



*National Innovation
Survey of the
Food and Beverage
Industry in
Trinidad and Tobago
2006*



NIHERST

**NATIONAL INSTITUTE
OF HIGHER EDUCATION
RESEARCH, SCIENCE AND TECHNOLOGY**

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1.0 Introduction

1.1 Evolution of Innovation Surveys

Innovation surveys have been carried out by a total of 51 countries, of which 21 are developing or non-OECD countries. These non-OECD countries included Asian countries (Taiwan, Singapore, Malaysia, Thailand), Latin American countries (Venezuela, Peru, Paraguay, Panama, Ecuador, Argentina, Uruguay, Brazil, Colombia, Chile), and one African country (South Africa).

Initially, most developing countries patterned their innovation surveys after the innovation surveys of developed countries, specifically the Community Innovation Survey (CIS) of Europe, which is based on common guidelines stipulated under the *Oslo Manual*.

Latin American countries, however, developed their own manual called the *Bogota Manual*, which tailored some of the questions utilised in the innovation survey, based on the *Oslo Manual*, to the peculiarities of innovation in Latin America.

Some of the characteristics of the Latin American firms that were not adequately addressed by the Oslo Standards included:

- the informal organisational setting for conducting innovation
- the few research and development projects undertaken
- the importance of organisational change in the innovation process
- fragmented information flows within the national system of innovation
- the fact that innovation is mainly based on acquisition of technology embodied in capital equipment.

Three periods can be distinguished in terms of the questionnaire design, scope and conduct of innovation surveys. The first, the pre-*Oslo Manual* period, consisted of individualised surveys. In these surveys, innovation was conceptualised in terms of output and measured by indicators such as patents and research and development expenditures. However, these indicators are not sufficient for the measurement of innovation. Patents only measure invention whereas research and development expenditures represent only a portion of innovation costs that includes product design, market testing, trial production, and investments in new machinery and equipment.

The second phase, which coincided with the advent of the Oslo Manual, was characterised by the introduction of harmonised guidelines in the innovation questionnaires. The measurement of innovation was expanded as an activity (i.e. percentage of the firm's activity devoted to innovation) and as an output (number of new significant products and processes produced by the firm). This came to be known as the subject (innovating firm) and object (innovations introduced by the firm) approaches to innovation surveys. In addition, there was an increasing awareness of the need for innovation surveys to address issues of what makes a firm innovate, why they innovate and how they innovate.

The third phase could be characterised as a focus towards innovation as an interactive process in which a variety of critical actors engage in the exchange of knowledge and information as part of the stimulus to innovate. In this phase, the innovation framework was further developed and applied in policy making with questions introduced concerning linkages and collaboration, knowledge and information flows and qualitative performance and impact and the role of government. The scope was also widened beyond the manufacturing industry to cover resource base and services sectors.

Innovation surveys were then carried out to achieve four goals:

1. To measure inputs and outputs of the innovation process across a wide range of firms and industries
2. To acquire an overview of the innovative behaviour of firms and enterprises
3. To develop policy and support analysis in the area of innovation
4. To benchmark innovation performance against some best practice standards of reference that would either be a firm, industry, country or region.

(For a fuller discussion of these issues refer to "Designing a Policy Relevant Innovation Survey of NEPAD" UNU-INTECH 2004)

As indicated by the above, there is ample precedent for the conduct of innovation surveys in both developed and developing countries. The undertaking of an innovation survey in Trinidad and Tobago, therefore, will seek to benefit from the lessons learnt with respect to the purpose, content and methodology of such surveys.

2.0 Innovation Survey in Trinidad and Tobago

2.1 Survey Instrument for Trinidad and Tobago

In arriving at an appropriate data collection instrument to be utilised for the Innovation Survey in Trinidad and Tobago the following survey instruments were reviewed.

- Survey of Innovation 1999 – Canada
- Innovation Survey 2003 – New Zealand
- UK Innovative Survey 2002 – 2004
- Draft Innovation Survey of NEPAD – 2004 prepared by UNU-INTECH
- Suggested basic Survey Form – *Bogota Manual*

The review encompassed a detailed analysis of the content of the survey instruments utilised by developed countries (UK, Canada) as well as by a spectrum of developing countries as exemplified in the New Zealand questionnaire and the survey instruments recommended in the NEPAD study and *Bogota Manual*. The Innovation Survey questionnaire for Trinidad and Tobago therefore incorporates relevant elements of these survey instruments whilst taking into consideration the realities of the Trinidad and Tobago environment. (See Appendix II)

2.2 Criteria for Choice of Sector for Pilot Survey

It was decided that a pilot survey should be undertaken in a selected sector/sub-sector of the economy of Trinidad and Tobago. In deciding on the sector to be surveyed, the following approach was utilised:

1. The well-established linkage between productivity, growth, innovation and international competitiveness was considered. It was postulated that for economies like Trinidad and Tobago, the fostering of innovation is critical to enhancing productivity, achieving international competitiveness and creating sustainable development.
2. Export performance was taken as a proxy for international competitiveness, since it provided a durable indicator of the extent to which firms/sectors had achieved levels of operational/strategic capability in a global context.
3. The export performance of economic sectors in Trinidad and Tobago was analysed over a 5-year period. In analysing the export performance of the economy, the contribution of the oil and energy related sectors was excluded. This approach was taken in order to focus on the relative contributions of the non-oil/non-energy related sectors to export growth.
4. The best performing non-oil/non-energy related sector would be chosen for the undertaking of the pilot survey. It was assumed that this could provide us with the most relevant insights with respect to aspects of innovative behaviours and activity of the surveyed companies, which could be culled from responses to the questionnaire.

Analysis of Export Performance

The value of exports by sections of the Standard Industrial Trade Classification (SITC) for the period 2001 – 2005 is presented at Table 1. The table indicates that over the period 2001 – 2004 the total value of exports grew by 56.2% from \$25bn. to \$39bn. When sections 3 and 5 (Mineral fuels, lubricants and related materials and Chemicals) are excluded, exports grew more modestly by 19.1% from \$4.5bn. to \$5.4bn (Table I).

Table I: Value of Exports by Sections of the SITC, 2001-2005

(\$000TT)

SITC Sections	2001	2002	2003	2004	2005
					Jan - June
0. Food and Live Animals	874,504.1	855,205.5	739,714.2	847,105.4	579,046.8
1. Beverages and Tobacco	493,752.6	533,234.3	544,243.4	486,502.3	378,202.7
2. Crude Materials inedible, excepts fuels	46,338.1	51,293.4	66,519.9	87,018.3	55,835.4
3. Mineral Fuels, Lubricants and Related Materials	15,427,899.2	14,343,838.4	21,731,938.4	24,206,608.4	19,071,254.8
4. Animals and Vegetables oils, fats and waxes	30,764.8	36,102.5	37,221.6	45,562.6	26,770.8
5. Chemicals	5,054,828.2	3,977,744.0	5,604,165.0	9,473,456.0	4,296,865.1
6. Manufactured goods classified chiefly by materials	2,586,997.9	2,757,668.1	2,674,317.6	3,481,687.9	1,892,436.8
Paper manufactures	393,342.4	339,799.2	305,959.3	314,381.1	171,359.8
Iron and Steel	1,823,367.0	2,077,246.1	2,134,835.0	2,908,838.0	1,626,225.8
7. Machinery & Transport Equipment	205,570.5	122,954.3	123,429.2	172,417.1	104,534.5
8. Miscellaneous Manufactured Articles	313,171.6	315,569.0	311,277.1	309,338.6	192,098.2
9. Commodities and Transactions NES	830.9	465.2	1,572.9	1,547.9	126.0
Total	25,034,657.9	22,994,074.7	31,834,399.3	39,111,244.5	26,597,171.1
Total (excluding sections 3 & 5)	4,551,930.5	4,672,492.3	4,498,295.9	5,431,180.1	3,229,051.2
Total (excluding Section 3)	9,606,758.7	8,650,236.3	10,102,460.9	14,904,636.1	7,525,916.3

Source: Central Statistical Office

Of the remaining sections, "Manufactured Goods classified chiefly by materials" (sector 6), and the "Food and Live Animals and Beverages and Tobacco Sectors" were responsible for the largest percentage of exports. A further disaggregation reveals, however, that iron and steel (an energy-based industry) accounts for up to 85% of section 6, with paper manufacturing accounting for between 9 – 15% of that sector.

Over the period 2001 – 2004, the Food and Beverages sector accounted for between 25 – 30% of the non-oil/non-energy sector, as defined to exclude sectors 3 and 5, (Table II) and an even greater percentage of exports if iron and steel exports (sector) are excluded. The Food and Beverages sections have therefore maintained a relatively stable level of performance over the period and have accounted for the highest percentage of non-oil/non-energy exports. On the basis of the above, it was recommended that the Food and Beverages sectors be targeted for the undertaking of the pilot survey.

Table II: Food and Beverages Sections as a percentage of Non-oil/non-energy Exports

SITC Sections	2001	2002	2003	2004	2005
					Jan - June
Food and Live Animals	19.2	18.3	16.4	15.6	17.9
Beverages and Tobacco	10.8	11.4	12.1	8.9	11.7
Total	30.0	29.7	28.5	24.5	29.6

Source: Table I

3.0 Innovation Survey of the Food and Beverages Sectors

3.1 Methodology

3.1.1 Background Information

The rationale for the choice of the food and beverages sectors for the undertaking of the pilot innovation survey has been explained in Section 2.2. Some of the major characteristics of the food and beverage industry include:

- It contributes 3% of the Gross Domestic Product (GDP) of Trinidad and Tobago.
- It represents approximately 36.5% of the total value added of the manufacturing sector.
- The largest driver within the sub-sectors is alcoholic beverages, contributing an average of 21.4% of total value added of sub-sector, followed by other food processing activities with an average contribution of 13.4%.
- The number of processors/factories in 2003 was 424, of which approximately 80% are SMEs.
- The sector employs approximately 9,500 persons (2001).

(Draft Strategic Plan for the Food and Beverage Industry – Ministry of Trade and Industry: Food and Beverage Team). The food and beverage sector has been identified as one of the priority sectors for development by the Ministry of Trade and Industry.

3.1.2 Objectives of the Survey

The objective of the survey was to obtain information with respect to the innovative activities of establishments in the industry including:

- The types of innovative activities undertaken and the reasons for undertaking such activities
- The obstacles/hindrances to innovative activities
- The impact of innovation on key performance indicators
- The role of linkages for the acquisition of information and collaboration leading to innovation
- The role of research and development in the innovation process.

It is proposed that the results of the survey be utilised to provide insights into the innovation process and to assist decision makers in developing policies to create the environment and incentives to catalyse innovation in the industry.

3.1.3 Sample

The list of food and beverage manufactures in Trinidad and Tobago was obtained from the Central Statistical Office (CSO). The list comprised 424 establishments. Additionally, the National Enterprise Development Company (NEDCO) provided a listing of 13 micro-enterprises, which were selected as being appropriate candidates to participate in the survey.

A sample of the larger establishments (based on employment) in the sub-sectors was chosen from the CSO listing.

The survey was administered to seventy-five (75) establishments across a range of fourteen (14) sub-sectors. Of the seventy-five (75) surveyed, 68 were derived from the CSO listing and 7 from the NEDCO listing. The sub-sectors surveyed were as follows:

- Meat processors
- Poultry processors
- Ice Cream factories
- Milk and milk products
- Citrus processors
- All other processors of fruit and vegetables
- Fish processors
- Animal feed mills
- Vegetable oil, animal oils and fats
- Bakeries
- Confectionery and snack foods
- Ice
- All other miscellaneous processors
- Non-alcoholic beverages

The survey was carried out by field officers during the period June-August 2006.

The survey elicited a response from 46 establishments for a response rate of 61.3%. Several establishments declined to participate in the survey, citing, among other things, sensitivity and confidentiality of information in spite of repeated verbal assurances from the field officers and the written assurances provided in the covering letter. Similarly, some of the firms that responded omitted to provide what they perceived to be sensitive data for example, with respect to sales and export earnings. Notwithstanding these challenges, the results from the survey provided the basis for developing an understanding of innovation in the food and beverage industry in Trinidad and Tobago.

3.2 Analysis of Survey Results

3.2.1. Firm Profiles

The questionnaire sought to elicit a profile of the firms surveyed. Elements of the profile included:

- Age
- Ownership structure
- Main activity (classification by sub-sector)
- Employment (including number of scientists and engineers employed)
- Sales
- Exports
- Licensing arrangements
- Sub-contracting arrangements
- Purchases of new machinery

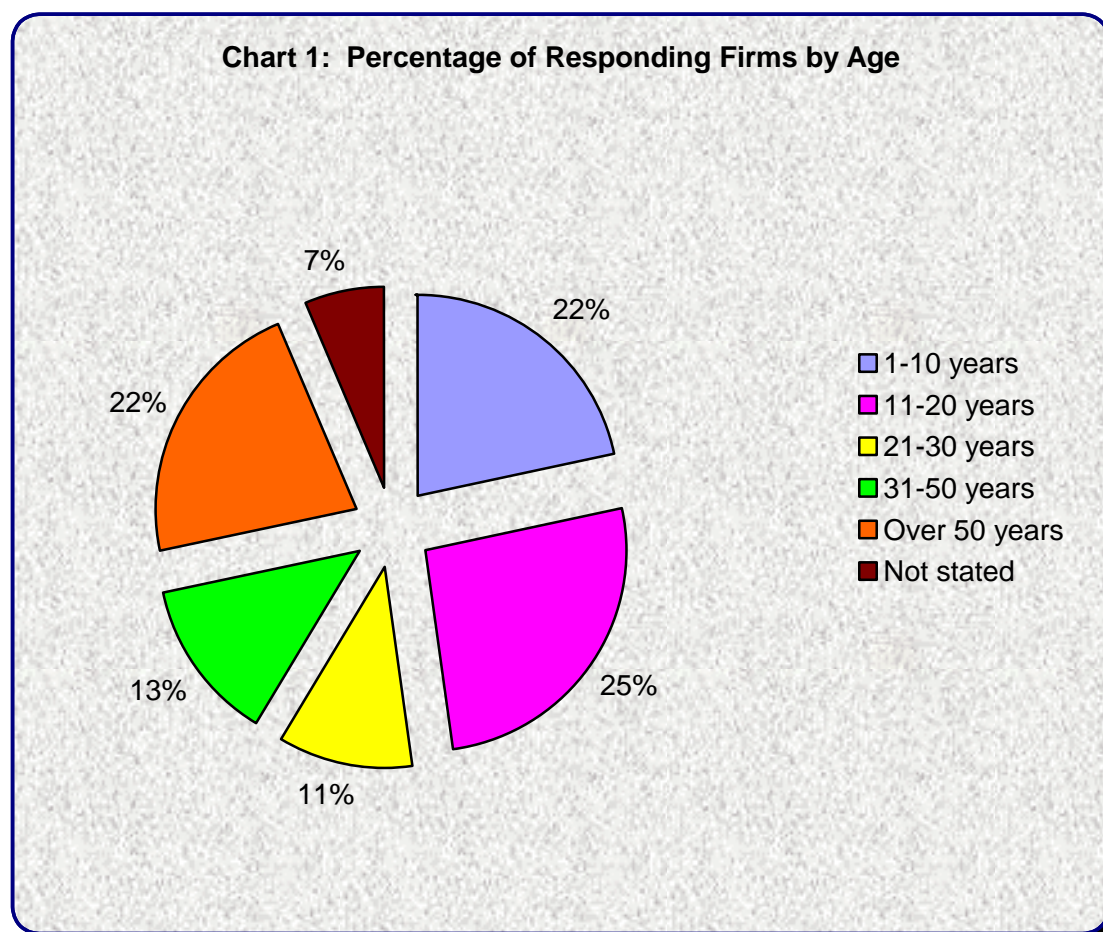
The survey results revealed the following:

Age

Ten firms (22%) were 10 years old and under with 12 firms (26%) between 11-20 years old. Cumulatively, 48% of the firms were 20 years old and under. At the other end of the spectrum ten firms (22%) were over 50 years old (Table 1).

Table 1: Age of Responding Firms

Age	Frequency	Percent	Cumulative Percent
1-10 years	10	22	22
11-20 years	12	26	48
21-30 years	5	11	59
31-50 years	6	13	72
Over 50 years	10	22	93
Not stated	3	7	100
Total	46	100	



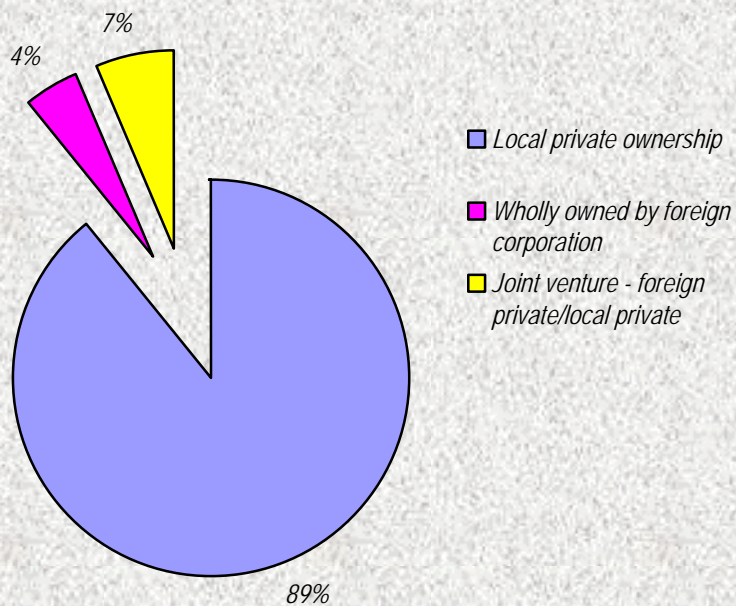
Ownership Structure

The vast majority of firms surveyed, 41 or 89% were local privately owned. Two firms were wholly owned by foreign corporations while 3 firms were foreign private/local private joint venture arrangements (Table 2).

Table 2: Type of Ownership of Firms

Ownership structure	Frequency	Percent	Cumulative Percent
Local private ownership	41	89	89
Wholly owned by foreign corporation	2	4	93
Joint venture - foreign private/local private	3	7	100
Total	46	100	

Chart 2: Percentage Response by Type of Firm



Main Activity

The activities of the responding firms were distributed over fourteen sub-sectors (Table 3). The major sub-sectors represented were:

- All other miscellaneous processors – 7 firms (15%)
- All other processors of fruits and vegetables – 6 firms (13%)
- Bakeries – 6 firms (13%)
- Non-alcoholic beverages – 6 firms (13%) (Table 3)

Table 3: Number of Firms by Sub-sector

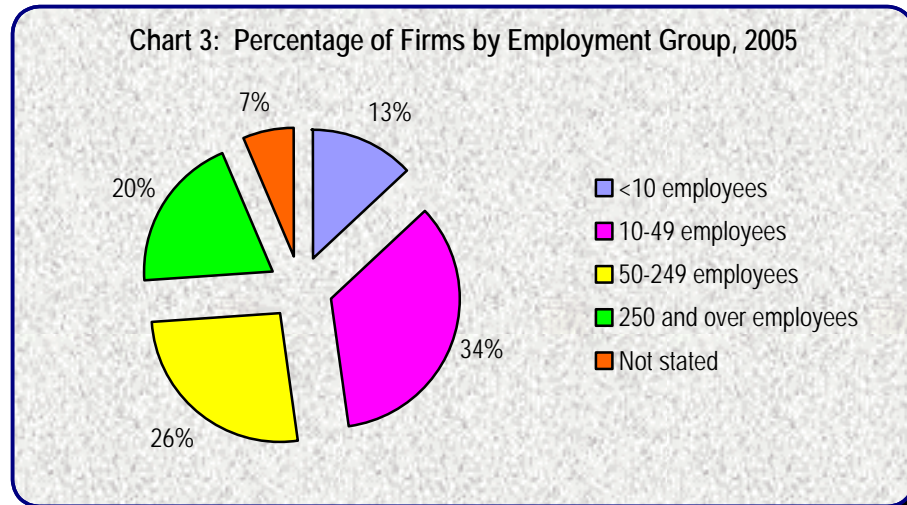
Sub-sector	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
Meat processors	3	7	7
Poultry processors	1	2	9
Ice-cream factories	4	9	17
Milk and milk products	1	2	20
Citrus processors	1	2	22
All other processors of fruits and vegetables	6	13	35
Fish processors	4	9	43
Animal feed mills	1	2	46
Vegetable oil, animal oil and fats	1	2	48
Bakeries	6	13	61
Confectionery and snack food	3	7	67
Ice	2	4	72
All other miscellaneous processors	7	15	87
Non-alcoholic beverages	6	13	100
Total	46	100	

Employment

Twenty-two firms representing 48% of firms that responded employed less than 50 persons in 2005. Of this, six firms (13%) employed less than 10 persons. Of the remainder 12 firms (26%) employed between 50-249 persons, while nine firms (20%) employed 250 and over persons (Table 4).

Table 4: No. and Percentage of Firms by Employment Group, 2005

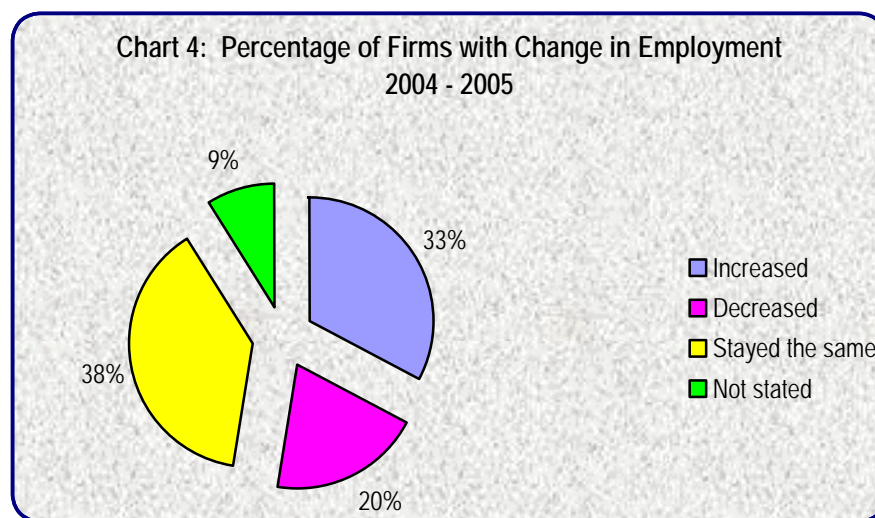
Employment group	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
<10 employees	6	13	13
10-49 employees	16	35	48
50-249 employees	12	26	74
250 and over employees	9	20	93
Not stated	3	7	100
Total	46	100	



Fifteen firms (33%) reported increases in the number of persons employed between 2004-2005, while nine firms (20%) reported decreases, and 18 firms (39%) indicated that employment remained the same over the period (Table 5).

Table 5: No. and Percentage of Firms with Change in Employment, 2004-2005

Employment	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
Increased	15	33	33
Decreased	9	20	52
Stayed the same	18	39	91
Not stated	4	9	100
Total	46	100	



The major increases in employment were experienced by firms employing in excess of 50 persons (Table 6).

Table 6: Change in Employment between 2004 and 2005 by Employment Group

Employment group	Change in employment 2004-2005									
	Increased		Decreased		Stayed the same		Not stated		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
<10 employees	2	33	0	0	3	50	1	17	6	100
10-49 employees	3	19	5	31	8	50	0	0	16	100
50-249 employees	5	42	3	25	4	33	0	0	12	100
250 and over employees	5	56	1	11	3	33	0	0	9	100
Not stated	0	0	0	0	0	0	3	100	3	100
Total	15	33	9	20	18	39	4	9	46	100

Scientists and Engineers

The paucity of scientists and engineers employed is reflected by the data which reveal that 26 (57%) of the respondents employed no scientists and engineers, with ten firms employing between 1-2 scientists and engineers and the remaining firms employing between 4-7 scientists and engineers (Table 7).

**Table 7: No. and Percentage of Firms by No. of Scientists and Engineers Employed
2005**

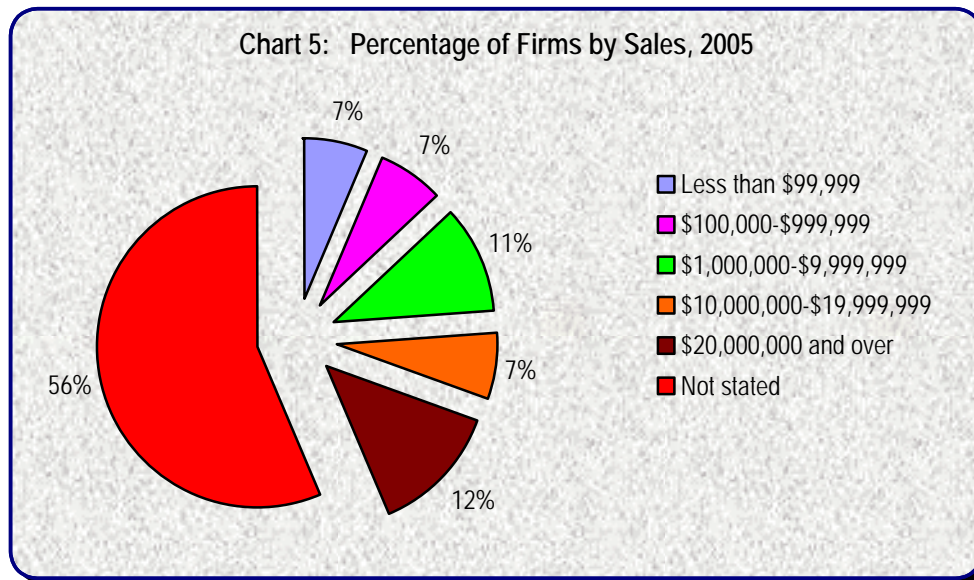
No. of Scientists/Engineers	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
0	26	57	57
1	4	9	65
2	6	13	78
4	1	2	80
5	1	2	83
6	1	2	85
7	2	4	89
Not stated	5	11	100
Total	46	100	

Sales

A significant percentage of the respondents 26 (57%) did not report their sales figures, many citing confidentiality and sensitivity concerns, in spite of written and verbal assurances with regard to the confidentiality with which the data would be treated. In 2005, sales of 25% of the establishments were below \$10mn, 7% were between \$10m - \$19.9mn and the remaining 13% over \$20mn (Table 8).

Table 8: No. and Percentage of Firms by Sales, 2005

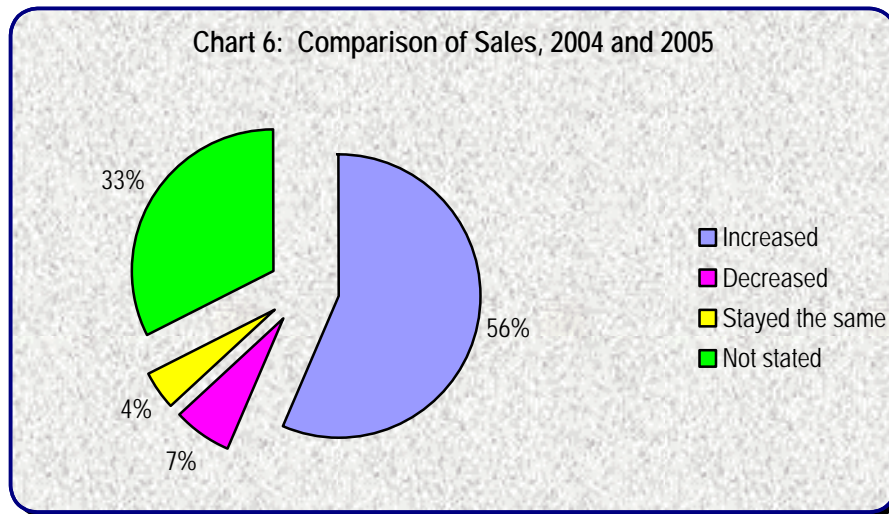
Sales range	No. and percentage of firms		
	Frequency	Percent	Cumulative percent
Less than \$100,000	3	7	7
\$100,000-\$999,999	3	7	13
\$1,000,000-\$9,999,999	5	11	25
\$10,000,000-\$19,999,999	3	7	32
\$20,000,000 and over	6	13	45
Not stated	26	57	100
Total	46	100	



Fifty-six percent of the firms reported increases in sales between 2004 and 2005, while 6.5% reported decreases and 4.3% indicated that sales remained the same (Table 9).

Table 9: Comparison of Sales, 2004 and 2005

Sales 2004 – 2005	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
Increased	26	57	57
Decreased	3	7	63
Stayed the same	2	4	67
Not stated	15	33	100
Total	46	100	

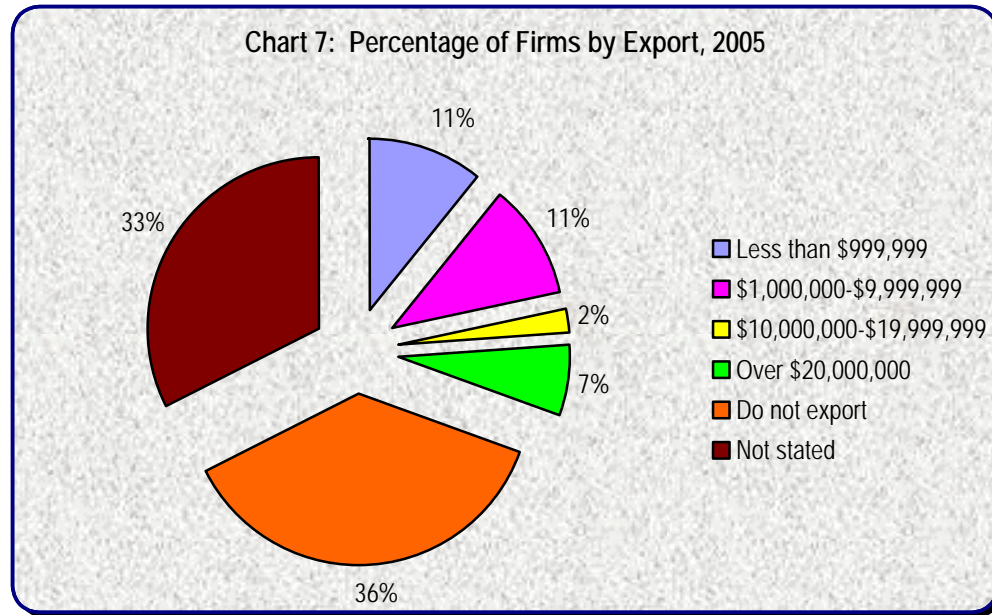


Exports

A significant number of firms 17 (37%) did not export, while 15 (33%) declined to report their export earnings. Of the remainder 10 (22%) exported less than \$10mn while three firms (7%) exported \$20mn and over in 2005 (Table 10).

Table 10: Export Sales, 2005

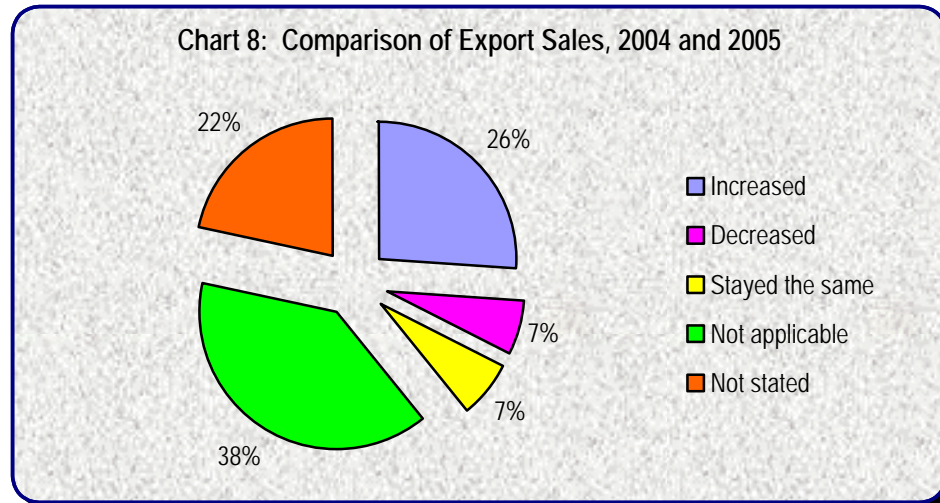
Sales range	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
Less than \$1,000,000	5	11	11
\$1,000,000-\$9,999,999	5	11	22
\$10,000,000-\$19,999,999	1	2	24
\$20,000,000 and over	3	7	30
Do not export	17	37	67
Not stated	15	33	100
Total	46	100	



Twelve firms (26%) reported increases in export sales between 2004 and 2005 (Table 11).

Table 11: Comparison of Export Sales, 2004 and 2005

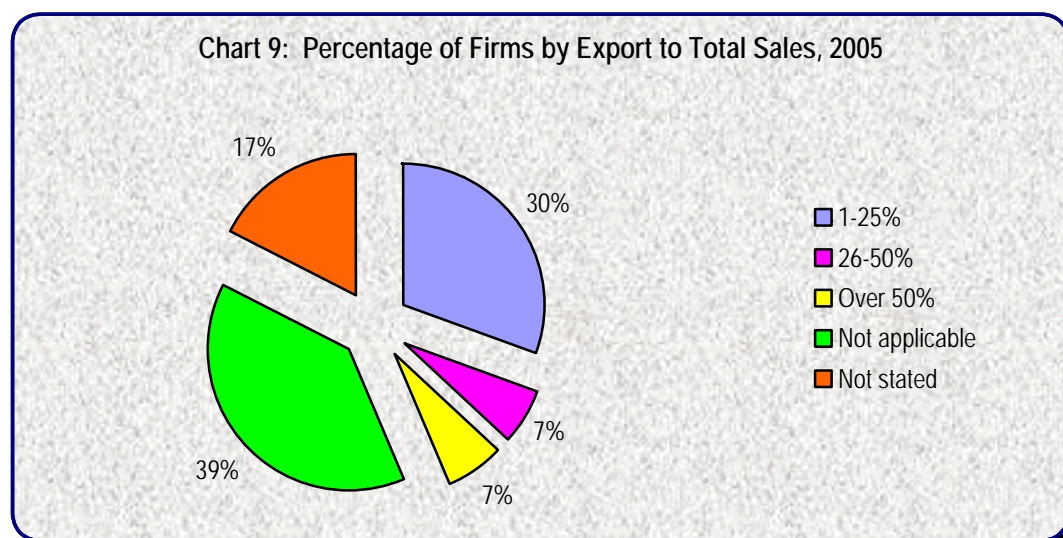
Exports 2004 - 2005	No. and percentage of firms		
	Frequency	Percent	Cumulative Percent
Increased	12	26	26
Decreased	3	7	33
Stayed the same	3	7	39
Not applicable	18	39	78
Not stated	10	22	100
Total	46	100	



Exports of the majority of these establishments represented less than 25% of total sales (Table 12).

Table 12: Percentage of Export to Total Sales, 2005

<u>Export</u> Total sales - %	No. and percentage of firms		
	Frequency	Percent	Cumulative percent
1-25%	14	30	30
26-50%	3	7	37
Over 50%	3	7	43
Not applicable	18	39	83
Not stated	8	17	100
Total	46	100	

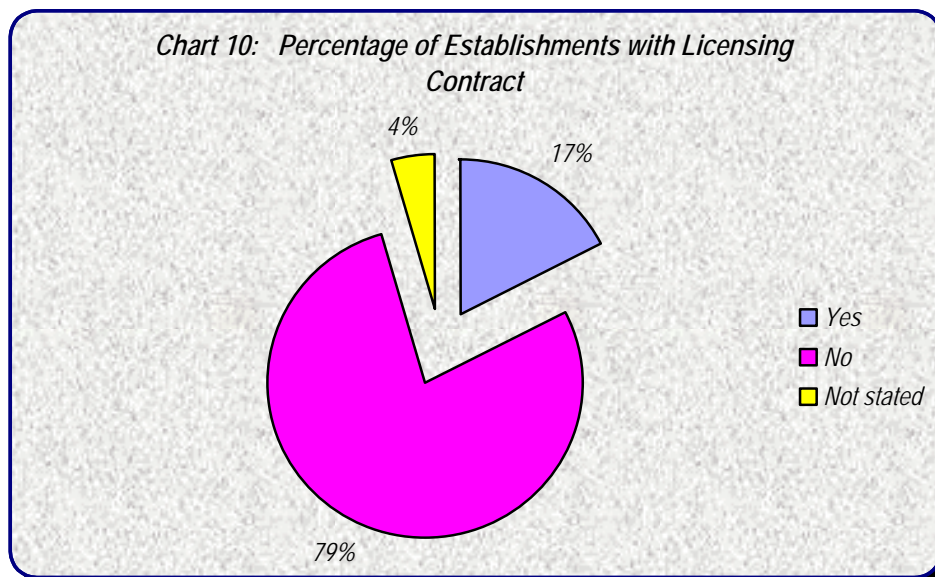


Licensing Arrangements

The majority of the firms 36 (79%) had no licensing contract for product or process technology, thereby nullifying this method of technology transfer for these firms. However, eight firms (17%) indicated that they had a licensing contract (Table 13).

Table 13: Licensing Contract for Product or Process Technology, 2005

Licensing contract	No. and percentage of firms	
	Frequency	Percent
Yes	8	17
No	36	79
Not stated	2	4
Total	46	100



The eight establishments that had licensing arrangements for product or process technology were dispersed among the ice cream factories, fish processors, confectionery and snack food and miscellaneous processors sub-sectors (Table 14).

Table 14: Licensing Contract by Sub-sector

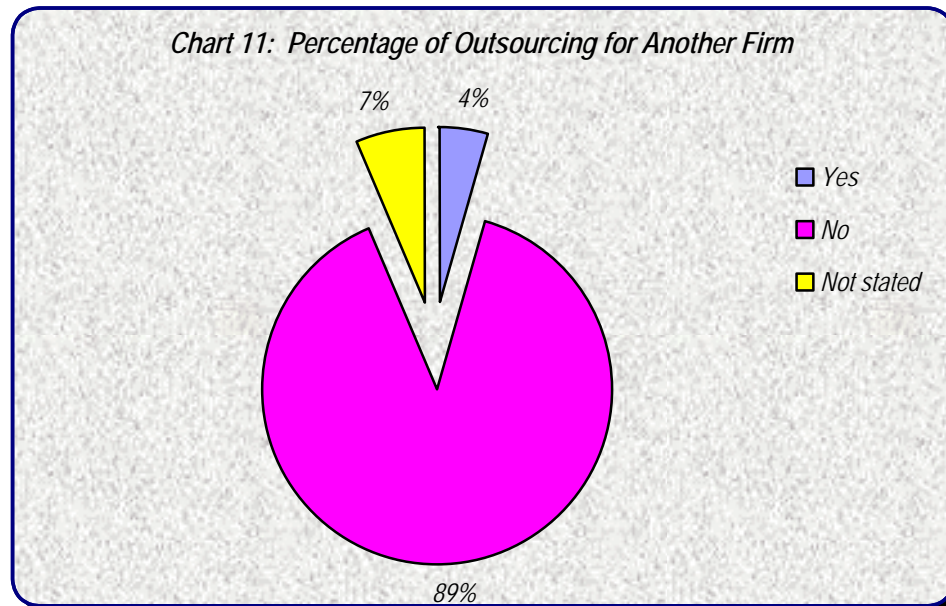
Sub-sector	With licensing contract			
	Total	Yes	No	Not stated
Meat processor	3	0	3	0
Poultry processor	1	0	1	0
Ice-cream factories	4	3	1	0
Milk and milk products	1	0	1	0
Citrus processor	1	0	1	0
All other processor of fruit and vegetables	6	0	5	1
Fish processors	4	2	2	0
Animal feed mills	1	0	1	0
Vegetable oil, animal oil and fats	1	0	1	0
Bakeries	6	0	6	0
Confectionery and snack food	3	1	2	0
Ice	2	1	1	0
All other miscellaneous processors	7	1	6	0
Non-alcoholic beverages	5	0	5	1
Total	46	8	36	2

Outsourcing

Forty-one firms (89%) indicated that they were not outsourcing for another firm (Table 15), thereby eliminating this arrangement as a possible source for diffusing innovative activity.

Table 15: Outsourcing for Another Firm

Outsourcing	Frequency	Percent
Yes	2	4
No	41	89
Not stated	3	7
Total	46	100



Purchase of Equipment

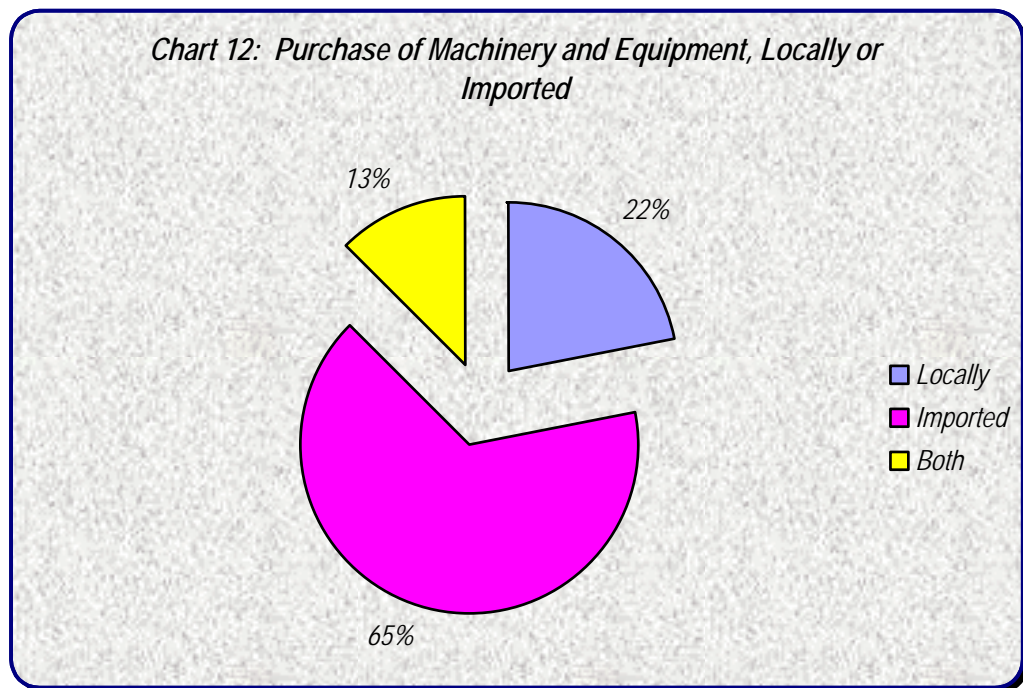
Thirty-two firms (70%) reported that they had purchased new machinery and equipment during 2004 and 2005, of which 21 (65%) indicated that the equipment had been imported (Tables 16,17).

Table 16: Purchase of New Machinery and Equipment, 2004-2005

Purchase	No. and percentage of firms	
	Frequency	Percent
Yes	32	70
No	13	28
Not stated	1	2
Total	46	100

Table 17: Purchase of Machinery and Equipment, Locally or Imported

Purchase	No. and percentage of firms	
	Frequency	Percent
Locally	7	22
Imported	21	66
Both	4	12
Total	32	100



Fifty-nine percent (59%) of firms which purchased new machinery and equipment indicated that sales had increased between 2004-2005 (Table 18). The data with respect to sales and exports were rendered less meaningful because of the relatively large percentage of firms that did not provide sales and export figures.

Table 18: Comparison of the Purchase of New Machinery and Equipment Sales, 2004 and 2005

Purchase new machinery and equipment	Comparison to sales									
	Increased		Decreased		Stayed the same		Not stated		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes	19	59	1	3	1	3	11	34	32	100
No	6	46	2	15	1	8	4	31	13	100
Not stated	1	100	0	0	0	0	0	0	1	100
Total	26	57	3	7	2	4	15	33	46	100

3.4.2 Innovation Activities

Innovation activities were evaluated under four main categories as follows:

- Product
- Process
- Organisational
- Marketing

3.4.2.1 Product Innovation

Product innovation was analysed under three activities as follows:

- Introduced a new product
- Improved an existing product
- Developed a new product

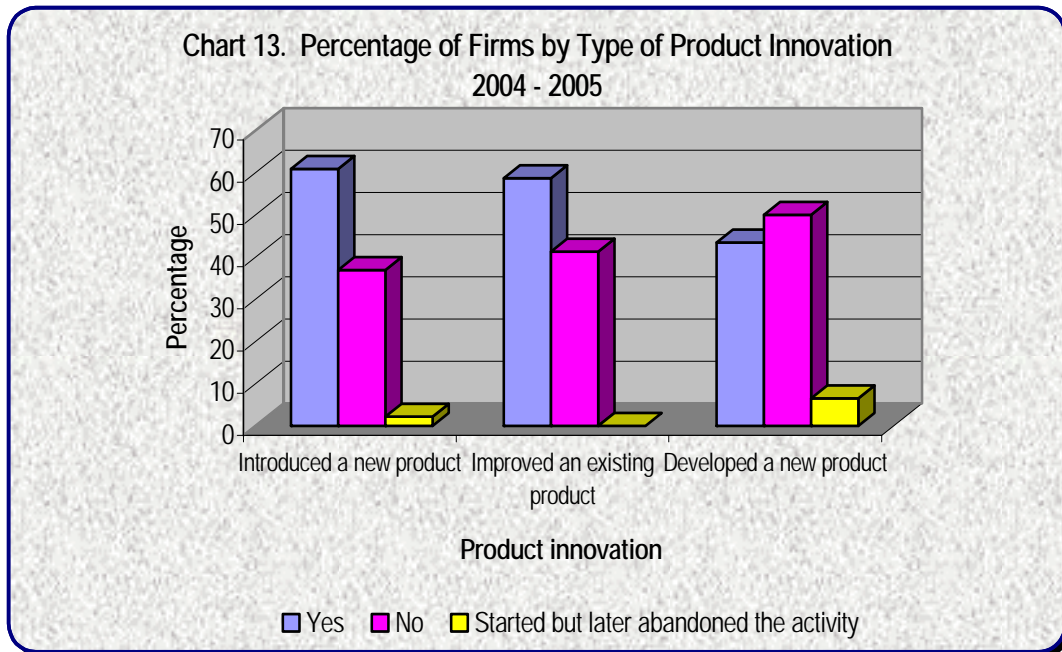
A new product was defined in the questionnaire as *"a product which is new to your firm whose characteristics or intended uses differ significantly from those of your firm's previously produced products."* A significantly improved product was defined as *"an existing product whose performance has been significantly enhanced or upgraded."*

- **Introduced a new product**

Of the firms surveyed, 28 (61%) had introduced new products and twenty seven (59%) were engaged in improving existing products. Twenty establishments (43%) had developed new products; three firms started but later abandoned this activity.

Table 19: No. and Percentage of Firms by Type of Product Innovation, 2004 – 2005

Type of product innovation	No. and percentage of firms							
	Total		Yes		No		Started but later abandoned the activity	
	No.	%	No.	%	No.	%	No.	%
Introduced a new product	46	100	28	61	17	37	1	2
Improved an existing product	46	100	27	59	19	41	0	0
Developed a new product	46	100	20	43	23	50	3	7



Sixty-four percent of the firms that introduced a new product or improved an existing product claimed that sales increased between 2004 and 2005 (Table 20).

Table 20: Percentage of Firms that Introduced a New Product or Improved an Existing Product and Increased/Decreased Sales in 2004-2005

Introduced a new or improved an existing product	Percentage of firms				Total
	Increased sales	Decreased sales	No change	Not stated	
Yes	64	4	0	32	100
No	47	12	12	29	100
Started but later abandoned the activity	0	0	0	100	100

Product innovation did not appear to differ significantly across age profiles [Tables 21(a) and (b)], and was spread across sub-sectors, including ice cream factories, processors of fruits and vegetables products, confectionery and snack, bakeries and non-alcoholic beverages [Tables 22 (a) and (b)].

Table 21a: No. of Firms that Introduced a New Product by Age

Age	Introduced a new product – no. of firms			Total
	Yes	No	Started but later abandoned the activity	
1-10 years	6	4	0	10
11-20 years	8	4	0	12
21-30 years	4	0	1	5
31-50 years	3	3	0	6
Over 50 years	6	4	0	10
Not stated	1	2	0	3
Total	28	17	1	46

Table 21b: Percentage of Firms that Introduced a New Product by Age

Age	Introduced a new product – percentage of firms			
	Yes	No	Started but later abandoned the activity	Total
1-10 years	60	40	0	100
11-20 years	67	33	0	100
21-30 years	80	0	20	100
31-50 years	50	50	0	100
Over 50 years	60	40	0	100
Not stated	33	67	0	100
Total	61	37	2	100

Table 22a: No. of Firms that Introduced a New Product by Sub-sector

Sub-sector activity	Introduced a new product – no. of firms			
	Yes	No	Started but later abandoned the activity	Total
Meat processor	1	1	1	3
Poultry processor	0	1	0	1
Ice-cream factories	4	0	0	4
Milk and milk products	1	0	0	1
Citrus processor	1	0	0	1
All other processors of fruits and vegetables	4	2	0	6
Fish processor	2	2	0	4
Animal feed mills	0	1	0	1
Vegetable oils, animal oils and fats	0	1	0	1
Bakeries	4	2	0	6
Confectionery and snack food	3	0	0	3
Ice	0	2	0	2
All other miscellaneous processors	3	4	0	7
Non-alcoholic beverages	5	1	0	6
Total	28	17	1	46

Table 22b: Percentage of Firms that Introduced a New Product by Sub-sector

Sub-sector	Introduced a new product – percentage of firms			
	Yes	No	Started but later abandoned the activity	Total
Meat processor	33	33	33	100
Poultry processor	0	100	0	100
Ice-cream factories	100	0	0	100
Milk and milk products	100	0	0	100
Citrus processor	100	0	0	100
All other processors of fruits and vegetables	67	33	0	100
Fish processor	50	50	0	100
Animal feed mills	0	100	0	100
Vegetable oils, animal oils and fats	0	100	0	100
Bakeries	67	33	0	100
Confectionery and snack food	100	0	0	100
Ice	0	100	0	100
All other miscellaneous processors	43	57	0	100
Non-alcoholic beverages	83	17	0	100
Total	61	37	2	100

In terms of employment characteristics, firms with between 50-249 employees showed the highest incidence of product innovations (92%) (Table 23).

Table 23: Percentage of Firms that Introduced a New Product by Employment Groups

Employment group	Introduced a new product							
	Yes		No		Started but later abandoned the activity		Total	
	No.	%	No.	%	No.	%	No.	%
<10 employees	3	50	3	50	0	0	6	100
10-49 employees	7	44	8	50	1	6	16	100
50-249 employees	11	92	1	8	0	0	12	100
250 and over employees	6	67	3	33	0	0	9	100
Not stated	1	33	2	67	0	0	3	100
Total	28	61	17	37	1	2	46	100

Firms with over \$20m in sales in 2005 had the largest percentage of new product introductions (Table 24). New product introductions were reported by an equal number of non-exporting (7) and exporting firms (7) (Table 25).

Table 24: No. of Firms that Introduced a New Product by Sales, 2005

Sales range	Introduced a new product							
	Yes		No		Started but later abandoned the activity		Total	
	No.	%	No.	%	No.	%	No.	%
<\$100,000	2	67	1	33	0	0	3	100
\$100,000-\$999,999	1	33	2	67	0	0	3	100
\$1,000,000-\$9,999,999	2	40	3	60	0	0	5	100
\$10,000,000-\$19,999,999	2	67	1	33	0	0	3	100
Over \$20,000,000	5	83	1	17	0	0	6	100
Not stated	16	62	9	35	1	4	26	100
Total	28	61	17	37	1	2	46	100

Table 25: No. of Firms that Introduced a New Product by Export, 2005

Export range	Introduced a new product			
	Yes	No	Started but later abandoned the activity	Total
<\$100,000	1	4	0	5
\$1,000,000-\$9,999,999	3	2	0	5
\$10,000,000-\$19,999,999	1	0	0	1
Over \$20,000,000	2	1	0	3
Do not export	7	9	1	17
Not stated	14	1	0	15
Total	28	17	1	46

Improved an existing Product

Twenty-seven (59%) firms indicated that they had improved an existing product while 19 (41%) had not (Table 19).

The sub-sector, age, employment, sales and export profiles were somewhat similar to that of firms which introduced a new product.

Developed a New Product

Twenty firms (43%) reported that they had developed a new product while 23 firms (50%) revealed that they had not done so. Three firms (7%) indicated that they had started but later abandoned the activity (Table 19).

The firm profiles (sub-sector, age, employment, sales and export) exhibited somewhat similar relationships as established for new product innovation and improvement of existing products.

3.4.2.2 Process Innovation

Process innovation encompassed the following:

- Introduced a new process
- Improved an existing process

New processes (manufactures/delivery processes) were defined in the questionnaire as, "processes which are new to your firm. *This involves the introduction into your firm of new manufacturing/delivery methods, procedures, systems, machinery or equipment which differ significantly from your firm's previous production/manufacturing/delivery processes.*"

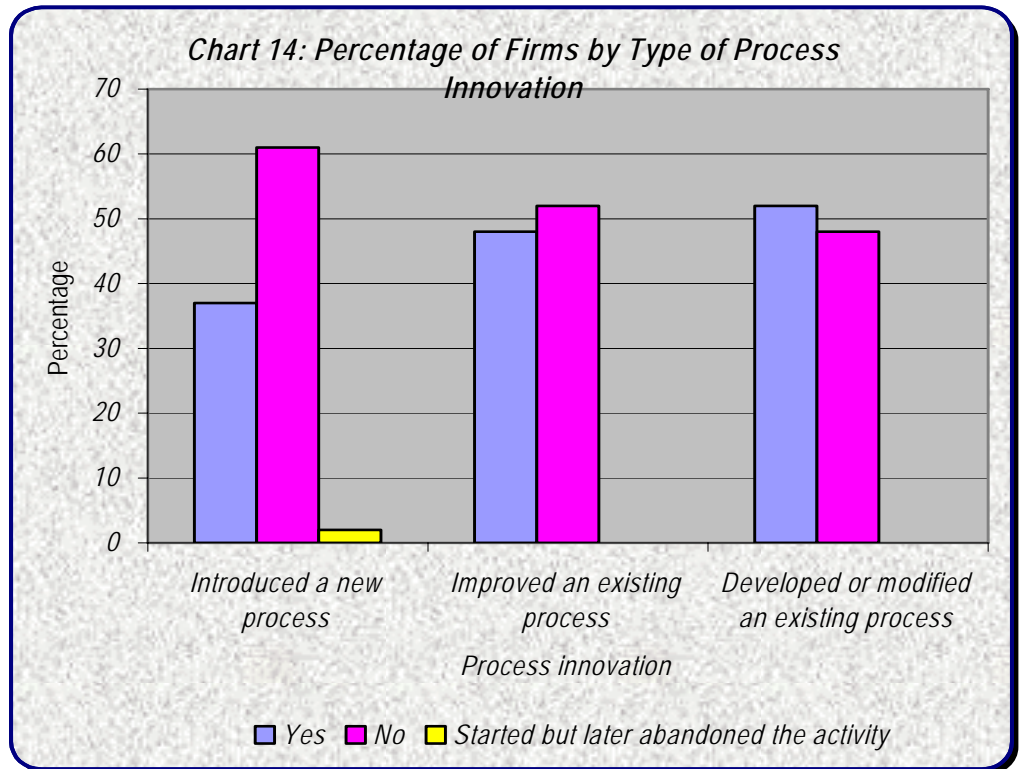
Significantly improved production/manufacturing/delivery processes involve "significant changes to your existing processes which result in changes in the level of output, quality of products, costs of production or distribution."

Introduced a new process

Seventeen firms (37%) claimed to have introduced a new process, while 28 firms (61%) reported that they had not been involved in that activity (Table 26).

Table 26: No. and Percentage of Firms by Type of Process Innovation, 2004 and 2005

Type of process innovation	No. and percentage of firms							
	Total		Yes		No		Started but later abandoned the activity	
	No.	%	No.	%	No.	%	No.	%
Introduced a new process	46	100	17	37	28	61	1	2
Improved an existing process	46	100	22	48	24	52	0	0
Developed or modified an existing process	46	100	24	52	22	48	0	0



Fifty-nine percent (59%) of the firms which introduced a new process reported that sales had increased between 2004 and 2005 (Table 27).

Table 27: Percentage of firms that Introduced a New Process and Increased / Decreased Sales in 2004-2005

Introduced a new process	Sales in 2004 - 2005				Total
	Increased sales	Decreased sales	No change	Not stated	
Yes	59	6	0	35	100
No	57	7	7	29	100
Started but later abandoned the activity	0	0	0	100	100
Total	57	7	4	33	100

In terms of age profile, firms under 20 years seemed to have been more active than firms over 50 years (Table 28). With respect to sub-sector activity, the non-alcoholic beverages (6 out of 17) and processors of fruit and vegetable products and fish, and ice cream factories were more engaged in process innovation than the other industries (Table 29).

Table 28: No of Firms that Introduced a New Process by Age

Age	Introduced a new process			Total
	Yes	No	Started but later abandoned the activity	
1-10 years	5	5	0	10
11-20 years	6	6	0	12
21-30 years	0	4	1	5
31-50 years	3	3	0	6
Over 50 years	3	7	0	10
Not stated	0	3	0	3
Total	17	28	1	46

Table 29: No. of Firms that Introduced a New Process by Sub-sector

Sub-sector	Introduced a new process			
	Yes	No	Started but later abandoned the activity	Total
Meat processors	1	1	1	3
Poultry processors	0	1	0	1
Ice-cream factories	2	2	0	4
Milk and milk products	0	1	0	1
Citrus processors	0	1	0	1
All other processor of fruits and vegetables	3	3	0	6
Fish processors	2	2	0	4
Animal feed mills	0	1	0	1
Vegetable oils, animal oils and fats	0	1	0	1
Bakeries	0	6	0	6
Confectionary and snack food	1	2	0	3
Ice	0	2	0	2
All other miscellaneous processors	2	5	0	7
Non-alcoholic beverages	6	0	0	6
Total	17	28	1	46

Process innovation was relatively more prevalent in firms with under ten employees and 250 and over employees (Table 30).

Table 30: No. and Percentage of Firms that Introduced a New Process by Employment Groups

Employment Group	Introduced a new process							
	Yes		No		Started but later abandoned the activity		Total	
	No.	%	No.	%	No.	%	No.	%
<10 employees	3	50	3	50	0	0	6	100
10-49 employees	3	19	12	75	1	6	16	100
50-249 employees	5	42	7	58	0	0	12	100
250 and over employees	5	56	4	44	0	0	9	100
Not stated	1	33	2	67	0	0	3	100
Total	17	37	28	61	1	2	46	100

Improved an existing process

Twenty-two (48%) firms reported that they had improved an existing process while 24 (52%) responded negatively (Table 26).

Firms under 10 years and those over 50 years old reported better results than the others with respect to process improvement (Table 31). In terms of the sub-sectors, all other processors of fruits and vegetables, all other miscellaneous processors, and non-alcoholic beverages were most active in this area (Table 32).

Table 31: No. of Firms that Improved an Existing Process by Age

Age	Improved an existing process		
	Yes	No	Total
1-10 years	7	3	10
11-20 years	5	7	12
21-30 years	2	3	5
31-50 years	2	4	6
Over 50 years	6	4	10
Not stated	0	3	3
Total	22	24	46

Table 32: No. of Firms that Improved an Existing Process by Sub-sector

Sub-sector	Improved an existing process		
	Yes	No	Total
Meat processors	2	1	3
Poultry processors	0	1	1
Ice-cream factories	2	2	4
Milk and milk products	1	0	1
Citrus processor	0	1	1
All other processor of fruit and vegetable products	5	1	6
Fish processor	0	4	4
Animal feed mills	0	1	1
Vegetable oils, animal oils and fats	0	1	1
Bakeries	1	5	6
Confectionery and snack food	2	1	3
Ice	0	2	2
All other miscellaneous processors	4	3	7
Non-alcoholic beverages	5	1	6
Total	22	24	46

In the employment groups, 83% of the firms with less than 10 employees and 75% of the firms with between 50-249 employees stated that they had improved an existing process (Table 33).

Table 33: Percentage of Firms that Improved an Existing Process by Employment Group

Employment group	Improved an existing process		
	Yes	No	Total
<10 employees	83	17	100
10-49 employees	19	81	100
50-249 employees	75	25	100
250 and over employees	44	56	100
Not stated	33	67	100
Total	48	52	100

There was a fairly even distribution of the numbers of firms reporting improved existing processes within the sales ranges. (Twenty-six firms (56%) did not state their sales range) (Table 34). In terms of exports, eight exporting firms reported improvements in existing processes, while seven non-exporting firms reported no improvement (Table 35).

Table 34: No of Firms that Improved an Existing Process by Sales

Sales range	Improved an existing process		
	Yes	No	Total
\$0-\$99,999	3	0	3
\$100,000-\$999,999	0	3	3
\$1,000,000-\$9,999,999	2	3	5
\$10,000,000-\$19,999,999	2	1	3
Over \$20,000,000	4	2	6
Not stated	11	15	26
Total	22	24	46

Table 35: No. of Firms that Improved an Existing Process by Export

Export range	Improved an existing process		
	Yes	No	Total
\$0-\$999,999	3	2	5
\$1,000,000-\$9,999,999	3	2	5
\$10,000,000-\$19,999,999	0	1	1
Over \$20,000,000	2	1	3
Do not export	7	10	17
Not stated	7	8	15
Total	22	24	46

3.4.2.3 Organisational Innovation

In relation to organisational innovation, six different areas of activities were highlighted as follows:

- Introduced changes in management systems and techniques
- Introduced/improved quality assurance systems
- Introduced/improved maintenance routines and systems
- Improved plant layout
- Introduced/improved waste management procedures
- Implemented major changes in organisational strategy and structure

Seventy percent (70%) of the firms indicated that they had introduced/improved quality assurance systems and maintenance routines and systems. Fifty-nine percent (59%) of the firms reported that they had introduced changes in management systems and techniques, and forty eight percent (48%) of the firms revealed that they had improved plant layout and waste management procedures. However, only twenty-eight percent (28%) of the firms stated that they had implemented major changes in organisational strategy and structure (Table 36).

Table 36: No. and Percentage of Firms Engaged in Organisational Innovation, 2004 and 2005

Organisational innovation	Engaged in organisational innovation							
	Total		Yes		No		Started but later abandoned the activity	
	No.	%	No.	%	No.	%	No.	%
Introduced changes in management systems and techniques	46	100	27	59	18	39	1	2
Introduced/improved quality assurance systems	46	100	32	70	14	30	0	0
Introduced/improved maintenance routines and systems	46	100	32	70	14	30	0	0
Improved plant layout	46	100	22	48	24	52	0	0
Introduced/improved waste management procedures	46	100	22	48	24	52	0	0
Implemented major changes in organisational strategy and structure	46	100	13	28	33	72	0	0

In the sub-sectors, non-alcoholic beverages and all other processors of fruit and vegetable products were represented by a greater number of firms than the other sub-sectors in the majority of the areas of organisational innovation activities. Confectionery and snacks, bakery, ice cream factories and all other miscellaneous processors were among those that were engaged, to a lesser extent, in organisational innovation. (Detailed data available on request)

Taking into account the limited sales and export data available, organisational innovation was somewhat more prevalent in firms with sales and exports in excess of \$20mn. (Detailed data available on request)

3.4.2.4 Marketing Innovation

Marketing innovation encompassed the following three activities:

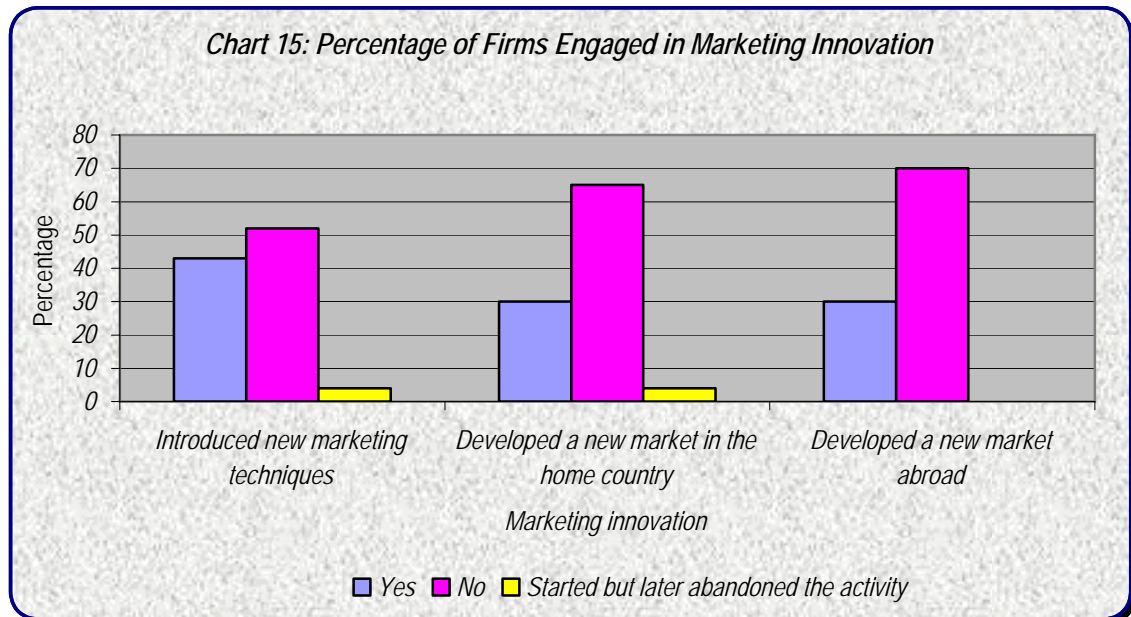
- Introduced new marketing techniques

- Developed a new market in the home country
- Developed a new market abroad

Forty-three percent (43%) of the firms stated that they had introduced new marketing techniques, 30% reported that they had developed a new market in the home country and 32% had developed a new market abroad (Table 37).

Table 37: No and Percentage of Firms Engaged in Marketing Innovation

Marketing innovation	Engaged in marketing Innovation							
	Total		Yes		No		Started but later abandoned the activity	
	No.	%	No.	%	No.	%	No.	%
Introduced new marketing techniques	46	100	20	43	24	52	2	4
Developed a new market in the home country	46	100	14	30	30	65	2	4
Developed a new market abroad	46	100	14	30	32	70	0	0



The non-alcoholic beverages, all other processors of fruit and vegetable products, and confectionery and snack food sub-sectors were represented by the greater number of firms with respect to marketing innovation activities (Table 38).

Table 38: No. of Firms that Introduced New Marketing Techniques by Sub- sector

Sub-sector	Introduced new marketing techniques – no. of firms			
	Yes	No	Started but later abandoned the activity	Total
Meat processors	1	1	1	3
Poultry processors	0	1	0	1
Ice-cream factories	2	2	0	4
Milk and milk products	0	1	0	1
Citrus processors	1	0	0	1
All other processor of fruit and vegetable products	4	2	0	6
Fish processors	0	4	0	4
Animal feed mills	1	0	0	1
Vegetable oils, animal oils and fats	0	1	0	1
Bakery	1	5	0	6
Confectionery and snack food	3	0	0	3
Ice	0	1	1	2
All other miscellaneous processors	2	5	0	7
Non-alcoholic beverages	5	1	0	6
Total	20	24	2	46

3.4.3 Driving Forces and Obstacles of Innovation

3.4.3.1 Reasons for innovating

Eleven reasons were adduced for innovating as follows:

- Reduce production costs
- Improve productivity
- Extend product range
- Improve product quality
- Increase market share
- Improve customer satisfaction
- Deal with new competitors at home
- Deal with new competitors in export markets
- Improve working conditions

- Develop more environmentally friendly, products and services
- Comply with local laws and standards

The major reasons for innovating were to improve customer satisfaction, productivity and product quality which gained ratings of very important by 80%, 74% and 72% of the respondents respectively (Table 39). Reducing production costs, increasing market share and complying with local laws or standards polled 65%, 63%, and 61% respectively in the very important category. Fifty-seven percent (57%) of the respondents stated that improving working conditions was very important, as did fifty-two percent (52%) of the respondents with respect to dealing with new competitors at home. On the other hand, however, 11% of the respondents deemed increasing market share to be not important.

The lowest rankings were accorded to developing more environmentally friendly products and processes in that only 37% of the respondents deemed it to be very important, while 11% in each case deemed it to be not important and slightly important. Dealing with new competitors in export markets received similar ratings, with 37% of respondents indicating that it was very important, while 13% in each case viewed it as being not important and as slightly important.

Table 39: Rating of Reasons for Innovating

Reason	Percentage						
	Total	Not Important	Slightly important	Moderately important	Very important	Not stated	Not applicable
Reduce production costs	100	2	4	13	65	2	13
Improve productivity	100	0	2	9	74	2	13
Extend product range	100	7	7	33	39	2	13
Improved product quality	100	4	0	7	72	4	13
Increase market share	100	11	2	9	63	2	13
Improve customer satisfaction	100	0	0	4	80	2	13
Deal with new competitors at home	100	7	7	17	52	4	13
Deal with new competitors in export markets	100	13	13	15	37	9	13
Improve working conditions	100	4	4	17	57	4	13
Develop more environmental-friendly products and processes	100	11	11	24	37	4	13
Comply with local laws or standards	100	7	11	4	61	4	13

3.4.3.2 Obstacles to Innovation

Eleven obstacles to innovation were identified as follows:

- High cost of innovation project
- Lack of financing
- Lack of skilled/qualified personnel
- Long administrative/approval process within the firm
- Lack of information on technology itself
- Lack of information on markets
- Domestic economic conditions

- Legislation/legal restrictions/administrative procedures affecting the innovation
- Weak customer demand
- Lack of marketing capability
- Lack of external technical support services

The main obstacle to innovation was identified as the high cost of the innovation project, which 35% of respondents declared to be very significant (Table 40). Twenty percent (20%) of respondents deemed lack of financing, lack of skilled/qualified personnel and domestic economic conditions to be very significant. On the other hand, fifty-two percent (52%) of respondents indicated that long administrative/approval process within the firm and lack of information on the technology itself were not relevant/appropriate, as did forty-six percent (46%) of respondents in relation to lack of financing, legislation/legal restrictions/administrative procedures and lack of external technical support services.

Table 40: Rating of Obstacles for Innovation

Obstacle or hindrance	Percentage					
	Total	Not relevant/ appropriate	Slightly significant	Moderately significant	Very significant	Not stated
High cost of innovation project	100	28	11	9	35	17
Lack of financing	100	46	4	13	20	17
Lack of skilled/qualified personnel	100	30	11	17	20	22
Long administrative/ approval process within the firm	100	52	15	11	0	22
Lack of information on technology itself	100	52	9	13	4	22
Lack of information on markets	100	35	24	13	7	22
Domestic economic conditions	100	24	15	20	20	22
Legislation/legal restrictions/administrative procedures affecting the innovation	100	46	11	13	11	20
Weak customer demand	100	37	15	11	15	22
Lack of marketing capability	100	41	17	13	7	22
Lack of external technical support services	100	46	13	13	7	22

However, care should be taken in the interpretation of these results because of the relatively large percentage of "not stated" entries which ranged from 17-22%.

3.4.4 Linkages and Learning

The importance of the role of linkages and collaboration for innovation was explored. Some linkages may involve a specific flow of information and knowledge, for example, ownership linkages, sub-contracting/outsourcing relationships. Based on the results of the survey, however, ownership, sub-contracting and outsourcing relationships appeared to be of minimal importance in this regard (Sections 3.4.1). The use of other linkages as sources of information, types of information obtained from these sources, co-operative and collaborative arrangements, and reasons for collaboration were addressed in the survey as follows:

3.4.4.1 Sources of Information

Eleven sources of information were identified as follows

- Within your firms
- Parent firm
- Customers
- Client firm with which the respondent is a sub-contractor
- Suppliers of equipment, material and components or software
- Consultancy firms
- Government or public research institutes
- Fairs /exhibitions, conferences
- Business and industry associations
- Professional journals and trade publications
- Education and research institutes

Customers were identified as a very important source of information by 61% of the respondents, while 54% gave a similar rating to information from within the firm. Suppliers of equipment, material and components or software, were viewed as very important by 33% of respondents (Table 41).

Twenty-eight percent (28%) of respondents viewed government or public research institutes as a very important and twenty percent (20%) as moderately important.

Likewise twenty-two percent (22%) and forty-three percent (43%) indicated that business and industry associates were very and moderately important respectively.

With respect to education and research institutions, 24% and 30% of respondents reported that they were very important and moderately important, respectively. Consultancy firms were seen as very important and moderately important by 17% and 22% of respondents, respectively. Thirty-nine percent (39%) of the respondents, however, indicated that they were not used.

Table 41: Rating of Sources of Information

Source of information	Percentage					
	Total	Not used	Moderately Important	Very important	Not stated	Not applicable
Within your firm	100	4	20	54	9	13
Parent firm	100	54	4	20	9	13
Customers	100	4	13	61	9	13
Client firm for which the respondent is a subcontractor	100	63	4	11	9	13
Suppliers of equipment, material and components or software	100	15	30	33	9	13
Consultancy firms	100	39	22	17	9	13
Government or public research institutes	100	30	20	28	9	13
Fairs, exhibitions, conferences	100	26	28	24	9	13
Business and industry associations	100	13	43	22	9	13
Professional journals and trade publications	100	24	39	15	9	13
Education and research institutes	100	24	30	24	9	13

3.4.4.2 Types of Information

Customers were identified as the major source of product and marketing related information by 61% and 41% of respondents respectively (Tables 42 and 44).

Table 42: Sources of Product Related Information

Source	Total	Product related - percentage			
		Yes	No	Not stated	Not applicable
Within your firm	100	41	30	11	17
Parent firm	100	17	4	11	67
Customers	100	61	13	9	17
Client firm for which the respondent is a subcontractor	100	11	4	9	76
Suppliers of equipment, material and components or software	100	20	43	9	28
Consultancy firms	100	20	17	11	52
Government ministries or public research institutions	100	24	20	13	43
Fairs, exhibitions, conferences	100	26	26	9	39
Business and industry associations	100	20	41	13	26
Professional journals and trade publications	100	26	22	15	37
Education and research institutes	100	24	28	11	37

Sources within the firm were also identified as being significant sources of product related information (41%) and management related information (37%) (Tables 42 and 45).

The major source of process related information was deemed to be suppliers of equipment, material and components or software by 57% of respondents, followed by in-house sources (48%) (Table 43).

Table 43: Sources of Process Related Information

Source	Total	Process related - percentage			
		Yes	No	Not stated	Not applicable
Within your firm	100	48	24	11	17
Parent firm	100	17	4	11	67
Customers	100	7	67	9	17
Client firm for which the respondent is a subcontractor	100	7	9	9	76
Suppliers of equipment, material and components or software	100	57	7	9	28
Consultancy firms	100	20	17	11	52
Government ministries or public research institutions	100	15	28	13	43
Fairs, exhibitions, conferences	100	13	39	9	39
Business and industry associations	100	17	43	13	26
Professional journals and trade publications	100	22	28	13	37
Education and research institutes	100	24	28	11	37

Table 44: Sources of Marketing Related Information

Source	Total	Marketing related - percentage			
		Yes	No	Not Stated	Not applicable
Within your firm	100	39	33	11	17
Parent firm	100	15	7	11	67
Customers	100	41	33	9	17
Client firm for which the respondent is a subcontractor	100	11	4	9	76
Suppliers of equipment, material and components or software	100	9	54	9	28
Consultancy firms	100	9	28	11	52
Government ministries or public research institutions	100	15	28	13	43
Fairs, exhibitions, conferences	100	33	20	9	39
Business and industry associations	100	28	33	13	26
Professional journals and trade publications	100	22	28	13	37
Education and research institutes	100	28	24	11	37

Table 45: Sources of Management Related Information

Source	Total	Management related - percentage			
		Yes	No	Not stated	Not applicable
Within your firm	100	37	35	11	17
Parent firm	100	15	7	11	67
Customers	100	7	67	9	17
Client firm for which the respondent is a subcontractor	100	7	9	9	76
Suppliers of equipment, material and components or software	100	11	52	9	28
Consultancy firms	100	17	20	11	52
Government ministries or public research institutions	100	11	33	13	43
Fairs, exhibitions, conferences	100	4	48	9	39
Business and industry associations	100	17	43	13	26
Professional journals and trade publications	100	11	39	13	37
Education and research institutes	100	22	30	11	37

Other sources of information were deemed to be less important by the respondents (below 30%) (Tables 42, 43, 44 and 45).

3.4.4.3 Co-operative and Collaborative Arrangement

Co-operative and collaborative arrangements involved the active participation in joint projects between the respondent establishment and other establishments or organisations.

Thirty-three percent (33%) of the firms stated that they had collaborative arrangement with suppliers while twenty-six percent (26%) had such arrangement with customers. Co-operative arrangements were also entered into with public research institutes (20%), government ministries (17%), consulting and marketing firms (17%), private research institutes (15%), associated companies within the corporate group (15%) and universities or higher education institutes (11%). Not surprisingly, only 7% of establishments entered into such arrangements with competitors (Tables 46).

Table 46: Sources of Co-operative and Collaborative Arrangements

Source	Percentage					
	Total	Yes	No	Do not know	Not Stated	Not applicable
Competitor	100	7	63	2	13	15
Customers	100	26	46	0	13	15
Suppliers	100	33	39	0	13	15
Associated companies within your corporate group	100	15	54	0	15	15
Consulting and marketing firms	100	17	52	2	13	15
Private research institutes	100	15	54	2	13	15
Public research institutes	100	20	48	4	13	15
Universities or higher education institutes	100	11	57	4	13	15
Government ministry	100	17	52	2	13	15

Reasons for Collaboration

Forty-one percent (41%) of the respondents cited accessing research and development as the reason for collaboration while thirty-five percent (35%) cited accessing new markets, 30% accessing critical expertise, 30% accessing new distribution channels and 24% sharing of costs. However, only 9% indicated spreading risks as a reason for collaboration (Table 47).

Table 47: Reasons for Collaboration

Reason	Percentage				
	Total	Yes	No	Not stated	Not applicable
Sharing costs	100	24	30	13	33
Spreading risks	100	9	46	13	33
Accessing research and development	100	41	13	13	33
Prototype development	100	13	41	13	33
Scaling-up production processes	100	17	37	13	33
Accessing critical expertise	100	30	24	13	33
Accessing new markets	100	35	20	13	33
Accessing new distribution channels	100	30	24	13	33

3.4.5 Impact of Innovation

The firms were requested to rate the impact of innovation on key performance indicators. Fifty-two percent (52%) of respondents indicated that innovation resulted in increased productivity while 50% cited increased product differentiation. Between 41-44% recorded increases in profitability, market share, competitiveness and service quality, while 37%

reported increased cash flow and improved compliance with regulations. Twenty-eight percent (28%) attributed increased employment and export growth to their innovation activities, while only twenty percent (20%) reported increased diversification (Table 48).

Table 48: Rating of Impact of Innovation on Performance Indicators

Indicator	Impact						
	Total	No change	Decrease	Increase	Do not know	Not stated	Not applicable
Profitability	100	13	4	43	4	22	13
Market share (domestic market)	100	13	4	41	2	26	13
Export growth	100	28	2	28	2	26	13
Productivity	100	9	0	52	2	24	13
Competitiveness	100	13	2	41	4	26	13
Cash flow	100	15	2	37	7	26	13
Diversification	100	24	2	20	11	30	13
Product differentiation (including changes in quality)	100	7	2	50	2	26	13
Positive environmental impact	100	28	2	26	4	26	13
Compliance with regulations	100	20	0	37	4	26	13
Employment	100	20	13	28	0	26	13
Service quality	100	15	2	41	2	26	13

3.4.6 Policy Related Issues

Questions drawn from various elements of the survey attempted to determine how the respondent firms perceived government's role with respect to innovation.

Sixty-one percent (61%) of respondents indicated that complying with local laws or standards was a very important reason for innovation (Table 39). Forty-eight percent (48%) of firms stated that government or public research institutions were very important/moderately important sources of information for innovation (Table 41), while between 17-20% reported that they had been involved in some kind of collaborative activity with public research institutions or government ministries (Table 46).

Twenty-six percent of respondents (26%) stated that their innovative activity had a positive environmental impact, while 37% signalled that innovative activity impacted positively on their compliance with regulations (Table 48). However, 24% of respondents reported that legislation/legal restrictions/administrative procedures were very/moderately significant hindrances to innovation activity (Table 40).

With respect to government support programmes, sixty-five percent (65%) of respondents did not use government support or assistance in their innovative activity, while 30% utilised these resources (Table 49).

Table 49: No. and Percentage of Firms that Use Government Support or Assistance

Use support or assistance	No. and percentage of firms	
	No.	Percent
Yes	14	30
No	30	65
Not stated	2	4
Total	46	100

In terms of the importance of government support programmes for innovation, research and development funding (24%), loans and grants (22%) and infrastructure support (20%), subsidies (17%), tax rebates (15%) training and technical support/advice (13%) were ranked as very important in that order. It should be noted that the not-applicable category for that question was approximately sixty-five percent (65%) (Table 50).

Table 50: Rating of Government Support Programmes for Innovation

Program	Percentage						
	Total	Not important	Slightly important	Important	Very important	Not stated	Not applicable
Research and development funding	100	4	2	0	24	4	65
Training	100	0	4	13	13	4	65
Subsidies	100	4	0	9	17	4	65
Tax rebates	100	4	4	7	15	4	65
Technical support/advice	100	4	0	13	13	4	65
Infrastructure support	100	7	0	4	20	4	65
Loans and grants	100	0	4	4	22	4	65
Venture capital support	100	9	7	7	9	4	65

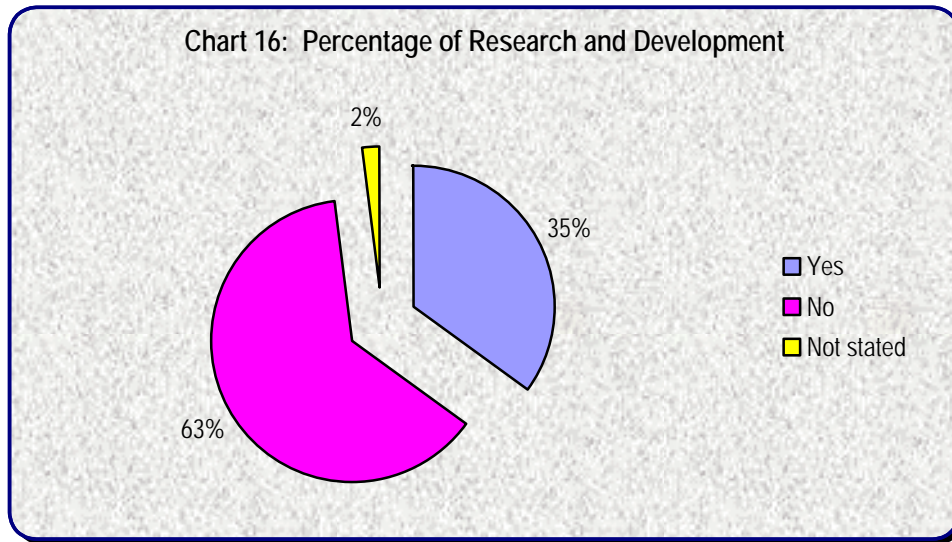
In response to an open question in relation to how government can encourage innovation in firms there were a range of responses including: reduce taxes, provide research and development information, help with staff training, improve infrastructural facilities and assist with international marketing.

3.4.7 Research and Development

Thirty-five percent (35%) of firms stated that they had undertaken research and development activities while 63% responded negatively (Table 51).

Table 51: Research and Development

Research and development activity	No. of firms	Percentage
Yes	16	35
No	29	63
Not stated	1	2
Total	46	100



Only two firms utilised patents to protect their intellectual property, while ten firms (22%) utilised trademarks, three firms (7%) copyright, five firms (11%) confidentiality agreements and five firms (11%) trade secrets (Table 52).

Table 52: Protection of Intellectual Property

Method to protect intellectual property	Total		Yes		No		Not stated		Not applicable	
	No.	%	No.	%	No.	%	No.	%	No.	%
Patents	46	100	2	4	11	24	4	9	29	63
Trademarks	46	100	10	22	3	7	4	9	29	63
Copyrights	46	100	3	7	11	24	3	7	29	63
Confidentiality agreements	46	100	5	11	9	20	3	7	29	63
Trade secrets	46	100	5	11	9	20	3	7	29	63

3.4.8 Use of the Internet

Seventy-eight percent (78%) of respondents utilised the internet, while the same percentage used it for e-mail. Sixty-seven percent (67%) utilised it for world web searches, 28% to sell products or services to clients and 20% for advertising through a home page (Tables 53 and 54).

Table 53: Internet Usage

Internet usage	No. of firms	Percentage
Yes	36	78
No	9	20
Not stated	1	2
Total	46	100

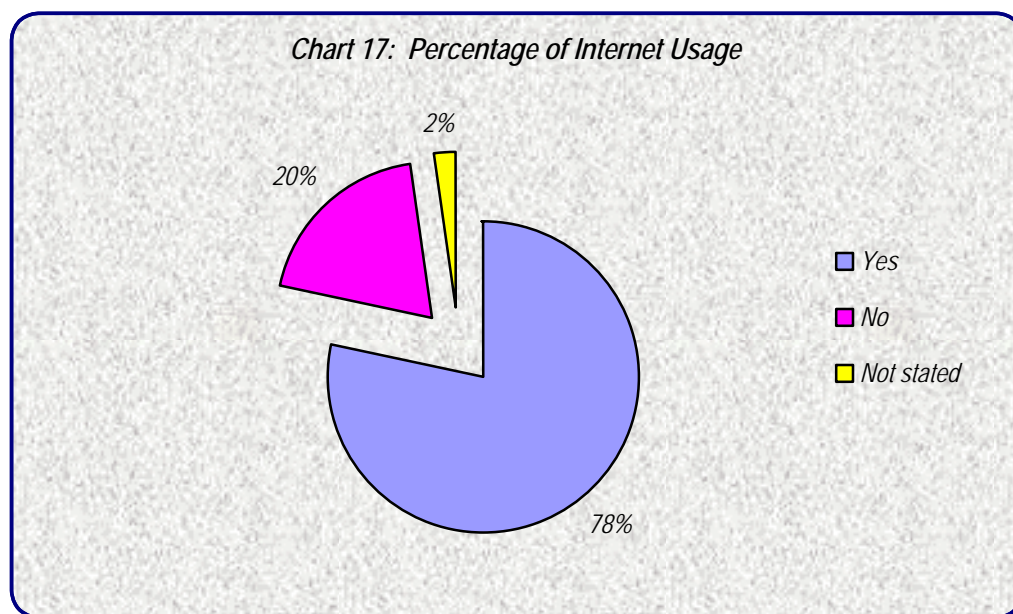


Table 54: Purpose of Internet Usage

Purpose	Total		Yes		No		Not stated		Not applicable	
	No.	%	No.	%	No.	%	No.	%	No.	%
For email	46	100	36	78	0	0	1	2	9	20
For searches on the world wide web	46	100	31	67	5	11	1	2	9	20
For selling your products or services to customers or clients	46	100	13	28	23	50	1	2	9	20
For advertising through a home page	46	100	9	20	27	59	1	2	9	20

3.5 Summary of Main Findings and Conclusion

3.5.1 Innovation Activities

- (i) The vast majority of companies surveyed were local and privately owned, and there were minimal licensing or outsourcing arrangements in place. The transfer of technology from foreign companies and outsourcing/licensing arrangements were therefore not significant mechanisms for the diffusion of innovation for firms in the sector. The purchase of machinery and equipment, mainly from imported sources, pointed to the diffusion of innovation to some extent through the use of embodied technology.
- (ii) Product innovation was more widely practised than process innovation. Sixty-one percent (61%) of the companies surveyed indicated that they had introduced a new product, as opposed to thirty-seven percent (37%) claiming to have introduced a new process. Similarly, fifty-nine percent (59%) of the respondents had improved an existing product, compared with forty-eight percent (48%) reporting improvement of an existing process.
- (iii) With respect to organisational innovation, the main areas of focus were the introduction/improvement of quality assurance systems and maintenance routines and systems (70% of firms surveyed), followed by the introduction of changes in management systems and techniques (59%).
- (iv) Marketing was seen to be the area of least innovation activity, with forty-three percent (43%) of the firms reporting the introduction of new marketing techniques, while only 30% of respondents had developed new markets locally or abroad. (This is a somewhat surprising outcome given the export performance of the sector).
- (v) The sub-sectors which were mostly involved in the various types of innovative activity included: non-alcoholic beverages, all other processor of fruits and vegetables, confectionery and snack food and ice cream factories.

3.5.2 Driving Forces and Obstacles

The following reasons for innovating were cited by respondents as very important:

- Customer satisfaction (80%)
- Improve productivity (74%)
- Improve product quality (72%)
- Increase market share (63%)
- Complying with local laws and standards (61%)

On the other hand only thirty-seven percent (37%) of respondents deemed the development of more environmentally friendly products and processes to be very important.

The main obstacles to innovation were identified as the high cost of the innovation project, followed by lack of financing, lack of skilled and qualified personnel and domestic economic conditions. The inadequacies of human and financial resources were the greatest barriers to innovative activity.

3.5.3 Linkages and Collaboration

Customers were cited as very important sources of information for innovation by 61% of the respondents, 54% gave a similar rating to in-house information, and thirty-three percent (33%) to suppliers. However, government or public research institutes and education and research institutions were viewed as very important sources of innovation information by only 28% and 24% of respondents respectively.

Equipment suppliers were identified as the most significant partners with respect to entry into co-operative/collaborative arrangements by respondent firms (33%). Seventeen (17%) and 20% of respondents had been involved in some kind of collaborative activity with government ministries and public research institutions respectively.

3.5.4 Impact of Innovation

The impact of innovation was reported to be greatest with respect to increased productivity (52%) and increased product differentiation (50%). Between 41-44% reported increases in profitability, market share, competitiveness and service quality. Only 28% of respondents, however, attributed increased employment and export growth to their innovation activities.

3.5.5 Research and Development

A minority of firms (35%) indicated that they had undertaken research and development, while 63% responded negatively. This is consistent with the paucity of scientists and engineers employed in the sector, reflected by the data which show that fifty-seven percent (57%) of respondents (26 firms) employed no scientists and engineers, while 10 firms employed between 1-2 scientists and engineers and the remaining firms employing between 4-7 such professionals. Not surprisingly, only two firms utilised patents to protect their intellectual property, in addition to trademarks, confidentiality agreements and trade secrets to some extent.

3.5.6 Role of Government

The majority of respondents (65%) did not utilise government support or assistance in their innovation activity. For those firms that utilised the programmes, research and development funding, loans and grants, infrastructure support, subsidies, tax rebates, training and technical support/advice were ranked as very important, in that order. Compliance with local laws or standards was deemed to be very important for innovation by 61% of respondents, while 26% of firms claimed that their innovative activity had a positive environmental impact.

Government or public research institutions were seen to be very important (28%) and moderately important (20%) sources of information and collaboration (17-20%). However, 24% of respondents stated that legislation/legal restrictions/administrative procedures were very/moderately significant hindrances to innovative activity.

Respondents indicated that government could encourage innovation by reducing tax, providing research and development information, providing assistance with staff training, facilitating international marketing and improving infrastructural facilities.

Appendix I

Covering Letter

June 16, 2006

The Managing Director

Dear Sir/Madam,

Survey of Innovation, 2006

The National Institute of Higher Education, Research, Science and Technology (NIHERST) is conducting a survey on innovation in the food and beverage industry.

The objective of this study is to obtain information with respect to the innovative activities of establishments in the industry including:

- ◆ the types of innovative activities undertaken and the reasons for undertaking such activities,
- ◆ the obstacles/hindrances to innovative activities,
- ◆ the impact of innovation on key performance indicators,
- ◆ the role of linkages for the acquisition of information and collaboration leading to innovation and
- ◆ the role of research and development in the innovation process.

The results of the survey will be utilised to provide insights into the innovation process and to assist decision-makers in developing policies to create the environment and incentives to catalyse innovation in the industry.

Kindly complete and return the attached questionnaire to our field personnel. Your co-operation in this exercise will be greatly appreciated.

Please be assured that the data provided will be treated with strict confidentiality. For further information please contact the Science and Technology Statistical Unit at 628-1154.

Yours sincerely,

/f/ President



Appendix II

Questionnaire

**National Institute of Higher Education, Research Science and Technology
(NIHERST)
Survey of Innovation, 2006**

Definition

Innovation can be broadly defined as the dynamic process of introducing new ideas and new ways of doing things, aimed at enhancing your competitive position, your performance, your know-how, or your capabilities for future enhancement. Innovations can be new or significantly improved products, services or processes, the opening up of new markets, and the adoption of new technology or a change in the organization of the business.

1. Name of Establishment _____

2. Year Established _____

3. Address _____

4. Telephone: _____ Ext. _____

5. Fax: _____

6. Email: _____

7. Name of respondent: _____

8. Position in the establishment:

9. Please describe the ownership structure of your firm?

- | | | | | |
|--|--------------------------|---|---|-------------|
| 1. Local private ownership | <input type="checkbox"/> | } | → | Skip to Q12 |
| 2. Local state-owned | <input type="checkbox"/> | | | |
| 3. Wholly owned by foreign corporation | <input type="checkbox"/> | → | | Skip to Q11 |
| 4. Joint venture – foreign private/government | <input type="checkbox"/> | } | → | Go to Q10 |
| 5. Joint venture – foreign private/local private | <input type="checkbox"/> | | | |

10. For the joint venture firm, please give the shares of foreign and local ownership.

1. Shares foreign (in %) _____
2. Shares local (in %) _____

11. Please give the nationality of the foreign owner/joint venture partner.

12. What is the main activity of your firm?

13. How many full-time employees did your firm have in 2005? _____

14. How does this compare with the number of employees in 2004?

1. Increased
2. Decreased
3. Stayed the same

15. How many scientists and engineers were employed in your firm in 2005?

16. What was the value of your sales in 2005? \$ _____

17. How does this compare with your sales in 2004?

1. Increased
2. Decreased
3. Stayed the same

18. What was the total value (in local currency) of your exports in 2005?

\$ _____

19. How does this compare with exports in 2004?

- 1. Increased
- 2. Decreased
- 3. Stayed the same

20. What was the percentage of your export sales to your total sales in 2005?

- 1. 0
- 2. 1 - 25%
- 3. 26 - 50%
- 4. Over 50%

21. Does your firm currently have a licensing contract for product or process technology?

- 1. Yes
- 2. No → **Skip to Q26**

In which year was this license acquired? _____

If your firm has more than one license, identify the date of the oldest of your licenses. Questions 23 and 24 refer to the oldest license acquired by your firm.

23. Please indicate whether this license is from

- 1. A Local firm
- 2. A local research institute or university
- 3. A foreign firm
- 4. A foreign research institute or university

24. If you intend to develop new or modified versions of the product or process for which you have this license, will you do this?

- 1. On your own
- 2. Through a new license
- 3. No intention to introduce a new or modified version

25. Is your firm subcontracting for another firm?

- 1. Yes
- 2. No

26. Is your firm outsourcing for another firm?

- 1. Yes
- 2. No

27. Did your firm purchase new machinery and equipment in the period 2004 – 2005?

- 1. Yes
- 2. No → Skip to Q30

28. Was the machinery and equipment purchased

- 1. Locally
- 2. Imported

29. What was the value of the new machinery and equipment bought?

- 1. in 2004 \$ _____
- 2. in 2005 \$ _____

INNOVATION ACTIVITIES

Definition

A new product (good or service) is a product which is new to your firm, whose characteristics or intended uses differ significantly from those of your firm's previously produced products.

A significantly improved product (good or service) is an existing product whose performance has been significantly enhanced or upgraded. Changes to your firm's existing products which are purely aesthetic or which only involve minor modifications are not to be included.

New production (manufacturing/delivery processes) are processes which are new to your firm. This involves the introduction into your firm of new production/manufacturing/delivery methods, procedures, systems, machinery or equipment which differs significantly from your firm's previous production/manufacturing/delivery processes.

Significantly improved production/manufacturing/delivery processes involve significant changes to your existing processes which result in changes in the level of output, quality of products, costs of production or distribution.

30. Did your firm undertake any of the following innovative activities (see definitions on page 4) in 2004 and 2005? (please tick appropriate box)

Activities	Yes	No	Started but later abandoned the activity
1. Introduced a new product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Improved an existing product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Introduced a new process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Improved an existing process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Developed a new product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Developed or modified an existing process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Introduced changes in management systems and techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Introduced/improved quality assurance systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Introduced/improved maintenance routines and systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Improved plant layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Introduced/improved waste management procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Introduced new marketing techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Introduced/expanded in-house training programme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Developed a new market in the home country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Developed a new market abroad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Implemented major changes in organizational strategy and structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no to all skip to Q37

OBJECTIVES

31. Please indicate the importance of the following reasons for innovating.

Please tick the appropriate box

Reasons	Not important	Slightly important	Moderately important	Very important
1. Reduce production costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Improve productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Extend product range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Improve product quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Increase market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Improve customer satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Deal with new competitors at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Deal with new competitors in export markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Improve working conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Develop more environmental-friendly products and processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Comply with local laws or standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SOURCES OF INFORMATION

32. Please rate the importance of the following sources of information for your innovation.

Please tick the appropriate box..

<i>Sources</i>	Not used	Moderately important	Very important
1. Within your firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Parent firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Client firm for which the respondent is a subcontractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suppliers of equipment, material and components or software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Consultancy firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Government or public research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fairs, exhibitions, conferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Business and Industry associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Professional journals and trade publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Education and research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Skip to Q 36 if none is used

TYPES OF INFORMATION

33. What type of information on innovation did you obtain from your sources?

Please tick appropriate box

Sources	Product related	Process related	Marketing related	Management related
1. Within your firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Parent firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Client firm for which the respondent is a subcontractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Suppliers of equipment, material and components or software	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Consultancy firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Government ministries or public research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Fairs, exhibitions, conferences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Business and industry associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Professional journals and trade publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Education and research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**LINKAGES
COOPERATIVE AND COLLABORATIVE ARRANGEMENTS**

34. Cooperative and collaborative arrangements involve the active participation in joint projects between your company and other companies or organizations. Please indicate whether your company has engaged in any formal form of cooperation or joint innovative activity with any of the following actors.

Source	Yes	No	Do not know
1. Competitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Associated companies within your corporate group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Consulting and marketing firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Private research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Public research institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Universities or higher education institutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Government ministry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REASONS FOR COLLABORATION

35. Please indicate which of the following reasons are important in determining the involvement of your firm in cooperative and collaborative arrangements.

- 1. Sharing costs
- 2. Spreading risks
- 3. Accessing research and development
- 4. Prototype development
- 5. Scaling-up production processes
- 6. Accessing critical expertise
- 7. Accessing new markets
- 8. Accessing new distribution channels
- 9. Other (specify):

IMPACT

36. Please rate the impact of your innovation in 2004 and 2005 on the following indicators of your firm's performance: *Please tick the appropriate box*

Impact	No change	Decrease	Increase	Do not know
1. Profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Market share (domestic market)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Export growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Competitiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Cash flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Diversification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Product differentiation (including changes in quality)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Positive environmental impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Compliance with regulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Employment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Service quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OBSTACLES

37. Please indicate the extent to which any of the following have been obstacles or hindrances to your innovative activity. *Please tick appropriate box*

Obstacles	Not relevant/ appropriate	Slightly significant	Moderately significant	Very significant
1. High cost of the innovation project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Lack of financing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Lack of skilled/qualified personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Long administrative/approval process within the firm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Lack of information on technology itself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Lack of information on markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Domestic economic conditions (e.g. inflation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Legislation/legal restrictions/administrative procedures affecting the innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Weak customer demand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Lack of marketing capability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Lack of external technical support services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Other reasons not listed above – please specify below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RESEARCH AND DEVELOPMENT

Definition

Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge of man, culture and society and the use of this stock of knowledge to devise new applications.

38. Does your firm have R&D activities?

1. Yes
 2. No → **Skip to Q43**

39. What was the total number of persons working in R&D in your firm in 2005?

40. What was the amount of R&D expenditures in local currency in your firm in 2005?

\$ _____

41. Please indicate which of the following methods have been used by your firm to protect its intellectual property during 2004 and 2005.

1. Patents
 2. Trademarks
 3. Copyrights
 4. Confidentiality agreements
 5. Trade Secrets
 6. Other (specify):

42. How many patents have been granted to your firm in the period 2004-2005?

43. Does your firm use the internet?

1. Yes
 2. No → **Skip to Q45**

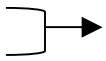
44. Please indicate the purposes for which you use the internet

Purposes	Yes	No
1. For email	<input type="checkbox"/>	<input type="checkbox"/>
2. For searchers on the world wide web	<input type="checkbox"/>	<input type="checkbox"/>
3. For selling your products or services to customers or clients	<input type="checkbox"/>	<input type="checkbox"/>
4. For advertising through a home page	<input type="checkbox"/>	<input type="checkbox"/>

GOVERNMENT SUPPORT PROGRAMMES

45. Did your firm make use of government support or assistance in its innovation activity?

- 1. Yes
- 2. No
- 3. Do not know



Skip to Q47

46. Please rate the importance of the following government support programs for innovation

Programs	Not important	Slightly important	Important	Very Important
1. Research and development funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Subsidies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Tax rebates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Technical support/advice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Infrastructure support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Loans and grants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Venture capital support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

47. Please give any suggestions on how government can encourage innovation in your firm.

Thank you for completing this questionnaire.

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