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# AGRICULTURAL MARKETING

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# कृषि विपणन

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# सोयाबीन के आवक एवं मूल्य में संबंध— कृषि उपज मंडी सीहोर (म. प्र.) के संदर्भ में

—कमलेश राठौर<sup>1</sup> एवं हरीओम शर्मा<sup>2</sup>

**सो**याबीन म.प्र. की प्रमुख खरीफ मौसम की तिलहनी फसल है। इसमें पौष्टिक तत्व 42% प्रोटीन, 22% तेल तथा 30% कार्बोहाइड्रेट पाये जाते हैं। यह नगद फसल के रूप में कृषकों द्वारा उगाई जाती है जिसका उपयोग मात्र बीज के रूप में ही होता है, जो कुल उत्पादन का (10%) ही होता है, तथा शेष (90%) विपणन योग्य होता है। इस फसल की इस मंडी में खरीफ मौसम में सर्वोच्च आवक होती है।

कृषि उपज मंडी, सीहोर (म.प्र.) ग्रेड “ए” की मंडी है। यह मंडी शरबती गेहूँ एवं सोयाबीन के लिए विशेष रूप से पहचानी जाती है। इस मंडी के अंतर्गत कुल 186 गांव आते हैं। इस मंडी के अंतर्गत एक उप मंडी बिलकिसगंज भी है। कृषि उपज मंडी, सीहोर के संचालक के लिए एक समिति है जिसका प्रबंध कृषि उपज बाजार समिति की देख-रेख में होता है। इस समिति में उत्पादक (कृषक) व्यापारी, स्थानीय संस्थाएं, सरकार व सहकारी समितियों के प्रतिनिधि हैं। इस समिति में 20 सदस्य हैं। यह समिति नियंत्रित बाजार में कार्य करने वाले आढ़तियों, दलाल, तुलावटी, पल्लेदार आदि विपणन कार्यकर्ताओं को अनुज्ञ पत्र प्रदान करती है। यह समिति विपणन पद्धतियों के अनुसार नियंत्रित बाजार के लिए आवश्यक नियम भी बनाती है। यह समिति विश्राम गृह, संग्रहण, श्रेणीकरण एवं प्रमाणीकरण, कृषकों को उपज का मूल्य शीघ्र दिलाने तथा व्यापारियों का प्रभुत्व कम करने में सहायक है। यह नियंत्रित बाजार प्रजातांत्रिक सिद्धांत पर आधारित है।

इस मंडी का प्रमुख उद्देश्य कृषि उपज के विपणन का नियमन करना है या उपज की खरीद एवं बिक्री पर नियंत्रण रखना है जिससे कृषक, व्यापारी व अन्य विपणन कार्यकर्ताओं की प्रचलित कुचालों से दूर रह सके साथ ही कृषक को उसकी उपज का उचित मूल्य प्राप्त हो सके। इस मंडी में कृषकों के लिए अनेक प्रकार की सुविधाएं, जैसे :—मंडी प्रांगण में पक्की सड़क है, पानी की टंकी, खरीदारी एवं बिक्री के लिए सुविधाजनक टीन शेड, तुलाई के लिए पल्लेदार एवं हम्माल की सुविधाएं, बैलगाड़ी एवं ट्रैक्टरों के लिए अलग-अलग स्थान, चाय, नाश्ता एवं भोजनालय की सुविधाएं, रात्रि में रुकने के लिए मंडी प्रांगण में हॉल एवं शिकायत पेटी आदि सुविधाएं उपलब्ध हैं।

## 1. कुल आवक में सोयाबीन

कृषि उपज मंडी, सीहोर, म.प्र. में मुख्य रूप से गेहूँ (47.38%), सोयाबीन (38.28%), चना (9.57%), की आवक होती है। इन तीन फसलों का कुल आवक में 95.23%, है इसके अतिरिक्त मंडी में मक्का, ज्वार, मसूर,

अरहर आदि उत्पादों की भी आवक होती है। खरीफ के मौसम में सीहोर विकास खण्ड की प्रमुख फसल सोयाबीन है, इसलिए इस मंडी में सोयाबीन का खरीफ मौसम में सर्वोच्च स्थान है। (सारणी 1)

## 2. वार्षिक उत्पादन एवं वार्षिक आवक

कृषि उपज मंडी, सीहोर में सोयाबीन की आवक विकास खण्ड में सोयाबीन के उत्पादन में वृद्धि के साथ वृद्धि दर्शाती है परन्तु जहां उत्पादन में आधार वर्ष (1992-93) की तुलना में (2001-02) 210.37% की वृद्धि पाई गई है वहीं मंडी में सोयाबीन की आवक भी आधार वर्ष की तुलना में (2001-02) में 86.35%, की वृद्धि दर्शाती है। सोयाबीन की आवक आधार वर्ष (233080 क्विंटल) की तुलना में वर्तमान वर्ष (2001-02) में 28.15% (C.V.%), प्रतिवर्ष के उतार-चढ़ाव के साथ वर्तमान वर्ष (2001-02) में 434825 क्विंटल हो गई है। सोयाबीन के कुल उत्पादन में मंडी में सोयाबीन की आवक मात्र वर्तमान वर्ष (2001-02) में 57.90% ही है जबकि यह वर्ष (1993-94) में 82.78% आंकी गई है इससे स्पष्ट होता है कि विगत वर्षों की तुलना में सोयाबीन का सम्पूर्ण उत्पादन मंडी में नहीं आ पा रहा है। आज भी सोयाबीन कुल उत्पादन का मात्र 57.90% वर्तमान वर्ष (2001-02) में ही आंका गया है। शेष उत्पादन गांव के व्यापारी, दलाल, के माध्यम से बेचा जा रहा है। चूंकि सोयाबीन एक नगद फसल है जिसका घरेलू उपभोग मात्र बीज के लिए ही होता है। अतः सोयाबीन की आवक मंडी में बढ़ाने के लिए उन कारणों का पता लगाना आवश्यक है जिसके कारण से मंडी में सोयाबीन के कुल विपणन योग्य उत्पाद मंडी में नहीं आ पा रहा है (सारणी 2)।

## 3. वार्षिक आवक एवं मूल्य

सोयाबीन की आवक एवं उत्पादन में धनात्मक एवं सार्थक संबंध ( $r = 0.90^{**}$ ) पाया गया अतएव उत्पादन में वृद्धि होने के साथ सोयाबीन की आवक में भी वृद्धि हुई है। परन्तु सोयाबीन की आवक एवं मूल्य (28.15%) में लगभग उतार-चढ़ाव हो रहे हैं तथा न्यूनतम मूल्य (26.76%), अधिकतम मूल्य (18.92) तथा बहुलक मूल्य (16.18%) है। आधार वर्ष (1992-93) की तुलना में जहां सोयाबीन की आवक 28.15% के उतार-चढ़ाव से आधार वर्ष की तुलना में 86.55% की वृद्धि दर्शाता है वहीं बहुलक मूल्य में भी 16.18% प्रतिवर्ष के उतार-चढ़ाव से वर्तमान वर्ष 59.29% की वृद्धि दर्शा कर 1297/- रुपये प्रति क्विंटल पाए गए हैं। आवक एवं मूल्य में संबंध ऋणात्मक एवं सार्थक पाया गया है जो यह दर्शाता है कि सोयाबीन की मंडी में आवक बढ़ने के साथ-साथ मूल्यों में कमी होती है (सारणी 3)।

<sup>1</sup> कृषि स्नातकोत्तर विद्यार्थी एवं सह प्राध्यापक। <sup>2</sup> कृषि अर्थशास्त्र एवं प्रक्षेत्र प्रबंध, आर.ए.के. कृषि महाविद्यालय, सीहोर (म.प्र.)।

#### 4. मासिक औसत आवक एवं बहुलक मूल्य

सोयाबीन की औसत मासिक आवक एवं मूल्य में भी ऋणात्मक एवं सार्थक संबंध ( $r = -0.601$ ) पाया गया है। सोयाबीन की आवक अक्टूबर (18.94%), नवम्बर (39.33%), दिसम्बर (15.54%), जनवरी (7.75%) में अधिक होती है इन चार महीनों में सोयाबीन की कुल वार्षिक आवक का 81.57% भाग मंडी में आ जाता है। साथ ही इन चार माहों में सोयाबीन का मूल्य सबसे कम आंका गया है। किसान धनाभाव के कारण सोयाबीन का विक्रय इन चार माह में विक्रय कर देता है यदि किसान को पूंजी (साख) सुविधा प्रदान करा दी जावे और वह सोयाबीन को मई माह तक भंडारण कर जून माह में बेचे तो उसे 14.96% का अतिरिक्त लाभ प्राप्त हो सकता है। सोयाबीन की मासिक आवक में उतार-चढ़ाव 137.12% तथा बहुलक मूल्य में उतार-चढ़ाव मात्र 8.18% पाया गया है (सारणी 4)।

#### 5. सोयाबीन की आवक तथा कुल उत्पादन एवं मूल्यों के बीच संबंध

वर्षों के साथ सोयाबीन की कृषि उपज मंडी में वार्षिक आवक ( $r = 0.76^{**}$ ) के साथ सीहोर विकास खण्ड में सोयाबीन के वार्षिक उत्पादन ( $r = 0.79^{**}$ ) में भी धनात्मक एवं सार्थक संबंध पाया गया है। इससे स्पष्ट होता है कि प्रतिवर्ष सोयाबीन की आवक कुल उत्पादन में भी वृद्धि हुई है। वार्षिक आवक एवं वार्षिक उत्पादन में भी धनात्मक एवं सार्थक संबंध ( $r = 0.90^{**}$ ) पाया गया है जिससे स्पष्ट होता है कि सोयाबीन के उत्पादन में वृद्धि होने पर मंडी में सोयाबीन की आवक में भी वृद्धि होती है। वार्षिक आवक एवं वार्षिक बहुलक मूल्य में धनात्मक एवं असार्थक संबंध ( $r = 0.25$ ) पाया गया है। मासिक औसत आवक एवं मासिक बहुलक मूल्य में ऋणात्मक एवं सार्थक संबंध ( $r = -0.60^{**}$ ) पाया गया है चूंकि किसान पूंजी (साख) के अभाव में इन चार माहों (अक्टूबर, नवम्बर, दिसम्बर, जनवरी) में कुल उत्पादन का 81.56% विक्रय कर देता है। अतः इन माहों में आवक अधिक होने के कारण मूल्यों में कमी पाई गई है (सारणी 5)।

#### निष्कर्ष

सोयाबीन की आवक, कुल उत्पादन एवं मूल्यों के बीच संबंधों को देखने पर स्पष्ट होता है कि सोयाबीन की आवक एवं कुल उत्पादन में प्रतिवर्ष वृद्धि हुई है तथा मासिक औसत आवक एवं मूल्यों में ऋणात्मक संबंध पाया गया है। चूंकि किसान सोयाबीन की फसल को कटाई के तुरन्त बाद पूंजी (साख) के अभाव में इन चार माहों (अक्टूबर, नवम्बर, दिसम्बर, जनवरी) में कुल उत्पादन का (81.56%) विक्रय कर देता है इन माहों में आवक अधिक होने के कारण मूल्यों में कमी पाई गई है। यदि किसान को पूंजी (साख) सुविधा प्रदान करा दी जावे और वह सोयाबीन को मई माह तक भंडारण कर जून माह में बेचे तो उसे 14.96% का अधिक लाभ प्राप्त हो सकता है।

### सन्दर्भ

यादव राजीव एवं शर्मा हरीओम (2000) चने की विपणन आवक एवं मूल्य में संबंध, कृषि विपणन ( ), 2--5

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#### सारणी-1

#### सीहोर कृषि उपज मंडी में विभिन्न फसलों के आवक का प्रतिशत

| क्र. सं. | फसल     | आवक     | कुल आवक का फसल प्रतिशत |
|----------|---------|---------|------------------------|
| 1.       | गेहूँ   | 538183  | 47.38                  |
| 2.       | सोयाबीन | 434825  | 38.28                  |
| 3.       | चना     | 108711  | 9.57                   |
| 4.       | मक्का   | 21382   | 1.89                   |
| 5.       | ज्वार   | 15844   | 1.39                   |
| 6.       | मसूर    | 7313    | 0.64                   |
| 7.       | अरहर    | 3059    | 0.27                   |
| 8.       | अन्य    | 1129317 | 99.42                  |
|          | योग     | 6395    | 0.58                   |
|          | कुल योग | 1135712 | 100.00                 |

#### सारणी-2

#### वार्षिक उत्पादन एवं वार्षिक आवक (कुन्टल)

| क्र. सं. | वर्ष    | आवक    | कुल उत्पादन | आधार वर्ष की तुलना में प्रतिशत |             | उत्पादन में आवक का प्रतिशत |
|----------|---------|--------|-------------|--------------------------------|-------------|----------------------------|
|          |         |        |             | आवक                            | कुल उत्पादन |                            |
| 1        | 2       | 3      | 4           | 5                              | 6           | 7                          |
| 1.       | 1992-93 | 233080 | 356935      | 100                            | 100         | 65.30                      |
| 2.       | 1993-94 | 272443 | 329092      | 116.88                         | 92          | 82.78                      |
| 3.       | 1994-95 | 283090 | 412625      | 121.45                         | 115.35      | 68.60                      |
| 4.       | 1995-96 | 467830 | 697281      | 200.71                         | 195.35      | 67.09                      |
| 5.       | 1996-97 | 390065 | 700075      | 167.35                         | 196.15      | 55.71                      |
| 6.       | 1997-98 | 522488 | 860645      | 224.16                         | 241.12      | 60.70                      |
| 7.       | 1998-99 | 572219 | 782733      | 202.59                         | 219.29      | 73.10                      |
| 8.       | 1999-00 | 457810 | 841368      | 196.41                         | 235.72      | 54.41                      |
| 9.       | 2000-01 | 515668 | 686044      | 221.24                         | 192.2       | 75.16                      |
| 10.      | 2001-02 | 434825 | 750885      | 186.55                         | 210.37      | 57.90                      |

| 1       | 2        | 3        | 4 | 5 | 6 | 7 |
|---------|----------|----------|---|---|---|---|
| योग     | 4149518  | 6417683  | — | — | — | — |
| औसत     | 414951.8 | 641768.3 | — | — | — | — |
| विचलन   |          |          |   |   |   |   |
| गुणांक% | 28.157   | 31.136   | — | — | — | — |

### सारणी-3

#### वार्षिक आवक एवं वार्षिक मूल्य

| क्र सं० | वर्ष                                  | आवक      | न्यूनतम मूल्य | अधिकतम मूल्य | बहुलक मूल्य |
|---------|---------------------------------------|----------|---------------|--------------|-------------|
| 1.      | 1992-93                               | 233080   | 600           | 950          | 811         |
| 2.      | 1993-94                               | 272443   | 500           | 946          | 850         |
| 3.      | 1994-95                               | 283090   | 515           | 1050         | 910         |
| 4.      | 1995-96                               | 467830   | 675           | 1100         | 910         |
| 5.      | 1996-97                               | 390065   | 616           | 1294         | 1200        |
| 6.      | 1997-98                               | 522488   | 575           | 1365         | 1040        |
| 7.      | 1998-99                               | 572219   | 251           | 1110         | 844         |
| 8.      | 1999-00                               | 457810   | 430           | 1175         | 955         |
| 9.      | 2000-01                               | 515668   | 660           | 1169         | 1000        |
| 10.     | 2001-02                               | 434825   | 800           | 1700         | 1297        |
|         | योग                                   | 4149518  | 5622          | 11859        | 9817        |
|         | औसत                                   | 414951.8 | 562.2         | 1185.9       | 981.7       |
|         | विचलन                                 |          |               |              |             |
|         | गुणांक%                               | 28.157   | 26.76         | 18.92        | 16.18       |
|         | आवक का आधार वर्ष की तुलना में प्रतिशत | 86.55    | 33.33         | 78.94        | 59.92       |

### सारणी-4

#### मासिक औसत आवक एवं बहुलक मूल्य

| क्र सं० | माह     | आवक      | बहुलक मूल्य | औसत मूल्य से प्रतिशत अंतर | कुल उत्पादन में आवक का प्रतिशत |
|---------|---------|----------|-------------|---------------------------|--------------------------------|
| 1.      | जनवरी   | 36531.3  | 969.7       | 100.43                    | 7.75                           |
| 2.      | फरवरी   | 18073.7  | 971.8       | 100.64                    | 3.83                           |
| 3.      | मार्च   | 7946.9   | 984.6       | 101.97                    | 1.69                           |
| 4.      | अप्रैल  | 7271.5   | 944.6       | 97.80                     | 1.54                           |
| 5.      | मई      | 11417.5  | 900         | 102.53                    | 2.42                           |
| 6.      | जून     | 17757.5  | 1110.7      | 114.96                    | 3.76                           |
| 7.      | जुलाई   | 15592.4  | 1001.9      | 103.76                    | 3.30                           |
| 8.      | अगस्त   | 3534.3   | 1020.5      | 105.76                    | 0.74                           |
| 9.      | सितम्बर | 3805.4   | 977.4       | 101.22                    | 0.80                           |
| 10.     | अक्टूबर | 89295.9  | 776.6       | 80.43                     | 18.94                          |
| 11.     | नवम्बर  | 185418.1 | 890.3       | 92.20                     | 39.33                          |
| 12.     | दिसम्बर | 74675.5  | 948.6       | 98.24                     | 15.84                          |
|         | योग     | 471320   | 11496.4     | --                        | 100                            |
|         | औसत     | 39279.23 | 965.53      | --                        | --                             |
|         | विचलन   |          |             |                           |                                |
|         | गुणांक% | 137.12   | 8.18        | --                        | --                             |

### सारणी-5

#### सोयाबीन की आवक, कुल उत्पादन एवं मूल्यों के बीच संबंध

| क्र सं० | चर                                  | सहसंबंध (r) |
|---------|-------------------------------------|-------------|
| 1.      | वर्ष एवं वार्षिक आवक                | 0.76**      |
| 2.      | वर्ष एवं वार्षिक उत्पादन            | 0.79**      |
| 3.      | वार्षिक आवक एवं वार्षिक उत्पादन     | 0.90**      |
| 4.      | वार्षिक आवक एवं वार्षिक बहुलक मूल्य | 0.25        |
| 5.      | मासिक औसत आवक एवं मासिक बहुलक मूल्य | -0.60**     |

हमेशा "एगमार्क" प्रमाणित वस्तुएं ही खरीदें

# Marketing of Vegetables in Himachal Pradesh

—SHAMSHER SINGH\* and S.K. CHAUHAN

## Introduction

With the changing life style and food habits, the importance of vegetables in the human diet is being increasingly realized. They supply a myriad range of essential nutrients to the population of the country, that is largely vegetarian. In ancient times, people used to consume tubers and vegetables primarily for their easy availability, tempting succulence, pleasant flavours and regulatory effects. Some studies reveal that per hectare income has been obtained almost four times from vegetable crops as compared to food crops (Srivastava, 1983). The production system particularly of perishable commodities like vegetables has been observed to be quite weak link in the programme for increasing vegetable availability and improving farmer's share in the consumer's rupee. Since vegetable crops require a chain of marketing functions before reaching the ultimate consumer, the role of various marketing agencies assumes great importance. The efficient marketing of vegetable crops will help in agricultural development of the region/state through multiplier effect. Therefore, a sound system of marketing is required to mobilize the surplus of vegetable crops which aims to reducing the post harvest losses significantly. Similarly, an efficient input marketing system particularly of seed, fertilizers and plant protection chemicals may prove to be helpful in checking/controlling the cost of production of vegetable crops where the use of market oriented inputs is quite high. Further, the market imperfection, if any causes low marketing efficiency. Market arrivals cause wide fluctuations in price of vegetables. Further, there is general feeling among the vegetable growers that the profit of the middleman in marketing of vegetables is out of proportion to the business and risk as compared to those of growers.

In Himachal Pradesh, farm economy is characterized by existence of large number of marginal and small (more than 84 per cent) categories farmers, lower agricultural productivity and extremely low level of investment in agriculture. On the other hand, soil fertility, good rainfall and suitable weather for producing off-season vegetables are favourable for agricultural diversification in this cereals dominated region. Farmers perceptions of accepting new innovations at farms are very encouraging. The last two decades have witnessed a significant shift of cropping pattern in favour of vegetables. During 2001 nearly 32,000 ha area with 5.80 lakh tonnes production was reported under vegetables in

Himachal Pradesh. Having this background, a study was conducted mainly to fulfill the following objectives :

## Objectives

to identify the existing marketing channels in the marketing of vegetables, and

to assess the marketing cost, margins, price-spread and marketing efficiency in different marketing channels.

## Methodology

Two-stage stratified random sampling technique was followed to collect the information from vegetable growers, chosen through proportional allocation method. Five villages selected at random, formed the first stage of sampling and ultimate vegetable growers (80 in numbers) were chosen as the second stage of sampling. Using cube root cumulative frequency method, the farmers were categorized into small and large groups. To examine the price spread, marketing costs, margins and producer's share in consumer's rupee the following formula were used :

## I. Marketing Cost

$$T_c = C_p + \sum_{i=1}^n MC_i$$

where,

$T_c$  = Total cost of vegetables marketing

$C_p$  = Cost incurred by the producer

$MC_i$  = Marketing cost increased by  $i^{\text{th}}$  middleman

## II. Marketing Margins

$$A_{mi} = P_{mi} - (P_p + MC_i)$$

where,

$A_{mi}$  = The absolute margin of the  $i^{\text{th}}$  middleman

$P_{mi}$  = The selling price of the  $i^{\text{th}}$  middleman

$MC_i$  = Marketing costs of the  $i^{\text{th}}$  middleman

## III. Producer's share in consumer's rupee

$$P_s = (P_p/P_c) \times 100$$

where,

$P_s$  = Producer's share in consumer's rupee

$P_p$  = Producer's price for his vegetables produce

$P_c$  = Price paid by consumer

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## Results and Discussion

The distribution of area under vegetables, marketing channels and marketing cost, margins, price spread and marketing efficiency are discussed below:

### Distribution of area under vegetables

Table 1 indicate that the average size of operational holding was 1.29 ha and per cent area under vegetable was 57.13 per cent of the operational holding. Area under vegetables in *kharif* and *rabi* season was found to be 42.80 and 46.73 per cent, respectively and area under tomato was higher (17.06%) in *kharif* season and area under cauliflower was higher (32.28%) in *rabi* season of the total cropped area. Area under zaid crop was found to be 10.46 per cent which was very low.

### Marketing channels for vegetable crops

The following marketing channels were identified in the present study:

|             |   |          |  |
|-------------|---|----------|--|
| Channel I   | : | Producer | Consumer   |
| Channel II  | : | Producer | Retailer Consumer  |
| Channel III | : | Producer | Wholesaler/Commission agent (local market)Retailer Consumer    |
| Channel IV  | : | Producer | Commission agent Wholesaler (distant market) Retailer Consumer |

Table 2 presents the number of growers and quantity sold by them of different vegetables through various channels. The percentage of these growers who sold their vegetables through channel-I varied from 3 to 11 per cent while vegetables sold through this channel varied from 0.14 to 10.54 per cent (maximum of peas) of the total produce of selected vegetables and in case of channel-II the percentage of vegetable growers who sold their vegetables through this channel varied from 3 to 24 per cent and selected vegetables sold through this channel varied from 0.72 to 13.45 per cent. The maximum quantity of French bean (13.45%) sold through Channel-II by the maximum number of vegetables growers (23.19 per cent). Channel III was found to be the most important channel in the marketing of selected vegetables, because maximum number of vegetables growers adopted this channel and also maximum selected vegetables was disposed of through this channel. The percentage of vegetables growers who followed channel III varied from 72.82 to more than 84 per cent and selected vegetables sold through this channel varied from 64 to more than 95% Maximum (95.35%) produce of lady's finger sold through this channel. Only four selected vegetables sold through channel-IV out of which maximum (34.74%) quantity of peas sold through channel-IV.

## Marketing costs, margins and price-spread

The marketing costs and price-spread for major vegetable crops produced in study area were analysed through important marketing channels, the results of which are presented in Table 3 which reveals that in case of channel-I (Producer Consumer), the producer's share in the consumer's rupee was found to be higher (94.50%) in case of lady's finger and it was found to be lowest (88.53%) in case of brinjal and tomato, peas, cauliflower and french bean, it was found to be more than 90%. Marketing costs incurred by the producer were found to be maximum Rs. 82.25 per q. in case of tomato.

Table 4 shows that in case of channel-II (Producer Retailer Consumer) the producer's share in consumer's rupee was found to be more than 70% in all the selected crops and it was found to be maximum (79.95%) in french bean. Marketing costs incurred by producer were observed to be maximum (3.5%) in case of tomato and minimum (1.46%) in case of lady's finger. Margin of retailer was found to be maximum of Rs. 232.50/q (23.25%) in case of peas. The retailer incurred Rs. 46.00, 42.50, 39.75, 39.75, 42.00 and Rs. 38.35 per q on loading/unloading, storage, transportation and losses for tomato, peas, cauliflower, french bean, lady's finger and brinjal, respectively.

Channel III (Producer Wholesaler/Commission agent Retailer Consumer) was the very important channel in study area. The unit marketing costs and margins in marketing of selected vegetables through channel III reveals that more than 70% vegetables growers followed this channel (Table 5). The producer's share in consumer's rupee was observed to be maximum in case of french bean (63.88%) and in case of tomato, peas, cauliflower, lady's finger and brinjal, it was observed to be 56.00, 53.07, 54.09, 62.56 and 48.07%, respectively. Marketing costs on grading, packing, transportation, loading/unloading and commission charges in wholesale market, incurred by producers were observed to be maximum of Rs. 96.50/q (11.00%) in case of tomato.

Margin of wholesaler/commission agent was observed to be highest in case of tomato (17.00%) followed by brinjal (13.68%). Marketing costs on loading/unloading, transportation, losses and storage incurred by the wholesaler/commission agents were found to be highest in case of brinjal (4.18%) followed by tomato (4.00%). Margin of retailer was found to be highest (2.207%) in case of peas followed by cauliflower (19.07%) and marketing costs on loading/unloading, storage and transportation and losses incurred by retailer were found to be maximum (6.44%) in case of brinjal followed by tomato (6.00). The marketing efficiency was found to be maximum for all the selected vegetables in channel-I and minimum in channel-III.

## Conclusion

Study revealed that vegetables were the main crops grown both in *Rabi* and *Kharif* seasons which collectively covered more than 50 per cent area of the total cropped area. Tomato in *Kharif* and cauliflower in *Rabi* season were the very important crops of the study area. Regarding disposal of the produce channel III (Channel III : Producer Wholesaler/Commission agent (local market) Retailer Consumer) was the important one being followed more than 70% vegetables growers who could dispose of 64 to 96 per cent of the total produce. The marketing margin of wholesalers was observed to be the highest (17.00%) for tomato and the marketing margin of retailer was the highest (19.03%) in case of cauliflower in channel-III.

## Policy implications

Most of the vegetables produce was disposed of through Producer Wholesaler/Commission agent Retailer Consumer, marketing channel. This leads to increase in wastages and marketing cost. This can be reduced by providing additional regulated marketing facilities.

Due to perishable nature of vegetables crops and huge glut during peak season, farmers do not get remunerative

prices. Therefore, storage facilities as well as a small unit of processing for tomato, cauliflower, peas and lady's finger needs to be established in the study area.

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Table—1  
Distribution of area under vegetables

| Particulars   | Small farms      | Large farms      | Overall         |
|---|------------------|------------------|-----------------|
| No. of small farms  | 47               | 33               | 80              |
| Operational holding (ha)  | 0.936<br>(56.20) | 1.800<br>(57.28) | 1.29<br>(57.13) |
| Area under vegetables in <i>Kharif</i> season   | 42.70            | 43.07            | 42.80           |
| Lady's finger   | 5.95             | 6.83             | 6.40            |
| French bean   | 3.31             | 3.03             | 3.23            |
| Tomato  | 16.62            | 17.61            | 17.06           |
| Brinjal   | 11.08            | 10.54            | 10.72           |
| Other vegetables  | 5.79             | 5.05             | 5.39            |
| Area under vegetables in zaid season  | 13.73            | 7.31             | 10.46           |
| Area under vegetables in <i>rabi</i> season   | 43.50            | 49.62            | 46.73           |
| Peas  | 11.99            | 12.85            | 12.43           |
| Cauliflower   | 30.10            | 34.41            | 32.28           |
| Others  | 1.41             | 2.36             | 2.02            |
| Cropped area under vegetables on the basis of which percentages have been worked out (ha) | 1.209            | 2.078            | 1.577           |

Figures in the parentheses indicate percentages of area under vegetables of the operational holding.

Table—2

## Marketing channels for selected vegetables in the study area

| Sl. No. | Channel   | Tomato        |                    | Peas          |                    | Cauliflower   |                    | French bean   |                   | Lady's finger |                   | Brinjal       |                    |
|---------|---|---------------|--------------------|---------------|--------------------|---------------|--------------------|---------------|-------------------|---------------|-------------------|---------------|--------------------|
|         |   | Grower (No.)  | Produce sold (q)   | Grower (No.)  | Produce sold (q)   | Grower (No.)  | Produce sold (q)   | Grower (No.)  | Produce sold (q)  | Grower (No.)  | Produce sold (q)  | Grower (No.)  | Produce sold (q)   |
| 1.      | Producer Consumer   | 3<br>(3.72)   | 7.00<br>(0.14)     | 5<br>(6.76)   | 9.00<br>(10.54)    | 9<br>(11.25)  | 150.00<br>(2.63)   | 4<br>(5.80)   | 9.00<br>(2.61)    | 7<br>(9.09)   | 12.20<br>(1.53)   | 3<br>(3.85)   | 35.00<br>(1.01)    |
| 2.      | Producer Retailer Consumer                                    | 7<br>(8.75)   | 55.01<br>(1.10)    | 3<br>(4.05)   | 17.00<br>(0.72)    | 7<br>(8.75)   | 255.00<br>(4.46)   | 16<br>(23.19) | 46.50<br>(13.45)  | 5<br>(3.49)   | 25.00<br>(3.13)   | 4<br>(5.13)   | 60.20<br>(1.88)    |
| 3.      | Producer Wholesaler/<br>Commission agent Retailer<br>Consumer | 65<br>(81.35) | 4507.00<br>(90.98) | 56<br>(75.76) | 1072.2<br>(64.004) | 56<br>(70.00) | 4100.6<br>(72.82)  | 49<br>(71.01) | 260.10<br>(83.94) | 65<br>(84.42) | 762.00<br>(95.35) | 66<br>(84.82) | 2695.00<br>(83.95) |
| 4.      | Producer Commission<br>agent Wholesaler<br>Retailer Consumer  | 5<br>(6.25)   | 390.20<br>(7.87)   | 10<br>(13.51) | 582.00<br>(34.74)  | 8<br>(10.00)  | 1148.00<br>(20.01) | —             | —                 | —             | —                 | 5<br>(6.40)   | 420.00<br>(13.08)  |
| Total   |   | 80<br>(100)   | 4959.20<br>(100)   | 72<br>(100)   | 1675.20<br>(100)   | 80<br>(100)   | 5713.60<br>(100)   | 69<br>(100)   | 345.60<br>(100)   | 77<br>(100)   | 792.20<br>(100)   | 78<br>(100)   | 3210.40<br>(100)   |

Figures in parentheses are percentages of total.

Table—3

## Marketing Costs and Margins in Marketing of selected Vegetables Crops through Producer Consumer

|         |                                     |                   |                   |                   |                   |                    | (Rs/q)            |
|---------|-------------------------------------|-------------------|-------------------|-------------------|-------------------|--------------------|-------------------|
| Sl. No. | Functionary                         | Tomato            | Peas              | Cauliflower       | French bean       | Lady's finger      | Brinjal           |
| 1.      | Net price received by the producer  | 817.75<br>(90.86) | 927.00<br>(92.70) | 724.75<br>(90.60) | 907.75<br>(92.63) | 1086.75<br>(94.50) | 619.75<br>(88.53) |
| 2.      | Marketing cost incurred by producer | 82.25<br>(9.14)   | 73.00<br>(7.3)    | 75.25<br>(9.40)   | 72.25<br>(7.37)   | 63.25<br>(5.50)    | 80.25<br>(11.46)  |
|         | (i) Grading charges                 | 3.00<br>(0.33)    | —                 | 1.00<br>(0.13)    | 1.25<br>(0.13)    | 2.00<br>(0.17)     | 1.50<br>(0.21)    |
|         | (ii) Packing charges                | 12.00<br>(1.33)   | 6.00<br>(0.6)     | 6.00<br>(0.75)    | 6.50<br>(0.66)    | 6.00<br>(0.52)     | 6.50<br>(0.93)    |
|         | (iii) Transportation charges        | 7.25<br>(0.80)    | 7.00<br>(0.7)     | 8.25<br>(1.03)    | 4.50<br>(0.46)    | 5.25<br>(0.46)     | 7.25<br>(1.03)    |
|         | (iv) Labour charges                 | 60.00<br>(6.67)   | 60.00<br>(6.0)    | 60.00<br>(7.5)    | 60.00<br>(6.12)   | 50.00<br>(4.35)    | 65.00<br>(9.28)   |
| 3.      | Price received by the consumer      | 900.00<br>(100)   | 1000.00<br>(100)  | 800.00<br>(100)   | 980.00<br>(100)   | 1150.00<br>(100)   | 700.00<br>(100)   |
| 4.      | Marketing efficiency                | 9.94              | 12.70             | 10.07             | 11.56             | 17.18              | 7.72              |

Figures in parentheses are percentages of consumer's price.

Table—4

## Marketing Costs and Margins in Marketing of selected Vegetables through Producer Retailer Consumer

|         |                                     |                   |                   |                   |                   |                   | (Rs/q)            |
|---------|-------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sl. No. | Functionary                         | Tomato            | Peas              | Cauliflower       | French bean       | Lady's finger     | Brinjal           |
| 1       | 2                                   | 3                 | 4                 | 5                 | 6                 | 7                 | 8                 |
| 1.      | Net price received by the producer  | 668.50<br>(74.30) | 707.50<br>(70.75) | 577.75<br>(72.22) | 783.50<br>(79.95) | 908.25<br>(78.98) | 506.00<br>(72.29) |
| 2.      | Marketing cost incurred by producer | 31.50<br>(3.50)   | 17.50<br>(1.75)   | 22.25<br>(2.78)   | 16.50<br>(1.68)   | 16.75<br>(1.46)   | 19.00<br>(2.71)   |
|         | (i) Grading charges                 | 3.00<br>(0.33)    | 1.50<br>(0.15)    | 1.00<br>(0.13)    | 1.25<br>(0.13)    | 1.50<br>(0.13)    | 1.78<br>(0.25)    |
|         | (ii) Packing charges                | 16.50<br>(1.83)   | 5.00<br>(0.5)     | 9.00<br>(1.13)    | 4.75<br>(0.48)    | 4.75<br>(0.41)    | 6.00<br>(0.86)    |
|         | (iii) Transportation charges        | 10.00<br>(1.11)   | 9.00<br>(0.90)    | 10.25<br>(1.29)   | 8.50<br>(0.87)    | 8.50<br>(0.74)    | 9.25<br>(1.32)    |
|         | (iv) Loading/unloading charges      | 2.00<br>(0.22)    | 2.00<br>(0.20)    | 2.00<br>(0.25)    | 2.00<br>(0.20)    | 2.00<br>(0.17)    | 2.00<br>(0.29)    |
| 3.      | Price paid by retailer              | 700.00<br>(77.80) | 725.00<br>(72.50) | 600.00<br>(75.00) | 800.00<br>(81.63) | 925.00<br>(80.43) | 525.00<br>(75.00) |
| 4.      | Margin of retailer                  | (17.11)           | (23.25)           | (20.03)           | (14.31)           | (15.91)           | (19.52)           |
| 5.      | Marketing cost incurred by retailer | 46.00<br>(5.11)   | 42.50<br>(4.25)   | 39.75<br>(4.97)   | 39.75<br>(4.06)   | 42.00<br>(3.65)   | 38.35<br>(5.48)   |
|         | i. Loading/Unloading charges        | 3.00<br>(0.33)    | 3.25<br>(0.32)    | 3.00<br>(0.375)   | 2.00<br>(0.20)    | 2.00<br>(0.17)    | 3.00<br>(0.43)    |
|         | ii. Storage                         | 3.00<br>(0.33)    | 2.00<br>(0.20)    | 3.25<br>(0.46)    | 1.75<br>(0.18)    | 2.00<br>(0.17)    | 3.10<br>(0.44)    |
|         | iii. Transportation charges         | 10.00<br>(1.11)   | 7.25<br>(0.72)    | 8.50<br>(1.06)    | 6.00<br>(0.61)    | 6.00<br>(0.52)    | 7.25<br>(1.04)    |
|         | iv. Losses                          | 30.00<br>(3.33)   | 30.00<br>(3.00)   | 25.00<br>(3.13)   | 30.00<br>(3.06)   | 32.00<br>(2.78)   | 25.00<br>(3.57)   |
| 6.      | Price paid by consumer              | 900.00<br>(100)   | 1000.00<br>(100)  | 800.00<br>(100)   | 980.00<br>(100)   | 1150.00<br>(100)  | 700.00<br>(100)   |
| 7.      | Marketing efficiency                | 2.89              | 2.42              | 2.77              | 3.99              | 3.76              | 2.61              |

Figures in parentheses are percentages of consumer's price.

**Table—5**  
**Marketing Costs and Margins in Marketing of selected Vegetables through Producer Wholesaler/Commission Agent Retailer Consumer**

|         |  | (Rs/q)             |                     |                    |                    |                     |                    |
|---------|--|--------------------|---------------------|--------------------|--------------------|---------------------|--------------------|
| Sl. No. | Functionary                                  | Tomato             | Peas                | Cauliflower        | French bean        | Lady's finger       | Brinjal            |
| 1       | 2  | 3                  | 4                   | 5                  | 6                  | 7                   | 8                  |
| 1.      | Net price received by the producer           | 5.03.50<br>(56.00) | 530.65<br>(53.07)   | 432.75<br>(54.09)  | 626.00<br>(63.88)  | 719.45<br>(62.56)   | 336.50<br>(48.07)  |
| 2.      | Marketing cost incurred by producer          | 96.50<br>(11.00)   | 69.53<br>(6.94)     | 67.25<br>(8.41)    | 74.00<br>(7.55)    | 80.55<br>(7.00)     | 63.50<br>(9.07)    |
|         | (i) Grading charges                          | 5.00<br>(1.00)     | 3.00<br>(0.30)      | 2.00<br>(0.25)     | 2.25<br>(0.23)     | 2.50<br>(0.22)      | 2.75<br>(0.39)     |
|         | (ii) Packing charges                         | 32.50<br>(4.00)    | 11.25<br>(1.13)     | 12.00<br>(1.50)    | 11.00<br>(1.12)    | 11.25<br>(0.98)     | 19.50<br>(2.79)    |
|         | (iii) Transportation charges                 | 15.00<br>(2.00)    | 9.50<br>(0.95)      | 16.00<br>(2.00)    | 8.75<br>(0.89)     | 8.80<br>(0.77)      | 10.25<br>(1.46)    |
|         | (iv) Loading/unloading charges               | 5.00<br>(1.00)     | 6.60<br>(0.66)      | 4.75<br>(0.59)     | 6.50<br>(0.66)     | 6.00<br>(0.52)      | 5.00<br>(0.71)     |
|         | (v) Commission                               | 39.00<br>(4.00)    | 39.00<br>(3.90)     | 32.50<br>(4.06)    | 45.50<br>(4.64)    | 52.00<br>(4.52)     | 26.00<br>(3.71)    |
| 3.      | Price paid by wholesaler in wholesale market | 600.00<br>(67.00)  | 600.00<br>(60.00)   | 500.00<br>(62.50)  | 700.00<br>(71.43)  | 800.00<br>(69.57)   | 400.00<br>(57.14)  |
| 4.      | Margin of wholesaler/ commission agent (CA)  | 65.20<br>(17.00)   | 93.25<br>(9.33)     | 68.00<br>(8.50)    | 67.70<br>(6.91)    | 90.40<br>(7.86)     | 95.75<br>(13.68)   |
| 5.      | Marketing cost incurred by wholesaler/CA     | 34.80<br>(4.00)    | 31.75<br>(3.18)     | 32.00<br>(4.00)    | 32.30<br>(3.30)    | 34.60<br>(3.01)     | 29.25<br>(4.18)    |
|         | i. Loading/Unloading charges                 | 5.00<br>(1.00)     | 6.00<br>(0.60)      | 5.00<br>(0.63)     | 6.80<br>(0.69)     | 6.60<br>(0.57)      | 5.00<br>(0.71)     |
|         | ii. Transportation                           | 12.80<br>(1.00)    | 10.50<br>(1.05)     | 11.50<br>(1.44)    | 9.00<br>(0.92)     | 9.25<br>(0.80)      | 12.50<br>(1.79)    |
|         | iii. Losses                                  | 12.00<br>(1.00)    | 12.00<br>(1.20)     | 10.00<br>(1.25)    | 14.00<br>(1.43)    | 16.00<br>(1.39)     | 8.00<br>(1.14)     |
|         | iv. Storage                                  | 5.00<br>(1.00)     | 3.25<br>(0.33)      | 5.50<br>(0.69)     | 2.50<br>(0.26)     | 2.75<br>(0.24)      | 3.75<br>(0.54)     |
| 6.      | Price paid by retailer                       | 700.00<br>(78.00)  | 725.00<br>(72.50)   | 600.00<br>(75.00)  | 800.00<br>(81.63)  | 925.00<br>(80.43)   | 525.00<br>(75.00)  |
| 7.      | Margin of retailer                           | 143.00<br>(16.00)  | 220.75<br>(22.21)   | 152.25<br>(19.03)  | 125.00<br>(12.76)  | 161.25<br>(14.02)   | 129.90<br>(18.57)  |
| 8.      | Cost incurred by retailer                    | 57.00<br>(6.00)    | 54.25<br>(5.43)     | 47.75<br>(5.97)    | 55.00<br>(5.61)    | 63.75<br>(5.54)     | 45.10<br>(6.44)    |
|         | i. Loading/Unloading charges                 | 6.00<br>(1.00)     | 7.00<br>(0.70)      | 4.00<br>(0.50)     | 5.25<br>(0.54)     | 7.00<br>(0.61)      | 6.25<br>(0.89)     |
|         | ii. Storage                                  | 3.00<br>(0.33)     | 2.00<br>(0.20)      | 3.25<br>(0.41)     | 1.75<br>(0.18)     | 2.00<br>(0.17)      | 3.10<br>(0.44)     |
|         | iii. Transportation charges                  | 13.00<br>(1.21)    | 9.00<br>(0.90)      | 10.50<br>(1.31)    | 8.00<br>(0.82)     | 8.50<br>(0.74)      | 9.50<br>(1.36)     |
|         | iv. Losses                                   | 35.00<br>(1.44)    | 36.25<br>(3.63)     | 30.00<br>(3.75)    | 40.00<br>(4.08)    | 46.25<br>(4.02)     | 26.25<br>(3.75)    |
| 9.      | Price paid by consumer                       | 900.00<br>(100.00) | 1000.00<br>(100.00) | 800.00<br>(100.00) | 980.00<br>(100.00) | 1150.00<br>(100.00) | 700.00<br>(100.00) |
| 10.     | Marketing efficiency                         | 1.27               | 1.13                | 1.18               | 1.81               | 1.67                | 0.93               |

Figures in parentheses are percentages of consumer's price

**“एगमार्क भारत सरकार द्वारा गुणवत्ता के प्रमाणन की एक प्रणाली है**

# Effect on Prices of Horticultural Commodities —A case study of Cold Storages

—M.S. JAIRATH<sup>1</sup>

## SECTION—I

### Introduction

With the technological development in the agricultural field, India has made rapid stride in horticulture too along with increased foodgrain production. Today our country has emerged as the second largest producer of fruit and vegetables in the world, with an annual production of 44 million tonnes of fruits and 87.5 million tonnes of vegetables contributing nearly 10 per cent and 14 per cent of the world total production of fruit and vegetables respectively. Owing to the varied agro-climatic zones, abundance of natural resources like sunlight and water and technology available for their production, India has considerable potential to increase its production of fruit and vegetables. By the end of Tenth Five Year Plan, Production of fruit and vegetables is expected to increase respectively to 58 million tonnes and 110 million tonnes annually. Out of 131 million tonnes of horticultural crops produced in the country, approximately 60 per cent is consumed by the local population or marketed in the nearby market yards and only 40 per cent of the produce is channelised through the regulated markets for the consumption of the urban population in the big and metropolitan cities. However, their exit large inefficiencies in terms of high levels of wastage and value loss, too many intermediaries in the procurement chain and so on. Handling of horticulture produce is in the hands of persons who are not trained in their jobs as such physiological and microbial damages are quick and more. The Food and agriculture Integrated Development Action (FAIDA) report estimates the loss due to poor handling at Rs. 23000 crores every year, which is almost 50 per cent of the total value of production. This emphasizes the urgent need to adopt cold chain, which includes pre-cooling, cold storages, refrigerated transport and air-conditioned outlets. The cold chain helps in keeping the produce in good quality over along period of time, making the commodities available in the off-seasons and thereby help in avoiding the glut and distress sales and also support the processing industries by assured availability of raw materials.

Though India is second largest producer of fruit and vegetables in the world but our country has been facing the situation of glut and scarcity in respect of many horticulture crops especially onion and potatoes. This is because of the non-existence of efficient marketing infrastructure and

proper storage facilities for the regulated supply management of the produce. In order to have proper and regular supply, it is necessary to create additional cold storage capacity in the country. A high level Expert Committee appointed in 1999 under the Chairmanship of Additional Secretary had *inter alia* recommended the creation of cold storage capacity of 50 lakh tonnes, out of which 12 Lakh tonnes capacity was targeted to be achieved in 3 years (by March 31, 2002). In addition, revival of 8 lakh tonnes closed cold storage capacity and construction of 4.5 lakh tonnes capacity for onion storage were also envisaged. On the recommendation of the High Level Expert Committee, the Govt. of India announced in the Union Budget of 1999-2000, the capital Investment Subsidy Scheme for construction/Expansion of Cold Storage and Storages for horticulture produce. The information about the progress made so far under this scheme is still sporadic and scanty. The present study is an attempt to fill this gap.

In the above background, this study attempts to (a) document the cold storage capacity created and its geographical coverage; (b) to highlight the effect of these cold storages on the prices of horticultural commodities stored in these cold storages; and (c) to enlist the constraints faced at the operational level and offer suggestions for improving the effectiveness of the scheme.

The paper is organized in six sections. Introduction about the study is given in Section-I. The second Section deals with the methodology, data and statistical methods used for the study. Section-III gives information about the Capital Investment Subsidy Scheme for construction/Modernization/Expansion of cold storages. Growth and development of cold storages, capacity created and their geographical spread in the study area is examined in the fourth Section. Section-V deals with the effect of cold storage capacity created on the prices of the commodities stored. The major constraints faced at the operational level and suggestions for enhancing the effectiveness of the Capital Investment Subsidy Scheme in creating cold storage capacities are presented in the last Section.

## SECTION—II

### Methodology

The present study has been conducted in the western region of India because of its distinct initiative drive for promoting horticultural crops, the agro-climatic suitability of the region

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for raising different horticultural crops and the active interest of Government in promoting cold storages for fruit and vegetables in the region. Among the states of western India, Rajasthan state has been purposively selected because of the fast growth of horticultural crops which need cold storage facilities i.e. vegetables, fruit and seed spices. The micro level functioning of the scheme is examined for Jaipur district. The main reason to select Jaipur was due to its decreasing per capita availability of fruit and vegetables and concern of the policy makers for enhancing the availability of cold storage facilities for the urban consumers in the area.

The data used in the analysis pertain to the number of cold storage units, capacity created, capacity utilized, cost of the project, eligible subsidy and the subsidy released by the National Bank for Agriculture and Rural Development (NABARD). The information has been collected from the directorate of Marketing and Inspection, Faridabad and the National Horticulture Board (NHB), Gurgaon and their Offices at Jaipur for better understanding of the cold storage at the micro level, data have been obtained by the personal interview method. Various unpublished reports/Annual Statistical Statements and published report of the NHB were also consulted for the study.

To capture a reasonably accurate picture of the availability of fruit and vegetables as well as that of price stabilization, the collected data from the office of the NHB, Jaipur were analyzed separately both for the entire period as well as for the cold storage period for the selected crops for a detailed investigation. The data have been analyzed by using simple statistical tools.

### SECTION—III

#### **Salient Feature of the Scheme**

With a view to reducing post-harvest losses, the Govt. of India formulated a Capital Investment subsidy Scheme for Construction/Modernization/Expansion of Cold Storages and Storages of Horticulture Produce. The scheme was launched in the year 1999. The main objectives of the scheme have been to reduce the post-harvest losses of the horticultural produce through promoting/setting up of cold storages including controlled/modified atmospheric storages, pre-cooling & other storages; to create a 12 lakh tone cold storage capacity and also to modernize/rehabilitate the sick cold storage units to the tune of 9 lakh MT in addition to a 4 lakh MT of onion storage within a period of 3 years. The total outlay of Rs. 652.50 crores was earmarked under the scheme, of which Rs. 175.00 crores will flow as 25 per cent back-ended subsidy, 25 per cent of the total outlay will be the margin money to be provided by the promoters and 50 per cent of the outlay will be in the form of term loans advanced by the financial institutions.

The subsidy scheme is being implemented by the NHB and the NABARD and operated by commercial banks. In the case of Cooperatives, the National Cooperative Development

Corporation (NCDC) finances the projects. Where term loans are not raised through institutional sources and projects are funded through internal resource generation, the NHB provides capital subsidy directly to such units on the completion of the projects, except for the individuals. The Non-Govt. Organizations (NGOs), association of growers, proprietary and partnership firms, cooperative, companies, corporations, Agricultural Produce Market Committees, the State agricultural Produce Marketing Boards and Agro-Industries Corporations, State Governments are also the eligible borrowers under the scheme and can avail the benefit of subsidy.

Cold storage capacities are being created for the storage of fruit, vegetables & their products, dried fruits such as dates, raisins, etc. and commodities other than horticulture produce in separate chambers matching to their potential use e.g. fish, eggs, dairy products, meat, chicken etc.

The scheme is implemented only in those States & UTs/area, which do not control rentals for cold storages under any statutory or administrative order. However, only multipurpose (except potato) cold storages are covered under this scheme in West Bengal, as storage of potato in cold storages in the State is under rent control. Under the scheme, the quantum of subsidy amount is determined at 25 per cent of the actual project cost subject to the ceilings of project cost viz. (a) new cold storage/expansion of existing cold storage @ Rs. 40000 per tonne of storage, (b) modernization/rehabilitation of the existing cold storages @ Rs.1000 per tonne of storage, (c) Storage for horticulture produce like onion @ Rs. 2000 per tonne the permissible subsidy calculated as above is subject to a further maximum limit of Rs. 50 lakhs per project, and in the North Eastern States however, the maximum subsidy admissible is Rs. 60 lakhs @ 33.33% of the project cost, (d) for calculating subsidy, the capacity of cold storage is decided by providing a volume of 3.4 Cu. Meter per tonne or 120 Cft. Per tonne of produce and (e) the subsidy is back-ended and is adjusted in the borrowers' account as outlined in the accounting procedure of NABARD/associated banks. The term loan repayment period though depends upon the cash flow but is up to 9 years including a grace period of 2 years. The Banks/NABARD prescribe a time limit of 18 months for the completion of the project from the date of sanction.

### SECTION—IV

#### **Progress**

Though this scheme was announced in the Union Budget of 1999-2000, yet the National Horticulture Board took nearly nine months for launching it. Therefore, very few cold storages units could be promoted in the financial year 1999-00. The response to the Capital Investment Subsidy scheme for Creation/Renovation and Expansion began in early 2000 and 273 cold storages with 12.75 lakh MT were however, promoted in the country by the end of March

2001. Investment to the tune of Rs. 376.56 crores was made for the creation of this capacity. The share of subsidy was Rs. 86.43 crores (Table-1). Of the total cold storages promoted, NABARD accounted for the highest share, followed by the National Cooperative Development Corporation and the National Horticulture Board. The micro level data analysis reveals that the cost of project on per tonne basis ranged from Rs.3335 to Rs. 7943 for the units financed by the National Horticulture Board, whereas, this figure ranged from Rs. 995 to Rs. 7578 in the case of projects promoted through NABARD (Details are not given for paucity of space). Only 10 per cent of the cold storages were promoted in Rajasthan. However, their share in the capacity created, cost of projects and eligible subsidy were observed to be only 8, 9 and 10 per cent respectively.

It may be seen from Table-II that the average capacity created, average cost of project and the number of cold storage per hundred Sq. Km were higher for the country as compared to those for Rajasthan. However, the number of cold storage per thousand tonnes of fruit & vegetables and the cold storage capacity created per thousand tonnes were noticed as marginally higher in the state.

It is interesting to mention that in the state of Rajasthan, cold storages were promoted largely by the private companies, followed by the partnership firms. Sole proprietor promoted only two units. However, this trend was not there in the case of cold storage capacities created where it was noticed the lowest in proprietorship concerns (Table-III). These cold storages were promoted for the storage of vegetables, fruits and seed spices. There were only two cold storages, which were promoted for storage of grocery and dairy products. Majority of the cold storages promoted were new except the two cold storage units, which expanded their existing capacities. All the cold storage units were using gravity flow technology like bunker/fin coil suitable for arid areas. Of the total cold storage, nearly one-fourth had less than 3000 MT capacity, another half between 3000 to 5000 MT and remaining units had above 5000 MT capacity. Location-wise analysis indicates that nearly three-fifths were promoted at the State capital, 18 per cent in Bharatpur, 10 per cent in Bikaner and balance 22 per cent in Kota, Udaipur, Jodhpur and Barmer districts. It is heartening to note that these cold stores were largely promoted in the consuming markets except the one in Kota district, where it had been promoted in the rural area to serve the interest of producers.

#### SECTION—V

##### Effect of Cold Storage Capacity on Prices

Cold storages were promoted with a view to having stability in the prices and availability of perishable product in the area. This has been examined for potato crop for both the period i.e. during the year and during the cold storage period (September to Mid December) and results

are presented in Table-IV. Variability in terms of absolute; and relative prices have been calculated for the average prices and arrivals during both the periods. It may be seen that both absolute and relative price variability decreased for potato crop after the promotion of cold storages in Jaipur market for the entire period. However, increased arrivals were witnessed particularly during the storage period. A close perusal of Table-IV indicates that prices soared up after 10th week and touched their maximum level during 27th and 28th weeks. Thereafter prices dipped drastically. However, after setting up of cold storages in Jaipur market, such tendency of price fluctuations was not there. This indicated that with the promotion of cold storages, fluctuations in prices were reduced and this has helped in achieving the objective of price stabilization.

#### SECTION—VI

##### Constraints

During the field visit, it was observed that nearly half of the cold storages were utilizing 50 per cent of their capacity, another 40 per cent utilized 40 per cent of their installed capacity and the remaining 10 per cent were utilizing nearly 90 per cent of the installed capacity. Majority of the promoters complained that lack of continuous availability of power accompanied by high tariff rate was a major constraint for the poor utilization of the installed capacity. Lack of technical guidance from the NHB was one of the main problems encountered by the promoters of cold storages. Besides this there was complete absence of publicity as well as awareness programme on cold storage. In the absence of such programmes, it becomes all the more difficult for the entrepreneurs to take full benefit of the Capital Investment Subsidy Scheme for Cold Storages. Time taken for the appraisal of projects, sanctioning and disbursement of terms loans and release of subsidy by banks (both partial as well as full) were also cited as major constraints by the promoters of cold storages.

The end users had different reasons for not opting for cold storage. Absence of any legal framework i.e. minimum control temperature for avoiding losses, insurance, guarantee of produce, insecticide and pesticide sprays during the storage period, variable charges for different commodities like seasonal basis for potato, week basis charges for grapes, monthly charges for fruits/spices has been cited as the major constraints by the end users.

#### SECTION—VII

##### Conclusion and suggestions

To give momentum to the cold storage programme, there is an urgent need to have two-fold strategy for making the Capital Investment Subsidy Scheme more effective and attractive. To make the scheme more effective, it is necessary that the procedural delay by banks for appraisal & sanction of term loans and release of subsidy (both partial and

complete) need to be shortened (from eleven stages to only three stages) and a time limit is to be imposed on these process. Such an action will help the entrepreneur to reap full benefit of this back-ended subsidy. There is also a strong need to launch a campaign on cold storage with a focus on the farmer education programme right at the village level. Farmers need to be educated as to which varieties of crops are to be grown and stored to meet the consumer demand. Today farmers in rural areas are not fully aware of the post-harvest operations to be undertaken before putting the produce in cold storage such as cleaning, sorting grading etc.

To give further impetus to cold storage, density per hundred sq. km of area as well as to increase availability of cold storage capacity, it is suggested that the Subsidy Scheme be made more attractive by introducing the soft and bridge loan component, providing for multi chambers units and extending guidance to entrepreneur about the know-how of cold storage technology. Levying of uniform charges for all perishable crops and developing legal frame work to further reduce losses at the cold storage level need to be addressed on priority. Ensuring regular and uninterrupted power supply along with the provision of low tariff rates as is applicable to the agricultural sector would go a long way in making the cold storage programme a grand success. For the balanced regional development and enhancement of the spread of cold storage between consuming and producing areas, it is suggested that potential assessment surveys be undertaken in the producing areas. This will not only reduce the post-harvest losses right at the farm level but also make available the produce to consumer and thereby enhance food security in the country.

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**Table—1**  
**Cold Storage Capacity created and Investment made in India and Rajasthan**

| Particulars India    | Cold storage (Number) | Capacity Created (in Lakh MT) | Cost of Projects (Rs. in Crores) | Eligible Subsidy (Rs. in Crores) |
|----------------------|-----------------------|-------------------------------|----------------------------------|----------------------------------|
| NABARD               | 243                   | 12.75                         | 338.2                            | 77.13                            |
| NCDC                 | 17                    | 0.85                          | 29.76                            | 7.55                             |
| NHB                  | 13                    | 0.34                          | 8.6                              | 1.75                             |
| TOTAL                | 263                   | 13.94                         | 376.56                           | 86.43                            |
| Rajasthan*           |                       |                               |                                  |                                  |
| NABARD               | 26                    | 1.15                          | 34.04                            | 8.21                             |
| % Share of Rajasthan | 9.89                  | 8.25                          | 9.04                             | 9.50                             |

\*In Rajasthan entire cold stores have been promoted through NABARD.

Source : Office of NABARD, Bombay and Jaipur.

**Table—2**  
**Comparative picture of Cold Storage Development in India and Rajasthan**

| Particulars   | Units         | India   | Rajasthan |
|---|---------------|---------|-----------|
| Average Capacity Created  | Lakh MT       | 0.051   | 0.044     |
| Average Cost of Project   | Rs. In Crores | 1.379   | 1.309     |
| Average Eligible Subsidy  | Rs. In Crores | 0.317   | 0.316     |
| No. of Cold Storage per 000' Tonnes of Fruit & Vegetables           | Number        | 2.075   | 3.202     |
| Cold Storage Capacity Created per 000' Tonnes of Fruit & Vegetables | in MT         | 105.951 | 141.626   |
| No. of Cold Storage per 00' Sq. Km. of Area                         | Number        | 0.0083  | 0.0076    |

**Table—3**

**Distribution of Cold Stores according to ownership type in Rajasthan**

| Particulars      | Units    | Proprietorship | % age | Partnership | % age | Pvt. Limited | % age | Total Nos. |
|------------------|----------|----------------|-------|-------------|-------|--------------|-------|------------|
| Cold Storage     | No.      | 2              | 7.69  | 4           | 15.38 | 20           | 76.92 | 26         |
| Capacity Created | MT       | 13146          | 11.42 | 10675       | 9.28  | 90969        | 79.04 | 115090     |
| Cost of Projects | Lakh Rs. | 357.91         | 10.51 | 299.728     | 8.79  | 2746.962     | 80.70 | 3403.952   |
| Bank Loan        | Do       | 196.15         | 8.28  | 208.728     | 8.82  | 1962.723     | 82.90 | 2367.601   |
| Promoter Share   | Do       | 153.69         | 15.08 | 90.352      | 8.87  | 775.109      | 76.05 | 1019.151   |
| Subsidy          | Do       | 84.74          | 10.32 | 74.371      | 9.06  | 662.051      | 80.62 | 821.162    |
| Refinance        | Do       | 136.535        | 6.55  | 188.108     | 9.02  | 1760.59      | 84.43 | 2085.233   |

Source : Compiled from the data collected from National Horticulture Board, Jaipur.

**Table—4**

**Average Price, Standard Deviation and Coefficient of Variation in Potato—Before and after establishment of Cold Storage in Jaipur Market**

|   | Average             |                      | Standard Deviation  |                      | Coefficient of Variation |                      |
|---|---------------------|----------------------|---------------------|----------------------|--------------------------|----------------------|
|   | Price<br>(Rs./Qutl) | Arrival<br>(In Qutl) | Price<br>(Rs./Qutl) | Arrival<br>(In Qutl) | Price<br>(Rs./Qutl)      | Arrival<br>(In Qutl) |
| During the year                           |                     |                      |                     |                      |                          |                      |
| — Before Establishment<br>of Cold Storage | 559.67              | 2621.02              | 260.53              | 1310.98              | 46.55                    | 50.02                |
| — After Establishment<br>of Cold Storage  | 216.79              | 3726.02              | 42.44               | 1044.10              | 19.57                    | 28.02                |
| During Cold Storage Period                |                     |                      |                     |                      |                          |                      |
| — Before Establishment<br>of Cold Storage | 827.29              | 2173.43              | 202.72              | 344.97               | 24.50                    | 15.87                |
| — After Establishment<br>of Cold Storage  | 214.57              | 3754.00              | 37.71               | 1297.50              | 17.57                    | 34.56                |

'AGMARK' IS THE SYMBOL, QUALITY IS THE REALITY

# Export Potential of Banana in India

—PHUKE K. D.<sup>1</sup>, N. D. PAWAR<sup>2</sup> AND P.R. WAGHMARE<sup>3</sup>

India can be safely referred to as the fruit basket of the world being the second largest producer of fruits next to Brazil. India is the largest producer of banana in the world. Fruits can earn about 20–30 times higher foreign exchange per unit area than cereals. Horticultural crops cover about 6.80 per cent area and contributes about 18 per cent of India's gross agricultural output. Fruits constitute a crucial nutrient source in human diet. Banana is an important fruit crop grown in the country and popularly known as common man's fruit. The economic importance of banana has been increasing on account of increase in domestic as well as international demand for it.

India lies in the banana production belt of the world having suitable climatic conditions for its production. India produces about 24 per cent of the total world banana production. In spite of this India's share in the global market is less than one per cent, indicating vast potential for India to emerge as a major exporter of banana. Recognizing an importance of banana fruit in foreign exchange earnings and the liberalization policy adopted by our country, the present study "**Export potential of banana in India**" was undertaken with the following specific objectives :

## Objectives

1. To examine the area, production and productivity of banana in India and Maharashtra;
2. To study the trends, magnitude (quantity) and direction of export of banana from India;
3. To analyse the variability in export of banana;
4. To document competitiveness of banana export in new world trade order; and
5. To estimate the projections for export of banana by 2005, 2010 and 2015 AD.

## METHODOLOGY

### Collection of data

Banana fruit crop was purposively selected, as it is a joint Agresco research project. Of the banana importing countries in the world, seven countries which were regular and larger importers of banana from India during the study period (1991-92 to 2001-02) were selected. The data regarding area,

production and productivity were collected from published source of Economic Intelligence Service, Agriculture, CMIE, November 2001 and December 2002. The country-wise time series data on quantity exported and value realized during the study period were collected from various volumes of Agro Export Statistics, APEDA, New Delhi. The domestic prices were obtained from the different volumes of Horticulture Database, National Horticulture Board.

### Analysis of Data

The data were analysed by using simple statistical tools such as means, percentages, ratios etc. in order to assess the performance of area, production and export, the time series data were divided into three periods, viz.; period I (1991-92 to 1996-97), Period II (1997-98 to 2001-02) and Period III (1991-92 to 2001-02).

### Fitting of Trends

With a view to examine the performance in export of banana from India, linear and compound growth rates for the three periods were computed by fitting the following types of linear and log linear equations to time series data.

I Linear growth trend equation :  $\hat{Y} = a + b x$

$$\text{Linear average growth rate (LGR)} = \frac{b}{\bar{Y}} \times 100 \text{ ----- I}$$

$\bar{Y}$  = mean of y

II Semi log or compound growth trend equation :  $\hat{Y} = ab^x$

$$\text{In log form : } \text{Log } \hat{Y} = \text{Log } a + x \text{ log } b$$

Where,

$\hat{Y}$  = Estimated export/area/production

a = Intercept

b = regression coefficient

x = time variable

$$\text{Annual per cent compound growth rate} = (b-1) \times 100 \text{ -----II}$$

The significance of linear and compound growth rates were tested with appropriate tests.

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### Coefficient of variation

To judge the stability in area/production/export of banana, Coefficient of Variation (CV) was computed by using the following formula.

$$CV = \frac{SD}{Mean} \times 100$$

### Export Competitiveness

The export competitiveness of banana was estimated by using Nominal Protection Coefficient (NPC) as a measure of competitiveness. It was computed as

$$NPC = \frac{DP}{BP}$$

Where,

NPC = Nominal Protection Coefficient

DP = Domestic Price

BP = Border Price (After adjusting the transport and marketing cost to FOB prices)

### Results

Area, Production & Productivity of banana presented in Table 2 revealed that area under banana crop in Maharashtra state was the highest in the year 2001-2002 (72 thousand ha) and the lowest in 1992-93 (52.2 thousand ha). The production was the highest in 2001-2002 (4332.6 thousand MT), while productivity in the year 2000-2001 (59.99 MT/ha).

At India level, the highest area and production was recorded in the year 2001-2002, whereas, productivity was the highest in 2000-2001.

In general, productivity level was higher in Maharashtra State as compared to India with the exceptions in 1995-96 and 1997-98. The lower production and productivity in Maharashtra State in the above years might be due to the occurrence of disease on large area.

### TRENDS IN AREA AND PRODUCTION IN MAHARASHTRA STATE

#### Area

The average area in India was 443.02 thousand ha during the study period. It increased to 472.00 thousand ha during II (1997-98 to 2001-2002) from 418.96 thousand ha during period I (1991-92 to 1996-97). The compound growth rate of increase in area of the country was 2.19 per cent per annum during the study period (1991-92 to 2001-2002). The fluctuations in area were in the range of 3.17 to 7.59 per cent throughout the study period (Table 3).

In Maharashtra State the average area under banana crop during 1991-92 to 2001-2002 was 64655 ha. It increased to 65920 ha in the period II from 63600 ha in period I. The

trends in area were positive and significant for period I and II; whereas the overall growth in area was non significant.

The CV values for the three periods were in the range of 13.96 to 16.64 per cent. Thus CV values for the state were comparatively higher than India, indicating higher fluctuations in the growth of area.

### Production

In India the average production per annum during the study period was 13272.55 thousand MT (Table 3). The production of banana was increased significantly at the compound rate of 6.27 per cent per annum during the study period. The average production during the period I was 1175.60 thousand MT, which considerably increased to 15428.88 thousand MT per year during period II. The CV value for overall period was 19.98 per cent. It was lower to the tune of 8.27 per cent during period II and during period I, it was 17.95 per cent. The lower CV values indicated no dynamic change in production of the banana in the country during period II. This was also observed getting non significant growth rate during the period II.

In Maharashtra the trends in production of banana were positive and significant. The average production of banana was 3033.17 thousand MT per year during the study period. The production significantly increased at the linear average rate of 6.61 per cent during the study period. The average production of banana in the state was 2597.48 thousand MT per year during the period I, which considerably increased to 3556.00 thousand MT during the period II.

Thus, higher fluctuations in production were noticed in the state as the CV values varied in the range of 14.51 per cent in period I to 36.58 per cent in period II. Comparatively higher fluctuations in the production of banana were observed in the State as compared to India. These higher fluctuations may be attributed to the vagaries of monsoon, high temperature and disease occurrence in the State.

### Export performance of Banana fruits

It is revealed from the Table 4, that annual export of banana from India was in between 656 to 8629 MT and value realized in the range of Rs. 41.906 to Rs. 1800.304 lakh during the study period. The highest quantity of banana was exported in the year 2000-01 (8629 MT) and lowest in 1996-97 (303 MT). The total highest value was realised in the year 2000-01 (Rs. 1800.304 lakh) and the lowest in 1991-92 (Rs. 26.935 lakh).

Per cent total export of the country's production was in between 0.002 to 0.05 only.

### Trends in export of Banana

Out of the list of regular and larger banana importer countries in the world first seven countries were selected to find out the direction and magnitude of banana fruit export from India during the period from 1991-92 to 2001-2002.

The selected countries are UAE (United Arab Emirates), Saudi Arabia, Bahrain, Qatar, Nepal, Oman and Kuwait.

It is seen from the Table 5 that during 1991–96 the average quantity of banana exported annually was 1018 MT from India, which was considerably increased to 7630 MT during 1997–2002. The trends in export of banana were highly significant during the period III (1991–2002). The compound growth rates of increase in export for this period was 32.43 per cent per annum.

The linear trend was better fit as compared to semi-log trend for the period III (1991–2002), which indicated falling growth rates per year during this period.

The coefficient of variation (CV) was very high (87.57 per cent) during period III compared to period I (49.88 per cent) and period II (12.47 per cent). This indicated that the high growth rate was also accompanied with high fluctuations in the export of banana fruits. Further this showed higher fluctuations of export during period I, but the same trend was not maintained in the period II.

Export to UAE was to the tune of 37.52 per cent per annum during the study period, followed by Saudi Arabia, Bahrain, Qatar, Nepal, Oman, Kuwait. During the period II, largest export was effected to the country UAE followed by Saudi Arabia, Bahrain, Qatar, Oman, Kuwait and Nepal. The average export to various countries considerably increased during period II as compared to period I, except Nepal.

During the overall period i.e. period III, the trends in export were positive and highly significant (at 1% level of significance) for UAE, Bahrain, Qatar, Oman and Kuwait. The growth rates of increase in export to these countries were 124.15, 55.23, 62.29, 207.47 and 47.49 per cent per annum at the compound rate, respectively. The compound growth rate of increase in export to Saudi Arabia was 43.62 per cent per annum during the study period (1991-92 to 2001-2002), which was significant at 5% level of significance.

The semi-log trend was better fit in UAE, Qatar and Oman and linear trend was better fit for Saudi Arabia, Bahrain and Kuwait. This indicated the constant growth rate of export per year for UAE, Qatar and Oman, whereas, the positive growth rate declined per year in Saudi Arabia, Bahrain and Kuwait. Hence it is concluded that there is better scope in UAE, Qatar and Oman for export of Banana.

There were high fluctuations in the export of banana and were more than hundred per cent for UAE, Saudi Arabia, Oman and Kuwait, whereas, the CV values were at par with the total CV values of total export of India. The high value of CV coupled with high growth rate of export indicated dynamic changes in the export of banana in these countries.

During the period I (1991-92 to 1996-97), the average export per year was 24, 70, 39, 52, 2 and 20 MT to UAE, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait,

respectively. This was considerably increased to 329, 1045, 555, 521, 432 and 356 MT per annum during period II. The export in Nepal was 346 MT per year during period I which was declined to 163 in period II.

### **Nominal Protection Co-efficient (NPC)**

A production strategy based on comparative advantage supported by a progressive export policy would help India to consolidate her position in global market. In view of these facts and to document competitiveness of banana export in new world trade order, an attempt was made in the present study to examine the comparative advantage in export of banana from India. For this purpose a technique known as Nominal protection coefficient (NPC) was used and the results are presented in Table 6.

It is seen from the Table 6 that India did not enjoy the comparative advantage in the total export of banana in 1991-92 as the NPC was more than unity. However, it has a comparative advantage in export of banana to all the countries under study except Nepal. In the year 1995-96 India has not comparative advantage in export of banana to Bahrain, Qatar, and Oman as the NPC values for these countries were more than one. It implied that domestic prices prevailing in the India were higher than the FOB prices fetched in the above countries. On the other hand India recorded the export competitiveness of banana in UAE, Saudi Arabia, Nepal and Kuwait as the NPC values were lower than one. This indicated that the FOB prices realized in export to these countries were higher than those of the domestic prices.

In the year 2000-01, it was worthwhile to export banana to all the countries under study except Nepal as NPC value for it was greater than unity. India also enjoyed comparative advantage in export of banana to all the countries under study except Nepal in 2001-2002. The highest comparative advantage in exporting banana was to Kuwait followed by Qatar, Saudi Arabia, equally to UAE, Oman and Bahrain.

From the above discussion it is inferred that India enjoyed comparative advantage in export of banana in the new world trade order (after LPG) to all the countries under study except Nepal.

### **Projections in Export of Banana**

The export projections of banana by 2005-2006, 2010-11 and 2015-16 have been estimated on the basis of the trend of export of banana prevailing during the period 1991-92 to 2001-2002. The future projections of export will be valid only if the other factors like production, surplus, demand for and supply of banana, in the world follow the similar trend in the next few years as it was following during the last eleven years. The countrywise projections of export of banana from India are presented in Table 7.

The Table 7 revealed that, the quantities of banana to be exported from India by 2005-2006 AD were estimated at 12328 metric tones. The countrywise scope for export of

banana showed that, there exist scope for export of banana to UAE, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait to the tune of 5650, 1563, 895, 841, 828 and 621 metric tones, per year, respectively.

By 2010-11 AD total banana export of India would be 16941 metric tones and the highest export would be to UAE (7950 MT). In 2015-2016 AD total banana export to different countries is expected to be 21555 metric tones and the major importing country would be UAE (10250 MT) and it would alone import about 47 per cent of the total export of banana from India.

As the growth rate of export for Nepal were negative the projections were not made.

### Conclusions

Based on the present study following conclusions can be drawn :

1. In Maharashtra as well as India, area under banana crop increased during the study period of 1991-92 to 2001-2002 barring few years and similar pattern in the production was also observed.
2. State productivity of banana is higher than the country except in the year 1995-96 and 1997-98. The highest productivity of the state is about 60 metric tones per ha, whereas it is about 33 metric tones of the country.
3. The area under banana in the country is increasing at the compound growth rate of 2.19 per cent per annum, but in the state overall growth rate in area is non significant.
4. Production of banana in the country is increasing at the compound growth rate of 6.27 per cent per annum having no much fluctuations during the study period and it increased significantly at the linear growth rate of 6.61 per cent per annum during the study period in the state.
5. Comparatively higher fluctuations in the production of banana were observed in the state than the country. The reasons can be attributed to the vagaries of monsoon and disease occurrence in the state.
6. Total export of banana ranged in between 0.002 to 0.05 per cent of the total production of the country which is very meager.
7. India exported banana to the countries like UAE, Saudi Arabia, Bahrain, Qatar, Nepal, Oman and Kuwait, which are the major importing countries i.e. major export is to the gulf countries.
8. Export trends in banana was highly significant during the study period (1991—2002) with a compound growth rate of 32.43 per cent per annum.
9. Trends in export of banana to different countries were also significant and compound growth rates in export were 124.15, 43.62, 55.23, 62.29, 207.46 and 47.49 per cent per annum of UAE, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait, respectively. However, Nepal recorded negative and non significant trend during the study period.
10. Better fit of semi-log trend in UAE, Qatar, and Oman indicated increasing rate of export to these countries and hence there is better scope in exporting banana to UAE, Qatar and Oman.
11. India enjoyed comparative advantage in export of banana in the new world trade order i.e. after LPG to UAE, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait, whereas, Nepal indicated no competitiveness in export of banana from India.
12. Export projections of banana by 2005-06, 2010-11 and 2015-16 AD were estimated to 12328, 16941 and 21555 metric tones per year respectively, and UAE would be the major importing country of banana from India keeping all other factors constant.

### Policy Implications

Based on the present study the following policy implications are emerged :

#### 1. Increase in production

Total production of banana in the country needs to be increased. Supply can be increased by increasing area and productivity in the country. For this purpose, modern technology of production including tissue culture should be adopted.

#### 2. Increase in exportable quality production

In long run, export of banana can only be enhanced by increasing its exportable quality production. At present exportable quantity of banana is less and needs attention in this direction. For this, the measures such as use of proper varieties, modern and highly improved cultivation technology like tissue culture, efficient irrigation methods, optimum use of plant protection, chemicals, etc. should be followed to produce required quality fruits in terms of size, shape, colour, taste, chemical content, etc.

#### 3. Creation of Infrastructure for Post-harvest handling and shipment

It consist of improved harvesting and processing facilities, improved harvesting methods should be popularized among the farmers. Manual on recommended packages of exportable production and export practices should be developed and in printed form should be distributed to extension organizations, farmers organizations and leading banana growers.

#### 4. Post-harvest handling facilities

This consists of storing, grading, washing, cleaning, pre-cooling, cold storage, etc. Such facilities are inadequate and should be created.

#### 5. Export promotion and market development

To enhance the export of banana, promotional programmes should be organized. Holding special meets of importers and showing the availability of new products, promotion of brand names, etc. will help to promote export and widen the market. This should be done Government level.

#### 6. Development of Market Intelligence and Marketing Information System

Govt. should establish well equipped market information dissemination system, whereby individual farmer exporter, export organizations and other organizations should get quick, reliable and accurate information of prices, demand, supply and their forecasts, etc. In domestic as well foreign markets.

7. Export of Banana to UAE, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait need to be encouraged, while export to Nepal should be discouraged.

8. Banana fruits should be processed and the different products may exported, so as to encourage total export.

9. At present hundred per cent EOU benefits are not available to agriculture sector. This deprives the units of the impact of technology and machine and other inputs at concessional rate of duty. Hundred per cent export oriented horticulture estates may be allowed to be set up to encourage export of fresh fruits.

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Table—1

#### Banana Production of Major Horticulturally Advanced Countries in the World

(Production in thousand MT)

| Country     | 1991       |            | 1995       |            | 2000       |            |
|-------------|------------|------------|------------|------------|------------|------------|
|             | Production | Percentage | Production | Percentage | Production | Percentage |
| World       | 46874      | 100.00     | 55500      | 100.00     | 67546      | 100.00     |
| India       | 7790       | 16.62      | 13095      | 23.59      | 16167      | 23.93      |
| Brazil      | 5510       | 11.75      | 5680       | 10.23      | 6079       | 9.00       |
| Equador     | 3052       | 6.51       | 5403       | 9.73       | 6477       | 9.59       |
| China       | 1813       | 3.87       | 3298       | 5.94       | 5140       | 7.61       |
| Philippines | 3018       | 6.43       | 3304       | 5.93       | 4930       | 7.30       |
| Indonesia   | 2358       | 5.03       | 2600       | 4.68       | 3747       | 5.54       |
| Maxico      | 1900       | 4.05       | 2033       | 3.66       | 1663       | 2.46       |
| Colombia    | 1677       | 3.58       | 2100       | 3.78       | 1651       | 2.44       |

Source : Database, National Horticulture Board.

Table—2

#### Area, Production and Productivity of Banana in India and Maharashtra State

(Area in '000', ha, Production in '000' MT, and Productivity in MT).

| Years   | Maharashtra |            |              | India |            |              | Productivity % Increase over India |
|---------|-------------|------------|--------------|-------|------------|--------------|------------------------------------|
|         | Area        | Production | Productivity | Area  | Production | Productivity |                                    |
| 1       | 2           | 3          | 4            | 5     | 6          | 7            | 8                                  |
| 1991-92 | 56.5        | 2081.0     | 36.83        | 383.9 | 7790.0     | 20.29        | 81.52                              |
| 1992-93 | 52.2        | 2724.5     | 52.19        | 396.2 | 10460.0    | 26.40        | 97.69                              |
| 1993-94 | 57.2        | 2827.1     | 49.42        | 431.7 | 11900.8    | 27.57        | 79.25                              |

| 1       | 2    | 3      | 4     | 5     | 6       | 7     | 8     |
|---------|------|--------|-------|-------|---------|-------|-------|
| 1994-95 | 62.7 | 3072.7 | 49.01 | 444.4 | 13168.1 | 29.63 | 65.41 |
| 1995-96 | 74.9 | 2216.9 | 29.60 | 443.0 | 13095.1 | 30.24 | -2.11 |
| 1996-97 | 78.1 | 2662.7 | 34.09 | 424.6 | 12439.6 | 29.29 | 16.39 |
| 1997-98 | 52.3 | 1330.0 | 25.00 | 449.1 | 13339.5 | 29.70 | -5.82 |
| 1998-99 | 59.0 | 3455.6 | 58.57 | 464.3 | 15072.7 | 32.46 | 80.43 |
| 1999-00 | 72.2 | 4330.5 | 59.98 | 479.3 | 16378.2 | 34.17 | 75.53 |
| 2000-01 | 72.2 | 4331.3 | 59.99 | 482.8 | 16167.0 | 33.49 | 79.12 |
| 2001-02 | 73.0 | 4332.6 | 59.35 | 483.9 | 16187.0 | 33.45 | 77.43 |

Source : Economic Intelligence Service, Agriculture, CMIE, Dec. 2002.

**Table—3**  
**Growth rates of Area and Production in Maharashtra and India**

| Country/State               | Period  | Mean<br>(000 MT) | CV    | LGR   | r      | CGR   | r      |
|-----------------------------|---------|------------------|-------|-------|--------|-------|--------|
| Maharashtra<br>(Area)       | 1991–96 | 63.60            | 16.64 | 8.16  | 0.91** | 8.31  | 0.91** |
|                             | 1997–02 | 65.92            | 13.96 | 8.01  | 0.90*  | 8.70  | 0.90*  |
|                             | 1991–02 | 64.65            | 14.78 | 2.50  | 0.56   | 2.59  | 0.57   |
| India<br>(Area)             | 1991–96 | 418.96           | 5.63  | 2.23  | 0.74   | 2.31  | 7.46   |
|                             | 1997–02 | 471.88           | 3.17  | 1.87  | 0.93*  | 1.90  | 0.93*  |
|                             | 1991–02 | 443.02           | 7.59  | 2.14  | 0.94** | 2.19  | 0.93** |
| Maharashtra<br>(Production) | 1991–96 | 2597.48          | 14.51 | 1.79  | 0.23   | 2.01  | 0.25   |
|                             | 1997–02 | 3556.00          | 3.58  | 19.35 | 0.83   | 29.53 | 0.79   |
|                             | 1991–92 | 3033.17          | 32.94 | 6.62  | 0.66*  | 6.11  | 0.54   |
| India<br>(Production)       | 1991–96 | 11475.60         | 17.95 | 8.07  | 0.84*  | 9.31  | 0.83*  |
|                             | 1997–02 | 15428.88         | 8.27  | 4.40  | 0.84   | 4.67  | 0.84   |
|                             | 1991–02 | 13272.55         | 19.98 | 5.63  | 0.93** | 6.27  | 0.90** |

\*Significant at 5% level of probability.

\*\*Significant at 1% level of probability.

**Table—4**  
**Export performance of Banana fruits**

(Qts. in thousand MT and Value in Rs. in lakhs)

| Year    | Production | Qty. Exported | Value realised | % export to total production |
|---------|------------|---------------|----------------|------------------------------|
| 1991-92 | 7790.00    | 0.656         | 26.935         | 0.008                        |
| 1992-93 | 1060.00    | 1.353         | 106.65         | 0.013                        |
| 1993-94 | 11900.80   | 1.086         | 147.31         | 0.009                        |
| 1994-95 | 13168.10   | 0.966         | 89.56          | 0.007                        |
| 1995-96 | 13095.10   | 1.744         | 222.09         | 0.013                        |
| 1996-97 | 12439.60   | 0.303         | 41.906         | 0.002                        |
| 1997-98 | 13339.50   | 7.017         | 1267.82        | 0.05                         |
| 1998-99 | 15072.70   | 8.111         | 1689.40        | 0.05                         |
| 1999-00 | 16813.50   | 6.290         | 1280.809       | 0.037                        |
| 2000-01 | 16167.00   | 8.629         | 1800.304       | 0.05                         |
| 2001-02 | 16158.80   | 8.099         | 1583.940       | 0.05                         |

Source : Various issues of Agro Export Statistics of APEDA and Horticultural data base of NHB.

**Table—5**  
**Growth rates of Export of Banana in different Countries**

| Country                    | Period  | Mean (MT) | CV     | LGR    | r      | CGR    | R      |
|----------------------------|---------|-----------|--------|--------|--------|--------|--------|
| UAE (United Arab Emirates) | 1991–96 | 23.56     | 87.19  | 29.86  | 0.64   | 56.21  | 0.72   |
|                            | 1997–02 | 3293.91   | 19.22  | 4.32   | 0.34   | 4.38   | 0.34   |
|                            | 1991–02 | 1510.08   | 116.17 | 30.46  | 0.87** | 124.15 | 0.91** |
| Saudi Arabia               | 1991–96 | 69.72     | 98.23  | -21.27 | -0.405 | -22.92 | -0.48  |
|                            | 1997–02 | 1044.72   | 33.14  | -14.69 | -0.70  | -14.34 | -0.68  |
|                            | 1991–02 | 512.90    | 108.48 | 22.74  | 0.69*  | 43.62  | 0.68*  |
| Bahrain                    | 1991–96 | 39.15     | 80.23  | 9.40   | 0.22   | 17.94  | 0.28   |
|                            | 1997–02 | 555.13    | 10.98  | -3.73  | -0.54  | -3.61  | -0.52  |
|                            | 1991–02 | 273.69    | 99.79  | 25.23  | 0.84** | 55.23  | 0.82** |
| Qatar                      | 1991–96 | 52.20     | 99.38  | 30.65  | 0.57   | 80.42  | 0.79   |
|                            | 1997–02 | 520.29    | 28.51  | -5.19  | -2.29  | -4.43  | -0.27  |
|                            | 1991–02 | 265.10    | 99.79  | 24.12  | 0.80** | 62.29  | 0.89** |
| Nepal                      | 1991–96 | 345.77    | 81.93  | -25.13 | -0.57  | -19.10 | -0.30  |
|                            | 1997–02 | 162.59    | 801.78 | 47.72  | 0.69   | 47.84  | 0.11   |
|                            | 1991–02 | 262.51    | 94.69  | -12.09 | -0.42  | -31.17 | -0.32  |
| Oman                       | 1991–96 | 2.04      | 165.77 | 0.22   | 0.01   | 133.98 | 0.50   |
|                            | 1997–02 | 432.47    | 54.23  | 28.73  | 0.84   | 55.22  | 0.80   |
|                            | 1991–02 | 197.69    | 136.23 | 35.41  | 0.86** | 207.47 | 0.86** |
| Kuwait                     | 1991–96 | 19.80     | 92.84  | -27.25 | -0.55  | -35.93 | -0.75  |
|                            | 1997–02 | 356.47    | 32.11  | 14.80  | 0.73   | 15.37  | 0.72   |
|                            | 1991–02 | 172.83    | 110.27 | 28.84  | 0.86** | 47.49  | 0.68*  |
| Others                     | 1991–96 | 465.66    | 93.36  | 12.91  | 0.26   | 26.47  | 0.31   |
|                            | 1997–02 | 1256.43   | 22.47  | 5.19   | 0.36   | 5.67   | 0.41   |
|                            | 1991–02 | 825.10    | 66.04  | 14.95  | 0.75** | 29.17  | 0.65*  |
| Total                      | 1991–96 | 1017.92   | 49.89  | -1.99  | -0.07  | -8.79  | -0.27  |
|                            | 1997–02 | 7629.53   | 12.47  | 3.52   | 0.44   | 3.55   | 0.43   |
|                            | 1991–02 | 4023.19   | 87.57  | 22.94  | 0.87** | 32.43  | 0.77** |

\*Significant at 5% level of probability.

\*\*Significant at 1% level of probability.

**Table—6**

**Nominal Protection Coefficient (NPC) of Banana fruit (Exportable hypothesis)**

| Countries    | NPC Values |         |         |         |
|--------------|------------|---------|---------|---------|
|              | 1991-92    | 1995-96 | 2000-01 | 2001-02 |
| UAE          | 0.42       | 0.67    | 0.41    | 0.40    |
| Saudi Arabia | 0.39       | 0.60    | 0.39    | 0.39    |
| Bahrain      | 0.34       | 1.60    | 0.47    | 0.46    |
| Qatar        | 0.31       | 1.01    | 0.33    | 0.37    |
| Nepal        | 1.72       | 0.38    | 2.18    | 2.09    |
| Oman         | 0.49       | 15.48   | 0.45    | 0.40    |
| Kuwait       | 0.36       | 0.62    | 0.25    | 0.33    |
| Total        | 2.45       | 0.54    | 0.42    | 0.47    |

**Table—7**

**Country-wise Export projections of Banana**

(Volume in MT)

| Countries    | 2005 AD  | 2010 AD  | 2015 AD  |
|--------------|----------|----------|----------|
| UAE          | 5650.25  | 7950.35  | 10250.44 |
| Saudi Arabia | 1562.72  | 2145.94  | 2729.17  |
| Bahrain      | 895.24   | 1239.64  | 1584.72  |
| Qatar        | 840.70   | 1160.47  | 1480.25  |
| Oman         | 827.64   | 117.61   | 1527.58  |
| Kuwait       | 621.45   | 870.68   | 1119.91  |
| Others       | 1935.03  | 2551.66  | 3168.28  |
| Total        | 12327.81 | 16941.49 | 21555.16 |

# Marketing Efficiency of Cole Vegetables in Western Maharashtra

—K. S. BIRARI<sup>1</sup>, D. S. NAVADKAR<sup>2</sup> AND J. T. DORGE<sup>3</sup>

## INTRODUCTION

Vegetable cultivation provides a good source of income to the grower and plays an important role in human nutrition. Higher nutrition values and economics returns per unit area are the two main advantages of growing vegetables

in preference to other food crops. From the nutritional point of view, vegetable is of greater economics significance in enriching the food resources. Nutritive value of vegetables has been recognised by the people. The high nutrition capacity of vegetables is only due to the presence of vitamins and minerals in it.

Table No.—1  
Nutritive value of Cole vegetables

| Vegetable   | Moisture % | Protein gm. | Fat Gm | Carbo-hydrate | Calcium Mg. | Phos-phorus Mg | Vit. I.U. | Thiamine B1 Mg. | Riboflavin B2 Mg. | Ascorbic-acid |
|-------------|------------|-------------|--------|---------------|-------------|----------------|-----------|-----------------|-------------------|---------------|
| Cabbage     | 92.1       | 1.4         | 0.2    | 5.7           | 46.00       | 28.00          | 70.00     | 0.05            | 0.05              | 46.00         |
| Cauliflower | 91.70      | 2.4         | 0.2    | 4.9           | 22.00       | 72.00          | 90.00     | 0.11            | 0.10              | 69.00         |

(Source : Vegetables Production in India by D.V.S. Chauhan)

Vegetable marketing is the process, which starts with a decision to produce the saleable vegetables and it involves all aspects of market structure, both functional and institutional based on technical and economic consideration and includes pre and post-harvest operations, assembling grading, storage, transportation and distribution. Increased production resulting in greater percentage increase in marketable surplus, accompanied by the increase in demand from urban population calls for rapid improvement in the existing vegetables marketing pattern.

There are many middlemen operate both at the assembling and distribution points in vegetable and marketing business who exploit the cultivators by taking high marketing margins. In the vegetable marketing system, marketing margin shows the spread between the price paid and received by any particular vegetable marketing agency.

Therefore the present study has been undertaken with the following specific objectives :—

1. To study the marketing channels in marketing of Cole vegetables.
2. To estimate the marketing cost of Cole vegetables marketing.
3. To estimate price spread in marketing of Cole vegetables in different markets.
4. To estimate marketing efficiency of Cole vegetables.

## Methodology

The present study has been undertaken in the Ahmednagar, Pune and Nasik, districts of the Western Maharashtra. The above districts were purposively selected because of high production of the different vegetables. Two tahsil from each of the three selected districts having maximum acreages under vegetables were selected purposively. Cabbage and Cauliflower, these two Cole vegetables were considered for the present study. Three villages from each of the tahsil were selected purposively based on maximum acreages under the selected Cole vegetables. Thus in all 18 villages were selected purposively. From each selected village, total of 10 sample farmers growing the selected vegetables in different seasons were selected randomly. In all 180 vegetables growers were selected randomly growing the selected vegetables in different seasons. The Survey method was adopted for collecting the data. The data were analysed with appropriate tools considering the objectives in mind. The marketing efficiency was estimated by the following formula:

$$\text{Marketing Efficiency} = \frac{\text{Value added by marketing}}{\text{Marketing cost}} \times 100$$

## Results and Discussion

Intermediaries are the agencies, which link the buyers and sellers in the market. Marketing efficiency depends on performance of the markets intermediaries, which in

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turn reflects competitiveness of the marketing system. Existing marketing system in the case of perishable like vegetables is not very satisfactory because of large number intermediaries reap the maximum share of consumer's rupee and the producer get only a marginal benefits over the cost incurred for long waiting period. If the efficiency of marketing is to be improved, it is necessary to minimise the number of intermediaries between actual buyers and sellers due to perishable nature of vegetables, it needs to be moved faster from producer to consumer with due efficiency. In the case of Cole vegetables following nine types of marketing channels were observed :—

- (i) Producer – Consumer.
- (ii) Producer – Commission Agent at Primary Market – Wholesaler – Retailer – Consumer.
- (iii) Producer – Commission Agent at Primary Market – Commission Agent at terminal market – Wholesaler – Retailer – Consumer.

- (iv) Producer – Commission Agent at Terminal Market – Wholesaler – Retailer – Consumer.
- (v) Producer – Co-operative Marketing Society – Wholesaler – Retailer – Consumer.
- (vi) Producer – Co-operative Marketing Society – Commission Agent at Terminal Market – Wholesaler – Retailer – Consumer.
- (vii) Producer – Co-operative Marketing Society – Consumer.
- (viii) Producer – Retailer – Consumer.
- (ix) Producer – Assemblers at Local Market – Commission Agent outside State Market – Retailer – Consumer.

### Marketed Surplus of Cole Vegetables

The average quantity of Cole vegetables sold in primary and terminal markets alongwith their proportionate share is presented in table 2.

**Table—2**  
Average quantity of Cole vegetables marketed in primary and terminal markets

| Name vegetable | Season | Market   | Total quantity marketed | Quantity marketed in primary & terminal market | Proportionate share of marketed qty. in different markets (%) |
|----------------|--------|----------|-------------------------|--|---|
| Cabbage        | Kharif | Primary  | 210.40                  | 52.60  | 25.00   |
|                |        | Terminal |                         | 157.80   | 75.00   |
|                | Rabi   | Primary  | 291.09                  | 58.22  | 20.01   |
|                |        | Terminal |                         | 232.87   | 79.99   |
| Cauliflower    | Kharif | Primary  | 217.20                  | 21.72  | 10.00   |
|                |        | Terminal |                         | 195.48   | 90  |
|                | Rabi   | Primary  | 289.35                  | 43.40  | 14.99   |
|                |        | Terminal |                         | 245.95   | 85.01   |

From table 2, it is indicated that majority of produce was sold in terminal market in both the seasons of Cole vegetables. Major share of the produce of kharif and rabi cabbage was sold in terminal market *i.e.* 75 per cent, 79.99 per cent respectively. Whereas kharif and rabi season cauliflower was sold in terminal market to the tune of 90 per cent and 85 per cent respectively.

### Marketing costs

The study on marketing cost was undertaken to estimate the per quintal cost of marketing of Cole vegetables and per hectare cost of marketing in different markets and seasons.

Total marketing cost comprises of sum total of cost of all the function and the other marketing charges. Thus, it constituted the expenses on the items like packaging, transportation, hamali, weighing charges, commission, market rent, postage etc. The information has been presented in table 3.

In case of Cabbage the per quintal marketing cost was noticed to be the highest in terminal market during rabi season (Rs. 70.49) and the lowest in primary market during kharif season (Rs. 40.57). High marketing cost was observed in rabi season in primary as well as terminal market also.



**Table—3**  
Average per quintal cost of marketing of Cole vegetable in primary and terminal markets

| Market               | Item of marketing cost |                  |                  |                                |   |                |                         |                |                          | Total cost     |
|----------------------|------------------------|------------------|------------------|--------------------------------|---|----------------|-------------------------|----------------|--------------------------|----------------|
|                      | Grading                | Packag-<br>ing   | Trans-<br>port   | Commis-<br>sion<br>of<br>agent | Commis-<br>sion<br>of<br>Hunde-<br>kari | Hamali         | Halt-<br>ing<br>charges | Post-<br>ing   | Weigh-<br>ing<br>charges |                |
| <b>Cabbage :</b>     |                        |                  |                  |                                |   |                |                         |                |                          |                |
| <i>Kharif</i>        |                        |                  |                  |                                |   |                |                         |                |                          |                |
| Primary              | 0.76<br>(1.87)         | 8.32<br>(20.51)  | 10.89<br>(26.84) | 18.48<br>(45.55)               | —                                       | 1.00<br>(2.46) | 0.62<br>(1.53)          | —              | 0.50<br>(1.23)           | 40.57<br>(100) |
| Terminal             | 0.59<br>(0.89)         | 15.10<br>(22.73) | 15.52<br>(23.36) | 20.45<br>(30.78)               | 10.70<br>(16.11)                        | 1.99<br>(2.99) | 1.25<br>(1.88)          | 0.33<br>(0.50) | 0.50<br>(0.75)           | 66.43<br>(100) |
| <i>Rabi</i>          |                        |                  |                  |                                |   |                |                         |                |                          |                |
| Primary              | 0.45<br>(1.00)         | 9.93<br>(22.15)  | 12.49<br>(27.85) | 19.26<br>(42.95)               | —                                       | 1.89<br>(4.21) | 0.32<br>(0.71)          | —              | 0.50<br>(1.12)           | 44.84<br>(100) |
| Terminal             | 0.86<br>(1.22)         | 16.32<br>(23.15) | 13.52<br>(19.18) | 25.40<br>(36.03)               | 11.18<br>(15.86)                        | 1.75<br>(2.48) | 1.25<br>(1.77)          | 0.21<br>(0.30) | 0.50<br>(0.71)           | 70.49<br>(100) |
| <b>Cauliflower :</b> |                        |                  |                  |                                |   |                |                         |                |                          |                |
| <i>Kharif</i>        |                        |                  |                  |                                |   |                |                         |                |                          |                |
| Primary              | 0.55<br>(1.28)         | 9.83<br>(22.96)  | 11.94<br>(27.89) | 16.26<br>(37.98)               | —                                       | 1.89<br>(4.41) | 1.32<br>(3.08)          | —              | 1.01<br>(2.38)           | 42.41<br>(100) |
| Terminal             | 0.40<br>(0.59)         | 16.43<br>(24.37) | 15.02<br>(22.27) | 19.17<br>(28.43)               | 12.22<br>(18.12)                        | 1.75<br>(2.60) | 1.25<br>(1.85)          | 0.19<br>(0.28) | 1.00<br>(1.48)           | 67.43<br>(100) |
| <i>Rabi</i>          |                        |                  |                  |                                |   |                |                         |                |                          |                |
| Primary              | 0.81<br>(1.96)         | 10.34<br>(25.05) | 13.50<br>(32.70) | 13.50<br>(32.70)               | —                                       | 1.01<br>(2.45) | 1.62<br>(3.92)          | —              | 0.50<br>(1.21)           | 41.28<br>(100) |
| Terminal             | 0.11<br>(0.15)         | 15.79<br>(21.76) | 16.07<br>(22.14) | 22.62<br>(31.17)               | 14.38<br>(19.82)                        | 1.00<br>(1.38) | 0.93<br>(1.28)          | 0.67<br>(0.92) | 1.00<br>(1.38)           | 72.57<br>(100) |

(Figures in the parantheses are the percentages to the total marketing cost).

The major items of marketing cost were commission, transportation and packaging which together contributed more than 92 per cent in both the markets and seasons. These were followed by hamali, halting charges and grading cost in both the seasons. The postage and weighing charges were negligible items of marketing cost.

In case of cauliflower, it was noticed that the per quintal marketing cost was the higher in primary market during kharif season (Rs. 42.81) and in terminal market during rabi season (Rs. 72.57). The major items of marketing cost were noticed to be commission, transportation and packaging which contributed nearly 90 per cent in primary market and more than 94 per cent in terminal market in both the seasons. It was interestingly noticed that the grading cost and hamali and weighing charges were more in primary market during kharif season than that of in other seasons. The transportation

cost was more packing cost in both the markets excepting terminal market during kharif season.

#### **Price spread in marketing of Cole vegetables in different markets according to seasons**

The price spread is the difference between the price paid by the consumer and the price received by the producer. The difference reflects the marketing cost shared by different intermediaries and margin taken by them. That was worked out for different seasons in various markets and presented in table 4.

The cabbage producer's share in consumer's rupee as could be seen from the table was more than 50 per cent in both the markets during kharif and rabi seasons, the magnitude was the highest in primary market (57.92 per cent) during rabi season only. It was just 50 per cent in terminal market

during kharif season. The expenses incurred by the producer himself and the intermediaries on marketing were the lowest during rabi season (22.19 per cent) in primary market as well as the profit earned by the intermediaries was also less in the market. Opposite

to this situation the farmers and the intermediaries paid 29.17 per cent marketing expenses in maximum profit of 23.08 per cent of consumers rupee in the same market during rabi season.

**Table—4**  
**Price spread in marketing of Cole vegetables**

| (Rs.)                |  |  |                                  |                             |                            |                              |                           |                          |                              |
|----------------------|--|--|----------------------------------|-----------------------------|----------------------------|------------------------------|---------------------------|--------------------------|------------------------------|
| Market               | Producer's<br>Net share<br>in<br>consumer's<br>rupee | Marketing<br>charges<br>paid by<br>producer<br>including<br>commission | Price<br>spread by<br>wholesaler | Expense<br>of<br>wholesaler | Profit<br>of<br>wholesaler | Price<br>paid by<br>retailer | Expense<br>of<br>retailer | Profit<br>of<br>retailer | Price<br>paid by<br>consumer |
| <b>Cabbage :</b>     |  |  |                                  |                             |                            |                              |                           |                          |                              |
| <i>Kharif</i>        |  |  |                                  |                             |                            |                              |                           |                          |                              |
| Primary              | 254.73<br>(54.54)                                    | 40.57<br>(8.69)  | 295.30<br>(63.23)                | 37.28<br>(7.98)             | 36.63<br>(7.84)            | 369.21<br>(79.05)            | 29.19<br>(6.25)           | 68.64<br>(14.7)          | 467.04<br>(100)              |
| Terminal             | 355.28<br>(50.42)                                    | 66.43<br>(9.43)  | 421.71<br>(59.84)                | 107.29<br>(15.23)           | 60.21<br>(8.54)            | 589.21<br>(83.16)            | 31.78<br>(4.51)           | 83.70<br>(11.88)         | 704.69<br>(100)              |
| <i>Rabi</i>          |  |  |                                  |                             |                            |                              |                           |                          |                              |
| Primary              | 236.30<br>(57.92)                                    | 44.84<br>(10.99)   | 281.14<br>(68.91)                | 30.45<br>(7.46)             | 31.48<br>(7.72)            | 343.07<br>(84.09)            | 15.27<br>(3.74)           | 49.63<br>(12.17)         | 407.97<br>(100)              |
| Terminal             | 315.95<br>(52.19)                                    | 70.49<br>(11.64)   | 386.44<br>(63.84)                | 56.49<br>(9.33)             | 82.78<br>(13.67)           | 525.71<br>(86.84)            | 22.67<br>(3.74)           | 56.97<br>(9.41)          | 605.35<br>(100)              |
| <b>Cauliflower :</b> |  |  |                                  |                             |                            |                              |                           |                          |                              |
| <i>Kharif</i>        |  |  |                                  |                             |                            |                              |                           |                          |                              |
| Primary              | 342.21<br>(56.88)                                    | 42.81<br>(7.12)  | 385.02<br>(64.00)                | 46.06<br>(7.66)             | 49.68<br>(8.26)            | 480.76<br>(79.91)            | 35.92<br>(5.97)           | 84.95<br>(14.12)         | 601.63<br>(100)              |
| Terminal             | 444.14<br>(51.76)                                    | 67.43<br>(7.86)  | 511.57<br>(59.62)                | 131.51<br>(15.33)           | 70.40<br>(8.20)            | 713.48<br>(83.15)            | 39.18<br>(4.57)           | 105.3<br>(12.28)         | 858.05<br>(100)              |
| <i>Rabi</i>          |  |  |                                  |                             |                            |                              |                           |                          |                              |
| Primary              | 284.53<br>(61.16)                                    | 41.28<br>(8.87)  | 325.81<br>(70.03)                | 32.23<br>(6.93)             | 34.68<br>(7.45)            | 392.72<br>(84.42)            | 16.79<br>(3.61)           | 55.71<br>(11.97)         | 465.22<br>(100)              |
| Terminal             | 371.12<br>(53.95)                                    | 72.57<br>(10.55)   | 443.69<br>(64.50)                | 68.45<br>(9.95)             | 90.54<br>(13.16)           | 602.68<br>(87.61)            | 20.62<br>(3.00)           | 64.59<br>(9.39)          | 687.89<br>(100)              |

In case of cauliflower, it was observed that producer's share in consumer's rupee was more in primary market in both the seasons. The magnitude of the same was indicated to be more in rabi season. The expenses incurred by the marketing combined together were in the range of 19.45 per cent to 27.76 per cent consumer's rupee. These were on higher line in terminal markets. The profit margin of above intermediaries together noticed to be on lower side and upper side during rabi season only for primary and terminal markets, respectively.

#### Marketing Efficiency of Vegetables

In measuring efficiency, the cost includes not only costs incurred by the marketers [otherwise the most efficient market would be one where producers sell their produce themselves directly to consumer.] but also by producers, consumers and marketers all together while calculating the marketing efficiency the value added by marketing cost of marketing services were considered. The marketing efficiency index of the farmers who marketed their produce through different agencies during different seasons was worked out and presented in table 5.

**Table—5**  
**Marketing efficiency of vegetable**

| Name of Vegetable | Season | Gross return (Rs.) | Cost of Production (Rs.) | Value added by marketing (Rs.) | Cost of Marketing (Rs.) | Marketing efficiency |
|-------------------|--------|--------------------|--------------------------|--------------------------------|-------------------------|----------------------|
| Cabbage           | Kharif | 70519.77           | 58937.61                 | 11582.16                       | 12616.63                | 91.80                |
|                   | Rabi   | 77284.40           | 65077.11                 | 12207.29                       | 19025.59                | 64.16                |
| Cauliflower       | Kharif | 79071.66           | 70051.28                 | 9020.38                        | 14111.05                | 63.92                |
|                   | Rabi   | 89487.27           | 72530.72                 | 16956.55                       | 19640.14                | 86.34                |

The marketing efficiency indices for cabbage, cauliflower were less than one hundred during all the seasons. It indicated that the produce of these vegetables was not marketed efficiently during all the seasons. However, the marketing efficiency indices of kharif cabbage, rabi cauliflower were noticed to be nearly 90. In these cases if certain efforts would have entertained in the marketing efficiency indices would approached to hundred.

#### **Conclusion**

The following are the major findings of the present study :—

- (1) The most important channel observed in the primary market was channel-II [Producer—commission agent at primary market-wholesaler—Retailer-consumer.] whereas in terminal market most commonly followed channels were channel-II (Producer—commission agent at terminal market-wholesaler—Retailer-consumer.)
- (2) Majority of produce was sold in terminal market in both seasons of Cole vegetables.
- (3) The per quintal marketing cost in case of cabbage was higher in terminal market during rabi season (Rs. 70.49) and the lowest in primary market during kharif season (Rs. 40.57). In case of cauliflower, it was observed that the per quintal marketing cost was the highest in primary market during kharif (Rs. 42.18) season and in terminal market during rabi season (Rs. 72.57).
- (4) For the cabbage the producer's share in consumer's rupee was more than 50 per cent in both the markets. In case of cauliflower, it was more in primary market in both the seasons.
- (5) The marketing efficiency indices for cabbage, cauliflower were less than one hundred during all the season, that indicated that the produce of these vegetables were not marketed efficiently during all the seasons.

**USE 'AGMARK' GRADED SPICES**

# Marketing of Jasmine—problems and suggestions

—V. BANUMATHY\* AND K. SITA DEVI\*

The Diverse agro-climatic conditions in various parts of India offer a vast scope for growing a wide range of flower crops throughout the year. India produces flowers worth rupees eight to ten crores annually and contributing substantially to the national economy. Among the different flowers, Jasmine, which is a leading flower in India accounting for 20 per cent of the area, is grown in 8000 hectares followed by Rose and chrysanthemum (Prabhakara Rao *et al*).

Jasmine is grown commercially for the extraction of the essential oil for perfume and for cut flowers which are commonly used for making garlands and for adornment of hair by women, particularly in the southern parts of the country. Tamil Nadu ranks first in flower cultivation with 8384 hectares. In the total area under flowers jasmine species occupy 75% i.e., jasmine is cultivated 6300 hectares with an annual production of 21035 tonnes. Among the varieties of jasmine, *jasminum grandiflorum* (Pichi) is cultivated in 4067 hectares and *jasminum auiculatum* (Mullai) is cultivated in 1212 hectares. In Tamil Nadu Mullai is extensively cultivated in Coimbatore, Cuddalore, Dharmapuri, Dindigul, Madurai and Salem districts. In the study area, i.e., Chidambaram taluk of Cuddalore district jasmine is cultivated under 247 hectares with an average annual production of 10 tonnes per hectare.

Marketing plays a very important role in determining the level of income to the producer for his saleable commodity. Hence, the present study is proposed with an objective of identifying the major problems in marketing of jasmine.

## Methodology

In order to study the problems in the marketing of jasmine, chidambaram taluk of Cuddalore district was purposively selected. Out of four blocks one block was selected randomly. From the selected block four villages were selected randomly. Sixty farmers who were cultivating jasmine were allotted to the selected four villages by probability proportionate method. Further, selected farmers were post-stratified into three groups based on area under jasmine flowers. The pretested schedule was used to collect data through survey method. The study is related to the agricultural year 2000-2001. Garret's ranking technique was used to identify the most important problems in the marketing of jasmine flowers.

## Findings and Discussion

An attempt was made to identify the major problems that acted constraints for marketing of flowers. Results are presented in the table along with the ranks assigned to them by the Garrett's ranking technique.

In the case of small farmers, lack of finance was the problem that was ranked first. With small marketable surplus and urgent need for cash farmers received advances from commission agents from cum whole saler and payment of interests to commission left the farmers with little chance to generate sufficient capital/finance. Perishable nature of flower, price fluctuations, poor market information and forced sale were other important problems ranked second, third, fourth and fifth respectively.

Medium farmers and large farmers ranked price fluctuation and perishable nature of flower as first and second respectively. Long distance to the primary market, lack of finance and poor market information were other important problems in medium farms. Mostly large farmers have their own vehicles for transporting their produce. Hence, they ranked lack of transport facilities as seventh. Large farmers can generate capital to meet out the operational cost since they have large marketable surplus and, therefore, they ranked lack of finance as tenth.

## Conclusion

The results indicated that perishable nature of flower, price fluctuations and forced sale were serious problems in marketing of jasmine. Hence, it is suggested that organising all the flower growers for collective action to help themselves would be the best remedy for all these problems. A co-operative structure would be ideal, but other forms of collective action might also be useful. Though the problems identified can be solved easily, it would still require proper monitoring of input supply system and popularisation of Co-operative marketing.

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**Problems in Marketing of Jasmine**

| Sl. No. | Problems                         | Small farm |            | Medium Farm |            | Large Farm |            |
|---------|----------------------------------|------------|------------|-------------|------------|------------|------------|
|         |                                  | Rank       | Mean Score | Rank        | Mean Score | Rank       | Mean Score |
| 1.      | Absence of proper local market   | VII        | 46.46      | VI          | 45.79      | IV         | 55.18      |
| 2.      | Absence of proper primary market | IX         | 29.57      | IX          | 37.32      | III        | 57.18      |
| 3.      | Lack of storage facilities       | X          | 29.56      | X           | 30.21      | VI         | 50.39      |
| 4.      | Lack of finance                  | I          | 71.32      | IV          | 54.85      | X          | 28.76      |
| 5.      | Long distance                    | VIII       | 41.19      | III         | 61.09      | V          | 54.50      |
| 6.      | Lack of transport facilities     | VI         | 47.60      | VII         | 45.71      | VII        | 45.61      |
| 7.      | Poor market information          | IV         | 56.68      | V           | 51.00      | IX         | 37.82      |
| 8.      | Price fluctuations               | III        | 59.05      | I           | 70.59      | I          | 71.39      |
| 9.      | Forced sale                      | V          | 48.84      | VIII        | 37.62      | VIII       | 39.76      |
| 10.     | Perishable nature                | II         | 69.72      | II          | 65.82      | II         | 60.08      |

**'AGMARK' STANDS FOR PURITY AND QUALITY, BUY  
AGMARK PRODUCTS**

# Economics and potentials of Apple Processing Industry in Kashmir Province of Jammu and Kashmir State

—F. A. SHAHEEN AND S. P. GUPTA\*

## Introduction

It is well known fact that agro-processing industries offer vast opportunities for increasing farm incomes, generating employment and earning foreign exchange. Though the Government policy environment for agro-processing industries in general and food processing industries in particular has become much more favourable in recent years but still the momentum of this sector in India and its exports is not of desirable level, thereby lagging behind in achieving the targets. The Indian Food Industry ranks fifth in the country and employ about 5 lakh workers. While area and production of fruits and vegetables have been increasing at a faster pace, their post harvest losses are quite serious in the country. The total post harvest losses in fruits and vegetables are estimated to be 20 to 40 per cent, amounting to more than Rs. 4000 crores annually (Joshi, 2001). In spite of all the efforts of policy makers and planners to develop Food Processing Industry in India, it is still at the infancy stage and could process even less than 2 per cent of the fruits and vegetables produces as compared to 30 per cent in Thailand, 70 per cent in Brazil, 78 per cent in Philippines and 80 per cent in Malaysia. The value addition of Food Processing Industry in India is only 7 per cent compared to 23 per cent in China, 45 per cent in Philippines and 188 per cent in UK (Patel and Vhora, 2001).

The Kashmir province of Jammu and Kashmir state, which is specialized in temperate horticulture due to favourable agro-climatic conditions for the same, produces fruits such as apple, pear, apricot, peach, plum, cherry and grapes besides other dry fruit crops. The total production of fresh fruits in the year 1998-99 was reported 8,81,141 metric tonnes (MT), of which apple contributes about 90 per cent. The apple crop dominates the horticultural industry and has an important role in economic scenario of the state. Involving around half a million households, apple plays a key role in the rural economy of the state. Nearly 30 per cent of total produce of apple crop going waste due to pre-harvest drop, making total annual quantum of such fruit about 0.25 million metric tonnes (MT) (Shah, 1999). The apples which are wasted due to pre-harvest drop, under development of colour, inferior grade and other reasons are utilized for the purpose of processing. These apples cannot

be marketed as they give negative returns to growers. Due to non availability of adequate processing facilities in the state, such fruits do not find an appropriate out let in the market. Against this huge un-marketable surplus, the state at present has facilities to process just about 60,000 MT of apple, which is about 24 per cent of total availability of apple culls. Remaining apple culls offers a good potential for processing industry. Though there have been multi-dimensional efforts to increase the production of apple in the state but processing sector has not received proper attention. Looking to this fact study was conducted to evaluate the processing cost, economics and potentials of apple processing industry in the state. At present there are two processing plants operating in Kashmir with a total capacity of 60,000 metric tonnes (MT) annual capacity to process raw apple culls. The processing plant, under the Jammu & Kashmir Horticulture Processing and Marketing Corporation (JKHPMC) is located at the hub of apple producing area, namely Sopore taluka of Baramulla district, which is also famously known as 'apple town of Kashmir'. This plant was installed by the CADBURY in early eighties and was later on handed over to JKHPMC in nineties. The other newly installed processing plant in year 1999-2000 by a private entrepreneur, with an annual capacity of 60,000 MT is situated at Rangret, Budgam district. For study purpose only Apple Juice Plant, Sopore, which is run by the JKHPMC was taken to evaluate the processing cost and economics of apple juice processing. The other private one refused to provide the necessary data, moreover, it was the first production year for the plant. The three years data was collected from the processing plant, Sopore, for the years 1997-98 to 1999-2000, in order to avoid any abnormal production period. The study was carried out in the period, March-April, 2000.

## RESULTS AND DISCUSSION

### Processing cost of Apple

The component-wise per quintal processing cost is presented in Table 1. The total processing cost was divided into variable cost and fixed cost. More than 70 per cent of the total processing cost is constituted by variable cost. The wages and salaries to staff and casual labourers is the major

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The paper has been drawn from the M. Sc. thesis of the first author.

cost component of the variable cost on which processing plant spends more than 50 per cent. The total variable cost was computed as Rs. 1995.12 per quintal on an average. The second important cost item is fuel which account for 28.26 per cent of the total variable cost. The scope lies for reduction of cost on this component if power could be supplied to the plant continuously. At present, plant runs on diesel because of non-availability of continued power supply. Cost can be minimized considerably on this component of electricity could be provided by the state electricity board. The costs on chemicals and lubricants and repairs and maintenance account for 7.02 per cent and 7.63 per cent of the total variable cost, respectively. The other cost components are pomace lifting and overhead expenditures which combinedly account about 6.00 per cent of the variable cost on an average.

The fixed costs (Rs. 812.01 per quintal) include the expenditure incurred on taxes in form of toll tax, sales tax, licensing fee, insurance premium, interest on working capital and depreciation on the plant. This cost constitutes about 29 per cent of the total processing cost. The major cost component of fixed cost is interest on working capital cost (@10% per annum), which contributes 60.92 per cent of the fixed costs. The cost on tax, insurance and licensing jointly constitute 23.06 per cent, while depreciation on plant accounts for about 16.00 per cent of the fixed cost. The per quintal processing cost of Concentrated Apple Juice (CAJ) was computed Rs. 2807.13 as an average for three years. It is observed from the table that per quintal processing cost is highest (Rs. 3652.88) for the year of 1988-89 due to diseconomies of scale as the quantity processed was less for the said year.

### **Economics of Apple Processing**

Economics of apple processing is presented in Table 2. The capacity utilized by the plant was highest (84.22 per cent) in the year 1997-98, while it was lowest (47.88 per cent) for the year 1998-99. The average capacity utilization of plant was worked out 69.03 per cent. On an average, the recovery was observed 7.42 kgs of Concentrated Apple Juice (CAJ) from one quintal of raw apple culls. It is observed from the table that the recovery percentage has decreased continuously over the period of three years. During first two years, the recovery was almost same (about 8 per cent), while during third year it has drastically reduced to a level of 6.33 per cent. The less water content in the fruit due to drought during this year is the main reason for low recovery percentage.

The per quintal price of final product (CAJ) is Rs. 5073.06, with a net return of Rs. 2189.23 per quintal on an average. The cost-benefit ratios are computed as 1:2.22, 1:1.36 and 1:1.66 for the year 1997-98, 1998-99 and 1999-2000, respectively with an overall average of 1:1.76. The highest net return of Rs. 2697.10 per quintal was in the year of 1997-98, while it was lowest (Rs. 1371.12 per quintal) in the year 1998-99. It clearly indicates that the processing unit had not fully exploited the economies of scale of the plant during last

two years. If the plant runs at full capacity and continued power supply is made available, the per quintal cost of production of CAJ will be reduced. This will not only increase the net returns of the processing plant, but the consumer will also get benefit in terms of low price of the product.

### **Potential of Apple Processing Industry**

The potential of apple processing industry is estimated on the basis of secondary data of area and production of apple in various districts as well as some estimate based on primary information collected from the apple growers. Based on primary information, about 36 per cent of the total produce is going waste in terms of culled apples. If this figure is multiplied with the total production of fresh fruit in Kashmir province, it will yield about 0.28 million M.T. of apple. With the help of quantity of total waste apple and area under apple cultivation, the per hectare apple culls production is estimated as 3.74 M.T. hectare. This figure varies from 1.17 M.T. per hectare in Pulwama district to 6.14 M.T. hectare in Barramulla district mainly based on productivity of the crop. Accordingly, the per hectare income of apple producers varies from Rs. 912.60 in Pulwama to about Rs. 5,00.00 in Barramulla district with an overall average of Rs. 2,917.20, from these waste apples.

The recovery per cent was estimated about 8 per cent in the present study, which will produce 22,377.60 M.T. of Concentrated Apple Juice (CAJ), if the whole quantity of waste apple culls could be utilized by the processing plants. Taking Rs. 53,000 per M.T. as price of CAJ, the total quantity of CAJ will give a revenue of about Rs. 118.60 crores annually to the state. In addition to this apple industry will make a good plate form to generate the considerable employment in the state.

At least 4 processing plants of 50,000 M.T. processing capacity per annum can be established in Kashmir province, where the raw material is more than sufficient to run them at full capacity. These facts clearly indicate that the state government as well as other entrepreneurs should come forward this direction to exploit the potential of this industry.

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**Table—1**  
**Per Quintal Processing cost of Apple**

| Particular                             | Year                   |                        |                        | Average                |
|--|------------------------|------------------------|------------------------|------------------------|
|  | 1997-98                | 1998-99                | 1999-2000              |                        |
| <b>(A) Raw Material (Apple culls)</b>  |                        |                        |                        |                        |
| 1. Quantity                            | 84229.69               | 47886.97               | 75000.00               | 69038.80               |
| 2. Rates (Rs./Qtl)                     | 76.00                  | 76.00                  | 78.00                  | 76.70                  |
| <b>(B) Processing cost</b>             |                        |                        |                        |                        |
| (a) Variable cost                      |                        |                        |                        |                        |
| 1. Fuel                                | 512.46(34.12)          | 624.73(23.84)          | 589.47(26.75)          | 563.89(28.26)          |
| 2. Chemicals & Lubricants              | 85.04(5.66)            | 191.05(7.29)           | 178.94(8.12)           | 140.14(7.02)           |
| 3. Repairs & maintenance               | 100.58(6.70)           | 194.78(7.43)           | 191.57(8.70)           | 152.00(7.63)           |
| 4. Pomace lifting                      | 35.92(2.39)            | 30.78(1.17)            | 52.63(2.39)            | 39.82(2.00)            |
| 5. Wages to casual labour              | 61.73(4.11)            | 60.78(2.32)            | 105.26(4.77)           | 74.95(3.75)            |
| 6. Wages to security staff             | 22.28(1.48)            | 37.63(1.45)            | 36.84(1.67)            | 30.45(1.53)            |
| 7. Salaries to permanent staff         | 672.14(44.73)          | 1302.63(49.71)         | 947.36(43.00)          | 913.07(45.76)          |
| 8. Overhead expenditures               | 12.47(0.83)            | 177.89(6.79)           | 101.26(4.60)           | 80.80(4.05)            |
| <b>Variable Cost</b>                   | <b>1502.62(100.00)</b> | <b>2620.27(100.00)</b> | <b>2203.33(100.00)</b> | <b>1995.12(100.00)</b> |
| (b) Fixed cost                         |                        |                        |                        |                        |
| 1. Tax, insurance & licensing fee      | 127.75(20.46)          | 285.65(27.66)          | 194.25(21.41)          | 187.28(23.06)          |
| 2. Interest on working capital         | 398.78(63.88)          | 569.07(55.11)          | 572.54(63.12)          | 494.60(60.92)          |
| 3. Depreciation on plant               | 97.75(15.66)           | 177.89(17.23)          | 140.35(15.47)          | 130.13(16.02)          |
| <b>Fixed Cost</b>                      | <b>624.28(100.00)</b>  | <b>1032.61(100.00)</b> | <b>907.14(100.00)</b>  | <b>812.01(100.00)</b>  |
| Total processing cost (a+b) (Rs./Qtl.) | 2126.90                | 3652.88                | 3110.47                | 2807.13                |
| Total processing cost (a+b) (Rs./Qtl.) | 2202.90                | 3728.88                | 3188.47                | 2883.83                |

**Table—2**  
**Economic of Apple Processing**

| Particular                                  | 1997-98 | 1998-99 | 1999-2000 | Average |
|---|---------|---------|-----------|---------|
| 1   | 2       | 3       | 4         | 5       |
| (A) Capacity utilised (per cent)            | 84.22   | 47.88   | 75.0      | 69.03   |
| (B) Apple Juice Recovery (Kg/Qtl.)          | 8.10    | 7.93    | 6.33      | 7.42    |
| (C) Price of Juice (Rs./Qtl.)               | 4900.00 | 5100.00 | 5300.00   | 5073.06 |
| <b>(D) Total cost</b>                       |         |         |           |         |
| Processing cost (Rs./Qtl.)                  | 2126.90 | 3652.88 | 3110.47   | 2807.13 |
| Total cost (Raw material + Processing cost) | 2202.90 | 3728.88 | 3188.47   | 2883.83 |

| 1                         | 2       | 3       | 4       | 5       |
|---------------------------|---------|---------|---------|---------|
| (E) Net Return (Rs./Qtl.) | 2697.10 | 1371.12 | 2111.53 | 2189.23 |
| (F) Cost-Benefit Ratio    | 1:2.22  | 1:1.36  | 1:1.66  | 1:1.76  |

**Table—3**

**Processing**

**Processing Potential of Apple Industry in Kashmir Province of J & K State**

| District       | Total fresh <sup>#</sup> prod. (M.T.) (1998-99) | Total waste apple prod. (M.T.) | Area under <sup>#</sup> apple (ha) | Per ha wastages of apple culls. (M.T.) | Per ha income from apple culls (Rs.)* | Production of CAJ (M.T.) (8% recovery) | Revenue/Income (crores)** @ Rs. 53,000/M.T. |
|----------------|---|--------------------------------|------------------------------------|--|---------------------------------------|--|---|
| 1. Srinagar    | 39,000  | 14,040                         | 4,141                              | 3.39                                   | 2644.20                               | 1123.2                                 | 5.95  |
| 2. Budgam      | 47,000  | 16,920                         | 7,709                              | 2.19                                   | 1708.20                               | 1352.6                                 | 7.17  |
| 3. Pulwama     | 41,000  | 14,760                         | 12,600                             | 1.17                                   | 912.60                                | 1180.8                                 | 6.26  |
| 4. Anantnag    | 1,30,000  | 46,800                         | 12,240                             | 3.82                                   | 2979.60                               | 3744.0                                 | 19.84                                       |
| 5. Baramulla   | 4,40,000  | 1,58,400                       | 24,700                             | 6.41                                   | 4999.80                               | 12672.0                                | 67.16                                       |
| 6. Kupwara     | 80,000  | 28,800                         | 13,310                             | 2.16                                   | 1684.80                               | 2304.0                                 | 12.21                                       |
| <b>Kashmir</b> | <b>7,77,000</b>                                 | <b>2,79,720</b>                | <b>74,700</b>                      | <b>3.74</b>                            | <b>2917.20</b>                        | <b>22,377.6</b>                        | <b>118.60</b>                               |

# Area and Production, Source (Directorate of Horticulture, Srinagar, J&K)

\* @ Rs. 780/M.T. based on 1999-2000 price.

\*\* CAJ price @ Rs. 53,000/M.T. based on 1999-2000 sale price of plant.

**'AGMARK' ENSURES CONSUMERS PROTECTION**

## **Fruit and Vegetables (Grading and Marking) Rules, 2004**

*The Directorate General of Foreign Trade, Department of Commerce and Industry has notified Directorate of Marketing and Inspection (DMI), as the official certifying agency for the Export of Fruit and Vegetables to European Union, Certification is voluntary. The DMI has harmonized 18 standards of important fruit and vegetables under the provisions of the Agril. Produce (Grading and Marking) Act, 1937. The Notification of the above standards are reproduced below :*

*—Editor*



























































































































































## Home News

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### (i) ICAR Issues Advisories for Flood-Hit Areas

ICAR has issued advisories for the benefit of farmers in flood hit areas. It has suggested that immediately after receding of floods, *toria* may be sown for which seeds are easily available. Lentil, Rajmash, Lathyrus, Chick-pea and Linseed should be sown between 15th October and 15th November. Sunflower varieties and hybrids should be sown

in large continuous areas to reduce damage by birds. Autumn planting of sugarcane with intercrop of maize and mustard can also be resorted to. Zero tillage should be followed wherever possible. ICAR has also made recommendations for livestock management in the flood-hit areas. The details are available on ICAR's website, [www.icar.org.in](http://www.icar.org.in).

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Source :—Press Information Bureau, New Delhi, dated 29.7.2004.

### (ii) Rice Sown in about 260 Lakh Hectares

Sowing of Kharif crops is continuing in various parts of the country.

Normal area under rice is about 406 lakh hectares. Rice sowing is in progress in all the States. The area coverage of rice so far is reported to be about 259.76 lakh hectares compared to 272.51 lakh hectares last year in the corresponding period. In Punjab, sowing of rice is over.

The area coverage under sugarcane is reported to be 37.36 lakh hectares compared to 46.43 lakh hectares during the corresponding period of last year.

Normal area under cotton is about 88 lakh hectares. Sowing is over in Punjab, Haryana and Rajasthan. In Gujarat, 92% of the normal area has been sown. Area coverage of cotton reported so far is 78.86 lakh hectares against 72.93 lakh hectares in the corresponding period last year.

Normal area under Kharif coarse cereals is about 231 lakh hectares. The total area coverage under coarse cereals is 186.30 lakh hectares as compared to 211.42 lakh hectares during last year in the corresponding period. The total area under jowar is 34.87 lakh hectares as compared to 40.62 lakh hectares in the corresponding period of the previous year. Maize is covered in 67.13 lakh hectares as compared to 65.38 lakh hectares during last year in the corresponding period.

As on the 13th of this month, total water storage in the 71 important reservoirs monitored by the Central Water Commission was 42 per cent of the full reservoir level (FRL) of 131.28 billion cubic meters. This was 110 per cent of the last year's storage and 84 per cent of the average of the last ten years.

### (iii) Kisan Call Centres Received Over 4 Lakh Calls Since Inception

The Kisan Call Centres have received 436257 calls till the last month of this year. The Kisan Call Centre scheme is functioning since 21st January, 2004. The Call Centres can be accessed by farmers all over the country (except Dadra & Nagar Haveli) on common toll free number **1551**. The objective of the scheme has been to make agriculture knowledge available to the farmers as and when desired.

The calls are received at Mumbai, Kanpur, Indore, Bangalore, Kochi, Hyderabad, Chandigarh, Delhi, Jaipur, Kolkata and Chennai. Call Centres where agriculture graduates

attended to answer the query of the farmers in the local language. In case specialist advice is required, the agriculture graduate transfers the call to experts located in agriculture universities and other agriculture related organisations. The Call Centres are attended by agriculture graduates from 6 P.M. to 10 P.M. and beyond these hours the calls are attended in the IVRS mode.

This information is given by the Minister of State for Agriculture, Shri Kanti Lal Bhuria in a written reply to Shri Jyotiraditya M. Scindia and Smt. Krishna Tirath in Lok Sabha today.

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Source :—Press Information Bureau, New Delhi, dated 16.8.2004.

## (iv) खरीफ फसलों के समर्थन मूल्य में वृद्धि

### (दिल्ली कार्यालय)

नई दिल्ली. केन्द्र सरकार ने खरीफ के कई खाद्यान्नों के न्यूनतम समर्थन मूल्यों में दस से लेकर 100 रुपए प्रति क्विंटल तक की वृद्धि का निर्णय लिया है। औसत धान की खरीद कीमत 10 रु. बढ़कर 560 रु. प्रति क्विंटल कर दी गई है।

धान ए ग्रेड का न्यूनतम समर्थन मूल्य दस रु. बढ़ाकर अब 590 रु. प्रति क्विंटल होगा। ज्वार, बाजरा और मक्का के न्यूनतम समर्थन मूल्यों में क्रमशः 10, 20 और 10 रु. की वृद्धि की गई है। इनके दाम अब क्रमशः 515, 515 और 525 रु. प्रति क्विंटल होंगे। सर्वाधिक 100 रु. प्रति क्विंटल

की वृद्धि मूंगफली समर्थन मूल्य में की गई है। इसका समर्थन मूल्य 100 रु. बढ़ाकर 1500 रु. प्रति क्विंटल घोषित किया गया है। पीली सोयाबीन का समर्थन मूल्य 70 रु. बढ़ाकर 1000 रु. तथा काली सोयाबीन का 60 रु. बढ़ाकर 900 रु. प्रति क्विंटल घोषित किया गया है। इसी तरह सूरजमुखी बीज का न्यूनतम समर्थन मूल्य 90 रु. बढ़ाकर 1340 रु., तिल का 15 रु. बढ़ाकर 1500 रु. और रामतिल नाइजर का 25 रु. बढ़ाकर 1180 रु. प्रति क्विंटल घोषित किया गया है। सामान्य कपास 35 रु. बढ़ाकर 1760 रु. प्रति गांठ होगा। जबकि कपास की अन्य किस्मों की कीमत 35 रु. बढ़ाकर 1960 रु. रखी गई है।

## वर्षवार खरीफ फसलों का समर्थन मूल्य

(इकाई रु. प्रति क्वि. में)

| फसल                          | 2000 का समर्थन मूल्य | 2001 का समर्थन मूल्य | 2002 का समर्थन मूल्य | 2003 का समर्थन मूल्य | 2003 के समर्थन मूल्य में वृद्धि | 2004 का निर्धारित समर्थन मूल्य |
|------------------------------|----------------------|----------------------|----------------------|----------------------|---------------------------------|--------------------------------|
| धान (सामान्य)                | 510                  | 530                  | 530                  | 550                  | 10                              | 560                            |
| धान ग्रेड-ए                  | 540                  | 560                  | 560                  | 580                  | 10                              | 590                            |
| ज्वार, बाजरा                 | 445                  | 485                  | 485                  | 505                  | 10                              | 515                            |
| मक्का                        | 445                  | 485                  | 485                  | 505                  | 20                              | 525                            |
| अरहर                         | 1200                 | 1320                 | 1320                 | 1360                 | 30                              | 1390                           |
| मूंग, उड़द                   | 1200                 | 1320                 | 1320                 | 1370                 | 40                              | 1410                           |
| मूंगफली                      | 1220                 | 1340                 | 1355                 | 1400                 | 100                             | 1500                           |
| सोयाबीन (पीला)               | 865                  | 885                  | 885                  | 930                  | 70                              | 1000                           |
| सोयाबीन (काला)               | 775                  | 795                  | 795                  | 840                  | 60                              | 900                            |
| सूरजमुखी                     | 1170                 | 1185                 | 1195                 | 1250                 | 90                              | 1340                           |
| तिल                          | 1300                 | 1400                 | 1450                 | 1485                 | 15                              | 1500                           |
| कपास (ए-414) (एच-777, जे-34) | 1625                 | 1675                 | 1675                 | 1725                 | 35                              | 1760                           |
| कपास (एच-4)                  | 1825                 | 1875                 | 1875                 | 1925                 | 35                              | 1960                           |

## (v) 21 करोड़ टन खाद्यान्न उत्पादन की आशा

नई दिल्ली. हाल की वर्षा से पश्चिमी उत्तरप्रदेश को छोड़कर सूखे की आशंका वाले सभी राज्यों में सुधार हुआ है। विलम्ब से वर्षा के परिणामस्वरूप रबी के उत्पादन में लाभ होगा।

केन्द्रीय कृषि मंत्री श्री शरद पवार ने यहां कृषि वर्ष 2003-04 जून-

जुलाई में खाद्यान्न उत्पादन कुल 21 करोड़ 20 लाख टन से अधिक रहने का अनुमान जाहिर किया है। यह वर्ष 2001-02 के बराबर होगा। उन्होंने बताया कि इसमें से चावल उत्पादन 8 करोड़ 70 लाख टन, गेहूं 7 करोड़ 20 लाख टन रहने का अनुमान है।

स्रोत:--कृषक जगत, 16-22 अगस्त, 2004, भोपाल।

## **(vi) Certification of Fruit and Vegetables for Export**

Directorate General of Foreign Trade, Department of Commerce, Ministry of Commerce and Industry, has notified Directorate of Marketing & Inspection as the official certifying agency for the exports of fruit and vegetables to European Union. Certification is voluntary. Harmonized standards of 18 important fruits and vegetables have been notified under the provisions of the Agricultural Produce (Grading & Marking) Act, 1937. Agmark Standards for another 12 fruits and vegetables are being framed.

European Commission has issued a Commission Regulation (EC) No. 761/2003 dated 30.04.03 approving India's procedure for pre shipment inspection for export of fresh Fruits and Vegetables to EU. Agricultural Marketing Adviser has been notified as Official authority and DMI as inspection body for the purpose.

Necessary guidelines for attending to the exports have been issued to all Regional Offices/Sub Offices. Regional Agmark Laboratories at Mumbai and New Delhi are being modernized for the analysis of residues of pesticides.