

# 6

## Chapter

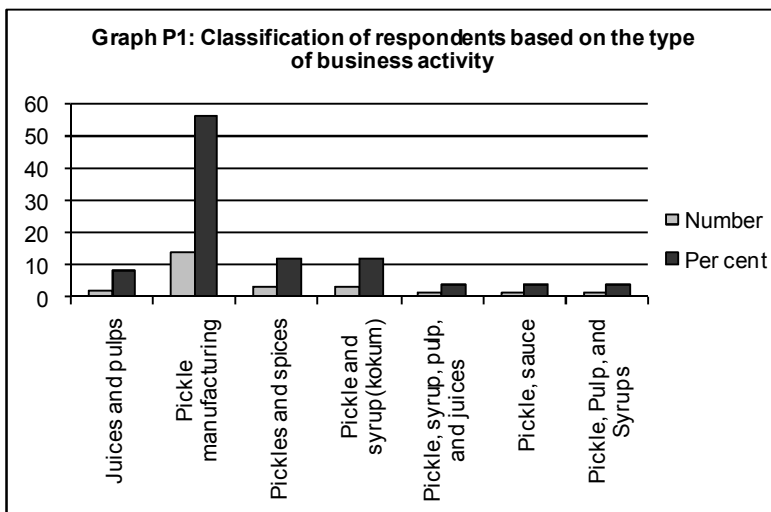
# Primary Research Pertaining to Processors

### Part A: Analysis of Introductory/General Information

**Table P1: Classification of respondents based on the type of business activity**

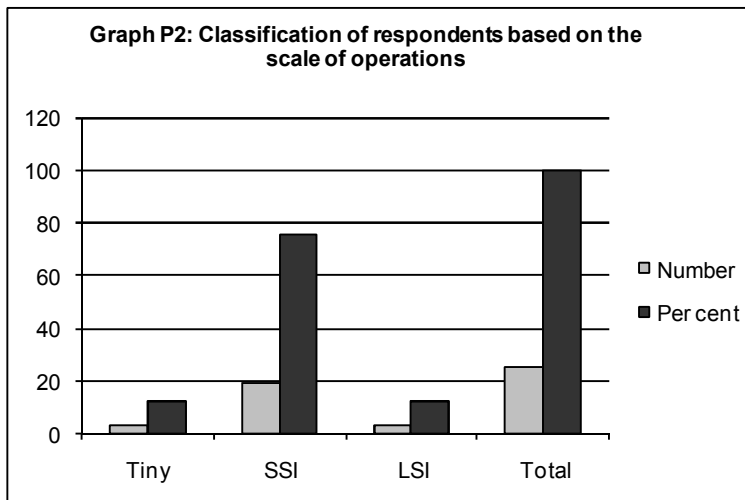
| <i>Sr. No.</i> | <i>Type of business activity</i> | <i>Number</i> | <i>Percent</i> |
|----------------|----------------------------------|---------------|----------------|
| 1              | Juices and pulps                 | 2             | 8              |
| 2              | Pickle manufacturing             | 14            | 56             |
| 3              | Pickles and spices               | 3             | 12             |
| 4              | Pickle and syrup (kokum)         | 3             | 12             |
| 5              | Pickle, syrup, pulp, and juices  | 1             | 4              |
| 6              | Pickle, sauce                    | 1             | 4              |
| 7              | Pickle, pulp, and syrups         | 1             | 4              |
|                | <b>Total</b>                     | <b>25</b>     | <b>100</b>     |

**Graph P1: Classification of respondents based on the type of business activity**



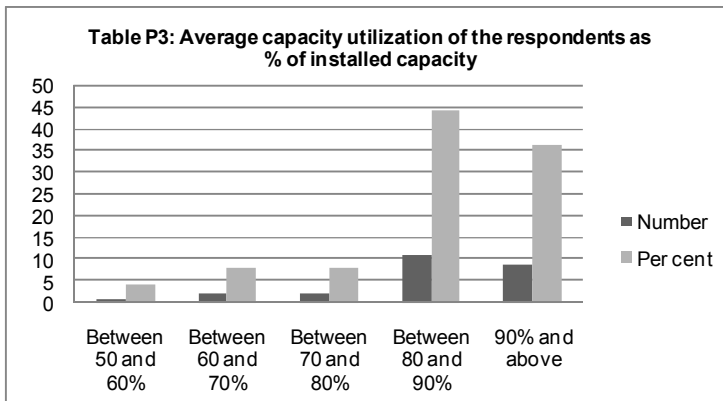
**Table P2: Classification of respondents based on the scale of operations**

| <i>Sr. No.</i> | <i>Scale of the unit</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--------------------------|---------------|----------------|
| 1              | Tiny                     | 3             | 12             |
| 2              | SSI                      | 19            | 76             |
| 3              | LSI                      | 3             | 12             |
|                | <b>Total</b>             | <b>25</b>     | <b>100</b>     |



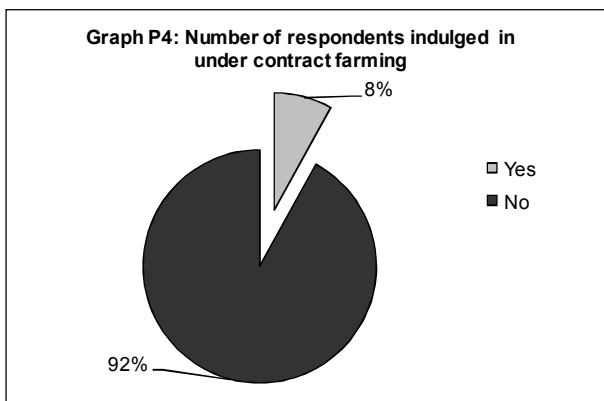
**Table P3: Average capacity utilization of the respondents as % of installed capacity**

| <i>Sr. No.</i> | <i>Average capacity utilization</i> | <i>Number</i> | <i>Percent</i> |
|----------------|-------------------------------------|---------------|----------------|
| 1              | Between 50 and 60%                  | 1             | 4              |
| 2              | Between 60 and 70%                  | 2             | 8              |
| 3              | Between 70 and 80%                  | 2             | 8              |
| 4              | Between 80 and 90%                  | 11            | 44             |
| 5              | 90% and above                       | 9             | 36             |
|                | <b>Total</b>                        | <b>25</b>     | <b>100</b>     |



**Table P4: Number of respondents indulged in under contract farming**

| <i>Sr. No.</i> | <i>Whether indulged in under contract farming or not</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | Yes  | 2             | 8              |
| 02             | No   | 23            | 92             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



## Research Findings and Discussion

From the tables (Table P01 to P04) and Graphs (Graph P01 to P04) shown above, the following inferences can be drawn:

1. As shown in Table P01 and displayed in Graph P01, Fruit processing industry of India as a whole can be categorically

divided into following main business activities, ranked based on their contribution as follows;

- (i) Pulp manufacturing
  - (ii) Juice manufacturing
  - (iii) Pickle manufacturing
  - (iv) Syrup manufacturing
  - (v) Sauce manufacturing
2. As shown in Table P02 and displayed in Graph P02, Fruit processing industry, especially mango processing industry of India is dominated by large number of SSIs (Small Scale Industries) (76%) spread all across the nation. Tiny industries account for 12 percent and LSIs (Large Scale Industries) account for remaining 12 percent. Even though the no. of LSIs is less, contribution wise or production wise, it stands first. A good example is; only one company, i.e., 'Jain group of companies' (Jain Irrigation) of Maharashtra consume around 35 percent of total mango production of India. Similarly one can identify big companies like 'Vadilal', 'Godrej', 'Marico', 'Cleanfoods', 'Pepsico', 'Parle', etc., contributing significantly to total production of the country. Many of these big giants have entered in to this industry or expanded their operations to a large scale recently, i.e., in last ten years. This clearly shows the vast potential which this sector has in store for India.
  3. As shown in Table P03 and displayed in Graph P03, 80 percent of the respondents have utilized their capacity to, 80 percent and above, the installed capacity. This clearly indicates that the installed capacity is being utilized to a maximum level and there is tremendous scope to create new facilities and also to expand the capacity. In management terms, there lies huge scope for integration, i.e., both horizontal and vertical (forward and backward) integration. Many companies have laid out a detailed plan for integration and some are at the implementation stage.
  4. As shown in Table P04 and displayed in Graph P04, only 8 percent of the total respondents have indulged in some kind of under contract farming. This is a serious cause for concern, which is going to impose serious limitations on the growth of this sector. The Indian fruit processing industry can flourish only when it becomes fully integrated, i.e., concept of 'from the farm gate to customers' plate' will become a reality. This requires backward integration. So, possible mechanisms, which will facilitate this integration process, have to be followed.

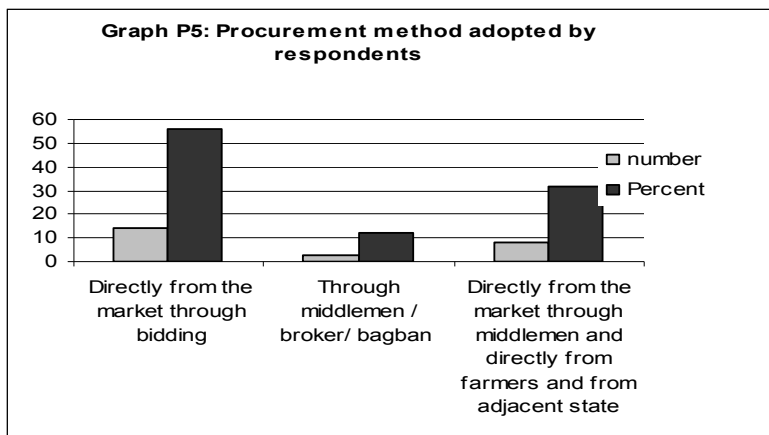
When we compare Indian fruit processing industry with the Brazilian one, we find that majority of the cultivators (or group of cultivators) of Brazil are so big that they have their own processing units. Those processors who don't own farms enter into buy back agreement with cultivators (or group of cultivators). This clearly means that all cultivators are processors and vice-versa, whereas in India we find huge gap between these two sections. They are not as closely tied-up as in Brazil. The gap can be bridged through combined integrated efforts from all the stake holders.

The above discussion clearly rejects Ho-04 and accept Ha-04 which state "Lack of integration of all the activities starting from farm gate till final consumers because of ill functioning of the Government departments/nodal agencies/institutions with no clear direction and goals prohibit the mango processing industry of India from attaining the desired growth".

**Part B (a): Analysis of Specific Information Pertaining to Procurement and Storing**

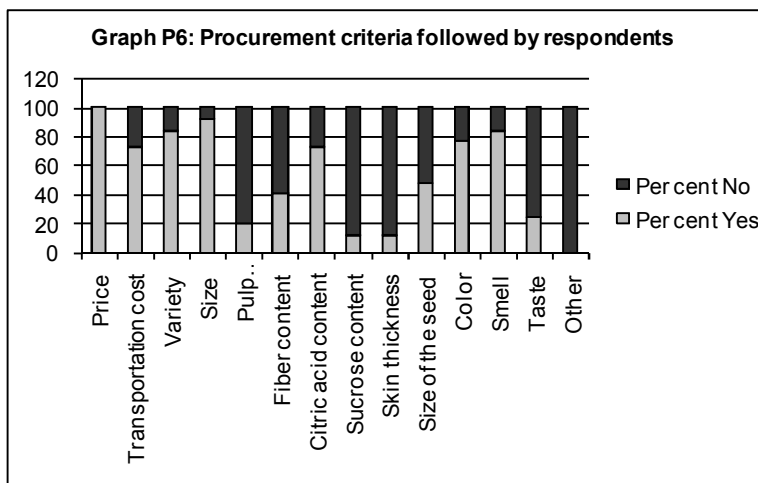
**Table P5: Procurement method adopted by respondents**

| <i>Sr. No.</i> | <i>Procurement Method</i>  | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | Directly from the market through bidding   | 14            | 56             |
| 02             | Through middlemen/broker/ bagban   | 3             | 12             |
| 03             | Directly from the market through middlemen and directly from farmers and from adjacent state | 8             | 32             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |

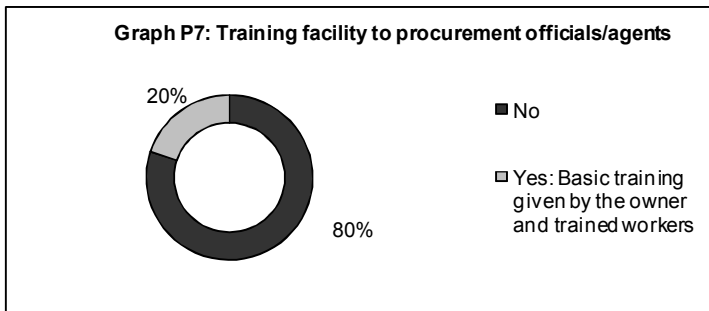


**Table P6: Procurement criteria followed by respondents**

| <i>Sr. No.</i> | <i>Procurement criteria</i> | <i>Number</i> |           | <i>Percent</i> |           |
|----------------|-----------------------------|---------------|-----------|----------------|-----------|
|                |                             | <i>Yes</i>    | <i>No</i> | <i>Yes</i>     | <i>No</i> |
| 01             | Price                       | 25            | 0         | 100            | 0         |
| 02             | Transportation cost         | 18            | 7         | 72             | 28        |
| 03             | Variety                     | 21            | 4         | 84             | 16        |
| 04             | Size                        | 23            | 2         | 92             | 8         |
| 05             | Pulp content/recovery       | 5             | 20        | 20             | 80        |
| 06             | Fiber content               | 10            | 15        | 40             | 60        |
| 07             | Citric acid content         | 18            | 7         | 72             | 28        |
| 08             | Sucrose content             | 3             | 22        | 12             | 88        |
| 09             | Skin thickness              | 3             | 22        | 12             | 88        |
| 10             | Size of the seed            | 12            | 13        | 48             | 52        |
| 11             | Color                       | 19            | 6         | 76             | 24        |
| 12             | Smell                       | 21            | 4         | 84             | 16        |
| 13             | Taste                       | 6             | 19        | 24             | 76        |
| 14             | Other                       | 0             | 25        | 0              | 100       |

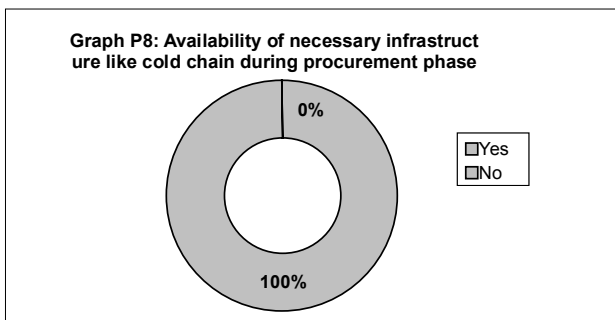
**Table P7: Training facility to procurement officials/agents**

| <i>Sr. No.</i> | <i>Whether necessary training given or not</i>             | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | No   | 20            | 80             |
| 02             | Yes: Basic training given by the owner and trained workers | 5             | 20             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



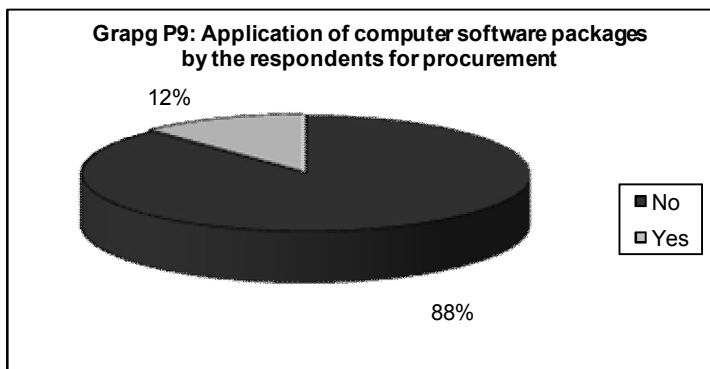
**Table P8: Availability of necessary infrastructure like cold chain during procurement phase**

| <i>Sr. No.</i> | <i>Availability of the infrastructure</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | No  | 25            | 100            |
| 02             | Yes                                       | 0             | 0              |
|                | <b>Total</b>                              | <b>25</b>     | <b>100</b>     |



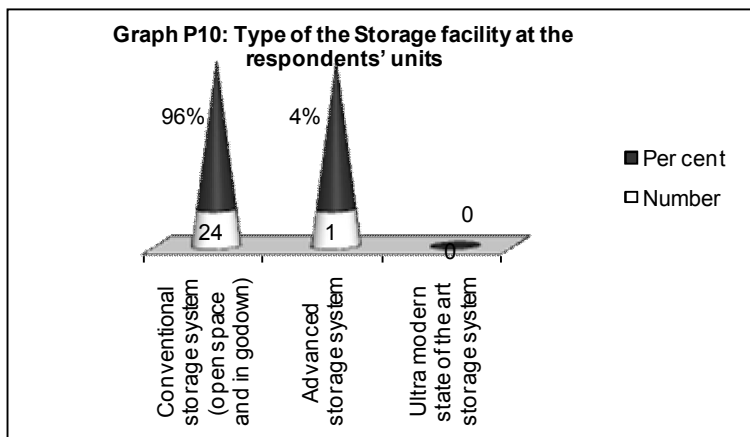
**Table P9: Application of computer software packages by the respondents for procurement**

| <i>Sr. No.</i> | <i>Usage of computer software packages like SAP, ERP, etc. in any of the processes</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | No   | 22            | 88             |
| 02             | Yes  | 3             | 12             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



**Table P10: Type of the Storage facility at the respondents' units**

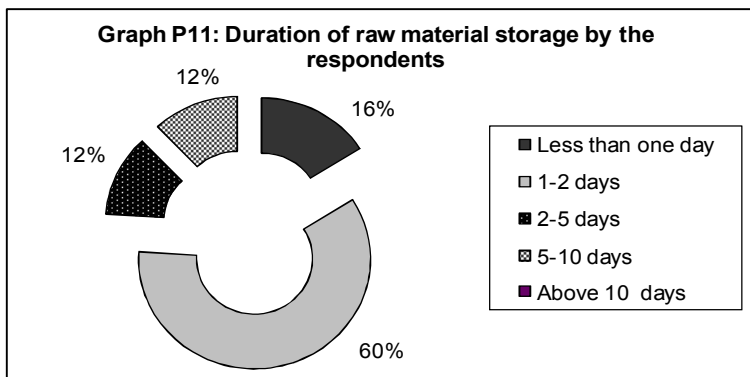
| <i>Sr. No.</i> | <i>Type of storage facility</i>                        | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | Conventional storage system (open space and in godown) | 24            | 96             |
| 02             | Advanced storage system                                | 1             | 4              |
| 03             | Ultra modern state-of-the- art storage system          | 0             | 0              |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |





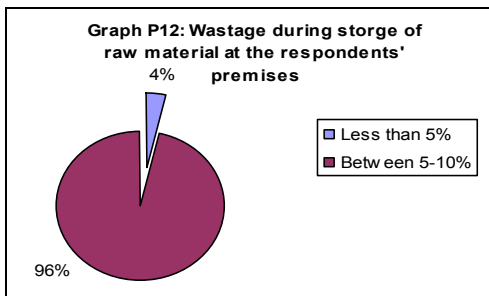
**Table P11: Duration of raw material storage by the respondents**

| <i>Sr. No.</i> | <i>Duration of raw material storage</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | Less than one day                       | 4             | 16             |
| 02             | 1-2 days                                | 15            | 60             |
| 03             | 2-5 days                                | 3             | 12             |
| 04             | 5-10 days                               | 3             | 12             |
| 05             | Above 10 days                           | 0             | 0              |
|                | <b>Total</b>                            | <b>25</b>     | <b>100</b>     |



**Table P12: Wastage during storage of raw material at the respondents' premises**

| <i>Sr. No.</i> | <i>Wastage during Storage of raw material</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | Less than 5%                                  | 1             | 4              |
| 02             | Between 5-10%                                 | 23            | 96             |
|                | <b>Total</b>                                  | <b>24</b>     | <b>100</b>     |



## Research Findings and Discussion

From the tables (Table P05 to P12) and graphs (Graph P05 to P12) shown above, following inferences can be drawn:

1. From the Table P05 and corresponding Graph P05 shown above, it is clear that nearly 44 percent of the total respondents procure the fruits through middle men. Remaining 56 percent of the respondents procure the fruits directly from the terminal markets through bidding process. But it is also true that the middle men/bagbans/brokers undertake bidding in terminal markets too. They are the sole people who dominate and control the terminal markets as well. They indulge in all sorts of price fixation/stock hoarding arrangements with the farmers as well as processors. Such practices create unhealthy competition in the market and disturb the entire equilibrium of the market, which will put both the farmer and processor to disadvantage.

Need of the hour is to create a common platform for both farmers and processors where-in they can interact freely and do the business. They both can enter in to arrangements like; under contract farming, buy back agreements, both forward as well as backward integrations, etc. Both parties will get benefited through such a kind of reciprocative arrangement between them. The role of the middlemen, if at all required, will be just to act as facilitator and nothing else. As discussed in the previous chapter (Chapter 5) concept of “Rural Business Hubs” should be implemented.

2. From the Table P06 and the corresponding Graph P06 shown above, it becomes clear that pulp content (recovery), sucrose content, skin thickness, and taste are the key criteria followed by processors while procuring the fruits. Whereas fiber content and the size of the seed are the next important criteria.

Farmers will be better off financially and otherwise also if they grow varieties which are rich in the following attributes:

- (i) High pulp content (recovery)
- (ii) High sucrose content
- (iii) Lesser skin thickness
- (iv) Mouth watering taste
- (v) Fiber content
- (vi) Smaller seed size

These are the attributes demanded by the processors as they result in higher yield, higher productivity, better taste, and higher profits. Varieties having the above listed features like 'Alphonso' (which has all the above attributes) need to be grown. Such varieties will fetch better price in the market for farmers. Moreover there is great export demand for such varieties (both as a fresh fruit and also as processed fruit product in the form of pulp, squash or juice) in the international markets and fetch higher price to processors. But unfortunately such varieties, collectively, account for 5 percent (approx) of total national production of mangoes and contribute to 95 percent (approx) of total exports.

The above discussion clearly rejects Ho-01 and accepts Ha-01 which states "Indian fruit processing industry especially mango processing industry is affected by non-availability of high yield, high pulp containing varieties of mangoes that also have high resistance towards pest attack, which are ideal for processing".

Thus growing such varieties will strengthen the overall position, including financial position of cultivators as well as processors.

3. From the Table P07 and corresponding Graph P07 shown above, it becomes evident that 80 percent of the respondents do not impart training of any kind to the procurement officers, where as remaining 20 percent of the respondents give the necessary in house, on the job training to procurement officials.

**Calculated Chi-square value:** 9.00, being higher than table value: 3.84, we reject the null hypothesis which state that 50 percent of the processors impart necessary training to procurement officials.

This gives a signal that fruit processors of India are running their business in a traditional manner. They need to become more professional and providing necessary training to people involved is one key step in this direction.

4. From the Table P08 and corresponding Graph P08 shown above, it can be inferred that Indian fruit processors lack the necessary infrastructure like; cold chain facility which includes cold storage units, pre-cooling units, refrigerated vans, etc., adequate processing capacity, full-fledge transportation facilities, etc.

**Calculated Chi-square value:** 25.00, being much higher than the table value: 3.84, we reject the null hypothesis which state that 50 percent of the processors have the necessary infrastructure pertaining to procurement.

Having necessary infrastructure at the disposal of fruit processors is one of the critical success factors (CSFs) of this business. So all the stake holders of this industry should come together and join their hands and work on a common agenda of building the required infrastructure. In simpler words, it calls for integrated movement encompassing all the stake holders naming;

- (i) Government departments, nodal bodies, and institutions like; NHB, NHM, Agricultural Universities, State horticultural departments, CFTRI, APEDA, NABARD, MOFPI, etc.
- (ii) Private and Public fruit processors
- (iii) Fruit cultivators
- (iv) Cold chain members
- (v) The State and the Central Government (Agriculture ministry)
- (vi) Cultivators Co-operative organizations, Processors Co-operative organizations, other Associations, NGOs, etc.
- (vii) Middlemen
- (viii) Retailers, whole-sellers, super markets, and other channel members.

From the above discussion we can clearly reject Ho-04 and accept Ha-04 which states “Lack of integration of all the activities starting from farm gate till final consumers because of ill functioning of the Government departments/nodal bodies/Institutions, with no clear direction and goals prohibit the fruit processing industry of India from attaining the desired growth”.

5. From the Table P09 and corresponding Graph P09, it is clear that only 12 percent of the respondents use the computer software packages that too ‘Tally’ accounting software package only. Remaining 88 percent of the respondents don’t use any kind of computer software packages like; TALLY, SAP, ERP, MRP, etc.

**Calculated Chi-square value:** 14.4, being much higher than the table value: 3.84, we reject the null hypothesis which state that 50 percent of the processors use the computer software packages like SAP, ERP, MRP, etc.

This indeed is a serious cause for concern and need to be addressed. Usage of computer software packages like SAP, MRP, ERP, etc. will equip the firm with real time information, quick processing of the

information, enhanced productivity, better decision quality, fool proof networking, negligible duplication efforts, etc.

The fruit processors have to embrace the technological advancements made in this particular sector and reap the benefits associated.

6. From the Tables P10 to P 12 and corresponding Graphs P10 to P12 shown above, the following inferences can be drawn;
  1. Almost all respondents except one have traditional /conventional storage facility (Open space and godowns). None of the respondents possess ultramodern or state-of-the-art storage facility.

**Calculated Chi-square value:** 44.3, being much higher than the table value: 5.99, we reject the null hypothesis which state that 33.33 percent of the processors possess the advanced storage facility and the same no. of respondents possess the ultramodern storage facility.

2. 76 percent of the total respondents store the fruits for less than two days, due to lack of necessary storage facility, whereas 12 percent of the remaining respondents could store the fruits for 2 to 5 days and the balance 12 percent could store the raw material for 5 to 10 days as they have an access to advanced storage facility.
3. Almost all processors except one waste around 5 to 10 percent of total fruits during storage phase due to inadequate storage facility at their end and inaccessibility to sophisticated state-of-the-art storage facility elsewhere.

Thus storage facility is another key area that needs substantial improvements. Fruit processors are tolerating huge loss of fruits, to an alarming levels of 5 to 10 percent, due to non availability of advanced storage facilities like;

- (i) Cold storage units
- (ii) Pre-cooling centers
- (iii) Refrigerated transportation facilities
- (iv) Freeze drying units
- (v) Vapor Heat Treatment (VHT) facilities, etc.

Above discussion clearly reject Ho-02 and accept Ha-02 which states “Indian fruit processing industry, especially mango processing industry is plagued with lack of necessary infrastructure that is required for harvesting, transporting, raw material storing, grading, processing

and packing, marketing of the output, etc. This is a serious bottleneck for this industry”.

This again calls for the joint effort by all the stakeholders as discussed above. Co-operative movement is another promised solution for this problem. All regional processors have to come together and form a Co-operative society/association like; ‘All Karnataka Pickle Manufacturing Association’ (APKMA), a pickle manufacturers association, formed in the year 2006. AKPMA has a total membership of around 60. Membership fee is ₹ 1,000 every year. All the members meet frequently at different places or member’s manufacturing premises and discuss the upcoming issues and problems facing them like;

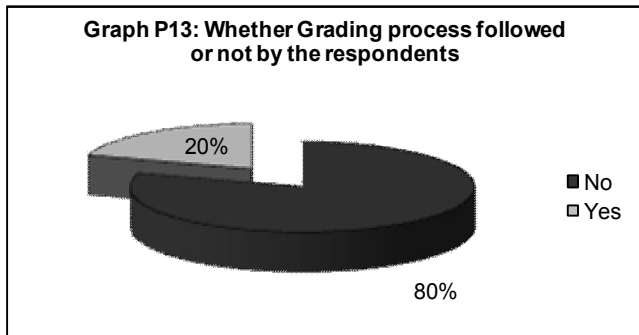
1. Modifications in the FPO (Fruit Processing Order) regulations as laid by MOFPI (Ministry of Food Processing Industries), India. Entrepreneurs who want to enter in to this industry will get all the support from the association and the association will make them aware of all the norms/regulations of FPO and liaise with FPO till they get the FPO license.
2. Changing tax structures. Recently the association succeeded in convincing the State Government to bring down the VAT (Value Added Tax) from 12.5 percent to 4 percent during 2007 and later from 4 percent to 0 percent during 2008.
3. Upcoming legislative issues pertaining to this industry. Recently the association succeeded in convincing the State Government and the Karnataka State Pollution Control Board (KSPCB) to treat this industry as a green industry which means Pickle manufacturers of Karnataka need not have to take the clearance from KSPCB.
4. The Association arranges seminars, conferences, lectures, visits, etc., so that all the processors get benefited in terms of added knowledge and skills. It also provides escort services to the processors who are facing problems in dealing with the Government offices.

From the above discussions we can reject null hypotheses Ho-03 and accept alternate hypotheses Ha-03 which states, “Lack of cooperative effort amongst processing community is a serious hindrance that prohibits this industry from reaping the benefits of larger economies of scale and higher value addition”.

**Part B (b): Analysis of specific information pertaining to grading, cleaning, processing and packing**

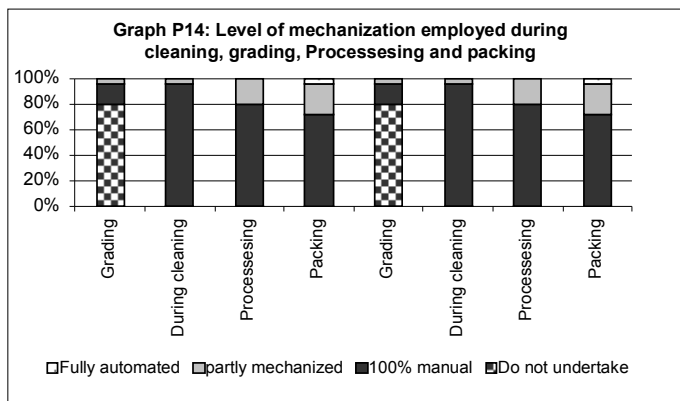
**Table P13: Whether Grading process followed or not by the respondents**

| <i>Sr. No.</i> | <i>Grading process followed or not</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | No                                     | 20            | 80             |
| 2              | Yes                                    | 5             | 20             |
|                | <b>Total</b>                           | <b>25</b>     | <b>100</b>     |



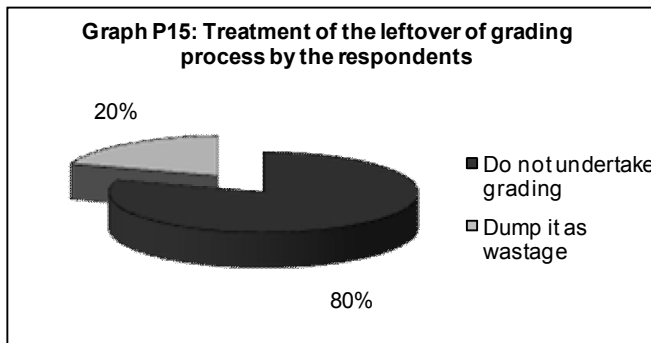
**Table P14: Level of mechanization employed during cleaning, grading, Processing and packing**

| <i>Sr. No.</i> | <i>Level of mechanization</i> | <i>Number</i>  |                        |                   |                | <i>Percent</i> |                        |                   |                |
|----------------|-------------------------------|----------------|------------------------|-------------------|----------------|----------------|------------------------|-------------------|----------------|
|                |                               | <i>Grading</i> | <i>During cleaning</i> | <i>Processing</i> | <i>Packing</i> | <i>Grading</i> | <i>During cleaning</i> | <i>Processing</i> | <i>Packing</i> |
| 1              | Do not undertake              | 20             | 0                      | 0                 | 0              | 80             | 0                      | 0                 | 0              |
| 2              | 100% manual                   | 4              | 24                     | 20                | 18             | 16             | 96                     | 80                | 72             |
| 3              | Partly mechanized             | 1              | 1                      | 5                 | 6              | 4              | 4                      | 20                | 24             |
| 4              | Fully automated               | 0              | 0                      | 0                 | 1              | 0              | 0                      | 0                 | 4              |



**Table P15: Treatment of the leftover of grading process by the respondents**

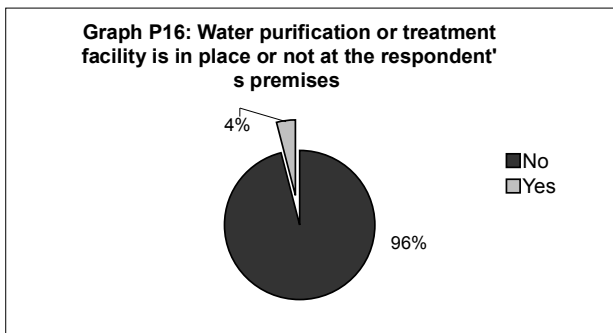
| <i>Sr. No.</i> | <i>Treatment of the leftover of grading</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | Do not undertake grading                    | 20            | 80             |
| 2              | Dump it as wastage                          | 5             | 20             |
|                | <b>Total</b>                                | <b>25</b>     | <b>100</b>     |



**Table P16: Water purification or treatment facility is in place or not at the respondent's premises**

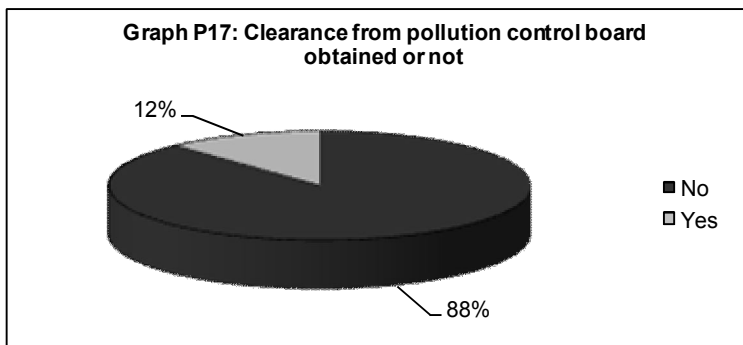
| <i>Sr. No.</i> | <i>Whether water purification/treatment plant in place or not</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | No  | 24            | 96             |
| 02             | Yes   | 1             | 4              |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |





**Table P17: Clearance from pollution control board obtained or not**

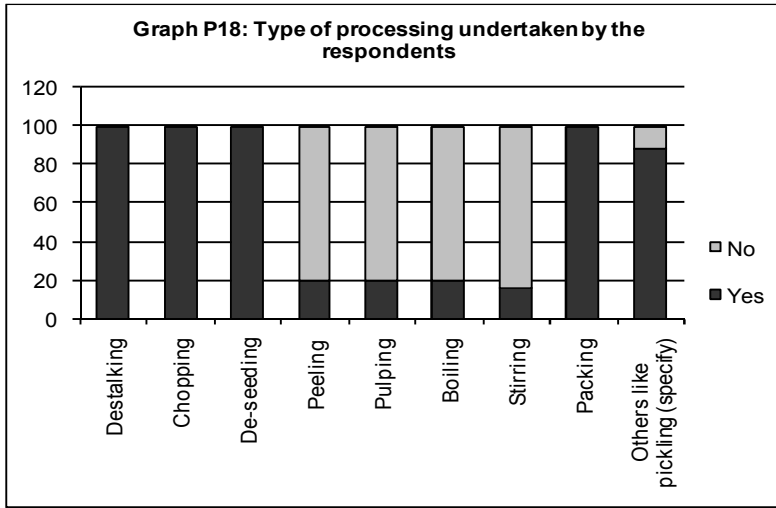
| <i>Sr. No.</i> | <i>Whether clearance from pollution control board obtained or not</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | No  | 22            | 88             |
| 02             | Yes   | 3             | 12             |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



**Table P18: Type of processing undertaken by the respondents**

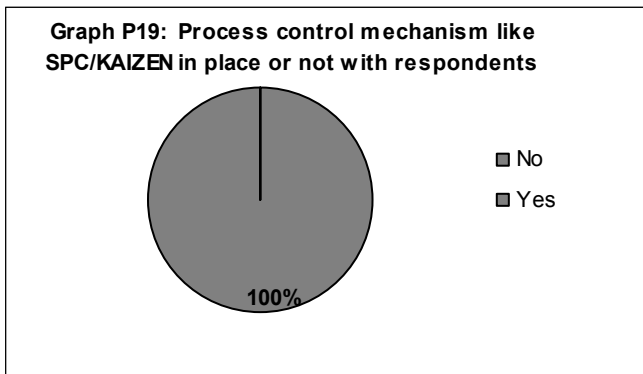
| <i>Sr. No.</i> | <i>Type of Processing undertaken</i> | <i>Number</i> |           | <i>Percent</i> |           |
|----------------|--------------------------------------|---------------|-----------|----------------|-----------|
|                |                                      | <i>Yes</i>    | <i>No</i> | <i>Yes</i>     | <i>No</i> |
| 1              | Destalking                           | 25            | 0         | 100            | 0         |
| 2              | Chopping                             | 25            | 0         | 100            | 0         |
| 3              | De-seeding                           | 25            | 0         | 100            | 0         |
| 4              | Peeling                              | 5             | 20        | 20             | 80        |
| 5              | Pulping                              | 5             | 20        | 20             | 80        |
| 6              | Boiling                              | 5             | 20        | 20             | 80        |
| 7              | Stirring                             | 4             | 21        | 16             | 84        |

|   |                                |    |   |     |    |
|---|--------------------------------|----|---|-----|----|
| 8 | Packing                        | 25 | 0 | 100 | 0  |
| 9 | Others like pickling (specify) | 22 | 3 | 88  | 12 |



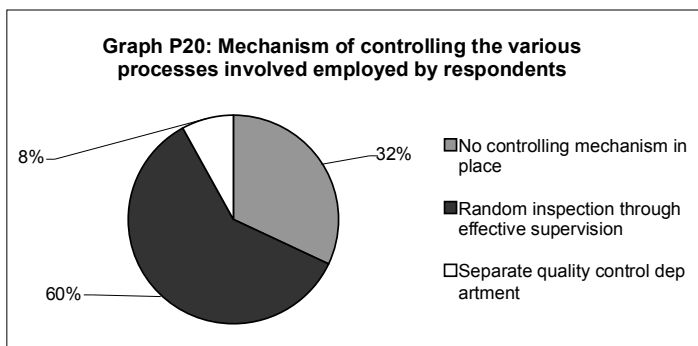
**Table P19: process control mechanism like SPC/KAIZEN in place or not with respondents**

| <i>Sr. No.</i> | <i>Is there any process control mechanism like SPC/KAIZEN in place or not</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No  | 25            | 100            |
| 2              | Yes   | 0             | 0              |



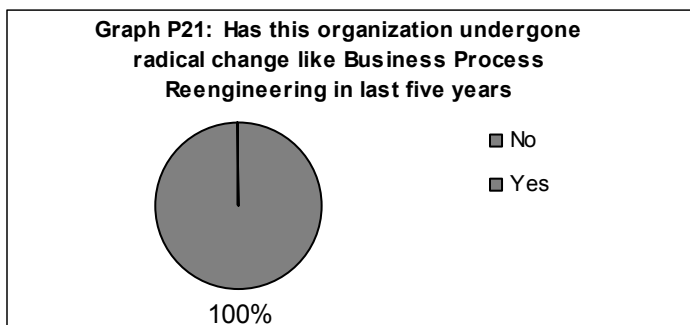
**Table P20: Mechanism of controlling the various processes involved employed by respondents**

| <i>Sr. No.</i> | <i>How would you control the various processes involved</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No controlling mechanism in place                           | 8             | 32             |
| 2              | Random inspection through effective supervision             | 15            | 60             |
| 3              | Separate quality control department                         | 2             | 8              |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



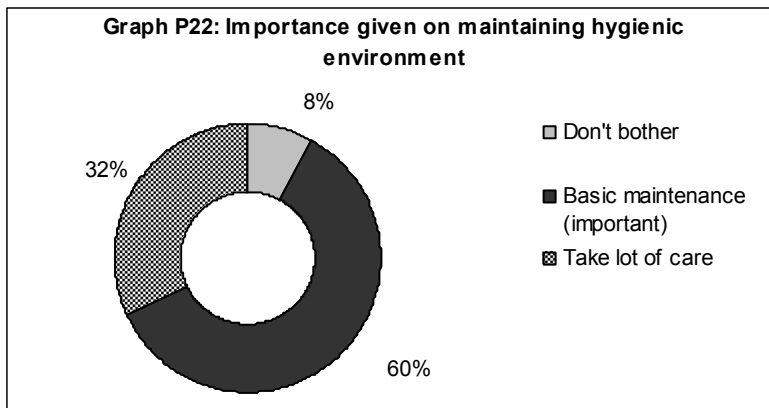
**Table P21: Has this organization undergone radical change like Business Process Reengineering in last five years**

| <i>Sr. No.</i> | <i>Has this org. undergone radical changes like Business Process Reengineering in last 5years</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | No  | 25            | 100            |
| 02             | Yes   | 0             | 0              |

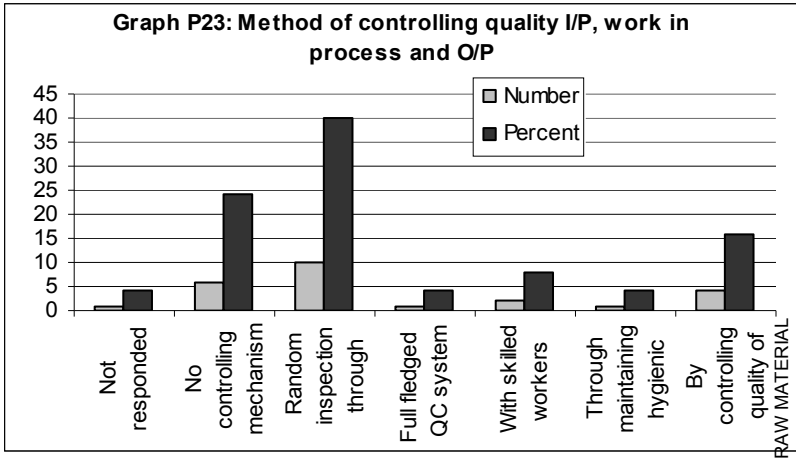


**Table P22: Importance given on maintaining hygienic environment**

| <i>Sr. No.</i> | <i>How much importance you give on maintaining hygienic environment</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 01             | Don't bother  | 2             | 8              |
| 02             | Basic maintenance (important)   | 15            | 60             |
| 03             | Take lot of care  | 8             | 32             |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |

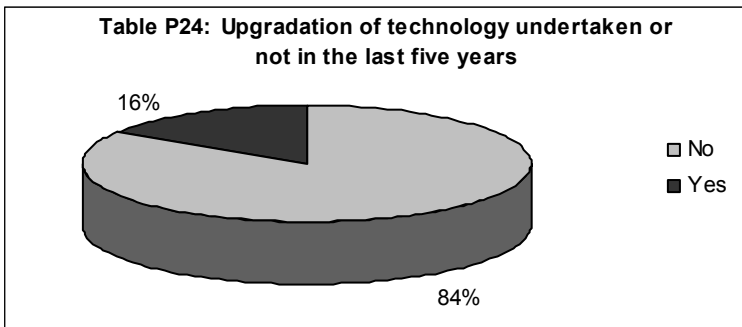
**Table P23: Method of controlling quality I/P, work in process and O/P**

| <i>Sr. No.</i> | <i>How would you control quality I/P, work in process and O/P</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | Not responded   | 1             | 4              |
| 2              | No controlling mechanism in place                                 | 6             | 24             |
| 3              | Random inspection through effective supervision                   | 10            | 40             |
| 4              | Full fledged QC system  | 1             | 4              |
| 5              | With skilled workers  | 2             | 8              |
| 6              | Through maintaining hygienic environment                          | 1             | 4              |
| 7              | By controlling quality of RAW MATERIAL                            | 4             | 16             |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



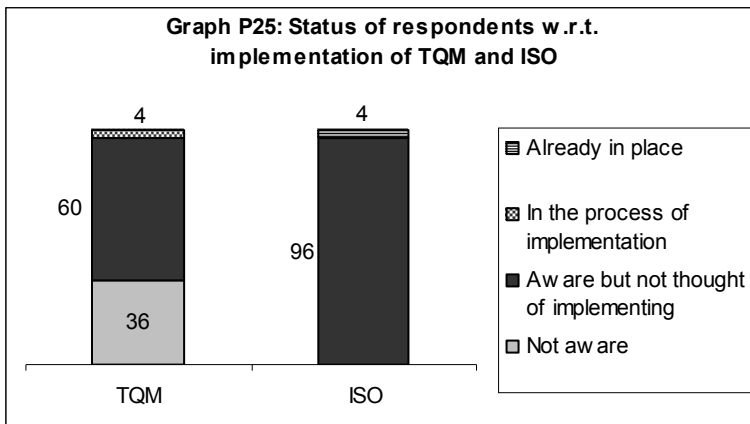
**Table P24: Upgradation of technology undertaken or not in the last five years**

| Sr. No. | Upgradation of technology undertaken or not in the last five years | Number    | Percent    |
|---------|--|-----------|------------|
| 1       | No   | 21        | 84         |
| 2       | Yes  | 4         | 16         |
|         | <b>Total</b>   | <b>25</b> | <b>100</b> |



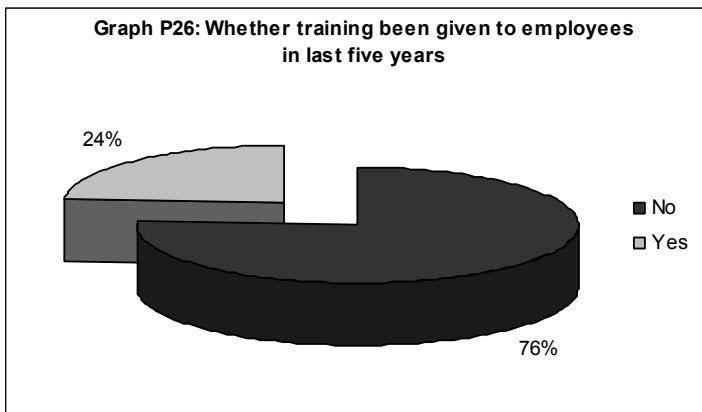
**Table P25: Status of respondents w.r.t. implementation of TQM and ISO**

| Sr. No. | Status w.r.t. implementation of TQM and ISO | Number    |           | Percent    |            |
|---------|---|-----------|-----------|------------|------------|
|         |   | TQM       | ISO       | TQM        | ISO        |
| 1       | Not aware                                   | 9         | 0         | 36         | 0          |
| 2       | Aware but not thought of implementing       | 15        | 24        | 60         | 96         |
| 3       | In the process of implementation            | 1         | 0         | 4          | 0          |
| 4       | Already in place                            | 0         | 1         | 0          | 4          |
|         | <b>Total</b>                                | <b>25</b> | <b>25</b> | <b>100</b> | <b>100</b> |



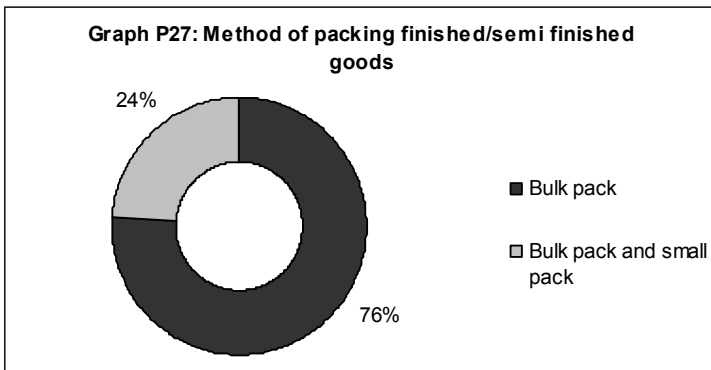
**Table P26: Whether training been given to employees in last five years**

| <i>Sr. No.</i> | <i>Whether any Training been given to employees in last five years</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | No   | 19            | 76             |
| 02             | Yes  | 6             | 24             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



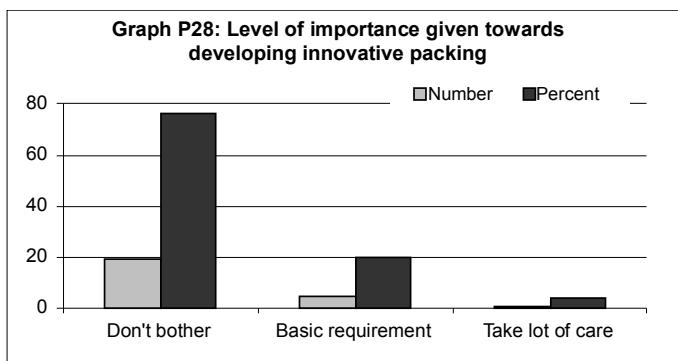
**Table P27: Method of packing finished/semi finished goods**

| <i>Sr. No.</i> | <i>How do you pack your finished/semi finished goods</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 01             | Bulk pack  | 19            | 76             |
| 02             | Bulk pack and small pack                                 | 6             | 24             |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



**Table P28: Level of importance given towards developing innovative packing**

| <i>Sr. No.</i> | <i>How much importance you give towards developing innovative packing</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | Don't bother  | 19            | 76             |
| 2              | Basic requirement   | 5             | 20             |
| 3              | Take lot of care  | 1             | 4              |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



## Research Findings and Discussion

From the Tables P13 to P28 and corresponding Graphs P13 to P28 shown above, following inferences can be drawn:

1. From the Tables P13 and P15 and Graphs P13 and P15, it is clear that only 20 percent of the processors undertake grading, whereas remaining 80 percent of the processors don't. Moreover those who undertake grading don't know how to

process the wastage or leftover. They simply dump the leftover as wastage.

Processing fruits without grading is unthinkable and should be avoided. Damaged, diseased, immature, defective, and spoiled fruits need to be separated out from the good ones. If not, entire lot may have to be rejected at a later stage. Processors should think of utilizing the leftovers. If utilized properly the processors may turn this activity into a promising and money making opportunity. Utilizing mango kernels is one good e.g. Mango kernel oil extracted out of mango kernel has a great demand in the international markets. This is processed further and sold as mango butter/mango margarine in the developed markets that too at a premium price. It is also used as one of the key ingredients in manufacturing of organic cosmetic products like facial creams, hair tonics, etc.

2. From the Table P14 and Graph P14, it becomes evident that nearly 72-96 percent of the respondents undertake all the primary activities, i.e., cleaning, processing and packing using 100 percent manual techniques/operations. This is one of the grave challenges facing Indian fruit processing industry. This also is one of the key reasons why Indian fruit products are not being seen favorably in the international markets. Lack of mechanization, computerization, and integration hinders the productivity and performance of the processors and quality of the products as well. This will weaken the competitiveness of Indian processors both in the local and international markets.
3. From the Table P16 and Graph P16, it is clear that only one processor out of 25 fruit processors has some kind of water purification/treatment plant in place. This is quite alarming as fruit processing industry is a water based industry. Processors require lot of water. If they don't recycle water then the entire industry may face problem of acute shortage of water. This is one important part of building necessary infrastructure.

**Calculated Chi-square value:** 21.2, being much higher than the table value: 3.841, we reject the null hypothesis stating that 50 percent of the processors have such necessary infrastructure.

4. From the Table and corresponding Graph P17, it becomes evident that Indian fruit processing industry lacks professionalism and functions more like an unorganized sector. Only three out of 25 processors have obtained clearance from the State Pollution Control Board (SPCB).



**Calculated Chi-square value:** 14.4, being much higher than the table value: 3.84, we reject the hypothesis which state that 50 percent of processors have obtained clearance from SPCB.

Fruit processors need to follow the ethics and the corporate governance philosophy, and abide by all the rules and regulations. Polluting the environment is against corporate governance and ethics also. So necessary measures have to be taken by the processing community to prevent this.

5. From the Table and Graph P18, it is clear that different processors have different sequence of processes in place. The process flow chart is not common to entire industry. Based on the type of the processed product, combination of the processes varies.

Pickle manufacturing involves destalking, chopping (in to two pieces), deseeding, Slicing into required sizes (ranging from 0.5 sq inches to 01 sq inches), pickling, and packing. Whereas pulping involves destalking, chopping, de-seeding, peeling, pulping, boiling, stirring and packing.

6. From the Table and Graph P19, it becomes crystal clear that none of the respondents have thought of adopting quality control mechanisms like SPC/Kaizen/SQC/Six sigma/Quality Control/House of quality/etc. Improvement of quality and that too, to international standards, is only possible through adopting such quality control mechanisms. If the Indian fruit processors want to create niche in the international markets and compete globally, they should be aggressive in adopting such quality improvement techniques. If quality improves, loss at various stages will decrease resulting in increasing of productivity and the yield. This will ensure that the cost will be lowest when compared with competitors. This will allow Indian processors to price their products at par with global leaders and increase their market share and also help them in fetching a premium price (for maintaining high level of quality) for their products in the international markets.

**Calculated Chi-square value:** 25.00, being much higher than the table value: 3.84, we reject the null hypothesis which state that 50 percent of the fruit processors have adopted quality control mechanisms like SQC/SPC/Kaizen/Six sigma/House of quality/Quality Circles and Councils/ etc.

7. From the Table and Graphs P20 and P23, it is clear that only 8 percent of the respondents have a separate Quality Control department to control quality. 60 percent of the respondents control quality through random inspection and effective supervision, whereas remaining 32 percent of the respondents have no controlling mechanism of whatsoever to control quality.

Fruit processors cannot control quality through random inspection and effective supervision only. There is a strong need to have some sort of controlling mechanism to control quality on continuous basis. Having sound Quality Control mechanism/doctrine is one of the Critical Success Factor (CSF) of this industry.

**Calculated Chi-square value:** 10.2, being much higher than table value: 5.99, we reject the null hypothesis which state that 33.33 percent of the processors possess the required Quality Control mechanism.

8. From the Table and Graph P21, it is clear that none of the respondents' organizations have undergone radical changes like BPRE (Business Process Re-engineering) in last five years.

**Calculated Chi-square value:** 25, being much higher than the table value: 3.84, we reject the null hypothesis which state that 50 percent of the fruit processors' organizations have undergone radical changes like BPRE.

For an industry to flourish, it is must that organizations, not only accept the change but be flexible enough to anticipate the change well in advance and be ready to accommodate the change with little or no resistance. Sometimes organizations should also undergo radical changes like BPRE to cope up with dramatic changes happening at the industry level.

9. From the Table and Graph P22, it can be noticed that 32 percent of the respondents take lot of care on maintaining hygienic environment in and around processing unit. 60 percent of the respondents undertake basic maintenance whereas remaining 8 percent of the respondents don't bother about hygiene.

Maintaining hygienic environment is one of the prerequisites of this industry as the end product is meant for human consumption. Processors can't afford taking risk of compromising on hygienic environment. Taking utmost care on maintaining 100 percent hygiene, in and around the unit, is one of the KSFs (Key Success Factors) to succeed in this industry.

10. From the Table and Graph P24, it is evident that only 16 percent of the respondents have undertaken Upgradation of technology in the last five years, whereas remaining 84 percent of the respondents have not thought about it.

**Calculated Chi-square value:** 11.6, being much higher than the table value: 3.84, we reject the null hypothesis which state that 50 percent of the respondents have undertaken technology Upgradation projects.

If Indian fruit processing industry wants to compete globally with international giants, it has to keep upgrading the technology and become leader when it comes to usage of upcoming contemporary technologies. Processors should, not only think of using the latest technology available but also develop new technologies in-house. Through technology Upgradation, productivity and quality improves, and thus provides a competitive advantage over international giants.

11. From the Table and Graph P25, it is clear that only one processor out of 25 processors has got ISO certification, whereas remaining 96 percent are aware of the benefits of ISO but never thought of applying for certification. Similarly only one respondent out of 25 respondents is in the process of implementing TQM and 15 respondents are aware of the benefits of TQM but never thought of implementing, whereas remaining 9 respondents are not even aware of TQM.

This clearly reveals the competency level of Indian Fruit Processing Industry. Having ISO certification and implementing TQM has to be made mandatory for all processors. Government departments /nodal bodies/institutions should help processors in this. Simply giving reimbursement of ₹ 75,000 per organization for getting ISO certification (Central Government had launched a scheme to reimburse ₹ 75,000 for spending around ₹ 1,00,000 for getting ISO certification) is not enough rather they should focus on the following;

- (i) Creating awareness about TQM and ISO
- (ii) Educating processors about how to implement TQM and bag ISO certification
- (iii) Providing necessary training to processors about TQM and ISO related practices
- (iv) Helping processors in the implementation phase

Having ISO certification has become must to qualify as a supplier for many importing countries. Hence not only processors but also

cultivators should get ISO certification and implement TQM. Even the cultivators should be given industry status.

12. From the Table and Graph P26, it is evident that 76 percent of the respondents have not given any kind of training to employees, whereas remaining 24 percent of the respondents have given some kind of training to employees related to processing, packing, etc.

**Calculated Chi-square value:** 6.76, being higher than the table value: 3.84, we reject the hypothesis which state that 50 percent of the processors impart necessary training to their employees.

Imparting necessary training to employees is must for the employees to update and acquire new KSAs (Knowledge, Skills and Abilities). Otherwise KSAs become obsolete like technology. Moreover expenditure on training should be viewed as an asset by the organizations and organizations should spend generously on training their work force. Quality of the Human Resource is one of the CSFs which provides a long term competitive edge to an organization over its rivals (domestic as well as international).

13. From the Table and Graph P27, it can be inferred that only 24 percent of the respondents undertake packing in bulk as well as small packs, whereas remaining 76 percent of the respondents undertake packing only in bulk packs.

From the Table and Graph P28, it is observed that 76 percent of the respondents don't even bother about developing innovative packing, 20 percent of the respondents try to meet the basic requirements and not beyond that, whereas only 4 percent of the respondents take initiative in developing innovative packing.

Ongoing continuous improvement in all areas, including packing is the need of the hour. Innovation and creativity at every level including packing is must for an organization if it wants to become the market leader and win competition at the international level. Lot of emphasis need to be given by the Indian processors to innovate and improve their packaging. Poor packing is one of the key reasons why Indian processed food products are not so well received in the international markets. Not only the quality of the product but also the quality of packaging (innovation in packaging) is important. Offering smaller and disposable packing, using recyclable packing material, is also important. Ongoing continuous improvement in all the processes, i.e., KAIZEN, is the need of the hour.

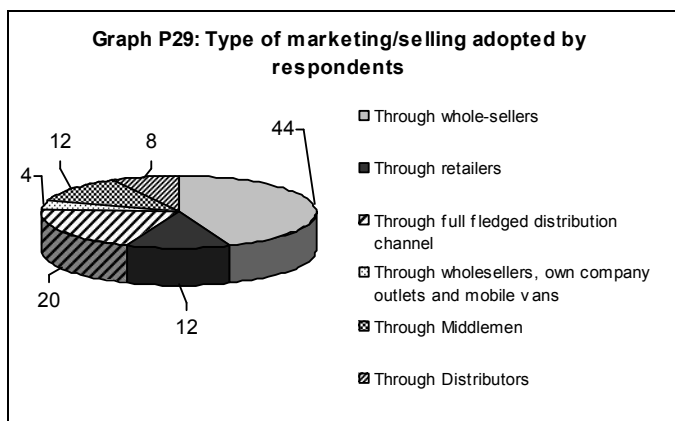
From the above discussion, we can clearly reject Ho-02 and accept Ha-02 which state "Indian fruit processing industry, especially mango

processing industry is plagued with lack of necessary infrastructure that is required for grading, processing, packing, etc. This is a serious bottleneck of this industry”.

**Part B(c): Analysis of specific information pertaining to marketing, competition, profitability and scope for expansion**

**Table P29: Type of marketing/selling channel adopted by respondents**

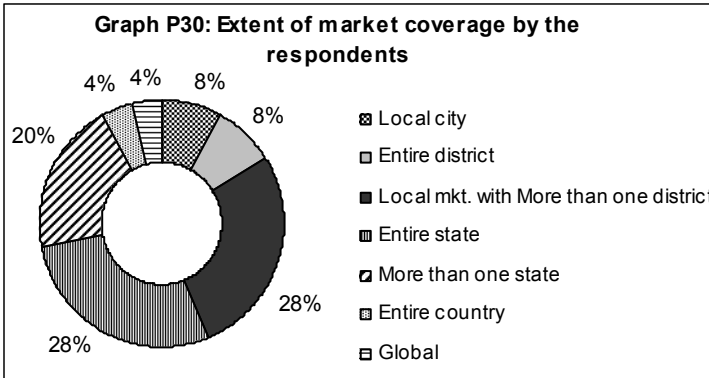
| <i>Sr. No.</i> | <i>How do you market your product</i>                    | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Through whole-sellers                                    | 11            | 44             |
| 2              | Through retailers  | 3             | 12             |
| 3              | Through full fledged distribution channel                | 5             | 20             |
| 4              | Through wholesalers, own company outlets and mobile vans | 1             | 4              |
| 5              | Through Middlemen  | 3             | 12             |
| 6              | Through Distributors                                     | 2             | 8              |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



**Table P30: Extent of market coverage by the respondents**

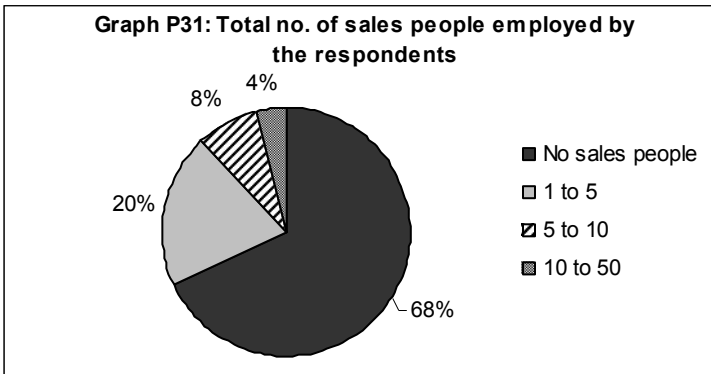
| <i>Sr. No.</i> | <i>What is your market coverage</i>    | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Local city                             | 2             | 8              |
| 2              | Entire district                        | 2             | 8              |
| 3              | Local mkt. with More than one district | 7             | 28             |

|   |                     |           |            |
|---|---------------------|-----------|------------|
| 4 | Entire state        | 7         | 28         |
| 5 | More than one state | 5         | 20         |
| 6 | Entire country      | 1         | 4          |
| 7 | Global              | 1         | 4          |
|   | <b>Total</b>        | <b>25</b> | <b>100</b> |



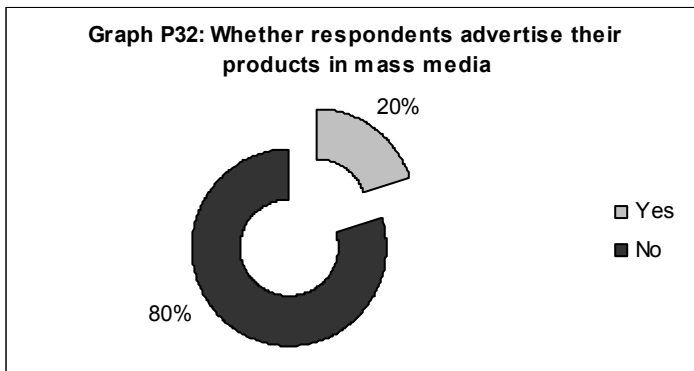
**Table P31: Total no. of sales people employed by the respondents**

| Sr. No. | Total no. of sales people employed | Number    | Percent    |
|---------|------------------------------------|-----------|------------|
| 1       | No sales people                    | 17        | 68         |
| 2       | 1 to 5                             | 5         | 20         |
| 3       | 5 to 10                            | 2         | 8          |
| 4       | 10 to 50                           | 1         | 4          |
|         | <b>Total</b>                       | <b>25</b> | <b>100</b> |



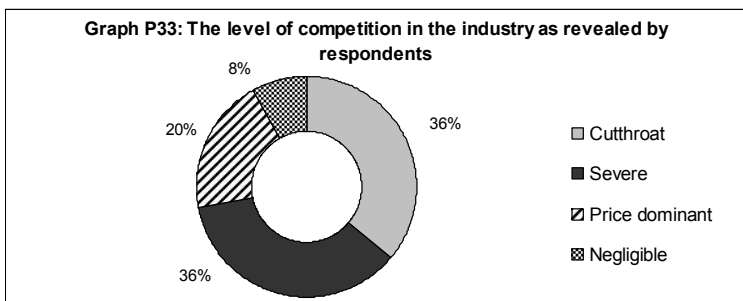
**Table P32: Whether respondents advertise their products in mass media**

| <i>Sr. No.</i> | <i>Do you advertise your product in mass media</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Yes  | 5             | 20             |
| 2              | No   | 20            | 80             |
|                | <b>Total</b>                                       | <b>25</b>     | <b>100</b>     |



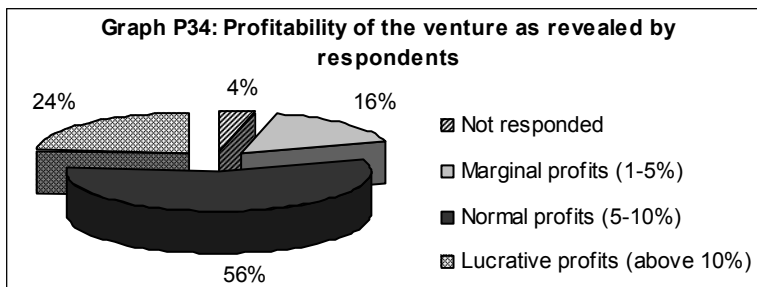
**Table P33: The level of competition in the industry as revealed by respondents**

| <i>Sr. No.</i> | <i>How do you rate the level of competition in your industry</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Cutthroat  | 9             | 36             |
| 2              | Severe   | 9             | 36             |
| 3              | Price dominant   | 5             | 20             |
| 4              | Negligible   | 2             | 8              |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |

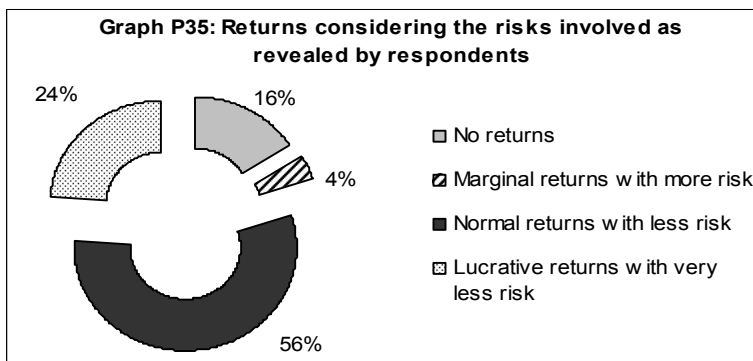


**Table P34: Profitability of the venture as revealed by respondents**

| <i>Sr. No.</i> | <i>How much profitable is this venture</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Not responded                              | 1             | 4              |
| 2              | Marginal profits (1-5%)                    | 4             | 16             |
| 3              | Normal profits (5-10%)                     | 14            | 56             |
| 4              | Lucrative profits (above 10%)              | 6             | 24             |
|                | <b>Total</b>                               | <b>25</b>     | <b>100</b>     |

**Table P35: Returns considering the risks involved as revealed by respondents**

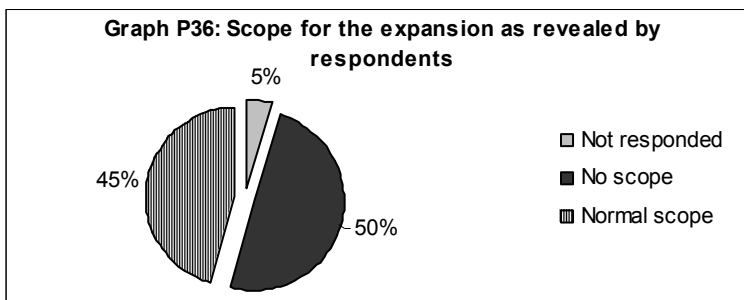
| <i>Sr. No.</i> | <i>Returns considering the risks involved</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No returns                                    | 4             | 16             |
| 2              | Marginal returns with more risk               | 1             | 4              |
| 3              | Normal returns with less risk                 | 14            | 56             |
| 4              | Lucrative returns with very less risk         | 6             | 24             |
|                | <b>Total</b>                                  | <b>25</b>     | <b>100</b>     |





**Table P36: Scope for the expansion as revealed by respondents**

| <i>Sr. No.</i> | <i>Scope for the expansion</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--------------------------------|---------------|----------------|
| 1              | Not responded                  | 1             | 4              |
| 2              | No scope                       | 11            | 44             |
| 3              | Normal scope                   | 10            | 40             |
| 4              | Tremendous scope               | 3             | 12             |
|                | <b>Total</b>                   | <b>25</b>     | <b>100</b>     |



## Research Findings and Discussion

From the Table and Graphs P29 to P36 shown above, following inferences can be drawn:

1. From the Table and Graph P29, it is clear that only 20 percent of the processors have a full fledged distribution channel, whereas the remaining 80 percent of the processors were marketing their produce through whole sellers (44%), retailers (12%), middle men (12%), or through distributors (8%) only.

Having a full fledged distribution channel, i.e., network of appointed distributors, dealers and retailers is one of the CSFs of this business. The processors can enjoy better market power and better control over market, if they have their own distribution channel. Otherwise middle men (freelance distributors, wholesalers, big retailers, etc.) will try and control the market and capture the profits by squeezing the margins of processors. This could be one of the key reasons behind ill growth of Indian processing industry, when compared with Brazil.

2. From the Table and Graph P30, it can be noticed that only one processor out of twenty five processors has an access to international markets. Only one processor has national coverage. Five processors have their presence in more than one state. Seven processors cover just one state. Whereas remaining

11 processors market their produce in the local markets covering one or more than one districts.

Having an access to at least national market if not international market, by the processors is must for their growth. Covering only the local markets or the regional markets will certainly restrict the growth prospectus of the processors. This is a serious drawback of small processors and need to be addressed. One of the solutions to overcome this drawback is to form associations or co-operative societies or cartels or consortium, and market their produce in a big way throughout the nation and in international markets as well.

The above discussion clearly reject null hypothesis Ho-03 and accept Ha-03 which state "Lack of cooperative effort amongst processing community is a serious hindrance that prohibits this industry from reaping the benefits of larger economies of scale and higher value addition".

3. From the Table and Graph P31, it can be noticed that nearly 68 percent of the respondents don't even employ a single sales person; 20 percent of the respondents employ one to five sales people; whereas remaining 12 percent of the respondents employ more than five sales people.

This again is due to smallness of the processors and can be overcome through co-operative effort, as discussed above.

4. From the Table and Graph P32, it is clear that only five out of twenty five processors advertise their products in mass media.

**The calculated Chi-square value:** 9.0, being higher than table value: 3.84, we reject the null hypothesis which state that 50 percent of the processors advertise their products in the mass media.

Advertising in the mass media creates awareness about the processed fruit products in the minds of customers and stimulates interest to try (buy) those products. The people of India, in general, are used to eating fresh fruits and avoid eating processed fruit products. This is primarily due to their poor understanding about the content and nutritional values of the processed fruit products (The people of India, in general, carry the notion that processed fruit products are not good for health and contain artificial/synthetic/chemical preservatives). Advertising in the mass media like TV, though very expensive, is one of the most effective ways to address this misunderstanding.

Due to entry of MNCs in to this sector in a big way, the attitude and behavior of Indian people towards processed fruit products is changing, but very slowly.

This definitely is a serious issue that needs to be addressed, for strengthening the domestic demand for processed fruit products. It is possible only through co-operative effort as discussed above.

5. From the Table and Graph P33, it becomes clear that nearly 92 percent of the respondents rate the competition as intense, severe, cut throat, and price dominant, whereas remaining 8 percent of the respondents rate the competition as negligible.

The intense rivalry in the market is primarily from the so called unorganized small sector. As they (unorganized small sector) carry less (very less) overheads compared to organized sector, their prices will be much cheaper than the prices set by the organized sector.

Unhealthy competition from the unorganized small sector where-in the firms (unorganized small firms) practice all sorts of unhealthy and unethical practices like; adulteration, tax evasion, producing without the necessary license, etc., is another reason for intense rivalry in this sector.

So the necessary steps/actions need to be taken by all the stake holders involved to weed out unhealthy competition from this sector and make this sector an investor savvy one. The fruit processing sector in India will flourish when the investors start pumping in their funds in to this sector and the investors will think of investing in to this sector if it is free from unhealthy competition and lucrative.

6. From the Table and Graph P34, it is clear that 24 percent of the respondents rated the profitability as lucrative (net margin above 10 percent); 56 percent of the respondents rated the same as normal (net margin between 5 to 10 percent); and the remaining 16 percent of the respondents rated the same as marginal (net margin between 1 to 5 percent).

From the Table and Graph P35, it is clear that 24 percent of the respondents rated overall returns considering the risks involved as 'Lucrative'; 56 percent of them rated the same as 'Normal'; 4 percent of them rated the same as 'Marginal'; whereas 16 percent of the respondents rated the same as 'No returns'.

Overall profitability of the processors in general is found to be adequate. Profitability can be further improved if the necessary actions

are taken by all the stake holders involved, to strengthen this industry at all the three levels naming;

- (i) **Firm level:** Through formulating and adopting innovative strategies, tactics, and policies, using advanced technology, minimizing post harvest loss, etc.
  - (ii) **Industry level:** Entire industry has to come together through mechanisms like; cartel, consortium, co-operatives, associations, and other mechanisms of co-operative effort; to stimulate the domestic demand, to fight with the evil forces that create unhealthy competition, to create necessary infrastructure, etc., which will make this industry a very attractive and lucrative one.
  - (iii) **Environment level:** The nodal bodies involved, the State Government, the Central Government, the Departments involved, NGOs involved, institutions involved, etc., should direct their efforts in a strategic and integrated manner to strengthen this industry.
7. From the Table and Graph P36, it can be noticed that 44 percent of the respondents rated the scope for the expansions as ‘No scope’; 44 percent of them rated the same as ‘Normal scope’; whereas 12 percent of them rated the same as ‘Tremendous scope’.

The growth trend and the growth pattern of exports of processed fruit products (CGR of 13 percent aggregate) as revealed in the Chapter 4 (Secondary Research) is on the rise and so also is the domestic consumption. People of India, especially the middle-class and the upper class, have become more health conscious and are reverting back to natural fruit drinks like; Orange squash, Mango juice, Strawberry squash, Lime juice, etc. They have started consuming processed fruit products that are available in cans, during off season like; mango pulp, sliced pineapple, etc. They even started eating condiments and chocolates made out of fruits like; Mango chocolate, Amla candy, etc. Thus the overall demand (domestic as well as international) for processed fruit products is increasing at a phenomenal rate (as discussed in detail, in the secondary research – Chapter 4). So, there lies ample scope for Indian fruit processors to undertake the following;

- (a) Expand their capacities; Integrate horizontally
- (b) Integrate vertically (both forward and backward)
- (c) Related diversification

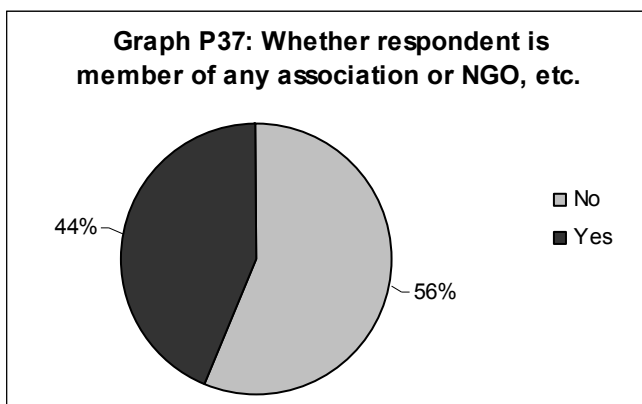
- (d) Product development (stretching product line) and market development activities (entering new markets)

From the above discussion we can clearly reject Ho-03 and accept Ha-03 which state “Lack of co-operative effort is a serious hindrance that prohibits this industry from reaping the benefits of larger economics of scale and higher value addition:”

### Part C: Analysis of Information Pertaining to Collaboration and Co-operation:

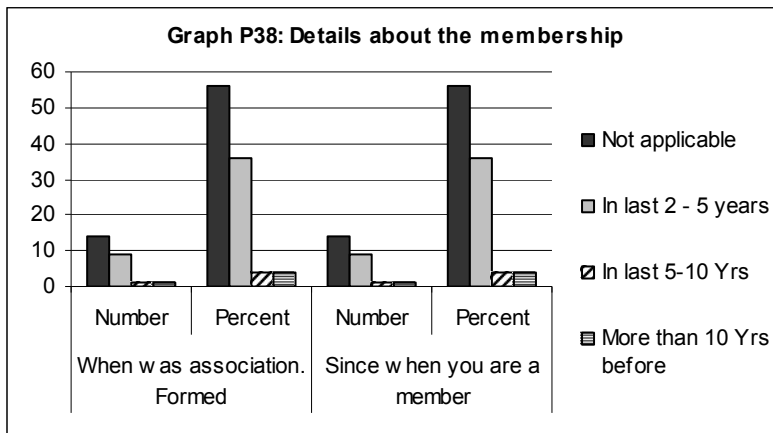
**Table P37: Whether respondent is member of any association or NGO, etc.**

| <i>Sr. No.</i> | <i>Are you member of any association or org.</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | No   | 14            | 56             |
| 2              | Yes  | 11            | 44             |
|                | <b>Total</b>                                     | <b>25</b>     | <b>100</b>     |



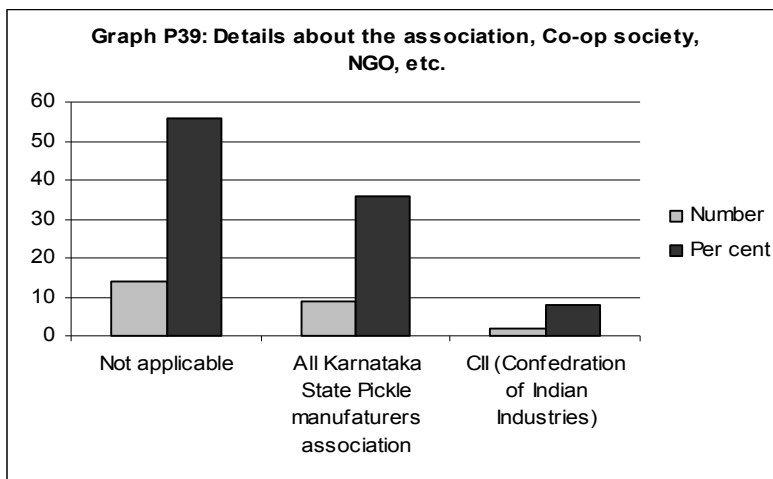
**Table P38: Details about the membership**

| <i>Sr. No.</i> | <i>If yes, when was it formed and since when you are a member</i> | <i>When was association Formed</i> |                | <i>Since when you are a member</i> |                |
|----------------|---|------------------------------------|----------------|------------------------------------|----------------|
|                |   | <i>Number</i>                      | <i>Percent</i> | <i>Number</i>                      | <i>Percent</i> |
| 1              | Not applicable  | 14                                 | 56             | 14                                 | 56             |
| 2              | In last 2-5 years   | 9                                  | 36             | 9                                  | 36             |
| 3              | In last 5-10 years  | 1                                  | 4              | 1                                  | 4              |
| 4              | More than 10 years before   | 1                                  | 4              | 1                                  | 4              |
|                | <b>Total</b>  | <b>25</b>                          | <b>100</b>     | <b>25</b>                          | <b>100</b>     |



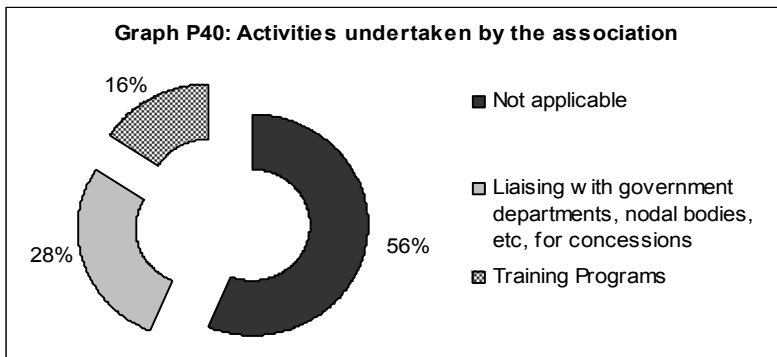
**Table P39: Details about the association, Co-op society, NGO, etc.**

| Sr. No. | Name of the organization and the number of members | Not applicable | AKPMA | CII | Total |
|---------|--|----------------|-------|-----|-------|
| 1       | Number   | 14             | 9     | 2   | 25    |
| 2       | Percent  | 56             | 36    | 8   | 100   |



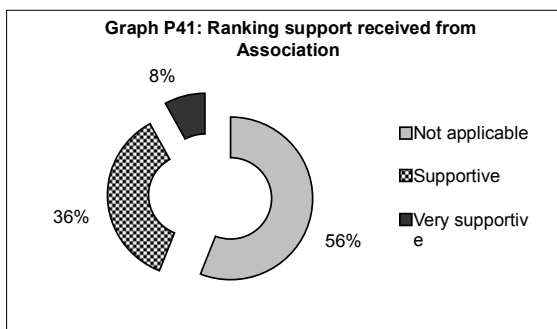
**Table P40: Activities undertaken by the association.**

| <i>Sr. No.</i> | <i>Activities undertaken by the association</i>                           | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | Not applicable  | 14            | 56             |
| 2              | Liaising with government departments, nodal bodies, etc., for concessions | 7             | 28             |
| 3              | Training Programs   | 4             | 16             |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



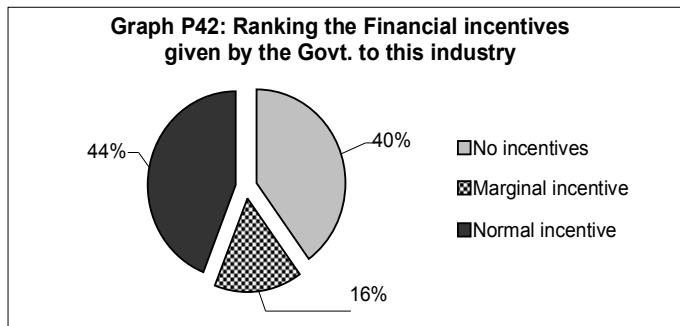
**Table P41: Ranking support received from Association**

| <i>Sr. No.</i> | <i>How supportive is the association</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Not applicable                           | 14            | 56             |
| 2              | Supportive                               | 9             | 36             |
| 3              | Very supportive                          | 2             | 8              |
|                | <b>Total</b>                             | <b>25</b>     | <b>100</b>     |



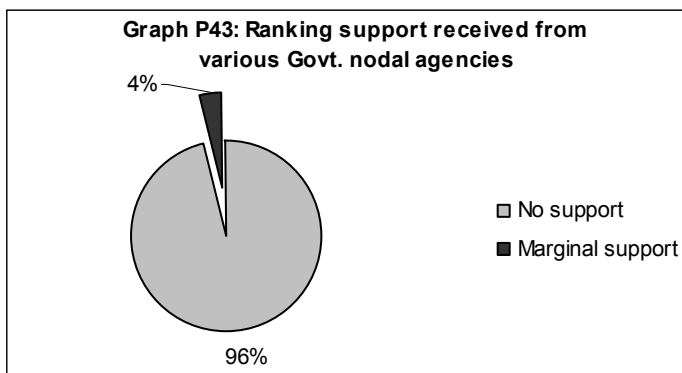
**Table P42: Ranking the Financial incentives given by the Govt. to this industry**

| <i>Sr. No.</i> | <i>Rating Govt. support</i> | <i>Number</i> | <i>Percent</i> |
|----------------|-----------------------------|---------------|----------------|
| 1              | No incentives               | 10            | 40             |
| 2              | Marginal incentive          | 4             | 16             |
| 3              | Normal incentive            | 11            | 44             |
|                | <b>Total</b>                | <b>25</b>     | <b>100</b>     |



**Table P43: Ranking support received from various Govt. nodal agencies**

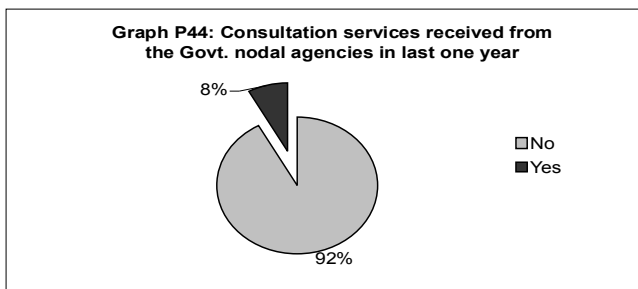
| <i>Sr. No.</i> | <i>How would you rank the support</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---------------------------------------|---------------|----------------|
| 1              | No support                            | 24            | 96             |
| 2              | Marginal support                      | 1             | 4              |
|                | <b>Total</b>                          | <b>25</b>     | <b>100</b>     |





**Table P44: Consultation services received from the Govt. nodal agencies in last one year**

| <i>Sr. No.</i> | <i>Consultation from Govt. nodal agency in last one year</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | No   | 23            | 92             |
| 2              | Yes  | 2             | 8              |
|                | <b>Total</b>   | <b>25</b>     | <b>100</b>     |



## Research Findings and Discussion

From the Table and Graphs P37 to P44 depicted above, following inferences can be drawn:

1. From the Table and Graph P37, it can be noticed that 44 percent of the respondents belonged to an association or NGO, whereas remaining 56 percent of them didn't belong to any association or NGO.
2. From the Table and Graph P38, it can be noticed that out of the 44 percent respondents who belong to some association or NGO; 36 percent be-came members in last 2 to 5 years; 4 percent in last 5 to 10 years; whereas remaining 4 percent became members more than 10 years back.
3. From the Table and Graph P39, it can be noticed that out of 44 percent respondents who belong to either APKMA or CII, 36 percent were members of All Karnataka Pickle Manufacturers Association (AKPMA), and the remaining 8 percent were members of Confederation of Indian Industries (CII). It can be further noticed that AKPMA was established very recently, i.e. in the year 2006.
4. From the Table and Graph P40, it can be inferred that liaising with the Government departments/nodal bodies/institutions like; NHM, NHB, APEDA, Agricultural Universities, etc. and the

Government (both state and central) itself for concessions and incentives to promote and strengthen this particular industry, and providing necessary training to members are the two key activities undertaken by these Associations.

5. From the Table and Graph P41, it can be noticed that out of 44 percent respondents who belonged to some Associations, 36 percent ranked the support received from Association as 'supportive' and 8 percent ranked the same as 'very supportive'.

From the above findings it can be inferred that fruit processors are slowly thinking of co-operative effort to strengthen the industry and hence want to belong to some Association. Many new Associations like; All Karnataka Pickle Manufacturers Association (AKPMA), etc. have been formed to take care of the interests of its members. The AKPMA liaised with concerned state government departments and government (state) itself and brought-in many concessions and incentives as discussed in the earlier part of this chapter. Below listed are some of the achievements of AKPMA;

- (i) It was successful in bringing down the VAT rate applicable to 'Pickles and chutneys' from 16 percent to 12.5 percent, later from 12.5 percent to 4 percent and very recently from 4 percent to 0 percent.
- (ii) It is assisting the new entrants in getting the FPO license from MOFPI (Ministry of Fruit Processing Industries), New Delhi.
- (iii) It liaised with the state government and made this industry a 'green industry' which means processors need not have to take clearance from the KSPCB (Karnataka State Pollution Control Board).
- (iv) The APMC (Agriculture Produce Marketing Committee) Cess (market cess) was brought down from 2 percent (on the tender mango purchases) to 0 percent.
- (v) The Association conducted seminars and lectures by the experts from various fields like; Trademark and Brand Registry, Weights and Measurements, Food Safety Act, Packaging industry, etc., to educate its members and create awareness in them about the latest developments.
- (vi) The Association had arranged visits to manufacturing facilities of the leading companies like; MTR Foods, Bangalore; Manjushree Extrusions Ltd., Bangalore; etc., to

assist members in understanding importance of various processes and practices followed by these companies.

From the above findings and discussion, we can reject null hypothesis Ho-03 and accept Ha-03 which states “Lack of cooperative effort amongst processing community is a serious hindrance that prohibits this industry from reaping the benefits of larger economies of scale and higher value addition”.

Co-operative effort is one of the surest ways to address the concerns of fruit processors and will definitely help the industry to bloom like Dairy industry of India during 1980s.

6. From the Table and Graph P42, it can be inferred that 40 percent of the respondents opined that ‘no financial incentives’ were being given to this industry by the Government; 16 percent of the respondents opined that ‘marginal financial incentives’ were being given; whereas remaining 44 percent of the respondents opined that ‘normal financial incentives’ were being given to this industry by the Government.
7. From the Table and Graph P43, it can be noticed that 96 percent of the respondents opined that ‘no support’ was received from the government departments/nodal bodies/institutions like; NHM, NHB, APEDA, HOPCOMS, State department of horticulture, Agricultural Universities, MOFPI, etc., whereas remaining 4 percent opined that they received ‘marginal support’.

**The calculated Chi-square value:** 21.2, being much higher than the table value: 3.841, we reject the null hypothesis which state that at least 50 percent of the processors received support from the concerned government nodal bodies.

8. From the Table and Graph P44, it can be inferred that 92 percent of the respondents neither consulted the government nodal bodies nor staff from the concerned government nodal bodies consulted processors in the last one year; whereas 8 percent of the respondents commented that they consulted the government nodal bodies.

**The calculated Chi-square value:** 17.6, being much higher than the table value: 3.841, we reject the null hypothesis which state that 50 percent of the processors availed consultation services from the concerned nodal government bodies.

From the above findings and discussion, it can be inferred that the government nodal bodies are not functioning properly. They are functioning like conventional government department (bureaucratic and political). Following are some of the key reasons for ill functioning of these government nodal bodies:

1. The bureaucratic 'top down' approach
2. Having strong influence of 'Inspector Raj'
3. Lack of incentives to work in the field. This will result in lack of interest to work in the field with either cultivators or processors.
4. Relying heavily on grants and aids from the government (either central or state) than making the nodal agency a self sustainable one.
5. Believing in subsidies and other financial incentives than providing necessary consultation, support services, technological knowhow, etc., to the processors.
6. Lack of strong, technically sound, dedicated, and vast extension network at ground level throughout the nation.
7. Lack of a strong well articulated clear cut vision and mission.
8. Lack of strong leadership (transformational) at the top.
9. Lack of co-ordination and integration within the organization, and also with other nodal bodies.

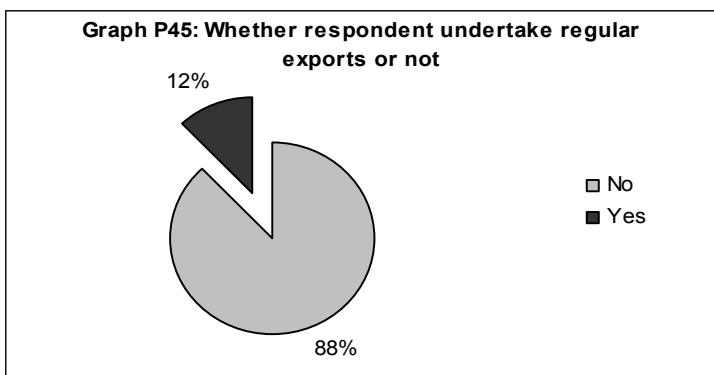
The above findings and discussion clearly reject the null hypothesis Ho-04 and accept the alternate hypothesis Ha-04 which states "Lack of integration of all the activities starting from farm gate till final consumers because of ill functioning of the government departments/nodal bodies/institutions with no clear direction and goals prohibit the processing industry of India from attaining the desired growth."

Thus there lies a most promising scope to import the 'Brazilian Model' where in a single nodal agency 'EMBRAPA' takes complete care of both farming community and processing industry by having a fool proof mechanism/system in place to address all their concerns/problems and working in an integrated fashion with more clearer objectives, strategies and policies to sort out the contemporary upcoming issues. This is the secret of the success of Brazilian fruit processing industry.

### Part D: Analysis of Concluding Information

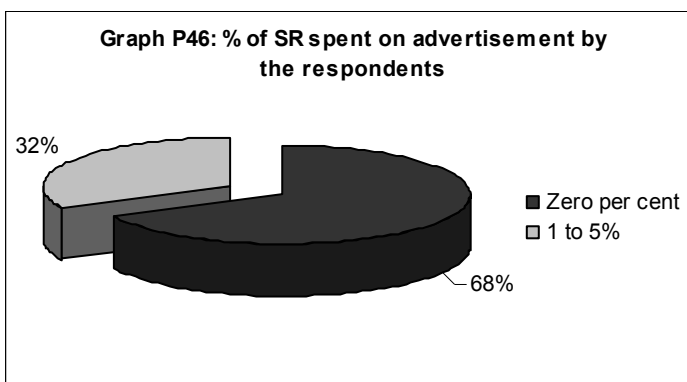
**Table P45: Whether respondent undertake regular exports or not**

| <i>Sr. No.</i> | <i>Do you undertake regular exports</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No                                      | 22            | 88             |
| 2              | Yes                                     | 3             | 12             |
|                | <b>Total</b>                            | <b>25</b>     | <b>100</b>     |



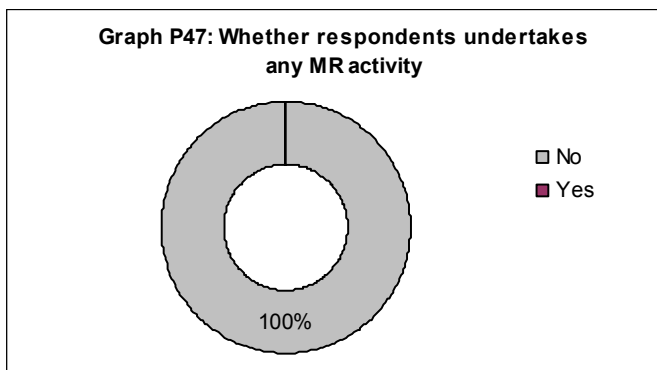
**Table P46: % of SR spent on advertisement by the respondents**

| <i>Sr. No.</i> | <i>What % of SR you spend on advertisement</i> | <i>Number</i> | <i>Percent</i> |
|----------------|--|---------------|----------------|
| 1              | Zero Percent                                   | 17            | 68             |
| 2              | 1 to 5%  | 8             | 32             |
|                | <b>Total</b>                                   | <b>25</b>     | <b>100</b>     |

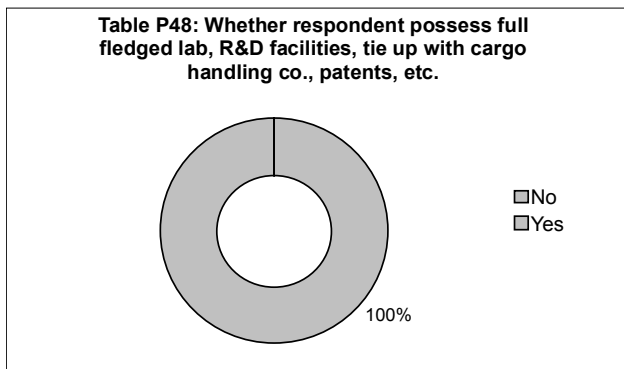


**Table P47: Whether respondents undertakes any MR activity**

| <i>Sr. No.</i> | <i>Do you undertake any MR activity</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No                                      | 25            | 100            |
| 2              | Yes                                     | 0             | 0              |
|                | <b>Total</b>                            | <b>25</b>     | <b>100</b>     |

**Table P48: Whether respondent possess full fledged lab, R&D facilities, tie-up with cargo handling co., patents, etc.**

| <i>Si. No.</i> | <i>Do you possess full fledged lab, R&amp;D facilities, tie up with cargo handling co., patents, etc.</i> | <i>Number</i> | <i>Percent</i> |
|----------------|---|---------------|----------------|
| 1              | No  | 25            | 100            |
| 2              | Yes   | 0             | 0              |
|                | <b>Total</b>  | <b>25</b>     | <b>100</b>     |



## Research Findings and Discussion

From the Table and Graphs P45 to P48 shown above, following inferences can be drawn:

1. From the Table and Graph P45, it can be inferred that 88 percent of the total respondents did not undertake regular exports, whereas remaining 12 percent of the respondents undertook regular exports.

**The calculated Chi-square value:** 14.4, being much higher than table value: 3.841, we reject the null hypothesis which states that 50 percent of the respondents undertook regular exports.

As discussed in the secondary research (Chapter 4) there is a great demand for Indian processed mango products in the international markets (The exports of processed mango products in total was growing at the CGR of 13.70 percent between 1996 to 2005). But only 12 percent of the respondents, that too, only bigger companies undertook regular exports. The smallness of small processors prohibits the small processors from undertaking regular exports, as exports involve sizable investments in creating the necessary infrastructure. Hence small firms should come together and form Association/cartel/consortium, so that together they become big so that they can undertake regular exports.

2. From the Table and Graph P46, it can be inferred that 68 percent of the respondents didn't spend any amount on advertising their products in the mass media, whereas remaining 32 percent of the respondents spent one to 5 percent of their sales revenue on advertising.

Smallness of individual small processors prohibits them from advertising their products in the mass media, as it involves huge

spending. The solution to this problem is the co-operative effort. All small processors should come together, at least region wise, under one umbrella and advertise their products collectively so that spending will be distributed amongst all.

3. From the Table and Graph P47, it can be inferred that none of the respondents undertook any Marketing Research activity. Majority of the respondents even don't know the meaning of Marketing Research.

**The calculated Chi-square value:** 25, being much higher than the table value: 3.841, we reject the null hypothesis which state that 50 percent of the respondents undertake regular Marketing Research activities.

Carrying out regular Marketing Research activities involve a great deal of talent, expertise, time, and amount. This makes undertaking regular MR activities difficult for small firms and even for medium scale enterprises. So small and medium enterprises (SMEs) should come together and form an Association so that regular MR activities can be undertaken. This will benefit every firm, as all the firms will be made aware about some of the important factors listed below;

- (i) Ongoing developments happening in the market
  - (ii) Changing customer preferences
  - (iii) Changing customer profiles
  - (iv) Changing customer needs
  - (v) Emerging substitutes
  - (vi) Changes in the competition forces
  - (vii) Changing customer attitudes
  - (viii) Changing customer behavior
  - (ix) Predicted demand for the forthcoming year, etc.
4. From the Table and Graph P48, it can be inferred that none of the respondents possessed full fledged laboratory facilities, R&D facilities, Patents, tie-up with cargo handling companies, etc.

**The calculated Chi-square value:** 25, being much higher than the table value: 3.841, we reject the null hypothesis which state that 50 percent of the respondents undertake regular Marketing Research activities.



This indeed is a matter of grave concern for the entire Indian Fruit Processing Industry. For an industry to flourish, it is must for the firms to have all such facilities/infrastructure. Ongoing improvement of the product, new product development, process re-engineering, etc. will be made possible through such kind of facilities/infrastructure. Brazil is far ahead compared to India when it comes to possessing of such kind of facilities/infrastructure. Creation of such unique facilities/infrastructure has become must for all the firms, if they want to emerge as the market leader not only in domestic markets but also in international markets. Strategic re-orientation is the need of the hour.

From the above research findings and the discussion, we can reject the null hypotheses Ho-02, Ho-03 and Ho-04 and accept alternate hypotheses Ha-02, Ha-03 and Ha-04, which are re-stated here-in-under;

**(Ha-02):** “Indian fruit processing industry especially mango processing industry is plagued with lack of necessary infrastructure that is required for harvesting, transporting, raw material storing, grading, processing, packaging, marketing of the output, etc. This is a serious bottleneck for this industry”.

**(Ha-03):** “Lack of cooperative effort amongst processing community is a serious hindrance that prohibits this industry from reaping the benefits of larger economies of scale and higher value addition.”

**(Ha-04):** “Lack of integration of all the activities starting from farm gate till final consumers because of ill functioning of the government departments/nodal bodies/institutions with no clear direction and goals prohibit the processing industry of India from attaining the desired growth.”

