### ELECTRONIC MAIL

This is a cheap and efficient means for communicating with users anywhere in the world. It allows you to send and receive messages and text files, send and receive newsletters, subscribe to newsgroups, mass-distribute reports and keep in touch with your firm or family whenever you are abroad.

Electronic mail is now one of the most widely-used tools and has largely supplanted conventional postal services, couriers, fax and even the telephone. Many government information services use electronic mail to send out product prices, as well as supply and demand data. All you need in order to use electronic mail is basic training and to sign up with a local or international service provider.

### SURFING THE WORLD WIDE WEB (WWW)

This is by far the most powerful tool for accessing a wide variety of sites on the agrifood trade or any other subject. As with electronic mail, to access the web you need a computer, Internet access (by telephone or cable) and an Internet browser such as Internet Explorer or Netscape. You can access the Internet by signing up to a local Internet provider, or from a teleconferencing room or Internet café.

You can search for information in two ways:

- By keying a known Web site address into the browser address bar. For this you need to know the Internet address of the institution or firm which has the information you are looking for, such as:
  - FAO: <http://www.fao.org>
  - World Bank: <http://www.worldbank.org>

In these cases the address takes you to the Web site home page and, once you are there, all you need to do is to search the list of contents for the section you are interested in. The disadvantage of searching for information on the Internet in this way is that you need to know the address of the web page in advance and it is easy to make mistakes when keying in the address. Furthermore, you need to be fairly skilful at “surfing” to speedily find the section you are interested in.

- The other option is to use search engines such as Yahoo, Altavista, Lycos or Google to search the Internet. These all search for data on the web and come back with the results in seconds. Nowadays Google is one of the most efficient search engines, and in addition to consulting its own databases, it reviews other search engines.

There are also metasearch engines like Metacrawler and software like WebFerret, but they are a little more complicated to use.

## CHAT AND VIDEO CONFERENCING

This makes it possible to communicate with others in real time using a keyboard (chat in text mode), or video camera and microphones (sound and image). These tools can be used to hold low-cost virtual meetings with no need to travel to another country or city. They use programmes such as MSN Messenger (software which can be downloaded free of charge from the Internet).

## NEWSGROUPS

This tool makes it possible to subscribe to news services on a specific topic. Regular newsletters are sent via electronic mail or a web page with the latest news featuring in the different media throughout the world. Some services are free of charge while others are fee-paying. IICA's Infoagro.net system is one example of such a service, providing weekly information via newsletters containing the latest news and documents on trade, rural agro-industry, agribusiness, plant and animal health, and rural development.

## MAILING LISTS

This service brings into contact people who share an interest in a specific subject. It allows them to receive news, bulletins and documents and to ask for technical advice or exchange information. Subscription is free of charge and is carried out by completing a form on the web, or by invitations sent by electronic mail.

## SPECIALIZED AND REFERENCE DATABASES

There are numerical databases (production statistics and prices), bibliographical databases, directories and others. These databases are sponsored by international organizations like FAO, the United States Department of Agriculture (USDA) and the World Trade Organization (WTO)\*.

FAO has developed **FAOSTAT** (<http://faostat.fao.org/default.aspx>), a site providing information on subjects like foreign trade (imports and exports), production and cultivated areas for every country in the world. FAOSTAT is a very important source of market intelligence because it includes production figures for identical products and years, so it allows apparent consumption to be calculated by product and by country.

The International Trade Centre (ITC), a joint subsidiary body of the United Nations and the World Trade Organization, provides users with such tools as:

➤ **TradeMap** ([www.trademap.org](http://www.trademap.org))

This presents data on trade flows from more than 180 countries and 5 300 product categories. TradeMap allows direct access via the Internet to the largest database in the world and can be used for interactive statistical analysis.

➤ **Product Map** ([www.p-maps.org](http://www.p-maps.org))

This provides extensive data on international trade and a range of market analysis applications specifically designed for firms and institutions actively involved in international trade. It is divided into 72 industrial sectors, ranging from automotive components to fruit and vegetables, nuts, footwear and textiles. Product Map provides online market-positioning, networking and market-intelligence tools for each of these sectors.

➤ **Country Map** ([www.intracen.org/countries](http://www.intracen.org/countries))

This contains a series of comparative indicators on the commercial and economic performance of 184 countries, as well as discussing issues of competitiveness.

➤ **Market Access Map** ([www.intracen.org/mas](http://www.intracen.org/mas))

This is an interactive database on tariffs and market-access barriers applied at the bilateral level by 167 importing countries to the products exported

by over 200 countries and territories. Products are described at the national tariff line level. The Market Access Map enables users to analyze protection at different levels of sectoral and regional aggregation.

Another source of global databases is the United Nations' COMTRADE (<http://unstats.un.org/unsd/comtrade/>), which contains information, for all countries, on trade flows by origin/destination of individual products grouped according to the four-digit Standard International Trade Classification (SITC) classification.

**In general, for consulting databases, especially numerical ones, you need to know the basics of market analysis and export marketing. What is more, much of the information is available only in English and access is not always free of charge. In such cases you are recommended to apply to foreign trade promotion institutions, which often subsidize such services.**

### FTP (FILE TRANSFER PROTOCOL)

This is a useful tool when you need to copy very large files from one computer to another. You need to have basic computer knowledge to use it and, in some cases, you need a login and password to be able to transfer files.

### TELNET (REMOTE SESSIONS)

This is a standard Internet protocol for accessing remote systems on other machines as though you had them in front of you, in order to consult information not available on the web. You may also need a login and password to access TELNET. In this case, you key the word 'Telnet' into the browser address bar, followed by the name of the server to which you wish to connect, e.g. Telnet: pac.carl.org.

## Basic guide to information searches on the Internet

You can use the following strategy to search for information on the Internet:

### 1. Define the objective of the search

Before entering the web it is very important to define a search objective because, apart from saving time in locating the information, it enables you to identify some “key words”, or “descriptors” to define the search. Some examples of search objectives might be:

- To identify the profile of the pineapple market in Europe.
- To find out the rules on exporting asparagus to the United States.
- To locate suppliers of plastic baskets.

### 2. Define the type of search

As explained earlier, you can search for information by going directly into the Web sites of organizations like USDA, FAO or WTO, for which you first need to know the electronic address of the Web site.

A second option is to go through a newsgroup where you can post your question and wait for a reply from one of the newsgroup members. This can be done to supplement your Internet search and, in many cases, the newsgroup provides you with first-hand information from experts on the subject, or from people who are in the same business as you and can give you very good advice. You need to be very clear and specific when you ask for information from a newsgroup.

The third option – the one which we discuss here – is to look for information using search engines like Google, or Yahoo.

### 3. Define the search

Here you need to synthesize your subject of interest into key words. For example: if you wanted to find information on the pineapple market, you could define the following variables: demand, supply, prices, trade, standards or importers. In addition, you could specify a region or country. You are advised to include synonyms or related terms as well.

#### 4. Perform the search

If you were to use the Google search engine (www.google.com), you could make a simple or advanced search, as explained below:

- **Simple search:** In this case you type into the corresponding box a search phrase containing your key words, for example: pineapple trade Europe. Lastly you press “enter” or click on the “search” option.

Pineapple trade Europe

Search

Once the information has been displayed, you evaluate the results. If you find they are unsatisfactory (the results are too numerous or too general), you can redefine the search, for example: pineapple demand Italy.

Pineapple demand Italy

Search

- **Advanced search:** In this type of search you use what are called “Boolean logical operators”. These include the plus sign (+), the minus sign (-), parentheses ( ), inverted commas (“ ”) and the words AND, OR, NOT. You can fine-tune your search by using these Boolean operators.

**Examples:**

- ✓ **Search operators (+ -)**

pineapple  
+prices

This search allows you to find web pages containing the words pineapple and prices.

+pineapple-  
cultivation

This search shows only pages containing the word pineapple, but not the word cultivation.

- ✓ **Reduction operators: AND, NOT**

Pineapple AND prices

Locates pages containing both words.

Pineapple AND NOT prices

Locates pages containing the first word but not the second one.

## ✓ Extension operators: OR

Pineapple OR mango

Locates pages containing one or more of the words (extension operator).

## ✓ Use of inverted commas: “ ”

“Rules of origin”

By using inverted commas you can locate pages containing the entire phrase.

## ✓ Use of parentheses. ( ): These are used to make combinations or groups of terms.

(sheep OR goats) AND  
“demand trends”

Locates pages containing the words sheep or goats, plus the phrase between inverted commas.

**In general it is recommended to use lower case letters and not to use accents when you key in the search words.**

## 5. Information capture

The search results will take the form of a list of documents, or links to web pages, which you can open and explore. If you identify any useful information, you have three options for capturing it:

- Add the site to your browser favourites list (bookmark) so that you can go back to it later.
- Print out the material of interest to you.
- Copy or save the file. In this case you are recommended to open a separate folder for downloaded files. For example: Pineapple market

Although files can be downloaded in different formats (text, sound, video, image, compressed file), you might need special programmes to open them, some of which can be downloaded free of charge from the Internet. You can tell what type of file it is by the extension attached to the file name, as shown below:

- **Text:** .asc .doc .htm .html .txt
- **Sound:** .au .ra .ram .snd .wav
- **Video:** .avi .mov .mpg
- **Image:** bmp .eps .gif .jpg
- **Special:** .csv .tsc .pdf .exe .zip



To end the search, all you need to do is to save the document in the folder you created for the purpose. To do this, you use the browser’s “save as” option. You can also print the document.

## 6. Interpreting the information

The last, but certainly the most important, step is to interpret the information as it can provide input to guide decision-making on which crops to grow and which products to develop. It can also help to identify the most attractive markets and to find out export requirements, etc.

Should the search be unsatisfactory, you can redefine it, or search for information using the internal search function displayed on certain Web sites, or follow the links on a Web site, which will usually take you to other Web sites dealing with the same subject.

In many cases, the search results are hard to interpret because they contain nothing more than statistical tables, with no further explanation. In such cases, you are recommended to search the same web page for periodical newsletters or reports, which analyze market trends during certain periods and contain statistical tables.

It is also important to be wary of how you use information downloaded from the Internet, as some sources are less trustworthy than others. In general, it is better to use information from government organizations, universities, research centres and the like.

Another point to take into account is that the information available on the Internet is constantly being updated and Web sites come and go all the time. That is why it is important always to specify the name and date of the sources consulted.

**Conclusions on the case study**

**Having compared your prior knowledge with the subject content of the unit, answer the following questions making optimum use of the new knowledge you have acquired.**

1. In your experience and that of your producers' association, are you aware of any other information services like ITC e-Chaupal? What is your experience of using them? Do you think that something similar could be adapted for use in your rural area?

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2. In the case of your producers' association, does Internet access act as a constraint on obtaining information?

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3. What prospects do you see for creating a local communication network that would complement the information available on the Internet? Could this be replicated in the area where your associative enterprise operates?

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4. Which attitudes and values should be reinforced in order to access new knowledge and to act as promoter and driver of a collective knowledge process?

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**Group exercise**

1. Sign up to the [www.apeda.net](http://www.apeda.net) newsgroup and request market information for an agro-industrial product of interest to your enterprise.

To do this, follow the instructions below:

✓ Write to the e-mail address [apeda@apeda.com](mailto:apeda@apeda.com) or [[apeda.com/apedanewsletter.htm](http://apeda.com/apedanewsletter.htm)] and ask to sign up to the newsgroup.

✓ When you have received confirmation of your subscription, follow the instructions for posting messages and requesting information, making your request as specific as possible. For example: “For an investment project, we need to know about markets for mango fruit pulp and other types of Asian fruit pulp. Please send us information on regulations and firms interested in buying this product”.

2. Search the Web site of the ITC e-Chaupal ([www.iutportal.com](http://www.iutportal.com)) to discover trends in the agro-industrial sector.
3. Conduct market research on the Internet to find a product of interest to your firm.
  - Use the Google search engine.
  - Define your search objective.
  - Carry out a simple search and then an advanced search and compare the results.
  - Capture the information.
  - Interpret the results.
  - Produce a report on your research.

### Summary

- The development of new information and communication technologies provides useful search tools for producers' associations with Internet access. They also make it possible for the programmes and projects of governmental and development cooperation agencies to offer more services.
- Over and above access to capital and technology, access to information is what strengthens a firm's ability to be competitive.
- The Internet can be a very economical way of finding information concerning markets and many other subjects.
- Lack of Internet access limits the use of NICT for many producers' associations. This can be overcome by deploying alternative systems such as local communication networks or teleconferencing rooms.
- The Internet contains seven information search tools: databases, FTP (file transfer), TELNET (remote sessions), electronic mail, newsgroups, chat rooms (conferencing) and the WWW (World Wide Web).
- Electronic mail, newsgroups and the web are the tools most commonly used by firms to communicate and obtain information.
- Internet searches can be simple or advanced. For advanced searches you use search operators (+ -), reduction operators (AND, NOT) and extension operators (OR).
- Interpreting information is certainly the most important step, as it can provide input to guide decision-making on which crops to grow and which products to develop, and can also help to identify the most attractive markets, to discover export requirements, and so on. Often the search results prove unsatisfactory, so you need to redefine the search. You can search for information using the internal search function displayed on certain Web sites, or follow the links on a Web site, which will usually take you to other Web sites dealing with the same subject.
- To ensure that data downloaded from the Internet is from a trustworthy source, it is recommended to use information from government organizations, universities, research centres and the like.

**Unit assessment**

**Answer the following questions on additional sheets of paper**

1. Do you know of any information service that supports the development of producers' associations? What is your experience with the services offered?

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2. Do you frequently use the Internet to seek information on the market for your products? What lessons have you learned from this?

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3. Can you identify three services in addition to information search that NICT offer you? Which do you consider to be the most useful for your enterprise?

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**While attempting to answer these questions if you have any doubts or feel that you do not have sufficient information for the analysis, take another look at the manual, consult the student's handbook or contact the facilitator.**



# Glossary

## Attribute

A perceived characteristic. A distinctive quality or feature of a product.

## Certification

A process carried out by a recognized body, independent of the interested parties, which demonstrates that a company, product, process, service or person complies with the requirements defined in standards or technical specifications. <http://www.iso.org>

## Codex Alimentarius

The Codex Alimentarius Commission was created jointly by FAO and the World Health Organization (WHO) in 1963 to develop food standards, regulations and other related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The chief aims of the Programme are to protect consumer health, ensure transparent trade practices and promote the coordination of all food standards agreed by governmental and non-governmental organizations. ([http://www.codexalimentarius.net/web/index\\_en.jsp](http://www.codexalimentarius.net/web/index_en.jsp))

## Ethylene

A natural plant hormone that affects the growth, development, ripening and ageing of all plants. It is normally produced in small quantities by most fruits and vegetables.

## Fair trade

A trade relationship between the countries of the Northern hemisphere and those of the South, aimed at achieving greater equity in international trade – as well as sustainable development – by offering better conditions and endeavouring to protect the rights of marginalized producers and workers.

## Food standard

An official provision by a country specifically defining a foodstuff and laying down the minimum requirements for its composition, manufacturing and/or handling, hygiene precautions and marketing requirements.

## Freezing point

The temperature at which the solid and liquid phases of a substance coexist in equilibrium.

**Good agricultural practices (GAP)**

A set of recommendations for conserving and promoting the environment with cost-effective products of satisfactory quality, whilst maintaining the required level of safety in products for human consumption while taking into consideration farmers' health.

**Good manufacturing practices (GMP)**

A set of minimum hygiene measures needed to prevent food contamination at the different food processing and marketing phases.

**Hazard Analysis and Critical Control Points (HACCP)**

A system for identifying, assessing and monitoring food safety risks.

**ISO standards**

A series of standardized procedures for making the manufacturing and distribution of products and services more efficient, whilst at the same time facilitating international trade by standardizing products.

**Marketing**

The processes required to move goods in time and space and to sell them at a price in keeping with supply and demand.

**Marketing channel**

A set of interdependent organizations involved in the process of making a product or service available for use or consumption (Kotler).

**Organic production**

A production system aimed primarily at producing sustainable supplies of healthy foodstuffs of the best nutritional quality without any pollutants.

**Packaging**

Any material used to enclose an article with or without a container, in order to preserve it and facilitate its delivery to the consumer.

**Post-harvest management**

A set of post-production practices that includes cleaning, washing, selection, grading, disinfection, drying, packing and storage.

**Relative humidity**

The capacity of air to absorb water vapour.

**Supplementary treatments**

Technical procedures applied in connection with post-harvest management, such as fungicides, coatings and the like.



**Temperature**

Measure of the amount of energy contained by an object. Temperature control is the primary and most effective means for extending the storage life of foodstuffs and improving their quality.

**World Trade Organization (WTO)**

The international body, which sets the standards governing trade among countries. At its core are the WTO Agreements, which have been negotiated and signed by most countries engaged in world trade and have been ratified by their respective parliaments. The aim is to help producers of goods and services, exporters and importers to carry out their activities. <http://www.wto.org/>.



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**World Trade Organisation** (<http://usinfo.state.gov/journals>)

### WEB SITES RELATING TO MODULE 4

<http://www.amuldairy.org>  
<http://www.bis.org.in>  
<http://www.catalyticgenerator.stores.yahoo.net>  
<http://www.codexalimentarius.net>  
<http://www.darjeelingtea.net>  
<http://www.ecomaccess.com>  
<http://www.fairtrade.net>  
<http://www.fda-us.com>  
<http://www.foodforsale.com>  
<http://www.foodsfortrade.com>  
<http://www.hindustantimes.org>  
<http://www.hindustantimes.com>  
<http://www.iffco.nic.in>  
<http://www.iimcal.ac.in>  
<http://www.indiateaportal.com>  
<http://www.indofood.co.id>  
<http://www.inforresources.org>  
<http://www.intracen.org>  
<http://www.itcportal.org>  
<http://www.lisi.go.th>  
<http://www.meatprocess.com>  
<http://www.organicmonitor.com>  
<http://www.slsi.lk/food-testing>  
<http://www.wto.org>  
<http://www.unstats.un.org>

Exchange rates: local currency to 1 US dollar. December 2006			
China	...	RMB Yuan	7.8
India	...	Rupees	46.00
Indonesia	...	Rupiah	11 000
Malaysia	...	Malaysia Ringgit	3.5
Japan	...	JapYen	121.1
Philippines	...	Pesos	48.5
Thailand	...	Baht	40



## Appendix 1

# Storage conditions for fresh fruit and vegetables and their ethylene sensitivity or production

TABLE A1.1  
Storage conditions for fresh fruit

Fruit	Temperature range (°C)	Relative humidity (%)	Storage time		Freezing point (°C)
Fresh olive	5 – 10	85–90	4 – 6	Weeks	-1.4
Raspberry	- 0.5 – 0	90–95	2 – 3	Days	-1.0
Strawberry	0	90–95	5 – 6	Days	-0.7
Blackberry	- 0.5 - 0	90–95	2 – 3	Days	-0.7
Starfruit	9 - 10	85–90	3 – 4	Weeks	
Sweet cherry	-1 – -0.5	90–95	2 – 3	Weeks	-1.8
Plum	-0.5 - 0	90–5	2 – 5	Weeks	-0.8
Custard apple	13	90–95	2 – 4	Weeks	
Date	-18 – 0	75	6 – 12	Months	-15.7
Peach	-0.5	90–95	2 – 4	Weeks	-0.9
Guava	5 - 10	90	2 – 3	Weeks	
Fig	-0.5 – 0	85–90	7 – 10	Days	-2.4
Kiwifruit	-0.5 – 0	90–95	3 – 5	Months	-1.6
Lemon	10 - 13	85-90	1 – 6	Months	
Mango	13	85–90	2 – 3	Weeks	-0.9
Apple	-1 – 4	90-95	1 –12	Months	-1.5
Passion fruit	7 – 10	85–90	3 – 5	Weeks	
Quince	-0.5 – 0	90	2 – 3	Months	-2.0
Orange	3 – 9	85–90	3 – 8	Weeks	-1.2
Nectarine	-0.5 – 0	90–95	2 – 4	Weeks	-0.9
Avocado (Fuerte, Hass)	4.4 – 13	85–90	2	Weeks	-0.3
Papaya	7 – 13	85-90	1 – 3	Weeks	
Pear	-1.5 -0.5	90–95	2 – 7	Months	-1.5
Pineapple	7 – 13	85–90	2 – 4	Weeks	
Prickly pear	2 – 4	90–95	3	Weeks	
Grape	-0.5 – 0	85	2 – 8	Weeks	-1.2

Source: Colombia International Corporation. Manual for Exports of Fruits and Horticulture.2002

TABLE A1.2  
Storage conditions for fresh vegetables

Vegetables	Temperature range (°C)	Relative humidity (%)	Storage time		Freezing point (°C)
Swiss chard	0	95–100	10 – 14	Days	
Dried chilli pepper	0 – 10	60–70	6	Months	-0.8
Garlic	0	65–70	6 – 7	Months	-1.1
Globe artichoke	0	95–100	2 – 3	Weeks	-1.1
Fennel	0 – 2	90–95	2 – 3	Weeks	
Celery	0	98–100	2 – 3	Months	-0.5
Aubergine	8 – 12	90–95	1	Week	-0.8
Broccoli	0	95–100	-14	Days	-0.6
Brussels sprout	0	95–100	3 – 5	Weeks	-0.8
Sweet potato	13 – 15	85–90	4 – 7	Months	
Green onion	0	95–100	3 – 4	Weeks	-0.9
Cauliflower	0	95–98	3 – 4	Weeks	-0.8
White asparagus	0 – 2	95–100	2 – 3	Weeks	-0.6
Spinach	0	95–100	10 – 14	Days	-0.3
Mushroom	0	95	3 – 4	Days	-0.9
Lettuce	0	98–100	2 – 3	Weeks	-0.2
Cantaloupe melon	2 – 5	95	15	Days	-1.2
Casaba melon	10	90–95	3	Weeks	-1.0
Honeydew melon	7	90–95	3	Weeks	-0.9
Early potato	10 – 16	90–95	10 – 14	Days	
Late potato	4.5 – 13	90–95	5 – 10	Months	
Cucumber	10 – 13	95	10 – 14	Days	-0.5
Pepper	7 – 13	90–95	2 – 3	Weeks	-0.7
Early cabbage	0	98–100	3 – 6	Weeks	-0.9
Tomato (mature green)	13 - 22	90–95	1 – 3	Weeks	-0.6
Mature carrot	0	98–100	7 – 9	Months	-1.4

Source: Colombia International Corporation. Manual for Exports of Fruits and Horticulture.2002



TABLE A1.3  
Commodities that produce ethylene or are ethylene sensitive

Ethylene-producing commodities		Ethylene-sensitive commodities	
Avocado	Kiwi, ripe	Swiss chard	Kiwifruit
Apricot	Mamey	Pea	Lettuce
Banana (ripening)	Mango	Plantain	Yam
Cantaloupe melon	Mangosteen	Aubergine	Okra
Plum	Apple	Watercress	Cucumber
Prune	Nectarine	Broccoli	Parsley
Custard apple	Honeydew melon	Squash	Pepper
Peach	Quince	Sweet potato	Cabbage
Passion fruit	Papaya	Brussels sprout	Watermelon
Guava	Pear	Cauliflower	Leafy vegetables
Fig	Banana	Spinach	Carrot
Rambutan	Tomato		

Source: The Packer, 2000 Produce Services Sourcebook, Vol. CVI, No. 55, 2000



## Appendix 2

# Optimum storage temperatures, relative humidity and expected storage life

TABLE A2.1  
Optimum storage temperatures, relative humidity and expected storage life

Perishable commodity	Optimum temperature (°C)	Relative humidity (%)	Expected storage life (Days)
Pineapple (Chapaco variety)	8 – 10	90	21
Orange (Valencia variety)	6 – 8	90	28 – 42
Grapefruit (Ruby Red variety)	10 – 15.5	90	42 – 56
Papaya	7	85 – 90	8 – 21
Mango (Tommy Atkins variety)	10 – 13	85 – 90	14 – 21
Lime	9 – 10	85 – 90	6 – 8
Avocado (Booth-8 variety)	16	90	28 – 56
Sweetcorn	1	90	3 – 4
Pepper	8 – 12	90	14 – 21
Tomato	10 – 12	90	14 – 21
Banana	13 – 14°	85 – 90	21 – 30

Data on optimum storage taken from USDA Handbook No. 66.



## Appendix 3

# Respiration rate and heat production of selected perishable fruit and vegetables during storage at different temperatures

TABLE A3.1

Respiration rate and heat production of selected perishable fruit and vegetables during storage at different temperatures

	Cold storage temperature (° Centigrade)			
	4–5°C	15–16°C	20–21°C	25–26°C
<b>Pineapple</b>				
Mg CO <sub>2</sub> /Kg/Hr	1.3–2.3	13.1–18.2	24.0–40.0	35.4–62.8
KJ/Ton/Day	345–580	3 365–4 645	6 150–10 215	9 050–16 015
<b>Mango</b>				
Mg CO <sub>2</sub> /Kg/Hr	10.0–21.9	45.0	75.0–151.4	120.0
KJ/Ton/Day	2 550–5 570	11 490	19 150–38 650	30 640
<b>Lime</b>				
Mg CO <sub>2</sub> /Kg/Hr	1.3–6.0	5.9–10.5	6.8–18.7	15.0–45.5
KJ/Ton/Day	345–1 510	1 510–2 670	1 740–4 760	3 830–11 605
<b>Orange</b>				
Mg CO <sub>2</sub> /Kg/Hr	3.6–7.3	12.7–23.7	22.2–34.1	24.5–40
KJ/Ton/Day	925–1 855	3 250–6 035	5 685–8 705	6 265–10 330
<b>Grapefruit</b>				
Mg CO <sub>2</sub> /Kg/Hr	3.1–6.0	10.0–18.2	12.7–26.0	19.1
KJ/Ton/Day	810–1 510	2 550–4 640	3 250–6 615	4 875
<b>Papaya</b>				
Mg CO <sub>2</sub> /Kg/Hr	4.0–6.0	15.0–21.9	-	39.0–88.2
KJ/Ton/Day	1 045–1 510	3 830–5 570	-	9 980–22 515
<b>Avocado</b>				
Mg CO <sub>2</sub> /Kg/Hr	20.0–30.0	61.8–156.9	73.6–346.9	117.7–428.2
KJ/Ton/Day	5 105–7 660	15 785–40 040	18 800–88 500	30 060–109 330

TABLE A3.1

Respiration rate and heat production of selected perishable fruit and vegetables during storage at different temperatures (Continued)

	Cold storage temperature (° Centigrade)			
	4–5°C	15–16°C	20–21°C	25–26°C
<b>Sweetcorn</b>				
Mg CO <sub>2</sub> /Kg/Hr	42.7–83.2	151.3–174.6	268.1–311	281.8–435.5
KJ/Ton/Day	10 910–21 240	38 645–44 570	68 475–79 835	71 955–111 185
<b>Pepper</b>				
Mg CO <sub>2</sub> /Kg/Hr	5–21.4	20.0–57.3	22.7–65	35.9–74.1
KJ/Ton/Day	1 275–5 455	5 105–14 625	5 800–16 595	9 170–18 920
<b>Tomato</b>				
Mg CO <sub>2</sub> /Kg/Hr	5.91	24–29.1	24.0–44.1	30–52.3
KJ/Ton/Day	1 508	6 150v7 430	6 150–11 260	7 660–13 345

Source: USDA Handbook No. 66.

## Appendix 4

# International market requirements regarding the appearance of fruit

**Pineapple:** yellow colour, free from defects, aroma, cylindrical shape, label with barcode and trademark. Packed in plastic baskets for mechanical protection.

**Mango:** red colour, medium to large size, fruit ripe but firm, free from defects, waxed, sticker with trademark and product code. Exports to the United States require hydrothermal treatment.

**Lime:** uniform intense green colour, free from defects, rough shiny rind, waxed, presented in net bags containing 10 to 20 units.

**Orange:** uniform orange colour, free from defects, waxed, seedless, very juicy.

**Grapefruit:** uniform yellow rind colour, pink or red flesh. Slightly sour taste, free from defects, waxed.

**Papaya:** greenish-orange colour, aroma, free from defects, waxed.

**Avocado:** green to purple skin, pale green flesh with no browning, uniformly ripe, waxed.

**Sweetcorn:** intense yellow colour, cob filled uniformly with kernels, similar-sized cobs on each tray, sold in polystyrene trays containing 4 to 5 units, wrapped in cling film.

**Pepper:** green or other colours. Free from defects, sold by weight or in a polystyrene tray wrapped in cling film.

**Tomato:** pink to bright red colour, aroma, free from defects, waxed, uniform size, sold by weight or in trays of 4 to 6 units.

**Banana:** yellow colour, free from defects, uniform size, pink to yellow flesh.





## Appendix 5

# A selection of marketing sites on the Internet

<b>Organization</b>	:	Agricultural Produce Export Development Authority of India
<b>Web site</b>	:	<a href="http://www.apeda.net">http://www.apeda.net</a>
<b>Content</b>	:	Export of agricultural produce
<b>Organization</b>	:	Asian Development Bank
<b>Web site</b>	:	<a href="http://www.adb.org">http://www.adb.org</a>
<b>Content</b>	:	Stock market information. Statistical, commercial, socio-economic and research databases
<b>Organization</b>	:	Bureau of Indian Standards
<b>Web site</b>	:	<a href="http://www.bis.nic.in">http://www.bis.nic.in</a>
<b>Contents</b>	:	Standards and certification
<b>Organization</b>	:	Fruit Net
<b>Web site</b>	:	<a href="http://www.fruitnet.com">http://www.fruitnet.com</a>
<b>Content</b>	:	Information on technology, markets, news
<b>Organization</b>	:	Indian Farmers' Fertiliser Cooperative Limited
<b>Web site</b>	:	<a href="http://www.ifco.nic.in">http://www.ifco.nic.in</a>
<b>Contents</b>	:	chemical fertilizer production, marketing and cooperative development
<b>Organization</b>	:	International Cooperative Alliance
<b>Web site</b>	:	<a href="http://www.ica.coop">http://www.ica.coop</a>
<b>Contents</b>	:	cooperative organization and management, consultancy
<b>Organization</b>	:	Market Asia Online
<b>Web site</b>	:	<a href="http://www.marketasia.org">http://www.marketasia.org</a>
<b>Content</b>	:	Information on Asian markets
<b>Organization</b>	:	Milk and milk products
<b>Web site</b>	:	<a href="http://www.amul.org">http://www.amul.org</a>
<b>Contents</b>	:	Institutional building, milk marketing, prices and stocks

<b>Organization</b>	:	National Agricultural Cooperative Marketing Federation of India
<b>Web site</b>	:	<a href="http://www.nafed-india.org">http://www.nafed-india.org</a>
<b>Contents</b>	:	Marketing of agricultural produce and consultancy
<b>Organization</b>	:	Network for Development of Agricultural Cooperatives in Asia
<b>Web site</b>	:	<a href="http://www.nedac@fao.org">http://www.nedac@fao.org</a>
<b>Contents</b>	:	State of agricultural cooperatives, production and IT



