ANNEX-D

Categorization of Diversified Agricultural Patterns

THE STUDY ON DIVERSIFIED AGRICULTURE FOR ENHANCED FARM INCOME IN THE STATE OF HIMACHAL PRADESH

FINAL REPORT

ANNEX-D
CATEGORIZATION OF DIVERSIFIED AGRICULTURAL PATTERNS

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ANNEX-D CATEGORIZATION OF DIVERSIFIED AGRICULTURAL PATTERNS

D-1 Objective of Spatial Categorization

In order to formulate the plan for the promotion of diversified agriculture in the State, spatial categorization was carried out on the basis of current progress and potential of diversified agriculture followed by the preparation of direction of diversified agriculture for each spatial category. The category shown in this Chapter is the basis for the formulation of effective and efficient diversified agriculture plan corresponding to the different conditions of agro-ecological and socio-economic conditions within the State.

D-2 Basic Concept and Methodology of Spatial Categorization

D-2.1 Basic Concept of Spatial Categorization

Himachal Pradesh is endowed with diversified climatic and topographic conditions, therefore, various crops are cultivated in the State. However, food grains such as wheat, rice and maize are predominant and occupy 74 % of the cropped area in the State, followed by fruits of 17.6 % and vegetables of 6.7 %. Vegetable production is increasing remarkably recently while fruit production is not. Vegetable and fruit production depend upon space/locations specific in the State.

The spatial categorization is carried out stepwise and explained as follows: (i) the present status of crop diversification focusing on vegetable production is clarified for each district; (ii) spatial and quantifiable potential of vegetable production is analyzed; (iii) direction of diversified agriculture promotion for each category is formulated integrating horticulture, livestock and inland fishery sectors on the basis of present status and development potential of diversified agriculture.

A methodology and results of spatial categorization is delineated in this Annex. Directions of diversified agriculture matching with area characteristics, namely Master Plan, are described in Chapter 6 in main report, on the basis of potential and constrains on crops, horticulture, livestock, inland fishery, post harvest facilities, irrigation, road network and so forth. Chapter 7 in main report deals with the action plan up to 2017/18,

D-2.2 Spatial Unit for Categorization

Indexes representing regional characteristics are generally utilized for spatial categorization. There are two alternatives spatial unit envisioned for the categorization: (i) ***Agro-Ecological Zoning (AEZ)-based Categorization*** through overlaying AEZ prepared by DOA with numerical indexes re-organized for each zoning, and (ii) ***Administrative Block-based Categorization*** by overlaying administrative blocks under 12 districts with numerical indexes re-organized for each block.

In the Study, latter alternative, ***Administrative Block-based Categorization*** is applied in the following reason. Administrative blocks are established within the States as the organizational units of development based on the national decentralization policy. As of the fiscal year 2007/08, there are 75 administrative blocks in the State of Himachal Pradesh. The State Government transferred each block office the function of block development planning and implementation consistent with local needs. DOA also has been following this mechanism through promoting the policy of crop diversification particularly vegetable production in each block agricultural office. Since the Study result is expected

for practical use by administrative officials concerned, adoption of ***Administrative Block-based Categorization*** concept is justified for the analysis of spatial categorization.

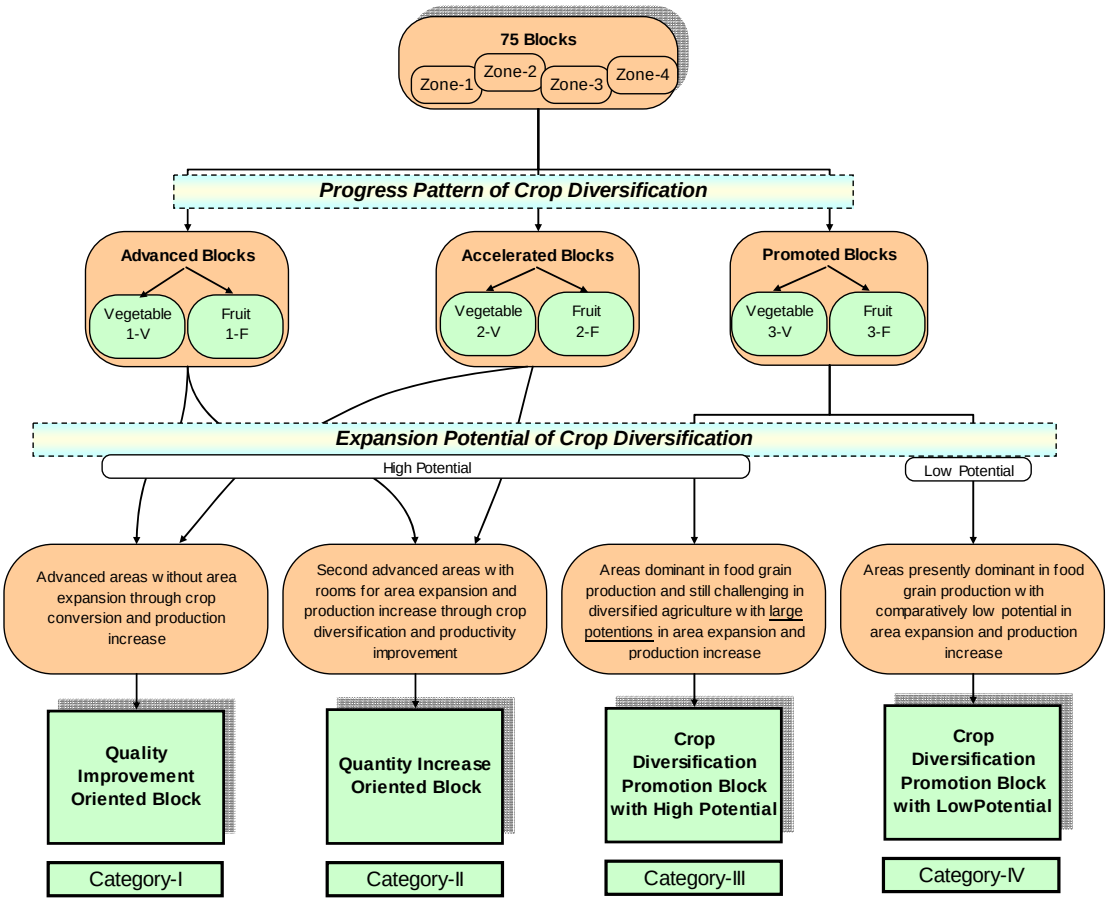
In the analysis of Agro-Ecological Zoning by DOA, there are four zones from zone 1 to zone 4 classified on the basis of elevation and climatic conditions, however, they do not match with administrative boundary. In addition, all the data useful for spatial categorization are not prepared for the zoning unit. Therefore, information extracted from AEZ is not utilized for spatial categorization but for agriculture planning such as crop selection etc.

D-2.3 Indexes for Spatial Categorization

Numerical indexes for spatial categorization are obtained from statistics issued from the State Government, internal document from relevant organizations and the result of questionnaire survey carried out by JICA Study Team. Such primary data are also utilized to produce secondary data for indexes of spatial categorization.

D-2.4 Outline of Methodology on Spatial Categorization

The categorization is made based on *the Progress Pattern of Crop Diversification and Expansion Potential of future Crop Diversification*. The flow of spatial categorization, formulation of Master Plan, selection of model areas, preparation of action plan is illustrated as follows. Especially, outline of spatial categorization is illustrated as follows.



Source: JICA Study Team

Fig. D-2.1 Flow of Spatial Categorization

D-3 Result of Spatial Categorization

D-3.1 Spatial Categorization Based on Progress Pattern of Crop Diversification

Indexes of spatial categorization based on present status and the progress of crop diversification are set up as summarize in Table D-3.1.

Table D-3.1 Numerical Indexes for Spatial Categorization based on Present Status of Crop Diversification

Status of Crop Diversification		Categorization Indexes		Progress Pattern
		Vegetable Cropping Rate	Fruit Cropping Rate	
Advanced	Vegetable	Over 10.0%	<30%	1-V
	Fruit		> 30%	1-F
Accelerated	Vegetable	5.0 ~ 9.9%	< 15%	2-V
	Fruit		> 15%	2-F
Promoted	Vegetable	Under 5.0%	< 7.5%	3-V
	Fruit		> 7.5%	3-F

Source: JICA Study Team

Status of Crop Diversification

Vegetables and fruits are widely cultivated in the State at present and that future market demand is promising. In particular, promotion of vegetables cultivation would be the first priority followed by fruits, which are expected to play core roles for the promotion of diversified agriculture in the State.

For the first step, present status and the progress of vegetable and fruit cultivation is analyzed to denote block-wise progress of crop diversification. The applying fruit cultivation together with vegetable for the categorization standard is inevitable. Fruits are generally cultivated together with other annual crops through mixed cropping due to States' topographic constraints; however, those areas are redundantly counted in the statistics, which would be difficult to demarcate one from another. Therefore, vegetable and fruits cultivation area is utilized as a common standard for the categorization of administrative blocks. The blocks are classified into three: (i) Advanced, (ii) Accelerated and (iii) Promoted from the view point of status on crop diversification. Six patterns are indicated on the basis of combination of vegetable and fruit cropping rate so as to delineate block-based progress pattern of crop diversification.

Categorization Indexes and Progress Pattern

Cultivation rate of vegetable and fruit against total annual cultivation area is applied for the categorization. Block-wise characteristics are illustrated from Fig. D-3.1 to D-3.4. Administrative blocks are categorized into three progress patterns and two categories: (i) 1-V, (ii) 1-F, (iii) 2-V, (iv) 2-F, (v) 3-V and (vi) 3-F. Number 1 shows more advanced in crop diversification. A letter "V" indicates blocks developed with vegetable cultivation while "F" means the blocks with fruit cultivation.

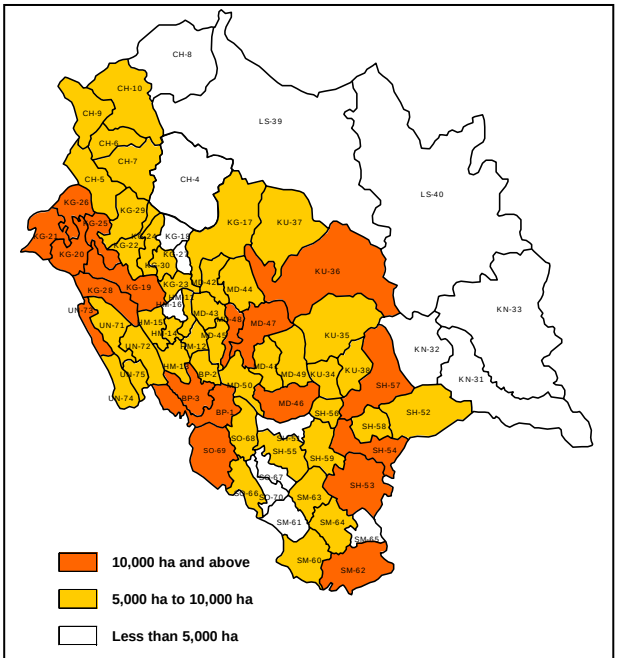


Fig. D-3.1 Classification of Blocks by Cultivated Area

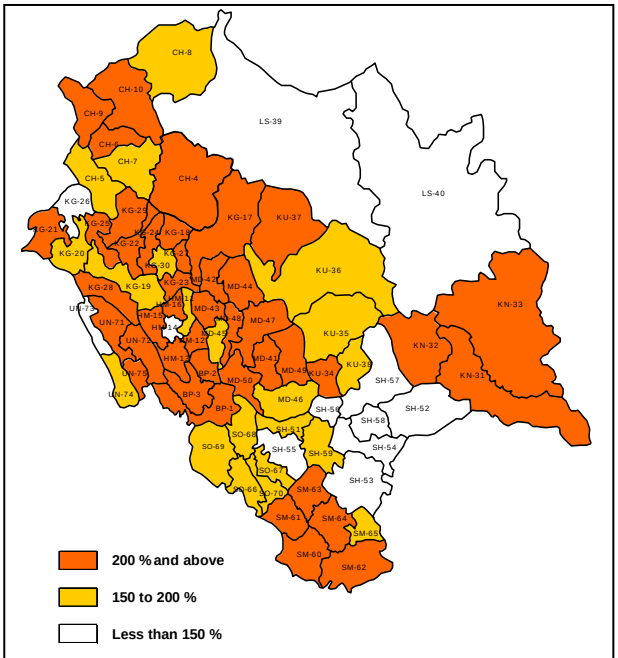


Fig. D-3.2 Classification of Blocks by Cropping Intensity

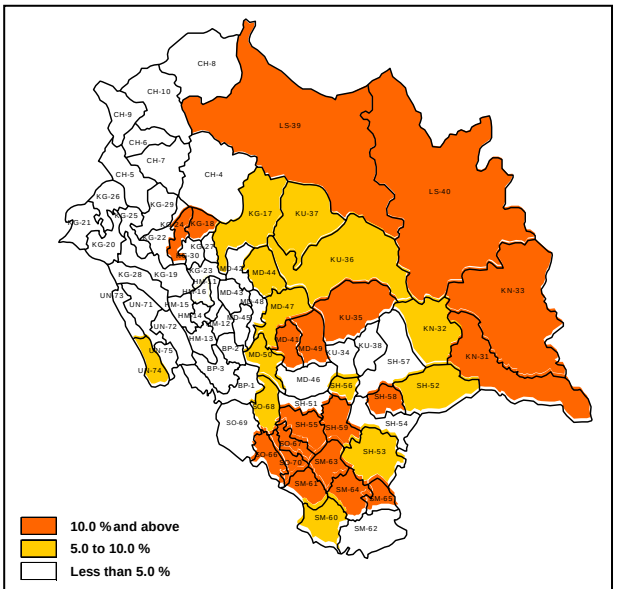


Fig. D-3.3 Classification of Blocks by Share of Vegetable Cropped Area in Total Cropped Area

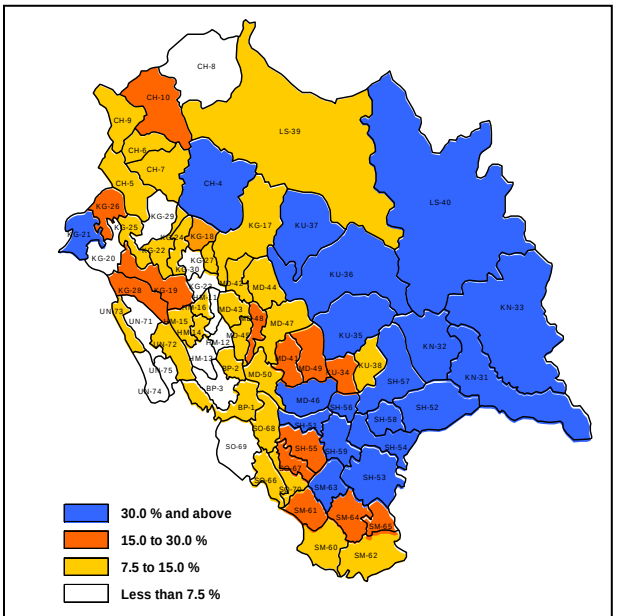


Fig. D-3.4 Classification of Blocks by Share of Fruit Cropped Area in Total Cropped Area

Numerical Information for the Categorization

Following information are utilized for the categorization.

- Primary information: Block-wise cultivated area, and
  Annual production of food grain, vegetable and fruit
- Secondary information: Block-wise total cropped area estimated by primary information, Cropping intensity, and rate of vegetable and fruit cultivation to total annual cultivation area

Using the indexes explained above, result of the categorization is summarized below:

Table D-3.2 Categorization of Administrative Blocks based on Progress Pattern of Diversified Agriculture

Status	Progress Pattern	Number of Blocks	Name of Blocks
Advanced	1-V	14	KG-18 Bhawarna, KG-24 Nagrota Bagwan, LS-39 Lahaul, LS-40 Spiti, MD-41 Chachyot, MD-49 Seraj, SH-55 Mashobra, SH-59 Theog, SM-61 Pachhad, SM-64 Sangrah, SM-65 Shillai, SO-66 Dharampur, SO-67 Kandaghat, SO-70 Solan
	1-F	5	KN-31 Kalpa, KN-33 Pooh, KU-35 Banjar, SH-58 Rohroo, SM-63 Rajgar,
Accelerated	2-V	8	KG-17 Baijnath, MD-44 Drang, MD-47 Mandi Sadar, MD-50 Sundernagar, SH-56 Narkanda, SM-60 Nahan, SO-68 Kunihar, UN-74 Haroli
	2-F	5	KN-32 Nichar, KU-36 Kullu, KU-37 Naggar, SH-52 Chhohara, SH-53 Chopal
Promoted	3-V	32	BP-1 Bilaspur Sadar, BP-2 Geharwin, CH-4 Bharmour, CH-5 Bhatiyat, CH-6 Chamba, CH-7 Mehla, CH-8 Pangi, CH-9 Salooni, CH-10 Tissa, HM-14 Hamirpur, HM-15 Nadaun, HM-16 Sujanpur Tira, KG-19 Dehra, KG-21 Indora, KG-22 Kangra, KG-25 Nagrota Surian, KG-26 Nurpur, KG-27 Panchrukhi, KG-28 Pragpur, KU-34 Ani, KU-38 Nirmand, MD-42 Chauntra, MD-43 Dharampur, MD-45 Gopalpur, MD-46 Karsog, MD-48 Rewalsar, SH-51 Basantpur, SH-54 Jubbal, SH-57 Rampur, SM-62 Paonta Sahib, UN-72 Bangana, UN-73 Gagret
	3-F	11	BP-3 Ghumarwin, HM-11 Bamsan, HM-12 Bhoranj, HM-13 Bijhri, KG-20 Fatepur, KG-23 Lamba Gaon, KG-29 Rait, KG-30 Sulah, SO-69 Nalagarh UN-71 Amb, UN-75 Una

Source: JICA Study Team

D-3.2 Categorization Based on the Expansion Potential of Crop Diversification

There are two directions on the expansion potential of crop diversification in the State of Himachal Pradesh: (i) area expansion and (ii) productivity increase. The former means expansion of cultivation area through new land development and conversion from other crops to vegetables cultivation whilst the latter represent the increase of vegetable production through the improvement of productivity. As shown in Table D-3.3, two sub-indexes are applied for the assessment of area expansion potential and three sub-indexes are selected for productivity increase potential.

Table D-3.3 Numerical Indexes for Further Potential of Crop Diversification

Index / Score	Area Expansion Potential		Productivity Increase Potential		
	Annual Cropped Area of Food Grain	Per Capita Wheat and Paddy Production	Irrigation Rate of Cultivated Area	Per Farm Household Annual Net Farm Income	Differential Rate with Average Yield of District
3	> 15,000 ha	>200 kg	>50%	< Rs. 25,000	>30 %
2	10,000 ~ 15,000 ha	150 ~ 200 kg	30 ~ 50 %	Rs. 25,000 ~ 49,999	20 ~ 30 %
1	5,000 ~ 10,000 ha	100 ~ 150 kg	15 ~ 30 %	Rs. 50,000 ~ 99,999	10 ~ 20 %
0	< 5,000 ha	< 100 kg	< 15%	> Rs. 100,000	<10%

Source: JICA Study Team

The score from 3 to 0 is given to blocks on the basis of current conditions. Blocks with the total score of seven points or above is judged “Blocks with higher potential of Production Increase” while the blocks with the score of under seven is classified into “Blocks with lower potential of Production Increase. Each index is detailed as follows:

1) Area Expansion Potential

Two directions would be considered in the expansion of the area for crop diversification: (i) expansion of cultivation area and (ii) expansion of crop diversification within existing farm. Former alternative is, however, significantly limited in the States due to its topographic conditions. Additionally, new land development has concern on adverse environmental impact. Therefore, only expansion of cropping diversification is considered for the potential, under which there are two sub-indexes explained as follows:

Annual Cropping Area of Food Grain

This sub-index indicates the potential of diversification from food grain to vegetable/fruit cultivation. It is classified into four grades with the median numerical value given from annual block-wise average area of food grain cultivation. The blocks with large food grain cultivation areas are judged higher potential of diversification.

Per Capita Wheat and Paddy Production

Per capita production of basic foods (wheat and paddy) is one of the important determinants for crop diversification. The blocks with higher per capita production in such foods comparatively have rooms for crop diversification from food grain to vegetable. On the contrary, the blocks with lower production tend to focus on securing basic food grain; therefore, it is difficult to promote crop diversification. Per capita wheat and paddy production is, therefore, applied as a sub-index for the assessment of area expansion potential. Analysis result is depicted in Fig. D-3.5.

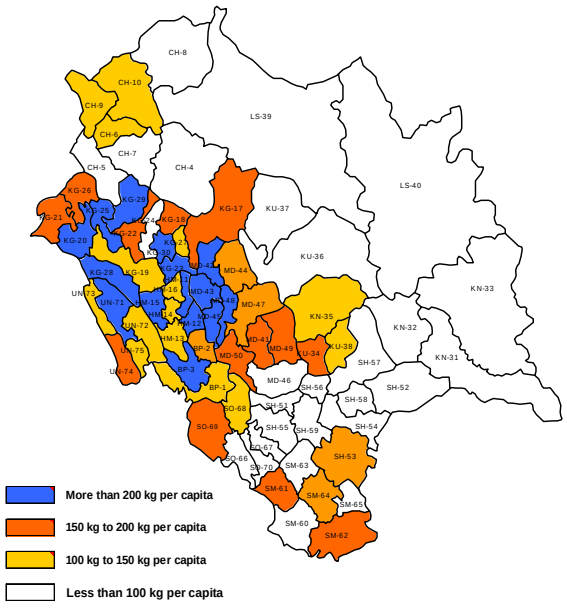


Fig. D-3.5 Per-capita Production of Wheat and Paddy

2) Productivity Increase Potential

Three sub-indexes are set up for the assessment of productivity increase potential: (i) irrigation rate in cultivated areas, (ii) per farm household annual net farm income, and (iii) yield increase potential of district.

Irrigation Rate of Cultivated Areas

Higher productivity can be expected at existing irrigated areas from the outset of crop diversification; therefore, higher point is given to such areas than rain-fed areas. Higher point is given to the block with higher irrigation ratio, the result of which is illustrated in Fig. D-3.6.

Per Farm Household Annual Net Farm Income

Farmers intend to crop diversification generally with the aim of increasing their income, therefore, such desire would be higher among lower income farmers. Since farm area is limited in the State, crop diversification can be materialized by: (i) promotion of high-valued crops in existing farm and (ii) increase of production through the improvement of productivity. As former issue has already been considered in the index of annual cropping area of food grain mentioned above, the latter aspect is

examined under this sub-index. The blocks with lower farm income is given higher scores and vice versa, the result of which is depicted in Fig. D-3.7.

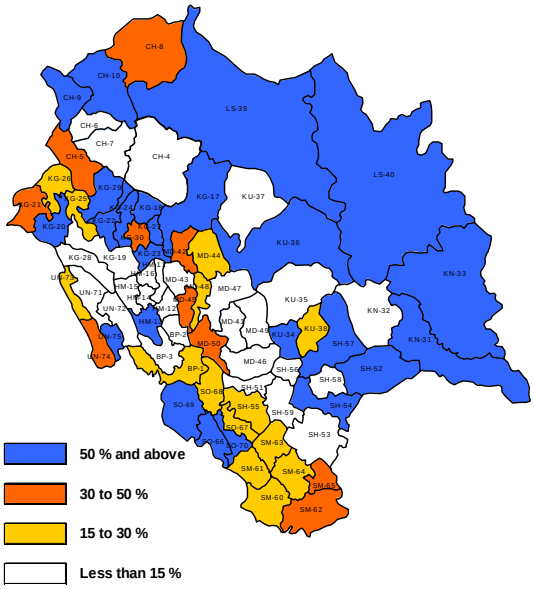


Fig. D-3.6 Classification of Blocks by Irrigation Ratio to Cultivated Area

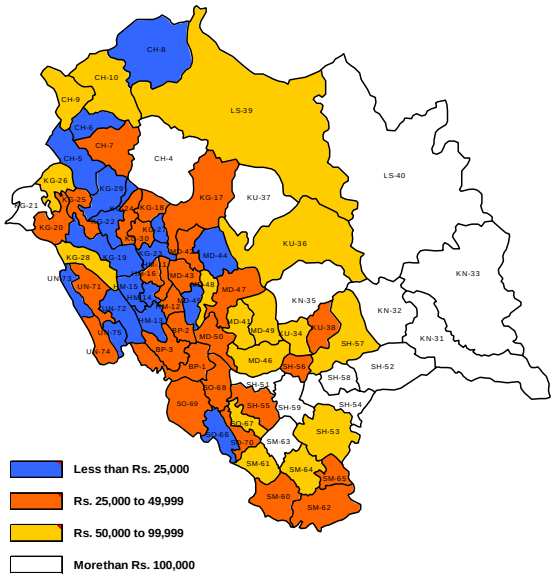


Fig. D-3.7 Classification of Blocks by Current Net Farm Income Level

Yield Increase Potential of District

Various countermeasures can be proposed to increase yield such as: (i) introduction of high yielding seed, (ii) improvement of farmers' agricultural skills, (iii) new development of irrigation facilities, (iv) improvement of existing irrigation facilities and so forth. However, quantifiable assessment of the effect of those countermeasures toward agriculture production would be hard to understand. Therefore, productivity increase potential is evaluated simply by current yield data.

Because crop productivity differs due to various factors: variety, farming skill, natural conditions such as climate, soil etc., simple categorization through comparison between average productivity of the State and blocks are not appropriate way. Instead, comparison between maximum productivity of each district and average productivity of each block is applied. If the experimental data obtained from CSKHPAU and National Institute of Sweet Potato is higher than maximum block average in the same AEZ, the experimental data is utilized for the comparison. The blocks with large differential rate are given higher score, meaning that they have higher potential in productivity increase. The results of categorization are shown in Fig. D-3.8.

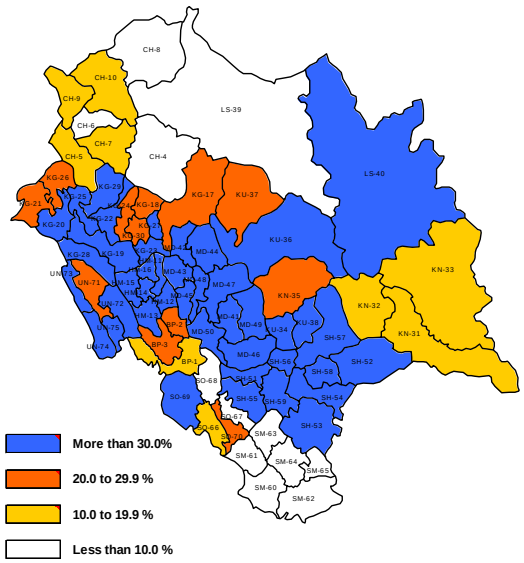


Fig. D-3.8 Classification of Blocks by Crop Yield Difference within District

3) Numerical Information for Spatial Categorization

Numerical information utilized for spatial categorization is listed below:

Table D-3.4 Numerical Information utilized for the Categorization based on Productivity Increase Potential

Type	Outline of the Information
Primary Data	• Block-wise abandoned farm area • Block-wise idle farm area • Annual cultivation area of grain • Annual production of grain • Block-wise population prepared based on population census 2001 • Number of household categorized by urban and rural areas • Total working population • Total agricultural population • Data of crop budget survey carried out by CSKHPAU • Irrigation project data from DIPH and DOA • Rural road data from PWD • Market facility data from APMC • Monthly vegetable handling quantity and market price of Delhi, Punjab and Halyana market
Secondary Data	• Wheat and paddy production per capita • Net value of crop production per capita farm household • Irrigation ratio • District- and block-wise vegetable production, all of which are estimated using primary data

Source: JICA Study Team

41 blocks are categorized in High while 34 blocks are in Low as shown below and illustratively presented in Fig. D-3.9.

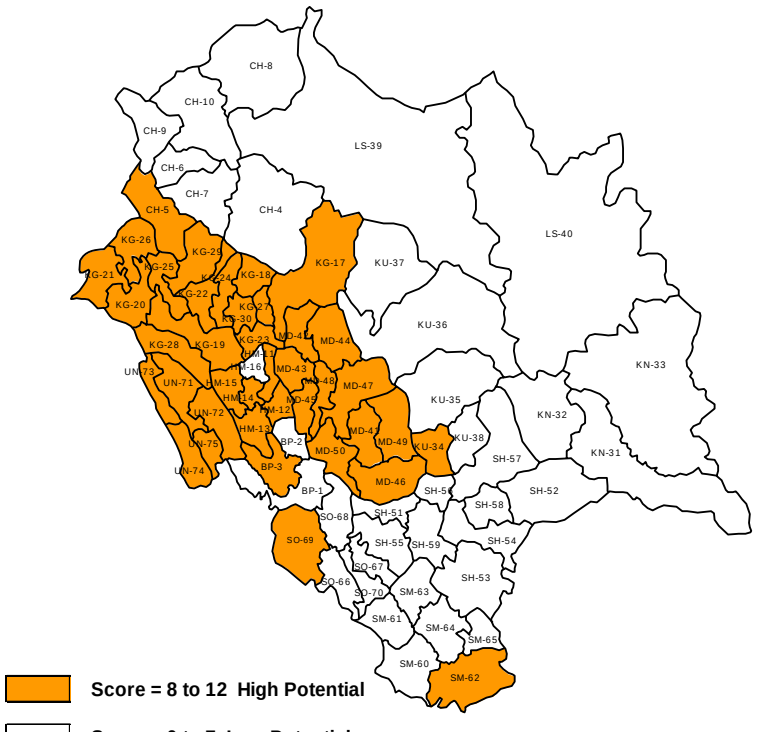


Fig. D-3.9 Classification of Blocks by Further Potential of Crop Diversification

Table D-3.5 Categorization based on Further Potential of Crop Diversification

High			Low	
41 Blocks			34 Blocks	
BP-3 Ghumarwin	KG-24 Nagrota Bagwan	SM-62 Paonta Sahib	BP-1 Bilaspur Sadar	SH-51 Basantpur
CH-5 Bhatiyat	KG-25 Nagrota Surian	SO-69 Nalagarh	BP-2 Geharwin	SH-52 Chhohara
HM-11 Bamsan	KG-26 Nurpur	UN-71 Amb	CH-4 Bharmour	SH-53 Chopal
HM-12 Bhoranj	KG-27 Panchrukhi	UN-72 Bangana	CH-6 Chamba	SH-54 Jubbal
HM-13 Bijhri	KG-28 Pragpur	UN-73 Gagret	CH-7 Mehla	SH-56 Narkanda
HM-14 Hamirpur	KG-29 Rait	UN-74 Haroli	CH-8 Pangi	SH-57 Rampur
HM-15 Nadaun	KG-30 Sulah	UN-75 Una	CH-9 Salooni	SH-58 Rohroo
KG-17 Baijnath	KU-34 Ani		CH-10 Tissa	SH-59 Theog
KG-18 Bhawarna	KU-36 Kullu		HM-16 Sujanpur Tira	SM-60 Nahan
KG-19 Dehra	MD-41 Chachyot		KN-31 Kalpa	SM-61 Pachhad
KG-20 Fatepur	MD-42 Chauntra		KN-32 Nichar	SM-63 Rajgar
KG-21 Indora	MD-43 Dharampur		KN-33 Pooh	SM-64 Sangrah
KG-22 Kangra	MD-44 Drang		KU-35 Banjar	SM-65 Shillai
MD-46 Karsog	MD-45 Gopalpur		KU-37 Naggar	SO-66 Dharampur
MD-47 Mandi Sadar	MD-49 Seraj		KU-38 Nirmand	SO-67 Kandaghat
MD-48 Rewalsar	MD-50 Sundernagar		LS-39 Lahaul	SO-68 Kunihar
KG-23 Lamba Gaon	SH-55 Mashobra		LS-40 Spiti	SO-70 Solan

Source: JICA Study Team

4) Categorization based on Progress Pattern and Expansion Potential of Diversified Agriculture

All the administrative blocks are categorized from Category-I to Category-IV by combining two results: (i) progress pattern and (ii) expansion potential as explained above. The results are in Table D.3.6 and illustrated in Fig. D-3.10.

The characteristics of blocks categorized into 4 categories in the above can be summarized as follows,

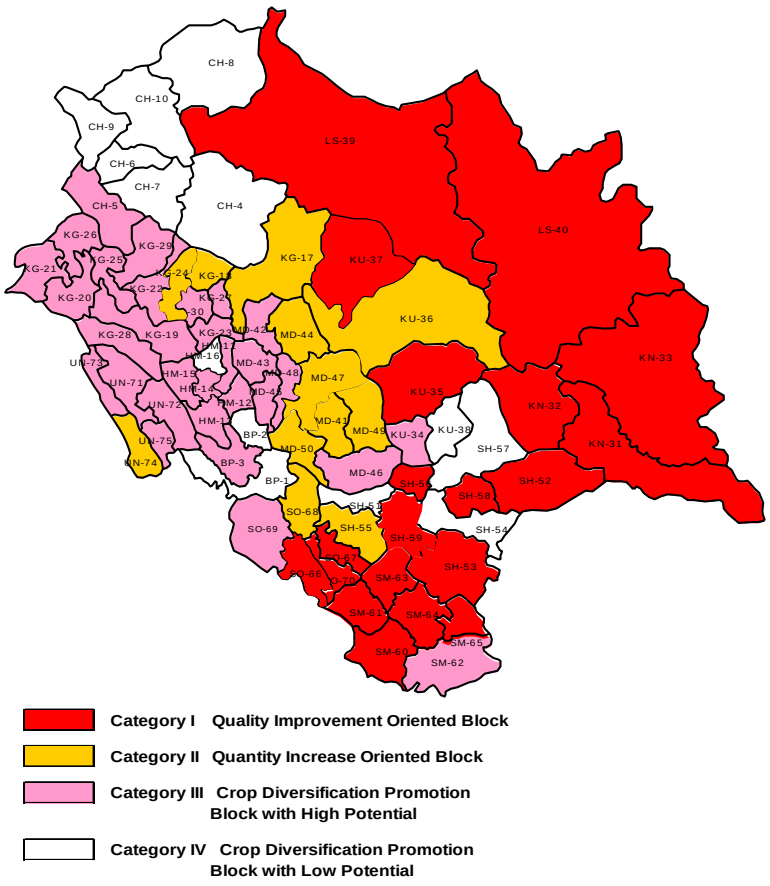


Fig. D-3.10 Classification of Blocks by Category

Category-I: Diversification is advanced, but limited potential for more expansion. Further improvement of farm income is planned by quality improvement.

Category-II: Diversification is accelerated, and there is potential for area expansion. Further improvement of farm income is planned by Crop Conversion to diversified crops.

Category-III: Dominant in food grain production, and still challenging in diversification. There is large potential in area expansion. Further improve of farm income is planned by crop diversification.

Category-IV: There is limited potential in area expansion. However, Crop diversification, especially to vegetable cultivation, is introduced where possible, followed by integrated farming consisting of horticulture, animal husbandry or fishery.

Table D-3.6 Spatial Categorization based on Present Status and Expansion Potential of Diversified Agriculture

Category	Number of Blocks	Name of Blocks
Category-I	21	KN-31 Kalpa KN-32 Nichar KN-33 Pooh KU-35 Banjar KU-37 Naggar LS-39 Lahaul LS-40 Spiti SH-52 Chhohara SH-53 Chopal SH-56 Narkanda SH-58 Rohroo SH-59 Theog SM-60 Nahan SM-61 Pachhad SM-63 Rajgar SM-64 Sangrah SM-65 Shillai SO-66 Dharampur SO-67 Kandaghat SO-68 Kunihar SO-70 Solan
Category -II	11	KG-17 Baijnath KG-18 Bhawarna KG-24 Nagrota Bagwan KU-36 Kullu MD-41 Chachyot MD-44 Drang MD-47 Mandi Sadar MD-49 Seraj MD-50 Sundernagar SH-55 Mashobra UN-74 Haroli
Category -III	30	BP-3 Ghumarwin CH-5 Bhatiyat HM-11 Bamsan HM-12 Bhoranj HM-13 Bijhri HM-14 Hamirpur HM-15 Nadaun KG-19 Dehra KG-20 Fatepur KG-21 Indora KG-22 Kangra KG-23 Lamba Gaon KG-25 Nagrota Surian KG-26 Nurpur KG-27 Panchrukhi KG-28 Pragpur KG-29 Rait KG-30 Sulah KU-34 Ani MD-42 Chauntra MD-43 Dharampur MD-45 Gopalpur MD-46 Karsog MD-48 Rewalsar SM-62 Paonta Sahib SO-69 Nalagarh UN-71 Amb UN-72 Bangana UN-73 Gagret UN-75 Una
Category -IV	13	BP-1 Bilaspur Sadar BP-2 Geharwin CH-4 Bharmour CH-6 Chamba CH-7 Mehla CH-8 Pangi CH-9 Salooni CH-10 Tissa HM-16 Sujanpur Tira KU-38 Nirmand SH-51 Basantpur SH-54 Jubbal SH-57 Rampur

Source: JICA Study Team

ANNEX-E

Agricultural Supporting Services

THE STUDY ON DIVERSIFIED AGRICULTURE FOR ENHANCED FARM INCOME IN THE STATE OF HIMACHAL PRADESH

FINAL REPORT

ANNEX-E
AGRICULTURAL SUPPORTING SERVICES

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ANNEX-E AGRICULTURAL SUPPORTING SERVICES

E-1 Agricultural Organization

E-1.1 Department of Agriculture

(1) Agricultural Development Policies of H.P State in the 11th Five Year Plan

In the 11th Five year Plan (2007-2012), the development policies for the growth of agriculture production lay emphasis on the following:

- To enhance the productivity and quality of crops besides replacement of low productivity varieties of crops towards high yielding varieties.
- Focus will be to laid raise the cropping intensity of existing agricultural land for increasing the agricultural production in the State.
- Diversion towards high value crops by adopting project approach.
- To bring more area under irrigation by tapping all sources of water and construction of water harvesting structures through people's participation.
- Provision for insurance to cover all important crops.
- Involvement of Panchayati Raj Institution (PRI)s in Agriculture Development Programme.
- Encouraging of organic farming

(2) Priority Areas for the 11th Five Year Plan (2007-2012)

1. Diversification of area from traditional food grain crops to high value commercial crops.
2. Development of rainfed areas through watershed approach on a large scale for efficient use of natural resources.
3. Rainwater harvesting which not only provide live saving irrigation water to the crops but also recharge the groundwater and prevent erosion.
4. Increase in maize productivity through high yielding hybrid varieties
5. Promotion of organic farming so as to ensure premium prices of the produce.
6. Developing efficient post harvesting and marketing system
7. Greater emphasis on hill mechanization through identification of suitable implements and machines and their propagation.
8. Agriculture Research System shall be re-oriented so as to address the problems of the farmers of the State.
9. Re-orientation of extension agency so as to ensure rapid transfer of technology and skill up-gradation.
10. Agro-processing and value addition
11. Increase in productivity and quality.

(3) Functions of the Department of Agriculture

The Department of Agriculture (DOA) is mainly involved to serve the farming community by implementing various developmental programes and disseminating the relevant technology to increase productivity and production of field crops and vegetables. The main functions of agriculture department are as follows:

1. To impart latest technology to the farmers for increasing agricultural production.
2. To ensure timely supply of all types of agricultural inputs like improved seeds, agricultural implements, pesticides and fertilizers.
3. To educate the farmers regarding economic use of irrigation water.
4. To educate the farmers about soil and water conservation technologies.
5. To impart training on Integrated Pest Management (IPM) and use of farmers friendly bio fertilizers.
6. To educate the farmers on diversified farming.
7. To create irrigation facilities to the farmers through minor/tank irrigation schemes so as to obtain maximum returns from their land
8. To educate on marketing of agricultural produce to enable the farmers to obtain remunerative prices of their produces.

(4) Administrative Set-up

The organizational structure of department of agriculture is shown in Fig. E-1.1. While the Minister and the Principal Secretary of Agriculture are the policy making authorities in the State, the Director of Agriculture is responsible for the planning and implementation of agricultural programmes and schemes in the State.

The Director is supported by Joint Directors at the State level and Deputy Directors at the district level. The development unit is ‘block’, which is managed by Subject Matter Specialist (SMS), who is supported by Agricultural Development Officers (ADOs) and Agricultural Extension Officers (AEOs).

(5) Activities of the Department of Agriculture

The activities of the Department of Agriculture can be broadly classified as mentioned below.

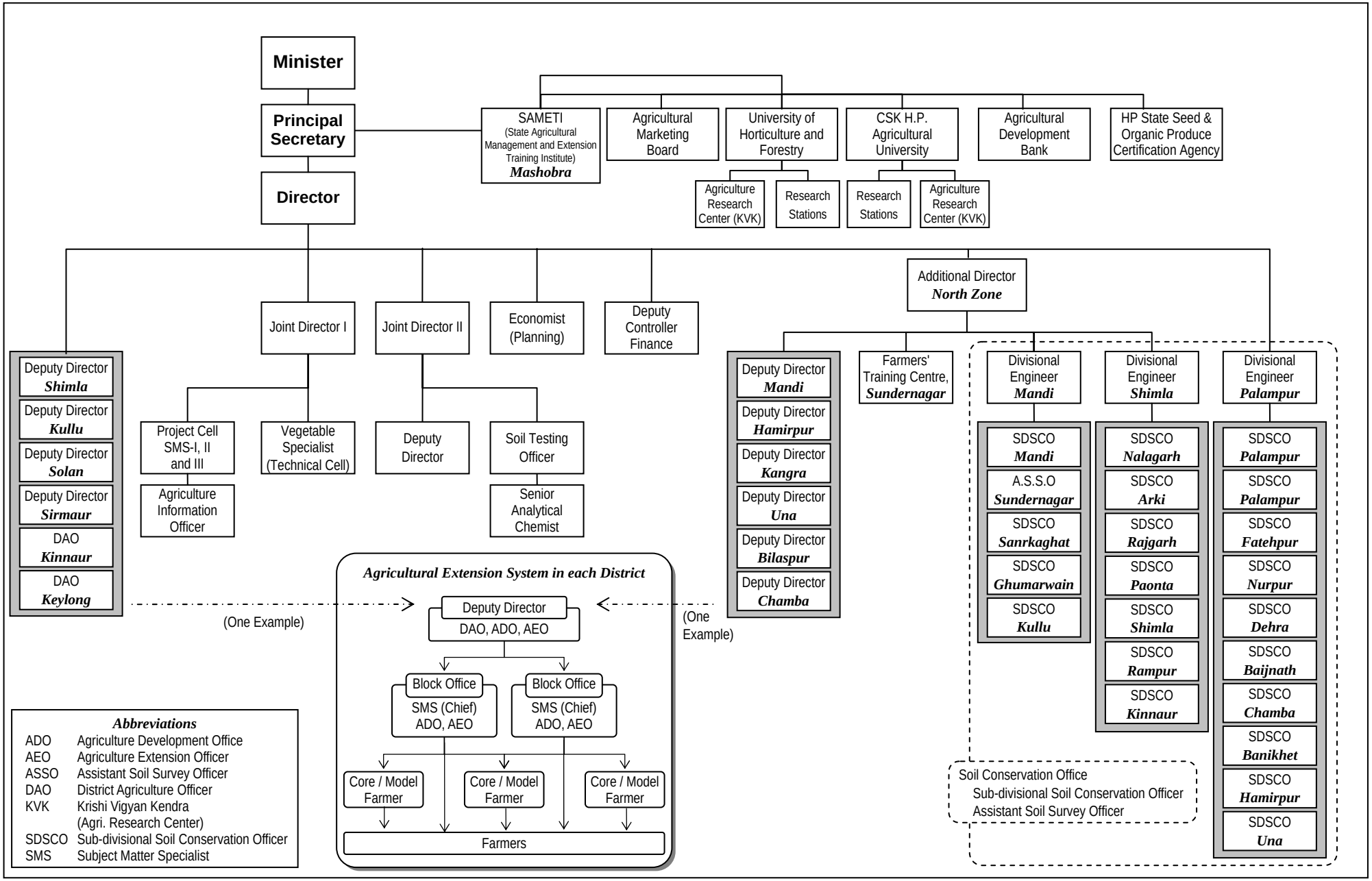


Fig. E-1.1 Organization of Department of Agriculture, State of Himachal Pradesh

Table E-1.1 Activities of the Department of Agriculture

Extension Activities	Quality Control Activities	Developmental Activities	
		Input Management	Soil and water conservation activities
• Production technology • Protection technology • Post-harvest and marketing management • Pest management For Cereals Vegetables Pulses Oil seeds Tea	• Pesticide control laboratory (Shimla) • Fertilizer and quality control laboratories (Sundernagar, Hamirpur) and fertilizer inspections • Seed testing laboratory • Bio-control laboratory (Palampur)	• Distribution of seeds fertilizers, and pesticides • Assisting the farmers to obtain the inputs with subsidies.	• Construction of water harvesting structures including check dams • Green houses • Sprinkler, drip and flow irrigation schemes

(6) State Government Schemes

1) Quality Seed Multiplication and Distribution: The department owns 25 seed multiplication farms where foundation seeds of Kharif and Rabi crops are produced. Annually about 350 to 400 tons of seeds of cereals, pulses and vegetables are produced. Further about 10,000 tons of certified seeds of various crops are distributed to the farmers in the state.

2) Soil Testing: The department has 11 soil testing labs, and 2 mobile soil testing labs to provide free soil testing facilities to the farmers. About 100,000 samples are analyzed annually.

3) Crop Protection: About 300 tons of pesticides through 1,500 sale centers are being supplied to the farmers. For quality control, pesticide testing laboratory is set up with an analysing capacity of 150 to 250 samples per year.

4) Seed Potato Development: The department owns 14 potato development stations where foundation seed potato is produced.

5) Vegetables Development Project: The department owns three vegetable seed farms where quality seeds are produced.

6) Ginger Development: The department is providing training, demonstrations and quality seed for production of disease free ginger. The department owns two ginger farms where quality seed is produced.

7) Agricultural Marketing: Marketing of agricultural products is regulated in the State through new APMC Act, H.P.Agriculture and Horticulture Produce Marketing Act, 2005. At present, 10 Market Committees are functioning and 45 market yards have been established.

8) Agricultural Economics and Statistics: Under this programme estimates of production of major crops like wheat, maize, rice, potato and ginger are carried out.

9) Tea Development: The total area under tea is 2,312 hectares with a production level of 855,000 kg during the year 2005-2006.

10) Rural Infrastructure Development Fund (RIDF): Under RIDF programme financed by NABARD, minor irrigation projects are executed since 1995-96.

(7) Central Government Schemes

1) Integrated Scheme of Oilseed, Pulses, Oil Palm and Maize (ISOPOM): The Government of India launched this scheme in the year 2004-2005. The main component of the scheme are distribution of hybrid maize seeds, block demonstrations, installation of sprinkler sets, distribution of HDPE pipes for carrying water from the source to field, involvement of

private sector in seed production, supply of input extension support etc. and publicity regarding development of maize etc.

2) Biogas Development: It is a 100% centrally sponsored programme under which Rs.3,500 is provided as subsidy for biogas plants upto 1 cu.m and Rs.4,500 is provided for biogas plant of more than 1 cu.m.

3) Work Plan for Accelerated Growth of Agriculture: This programme has been carried out by Government of India since 2000-2001 on 90% Centre share and 10% State share basis. Under this program, different schemes for crop improvement, farm mechanization, integrated nutrition management, agricultural extension, quality seeds production etc. are carried out.

E.1.2 Farmers Organizations and Cooperatives

In H.P. State, there are different types of agricultural/farmers organizations, farmers cooperatives, and Self-Help Groups (SHGs) established by different organizations under different programs as mentioned below.

1) Farmers organizations formed under National Agricultural Technology Project (NATP) of DOA

2) Farmers cooperatives formed under Co-operatives Department

3) Self-help Groups (SHGs) established under Social Welfare & Empowerment

4) Water Users Associations formed by DOA and IPH.

(1) Farmers Organizations under NATP of DOA

In National Agriculture Technology Project (NATP), farmers organizations are formed at the village level which evolve into Community Associations (CAs), Cooperatives and other types of farmers organizations at the block level and district level. The village extension workers of line departments such as AEOs/HEOs/ Vetinerary Pharmacists are instrumental in establishing the links with the farming community at the village level. These farmers organizations and Farmer Interest Groups (FIGs) are effectively involved in the preparation of block action plans. These organizations coordinate in organizing on-farm demonstrations, and give their feed back to the extension and research. Their representatives are directly involved in the block level Farmer Advisory Committee (FAC) and also the governing board of ATMA. These groups are providing feedback and their needs to FAC and ATMA. The details of FIGs are given in Table E-1.2.

Table E-1.2 Farmers Interest Groups for Various Activities Established under NATP

District	Activities Undertaken	Number of FIGs
Shimla	Agriculture, Horticulture, Vegetables, Floriculture, Sericulture, Mushrooms, Dairy, Fisheries, Vermi-Compost, Bee Keeping, Rearing of Poultry, Nursery Raising of Temperate Fruit Crops, Rearing of Sheep, and Post Harvest Technology	656
Hamirpur	Vegetable Cultivation, Mushroom Cultivation, Agriculture (Mixed Groups), Dairy, Horticulture, Sericulture, Bee Keeping, Post Harvest and Value Addition, Medicinal & Aromatic Plants, Vermicompost, Floriculture, Fisheries and Poultry	203
Kangra	Vegetable production, Agriculture, Floriculture, Mushroom, Horticulture, Dairy, Sericulture and Fisheries	744
Bilaspur	Mahila Mandals and Yuvak Mandals involving mostly village level groups working for overall welfare, development of villages including Agriculture and Horticulture development activities. FIGS are also involved in different agriculture, animal husbandry activities in the district.	141

Source: Department of Agriculture, 2005-06 data

The main activities undertaken by FIGs are as follows:

- They are actively involved to identify need and location specific problems and get them included in block action plan.
- They are involved in forming societies for marketing purpose
- They purchase and transport the inputs collectively in groups
- Demonstrations are laid out in FIG fields and the feedback is given to extension and research

(2) Farmers' Cooperatives under Cooperative Department

In Himachal Pradesh, the cooperative movement started way back in 1892 in Panjavar in Una district. It was an agricultural co-operative society. At present, there area 2086 Primary Agricultural Co-operative Societies as mentioned below.

Table E-1.3 Primary Agricultural Cooperatives in H.P

S.No	District	Number of Primary Agricultural Co-operatives
1	Bilaspur	73
2	Chamba	130
3	Hamirpur	217
4	Kangra	597
5	Kinnaur	35
6	Kullu	128
7	Lahaul & Spiti	52
8	Mandi	216
9	Shimla	149
10	Solan	158
11	Sirmaur	119
12	Una	212
Total		2086

Source: Co-operative Department, Annual Administrative Report, 2005-06

The major functions of agricultural cooperatives are given below.

1. To make arrangements for the distribution of seeds, fertilizers, agriculture implements, insecticides and pesticides etc. and inputs for agriculture and cottage industry and distribute them amongst the members of the society.
2. To ensure sale of produces of the members of society at fair prices.
3. To ensure storage facilities by construction or leasing in godowns for safe storage of member farmers' produce.
4. To make arrangements for the distribution of credit and recovery of loans, sale of agricultural implements.
5. To support activity of fisheries by promoting scientific rearing of fish, make provision for fish ponds and facilitate the marketing of the produce.
6. To make provision for upgrading the breeds of milch cattle of the members of the society and liaison with the officials of animal husbandry department.
7. To make provisions for selling of milk and milk products and eggs and poultry products.
8. To disseminate agriculture related innovative ideas and information with the help of agriculture department officials to the farmer members of the society.

(3) Self-help Groups (SHGs) established under Social Welfare & Empowerment

Under the department of Social Welfare & Empowerment, 17,571 SHGs were formed till March 2007. Out of these SHGs, 11,708 SHGs are linked with banks for micro-credit purposes. These SHGs were

involved in a number of activities that also included agriculture activities, vermin-composting, dairy farm activities etc.

(4) Lahaul Potato Society (LPS)

In the tough terrain of Lahaul, transportation of potato was a very challenging task. Due to such conditions traders, middleman and commission agents were exploiting the farmers by quoting very low rates of their produce. To solve this problem LPS was formed and the farmers have been able to get good marketing facilities and good prices, and exploitation from middle man have been avoided. Initially its office was opened in Lahaul, but in 1968 office was shifted to Manali due to bad weather conditions in Lahaul.

The major objectives as enshrined in its bylaws are as mentioned below:

1) To arrange for the sale of agriculture produce of its members at remunerative prices.
2) To provide loans against their produce to the members to meet their immediate requirements.
3) To arrange supply of consumer goods to their members at reasonable rates.
4) To arrange transportation, grading, bagging and forwarding of their agricultural / horticultural produce to the markets.
5) To arrange / supply foundation seed to its grower members.
6) To arrange for transportation facilities.
7) To arrange lodging facilities to its members at Manali in its guest house at reasonable rates.
8) To act as an agent of the State Govt. for procurement and distribution of agricultural produce as well as essential commodities.
9) To promote and set up processing units based on fruits and vegetables.
10) To arrange procurement of packing material, spray oil, fertilizers and other inputs for increasing Agriculture and Horticulture produce and supply the same to members and fruit growers.

The major features of LPS are mentioned below.

- The advantage to farmers is that they just have to bring their produce to the collection center of LPS. After that all the grading, packing and marketing is done by LPS. Daily needs items are also supplied to the members of LPS on credit. They have their own retail shops at Manali, Keylong, Kullu and Udaipur, and LPS gives concession to all its members from their retail shops.
- LPS organizes camps seasonally for quality potato. The farms are visited by seed certification officers of government department for 3-4 times in a season.
- The LPS farmers meeting is carried out once in a year. The subjects discussed are profit and loss of LPS activities in a year, and suggestions are also provided by growers.
- Collection location of LPS is at Pandra Mile. Their grading, packing and marketing is done by LPS. The gunny bags are used for packing and capacity of gunny bag is 50 kg. Some private traders visit the collection place of LPS, and purchase the potato from collection place of LPS.
- Potatoes are sent to Chandigarh first and then sent to different parts of the country.

(5) Kullu Fruit Growers Association

The association was established in 1980 with the following objectives.

- To provide fungicides, pesticides/insecticides, quality packaging material to the growers at no profit, no loss (group purchasing).
- To help the farmers to get subsidy under HTM (horticulture technology mission).

- To organize the camps and trainings for farmers for better quality produce.
- To help the farmers to get crop loan from the banks.
- To help the farmers to get the payment in time from the dealers and commission Agents.
- To provide transportation facilities to the farmers at cheaper rate. (Transportation charges are fixed by the association with the transport union).

Extension and research activities: Experts from research stations and from horticulture universities give trainings to the farmers during camps.

Marketing: Association does not involve in the marketing of growers produce (fruits and vegetables) due to different quality of produce. The farmers having the orchard at the same place but their produce having difference in the quality, demand for the same price most of the times, and therefore to avoid conflicts, the association does not involve in the marketing of produce from farmers.

Other Associations for fruits in Kullu district include Lower Kullu Fruit Growers Association (Bhuntar) and Kullu Sadar Fruit grower Association (Akhara Bazar).

(6) Exotic Vegetable Farmers Group in Karsog, Mandi District

There are 30 such farmers groups in Karsog, and on an average each group consists of 35-40 farmers. The groups are formed by farmers themselves. The farmers group usually own collection cum grading center in which exotic vegetables like lettuce, Chinese cabbage, celery, leek, and broccoli are collected. Other vegetables like red and yellow capsicum, yellow summer squash and peas are also collected. The information surveyed by the Study Team from such groups are mentioned below.

i) Collection group - Prakritik

- Collection group name: Prakritik
- This group consists of 100 farmers group and has 5-6 sub centers in block area.
- This group is formed on 1st April, 2008.
- They have 2 A/C vehicles (3 ton type) and 1 vehicle is sent to Delhi daily. The A/C vehicles were purchased by the group with bank support.
- 3 ton produce/day is sent to Delhi daily.
- Packing and grading is done by farmers themselves.
- They are paying Rs.600 per quintal as transportation charges. No member fee is collected.
- Confirmation of present market prices is confirmed by one member of this group in Delhi.
- Group leader also fixes the rates and quantity with the traders and on telephone he asks the group to send the fixed quantity if they are satisfied with the rates.
- On the basis of fixed rates, the money is given to each farmer.
- All the vegetables are sent from March to November.
- Destinations of produces are Okhla Mandi, and 5 star Hotels in Delhi.

ii) Chaman Pur Kissan Club

- Collection group: It is a group of 5 sub-groups including Chaman Pur Kissan Group (35 members), Kheel Dharmour Farmer Group (30 members), Maha Maya Farmer Group (30 members), Middle Valley Farmer Group (50 members), and Mahu Nag Farmer Group (100 members).
- Lettuce, Chinese cabbage, ice burg, celery, broccoli, leek, fennel and parsley are sent directly to Delhi and Chandigarh.
- 2tons of produce/day is sent to Delhi directly.
- They also have 2 A/C vehicles (2.5 ton type) on rental basis.
- This group has 4 members in Delhi, and 1 member in Chandigarh.
- These members confirm the present market prices and fix the rates and give the same information to there group. The money is paid to each farmer on the basis of fixed rates.
- Seeds required are generally prepared and distributed to farmers by the group leader

- The produces are sold to the buyers of 5 star Hotels.
- Transportation charges are collected, but no member fee is collected.
- Destinations are Okhla Mandi, Azadpur, Khan market, INA market in Dehli.
- All the vegetables are being sent from April to November.

E-1.3 Agricultural Research and Education

The agriculture universities and the research institutes in Himachal Pradesh, which are involved in agricultural research and education in H.P., are mentioned below.

Agricultural Universities:

- Himachal Pradesh Agriculture University, which is called as Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSK HPKV)) located in Palampur, Kangra district.
- Dr Y.S.Parmar University of Horticulture & Forestry (YSP UHF), located in Nauni, Solan district.

Research Institutes:

- Agro-Economic Research Centre (AERC) at the Himachal Pradesh University, Shimla
- Central Potato Research Institute (CPRI), Shimla
- National Research Center for Mushroom (NRCM), Solan
- Indian Agricultural Research Institute (IARI) Regional Station, Shimla
- Indian Agricultural Research Institute (IARI) Regional Station, Katrain, Kullu Valley
- National Bureau of Plant Genetic Resources Regional Station, Shimla
- Institute of Himalayan Bioresource Technology (IHBT), Palampur
- G.B. Pant Institute of Himalayan Environment & Development, Himachal Unit, Mohal-Kullu.

A brief description on the mandate and their involvement in the agricultural research, education and extension activities are given below.

(1) Himachal Pradesh Agriculture University

The university was established in 1978 with the mandate of imparting education in agriculture and allied sciences, furthering advancement of learning in hill agriculture by research and undertaking extension of scientific knowledge to the farmers of Himachal Pradesh.

Besides offering academic programmes, advanced education and research are conducted in the fields of Agriculture, Veterinary, Home Science and Basic Sciences. The university has been giving priority to location specific, need-based and problem oriented research with multi disciplinary approach at main campus Palampur and research stations and sub stations. The Directorate has research network at main campus and three research stations at Bajaura (Kullu), Dhaulakuan (Sirmour) and Kukumseri (Lahaul) and 11 research sub-stations at Kangra, Nagrota, Malan, Berthin, Akrot, Sundernagar, Katrain, Leo, Lari, Sangla and Salooni.

The university also shares the responsibility for planning, implementation and coordination of various extension education programmes of all the departments of four constituent colleges and research centres in close collaboration with the State Departments of Agriculture, Animal Husbandry, Fisheries and other concerned departments and institutions. It conducts a large number of trainings at main campus and at its eight Krishi Vigyan Kendras (KVK) at Bajaura, Dhaulakuan, Hamirpur, Una, Mandi, Kangra, Berthin and Kukumseri. KVKs provide training and field demonstration on latest agricultural techniques. After integration of Research and Extension set-up, the KVKs are working in close coordination with R & E Centres. Agricultural Technology Information Centre is functional at the

main entrance of the University.

(2) Dr Y.S.Parmar University of Horticulture & Forestry (YSP UHF)

In December, 1985 the Horticulture complex of HPU got the recognition of Dr.Yashwant Singh Parmar University of Horticulture and Forestry, Solan. It is playing an important role in increasing horticulture production in the state of Himachal Pradesh in particular and in the country in general. The mandate of the university includes the following.

- Providing education in Horticulture, Forestry and allied branches of learning and scholarship
- Advancement of basic and applied research pertaining to Horticulture, Forestry and other allied sciences
- Extension and dissemination of Scientific information among rural farmers of H.P. state
- Developing linkages with the State/Central/International Institutions, NGOs, Orchardists, Farmers and Industrialists in the State towards the promotion of horticultural development.

Vocational Training Program for Youth:

Vocational training courses on Horticulture Management are run by the Directorate of Extension Education through Regional Horticulture Research Stations at Jachh, Bajaura, Mashobra, Sharbo, Kotkhai and Dhaulakuan and KVK Chamba. This course is meant for imparting training in horticulture to youths from different districts of Himachal Pradesh involved in farm management. The youths, and farm women having matriculate qualification and belonging to rural background are eligible for this training. No fee is collected from the participants, but boarding and lodging charges are to be borne by the participants.

Vocational Training Program for Horticulture Supervisors & Entrepreneurs

Horticulture supervisors and entrepreneurs are enrolled in horticulture trainings sponsored by Ministry of Agriculture, Government of India under Human Resource Development in Horticulture. The ministry has identified this university as one of the nodal agencies for the organizing horticulture supervisor and entrepreneurs course in horticulture for one year and 3 months respectively for the rural youths belonging to the entire temperate region of the country. The aim of this vocational training program is to generate self employment to the rural youths by improving their knowledge, skill and attitude for taking up horticulture pursuits to earn their livelihood as well as to act as satellite progressive farmers in their respective areas.

(3) The Agro-Economic Research Centre (AERC)

The Agro-Economic Research Centre (AERC) at the Himachal Pradesh University was established in December 1972 by the Ministry of Agriculture, Government of India to carry out research and investigations in the field of Agricultural Economics in Western Himalayan Region consisting of Himachal Pradesh and Jammu & Kashmir. The broad functions assigned to this Centre are:

- To make a study of changes in rural economy by means of survey of a number of selected villages each year and resurvey of the same group of villages at an interval of say, five years;
- to conduct adhoc investigations into problems of interest to the Ministry of Agriculture, Government of India;
- to carry out research on fundamental problems relating to agricultural economics of the country;

(4) Central Potato Research Institute (CPRI)

Central Potato Research Institute (CPRI) under Indian Council of Agricultural Research (ICAR) is involved in research on potato related to breeding, biotechnology, culture (crop improvement, crop production), physiology, nutrition, soil and water management, crop protection, engineering, post-harvest technology, extension, and transfer of technology. The mandate of CPRI includes the following:

- To undertake basic and strategic research for developing technologies to enhance productivity and utilisation of potato.
- To produce disease-free basic seed of different notified varieties developed by the institute.
- To act as national repository of scientific information relevant to potato.
- To provide leadership and coordinate network research with state agricultural universities for generating location and variety-specific technologies and for solving area-specific problems of potato production.
- To collaborate with national and international agencies in achieving the objectives.
- To act as a centre for training in research methodologies and technology for upgrading scientific manpower in modern technologies for potato production.
- To provide consultancy in potato research and development.

(5) National Research Center for Mushroom (NRCM)

National Research Centre for Mushroom (NRCM) at Solan, is functioning under Indian Council of Agricultural Research (ICAR) with a mandate to carry out research, training and extension on all aspects of mushrooms in the country. The Centre has been disseminating upto date information relating to different aspects of mushroom cultivation technology. Besides it has also created a general awareness among the people about mushrooms, their nutritional qualities and their potential as an income generating high value crop.

(6) Indian Agricultural Research Institute (IARI) Regional Station, Shimla

The station was started with the mandate of breeding rusts resistant hill wheat variety and barley was added later on. The two approved projects of the station in early days were:

- Improvement of Wheat for Northern Hills
- Improvement of Barley for Northern Hills

The station has been reviewing and resetting its research priorities from time to time on the basis of previous findings and the ensuing demands of the hill environments prevailing over the region of northern hills of India where wheat is grown. The mandate of Regional Station is continued to be wheat improvement with the project entitled Breeding Disease Resistant and Productive Wheat Cultivars for Northern Hills.

(7) Indian Agricultural Research Institute (IARI) Regional Station, Katrain, Kullu

The Station was established with the following main objectives:

- Production of quality seeds of temperate vegetables and their distribution to the vegetable growers,
- Providing advice on the technology of production of these vegetables and their seeds; and
- Development of new varieties in temperate vegetable crops.

With the realization of scope of hybrids in vegetables and their acceptance by the growers, the research mandate has been directed towards developing of high yielding hybrids with resistance to

major diseases and pests for different zones.

(8) National Bureau of Plant Genetic Resources Regional Station, Shimla

The research station has the major responsibility for the conservation and management of plant genetic resources of western Himalayas comprising Himachal Pradesh and Jammu and Kashmir. A field genebank of temperate fruits and newly introduced fruit plants, and the largest germplasm collection of french bean, buckwheat are maintained at the station. The station has also a facility of medium-term storage for conserving orthodox seeds where seeds can be stored up 12-15 years without losing viability. This station also acts as National Active Germplasm Site (NAGs) for french bean, buckwheat and temperate fruits. It has strong linkages with State Agriculture Universities of Himachal Pradesh and Jammu and Kashmir as well as Himachal Pradesh University, Shimla.

(9) Institute of Himalayan Bioresource Technology (IHBT), Palampur

IHBT, a constituent laboratory of Council of Scientific and Industrial Research (CSIR) India has a mandate of providing research and development services on economic bioresources in western Himalayan region leading to value added plants, products, process for industrial, societal and environmental benefit. The main research areas include biodiversity conservation, bioprospection, metabolomics, virolgy, bamboo research and mapping.

(10) G.B. Pant Institute of Himalayan Environment and Development, Himachal Unit

G. B. Pant Institute of Himalayan Environment and Development is an autonomous institute of the Ministry of Environment and Forests, Government of India. The Institute is identified as a focal agency, to advance scientific knowledge, to evolve integrated management strategies, demonstrate their efficacy for conservation of natural resources and to ensure environmentally sound development in the entire Indian Himalayan Region. All R&D activities of the Institute are essentially multi-disciplinary in nature, and based on a conscious effort to interlink natural and social sciences to promote sustainable development.

E-1.4 Constraints and their Countermeasures in Agricultural Organization

The constraints, development potentials and their countermeasures in agricultural organization are summarized as shown below.

Table E-1.4 Constraints and their Countermeasures in Agricultural Organization

Present Conditions / Constraints	Potential / Opportunities	Future Strategy & Measures
1. While DOA is responsible for various activities related to developmental programmes and disseminating the relevant technology to increase productivity and production of field crops and vegetables, there are shortages of extension staff to carry out these activities. 2. Because of the hilly terrain, the mobility of the extension staff is a major problem, and there are insufficient facilities for mobility of the extension staff. Besides, there are also shortages of extension and soil conservation survey and drawing equipment. 3. Top-down approach is mostly followed in implementing the development schemes, and sometimes schemes are implemented without any analysis of needs at the block or lower level. 4. Although some capacity building trainings are conducted on agronomical aspects, not much trainings are conducted on planning aspects. 5. Although farmers organizations are set-up under ATMA, their activities are still limited. 6. There are insufficient farmers grouping / organizations for extension & shipping their produces. 7. Although field-oriented researches are conducted, the linkages between the extension officers, universities and the farmers are limited.	i) There are many young unemployed agricultural graduates in the State. ii) If the extension and soil conservation personnel are provided with transport equipment, they will be more actively involved in the field activities. iii) Irrigation projects can be carried out more systematically with the provision of soil conservation survey and drawing equipment. iv) The field extension officers will be more involved in the planning through suitable capacity building trainings. v) The Himachal farmers are receptive & highly interested towards crop diversification and adaptation of new technologies. vi) There are sufficient State and Central Research stations to carry out area oriented research. vii) The agricultural universities also shares the responsibility for planning, implementation and coordination of various extension education programmes in close collaboration with the State Departments of Agriculture, Animal Husbandry, Fisheries and other concerned departments.	1) H.P State is already in the process of increasing the extension staff. However, it should be increased more so as to meet the requirement for each block. 2) Necessary equipment and tools should be provided to department, district and block offices, and soil conservation offices for implementation of crop diversification 3) Capacity building of staffs shall be carried out on planning, implementation, monitoring and evaluation of crop diversification. 4) Organizing or strengthening of farmers' groups (marketing group) aiming at crop diversification is needed. 5) Periodical meetings and workshops should be conducted among the research institutes, extension departments and farmers' representatives at the state and district level. 6) Research & extension linkage shall be strengthened through field visits of researchers together with extension officers in order to cope up with on-going constraints in the field, and linking of research activities matching demands of the farmers. 7) Linkages with the State/ Central/International Institutions, NGOs, Farmers and Industrialists should be developed.

E-2 Agricultural Extension System

E-2.1 Agricultural Extension Organization and System (DOA)

(1) Agricultural Extension Organization

In Himachal Pradesh, Department of Agriculture (DOA) is responsible for the planning and implementation of agricultural programmes and schemes in the State. According to functions, the DOA is broadly classified into two sections i.e. Extension Section and Soil Conservation Section as shown in the following Fig. E-2.1.

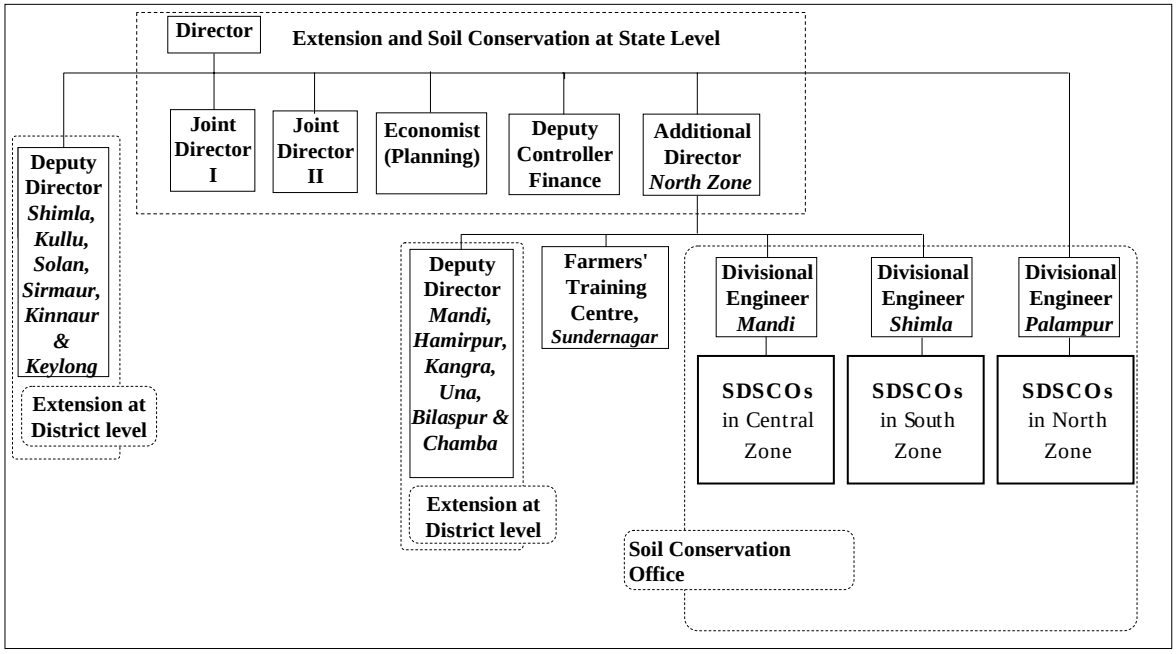
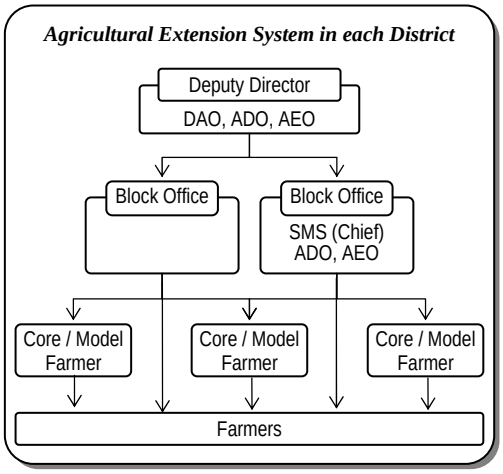


Fig. E-2.1 Extension System at the State and District Level

In regard to the extension activities, the Director is supported by Joint Directors at the State level and Deputy Directors at the district level. The development unit is 'block', which is managed by Subject Matter Specialist (SMS), who is supported by Agricultural Development Officers (ADOs) and Agricultural Extension Officers (AEOs).



The Department runs a training center at Sundernagar in District Mandi. Trainings are conducted for farmers, farmers organizations and the block-level and village level extension staffs.

The extension activities at the block level are carried out for cereals, vegetables, pulses, and oil seeds related to following fields:

- Production technology
- Protection technology
- Post-harvest and marketing management
- Pest management

(2) Number of Extension Officers

The number of extension officers in the Department of Agriculture (as on July 1, 2008) is shown below.

Table E-2.1 Extension Officers in Department of Agriculture (As on July 1, 2008)

Position	Sanctioned Posts	Presently Filled up Posts	Vacant Posts	% of vacancy
Director	1	1	-	-
Addl. Director	1	1	-	-
Joint Director	2	2	-	-
Dy. Dir.	12	12	-	-
DAO/APO	3	3	-	-
SMS	71	59	12	17%
ADO	332	171	161	48%
AADO	60	56	4	7%
AEO	820	313	507	62%
Total	1302	618	684	53%

DAO - District Agriculture Officer; SMS - Subject Matter Specialist; APO - Agriculture Project Officer; ADO - Agriculture Development Officer; AADO - Assistant Agriculture Development Officer; AEO - Agriculture Extension Officer
Source: Department of Agriculture

As it can be seen in the Table E.2.1, there are almost 50% vacancy of ADOs and AEOs who are involved in the agricultural extension activities at the block level. In consideration of 816,000 farm households in the State, an extension officer should cover atleast 1,320 farm households. At present, the government is already planning to increase atleast 300 extension staff within this financial year, by which the number of farm households to be covered by one extension officer will become about 890.

(3) Major Extension Activities at the Block Level

The major daily extension activities of the extension officers at the block level can be summarized as follows:

1) Distribution and monitoring of agriculture inputs (seeds, plant protection materials and equipment)
2) Accounts Maintenance related to distribution of inputs
3) Organization of training camps
4) Field Demonstration
5) Field visits of extension officers
6) Exposure visits for farmers
7) Soil sample collection,
8) Crop cutting experiment of maize and paddy, and
9) Regular work (Capacity building of officers, review meetings, preparation of progress reports, farmers visits to the offices, Organization of groups, field days, exhibitions)

The time involved in each month in all these extension activities are shown below.

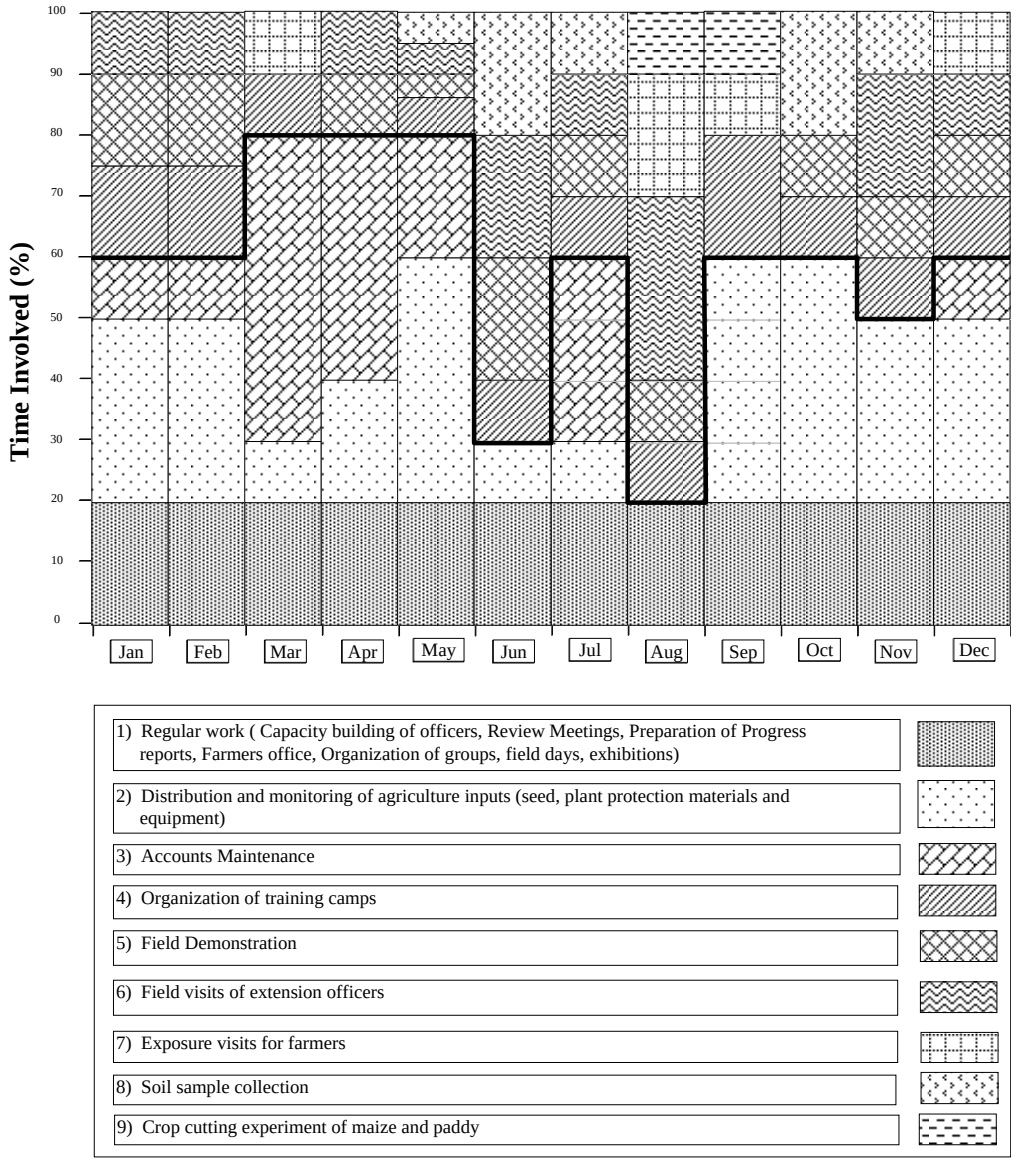


Fig. E-2.2 Activities of Field Extension Officers

The field extension officers have to spend more time in input distribution including seeds (cereals, and vegetables), plant protection materials and equipment during most of the year, and in particular they are more busy in the beginning of kharif and rabi periods. Besides, they also have to maintain the accounts regularly for the input distribution. However, the various extension activities including organization of training camps, field demonstration, field visits for farmers, soil sample collection and crop cutting experiments are also conducted in about 40% of their total time.

For the crop diversification, various activities such as farm demonstration trials, organizing training camps, exposure visits etc. need to be carried out in a more intensive manner. In the present condition, the extension officers are occupied for 60% of the time for the input distribution and the regular office works. If the input distribution can be carried out by some cooperative similar to fertilizer distribution in the State, it would save a lot of burden for the extension officers, and they can focus more on the extension activities.

(4) Extension Information System with Mobile Phones

The role of communication in overall growth of economy has been recognized widely in India, and all

over the World, and it has been proved that mobile telephone has a positive and significant impact on the economic growth. It view of this, Indian Farmers Fertilizers Cooperative Limited (IFFCO) has tied up with telephone company AIRTEL and launched a company known as IFFCO KISAN SANCHAR LTD (IKSL) which aimed at enhancing the farmers' income by providing them with a tool to easy access to locally relevant information, best agricultural practices, linkages with government and important authorities etc. through Value Added Services (VAS). An illustration of the extension information system with mobile phone is shown in Fig. E-2.3. The objectives of this organization are as follows.

1) Enhancing the farmers' income and empowering them by providing timely and locally relevant information.
2) Enhancing the capacity of cooperative societies/other groups by providing them with an additional means of generating income.

1) Activities

IKSL is taking up the activities of providing locally relevant and timely information associated with farming, livestock and weather etc. to the agrarian society by means of mobile phones. IKSL is making available the said information by voice messages which will be available to the farmers. Some of the issues on which information is being aggregated and disseminated are as follows.

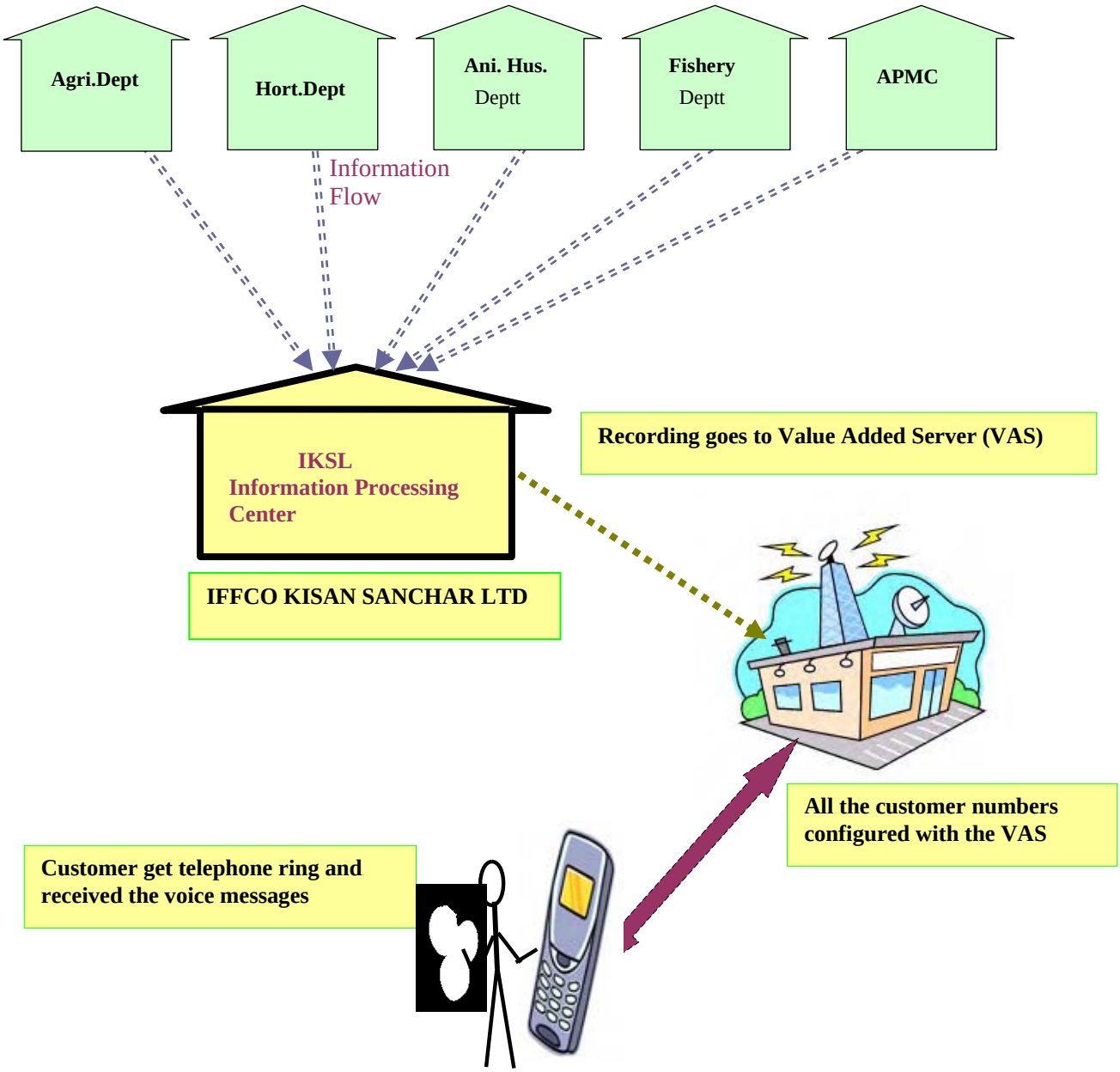


Fig. E-2.3 Extension Information System with Mobile Phone

1. Prices of major crops in a particular season that are prevailing in nearby markets, where farmers usually sell their produce. Farmers can compare the respective prices and decide as to where they should sell their produce to earn maximum profits.
2. Weather forecast information and what measures the farmers should take in those conditions. Farmers are being advised as to how they should plan their sowing, irrigation, ploughing, schedule in light of prevalent weather conditions.
3. Information on rural benefit events: Rural benefit events are regularly arranged by agriculture universities or block development offices etc. However, farmers are some times not even aware where a particular rural benefits event is being held. If they have prior details on subject, venue, date and time of the events they will be able to plan their schedule more effectively.
4. Information relating to healthy farming practices: Most farmers do not have a technical education in agriculture and the level of awareness about latest farming technology or high

yielding farming practice is also quite limited. These are being imparted by way of short voice messages.

5. Emergency messages: situation such as outbreak of epidemics or other emergent messages which are concerning rural folks can be relayed to the subscribers.
6. Medical information: information relating to locally prevailing diseases in a particular season, related precautions and curative practices can also be disseminated through voice messages on mobile telephones.

2) Modalities

The reputed mobile service provider i.e. Airtel has prepared a unique sim card (Green card) which is enabling the farmer to receive upto 5 voice messages per day of minimum duration of one minute each free of cost. Special designed software is enabling recording of voice messages, their dissemination among the local "Green card" users in short interval.

The IKSL has opened its office in H.P. at Shimla which is doing the business of telecom in rural areas of Himachal Pradesh along with Airtel. The airtel is the service provider, and IKSL is their distributor and in the field, the primary agricultural cooperative societies, milk societies, farmers club, women groups, etc. are the retailers in the rural areas of the HP. So far, the programme has started in 9 districts of the State barring Kinnaur, Lahaul Spiti and Chamba district of the state. Until now there are about 200 retailers working in the State, who has activated about 2500 customers in the rural areas of the state. These voice messages are going to all these customers.

3) Cost

Any person or farmer in the rural area of the state can purchase this green card (sim) which is costing Rs. 50. Thereafter he can get it first recharged either for lifetime or one year or 6 months validity and then purchase talk time according to his need. Thus if a farmer or any other person has his own handset he can get pre-paid connection of mobile by spending Rs.201 to 297 for 6 months to life time validity respectively of Airtel. The connection holder thereafter will receive 5 voice messages of one minute duration each relating to information as described above. The IKSL has also one helpline which can be used by all those customers for any detailed clarifications on any information required by them.

(5) E-Governance by AGRISNET Project

1) Background and Objective

The department of Agriculture and Co-operation, Ministry of Agriculture of Govt. of India has started implementing e-governance through various information communication technology (ICT) Initiatives. The government of India has launched a Central sector scheme titled "Strengthening of/promoting agriculture informatics and communications" of which one component is AGRISNET (Agriculture resources information system network). The objective of AGRISNET is to provide improved services to the farming community through use of ICT.

2) Project Functions

The project functions are mentioned below.

Table E-2.2 Government to Citizen (G2C) Services

	Services	Service goals	Description
i.	Information dissemination	To make the farmers more informed, capable and professional in their respective fields.	The Information will be available on the HP AGRISNET portal.
ii.	Curbing diseases and maintaining general health	To prevent, control and cure diseases for minimizing losses due to outbreak of diseases and for quality products.	These are done by the Departments at the predefined levels. If the problem is not rectified at lower levels, it is sent to higher levels. Through the project, the information can travel faster to the higher levels with the help of digital cameras and internet.
iii.	Supply of different items	The farmers get required items close to their work place saving their time, energy and money.	It is done at the predefined levels (e.g. block or subdivision) and will continue to be so but information on availability will make the things easier.
iv.	Trainings and services	To make them aware of modern techniques and new practices. The capacity-building exercise for the farmers will help them in having better techniques at their doorstep.	Training schedule will be on the portal with application forms and required information. List of the related institutions will be available.
v.	Expert advisory services	Interaction with the experts of their respective fields from the department, universities and laboratories may solve their problems quickly and in a better qualitative manner.	Farmers will have greater exposure to the scientific expertise.
vi.	Market information	To assist the farmers in getting proper value of their hard earned products. Since marketing is the key problem area for the farmers, AGRISNET is a tenable solution for better marketing.	Presently the market rates of Himachal market are available on http://agmarknet.nic.in This site will be linked with the HP AGRISNET Portal
vii.	Application forms	Availability of application forms for all services	Application forms with information about the requisite documents will be available.

Table E-2.3 Government to Government (G2G) Services

i.	Generation of database of respective Departments	This database will act as a Decision Support System and will be used by researchers / students.
ii.	To exchange and disseminate information	General information for the officers /staff of the department.

3) Implementation strategy

The implementation strategy of AGIRSNET is mentioned below.

1. The AGRISNET scheme will be implemented in a project mode. The project proposal for funding under the project will clearly specify the all the details of the project including the infrastructure, schedule, funding etc..
2. The state govt shall specify the output and deliverables for each project in terms of G2C services. Provision for G2G services should be treated as an intermediate output.
3. The roadmap to be provided in the project proposal shall explicitly cover delivery of G2C

services.

4. The state govt. should indicate as to how they intend to deliver the services to the farmers. The delivery points should be identified and indicated in the proposals.
5. The improvement of services to the farming community through the use of ICT and the services per se, would be considered for funding under AGRISNET.
6. The items/activities eligible for funding under AGRISNET will include Hardware and system software, Application Software, Data entry, Networking, and Training of stakeholders.
7. The Hardware and software should so designed that, if needed, it can be extended up to block level.
8. The state govt shall provide physical site for the project and bear the initial and recurring cost for the physical infrastructure such as premises, site preparation, furniture etc. The state govt shall also provide manpower and utilities for implementing the project.
9. The state govt shall commit to integrate other national / state level agricultural portals / applications with AGRISNET project.

The concept of AGRISNET is shown below.

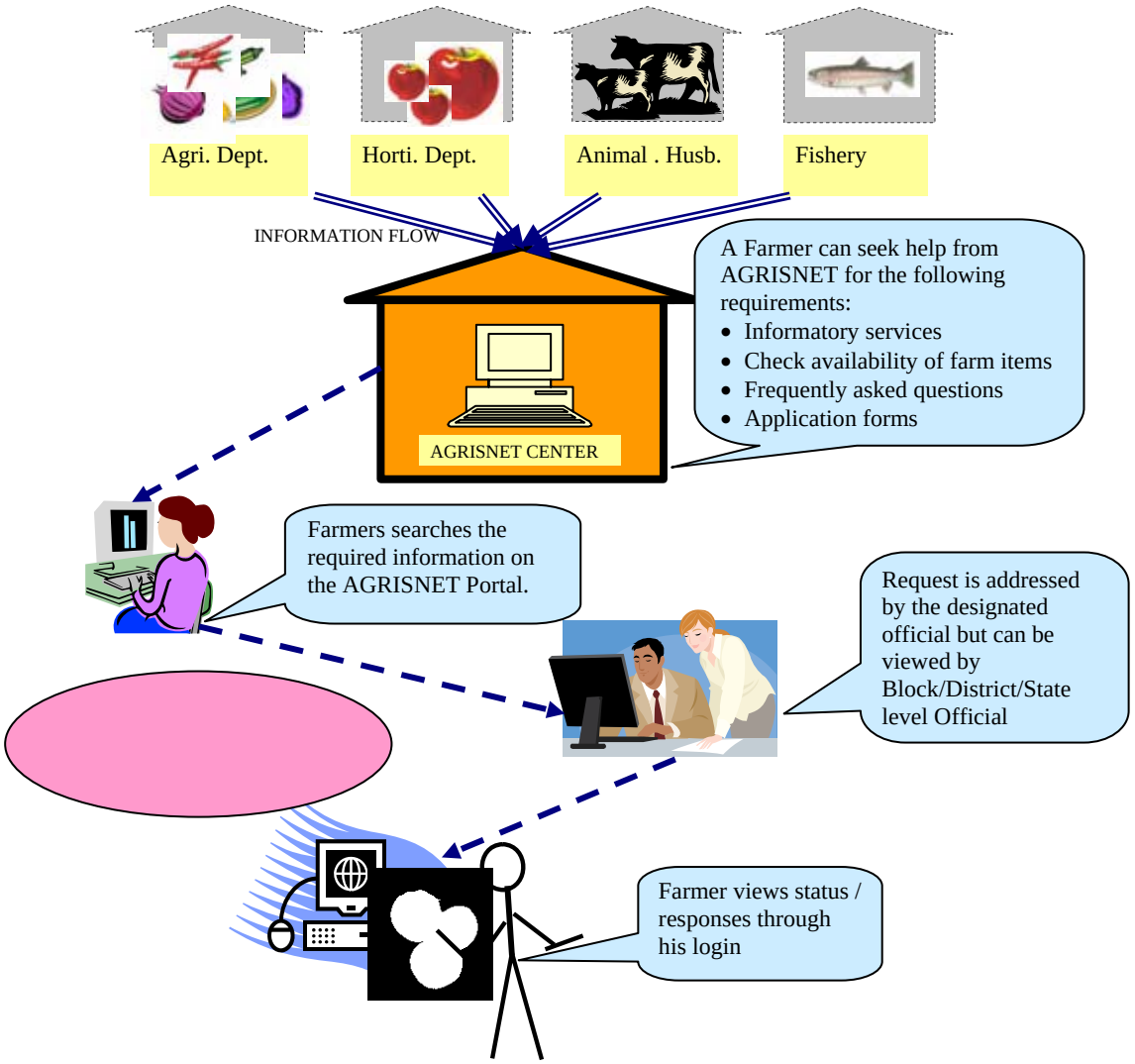


Fig. E-2.4 Concept of AGRISNET

4) Progress of HP AGRISNET

- The stakeholders of HP AGRISNET include Department of Agriculture, Department of Horticulture, Department of Animal Husbandry and Department of Fisheries.
- Software Requirement Specifications proposal of HP AGRISNET has been prepared by the Society for IT and e-governance keeping in view the guidelines of the project.
- Total funds required for the project is Rs. 8.12 crores.

E.2.2 Agricultural Technology Management Agency (ATMA)

(1) General

The Ministry of Agriculture of Government of India has developed a broad policy framework for Agriculture Extension (PFAE) on the basis of reforms in agricultural extension raised in the National Agricultural Policy. In line with the PFAE, the following key reforms are being promoted.

- New Institutional Arrangements: Providing innovative restructured autonomous bodies at the district/ block level, which are flexible, promote bottom up and participatory approaches, are farmer driven and facilitate public- private partnership.
- Convergence of line departments' programmes and operating on gap filling mode by formulating Strategic Research and Extension Plan (SREP) and Annual Work Plans.
- Encouraging Multi Agency Extension Strategies involving inter-alia public/ private extension service providers.
- Moving towards integrated, broad-based extension delivery in line with farming systems approach.
- Adopting Group Approach to Extension (Operating through Farmer Interest Groups (FIGs) & Self Help Groups (SHGs).
- Addressing gender concerns (mobilizing farm women into groups, capacity building etc.).
- Moving towards sustainability of extension services (e.g. through beneficiary contribution).

The reforms have been pilot tested under Innovations in Technology Dissemination (ITD) component of World Bank funded National Agricultural Technology Project (NATP). Under NATP, Agricultural Technology Management Agency（ATMA）has been piloted an extension reform model on district basis since 1998/99. Following this pilot model, the State Government has been promoting this extension reform arrangement to cover the all the Districts by 2007/08. ATMA is an autonomous institution with participation of all the key stakeholders involved in agricultural activities for sustainable agricultural development in the district. It has the flexibility to receive funds directly (Government of India / States, membership fees, beneficiaries' contribution etc).

ATMA has the main responsibility of all the technology dissemination activities at the district level. It has linkages with all the line departments, research organizations, non-governmental organizations and agencies associated with agricultural development in the district with a substantial representation of farmer organizations. Research and extension units within the district, Department of Agriculture, Horticulture, Animal Husbandry, Fisheries, Marketing etc. are constituent members.

(2) Organizational Structure of ATMA

The organizational structure of ATMA is shown below in Fig. E-2.5.

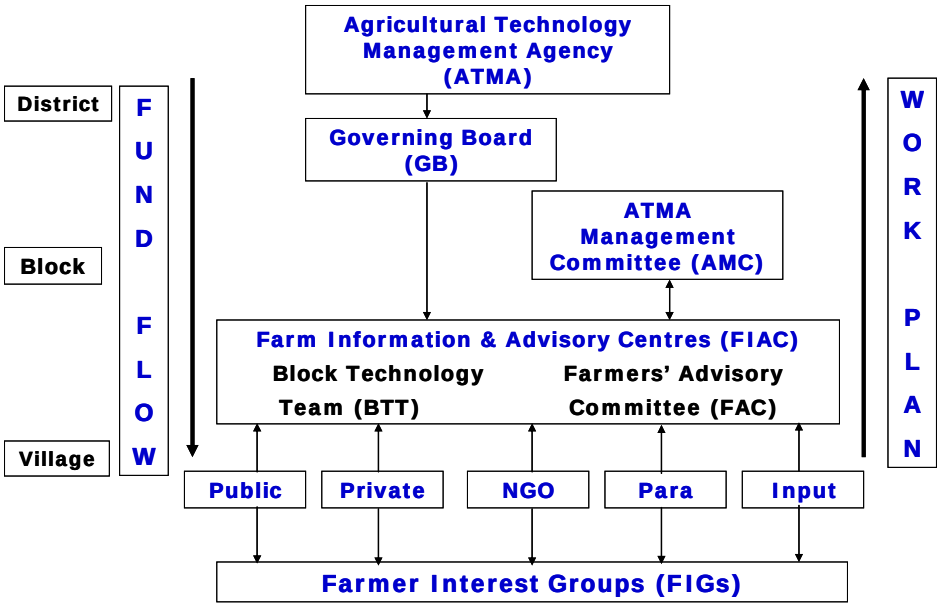


Fig. E-2.5 Organizational Structure of ATMA

Each district ATMA is under jurisdiction of Governing Board chaired by District Magistrate and having 9 officers and 7 other members, ATMA Management Committee (AMC) consisting of 7 official members, and Farmers Advisory Committee (FAC) with 12 members. The programmes and procedures concerning district-wise activities are determined by ATMA, Governing Board and implemented by its Management Committee. In order to manage programme implementation at block level and below, ATMA has established a Farm Information and Advisory Center (FIAC) at each block in the district. In effect the FIACs act as extension planning and operational arm of ATMA. These are supported by two groups; one, a group of technical officers at block derived from different functional areas termed as Block Technology Team (BTT) whereas, the others is a Farmers Advisory Committee (FAC) which is a body exclusively of farmers. While BTT develops the Block Action Plans (BAPs) in light of the SREP and is responsible for its implementation, the FAC plays a more proactive role by scrutinizing, improving and approving BAPs, before these are referred to the ATMA GB for its final approval.

Commodity oriented Farmer Interest Groups (FIGs) are promoted at block/ village level to make the technology generation / dissemination farmer driven and farmer accountable. These Village level FIGs are ultimately federated at block / district level and represented in FACs and GB. In order to address the extension needs of these groups, ATMA has established close linkages with various players operating at cutting edge level viz., public, private, NGOs, Para extension workers and input dealers etc. SAMETI is providing the needed human resource development support in innovative areas of extension delivery.

The project activities, at state level are closely monitored by an Inter Departmental Working Group (IDWG) functioning under Chairmanship of APC or Secretary (Agriculture) of the state. A project Implementation Cell (PIC) at the State Headquarter level provides support to the IDWG.

Organizational set up of ATMA at each level are summarized below.

1) National Level
   - Technology Dissemination Management Committee (T.D.M.C) under Ministry of Agriculture, Govt. of India, New Delhi.
   - Technology Dissemination Unit (TDU) under D.O.E Govt.of India, New Delhi.

- National Institute of Agricultural Extension Management (MANAGE), Hyderabad.

2) State Level
   - Inter Departmental working Group (IDWG) headed by Secretary of Agriculture.
   - Nodal Department -Dept. of Agriculture (DOA).
3) District Level
   - Agricultural Technology Management Agency (ATMA).
   - Governing Board (GB).
   - ATMA Management Committee (AMC).
4) Block Level
   - Block Technology Team (BTT).
   - Farmer Advisory Committee (FAC).
5) Village Level
   - Village level extension officers of line department.
   - Farmers Organizations (FOs, SHGs, FIGs etc).

(3) Key Functions at Each Level

State Level

A) Key functions of Inter Departmental Working Group (IDWG):

a) To provide a mechanism for interactions with the Technology Dissemination Management Committee (TDMC) of the DAC, GOI, guide the human resource development activity and to monitor the district level technology dissemination programme.
b) To oversee and support Agriculture Extension Research activities being undertaken by ATMA and to make policy interventions on inter departmental matters including issues related to Women in Agriculture and co-ordination thereof.
c) To promote and establish integrated approach in transfer of technology at state, division and district level by agriculture and line departments.
d) To establish effective linkages with different line departments, marketing, input and credit institutions, NGOs, Private / Corporate sector to promote large scale extension reforms.
e) To internalize new concepts and institutional arrangement successfully demonstrated by the ATMAs: and
f) To deal with any other policy issue related to implementation of the project, which emerges from time to time.

B) Key functions of the SAMETI:

a) To provide capacity building support in Extension Management related areas to the extension functionaries both from public and private sector.
b) To provide consultancy in the areas like project planning, appraisal and implementation etc.
c) To develop and promote the application of management tools for improving the effectiveness of Agricultural Extension Services through better management of human and material resources.
d) To organize need based training programmes for middle level and grass-root level agriculture extension functionaries; and
e) To develop modules on Management, Communication, Participatory Methodologies etc, as a sequel to the feedback from training programmes.

District level

A) Key functions of the ATMA Governing Board:

1) To review and approve strategic and annual work plan that are prepared and submitted to the Governing Board by the participating unit.
2) To receive and review annual progress reports submitted by the participating units, provide feed back and direction of these participating units as need about the various research and extension activities being carried out within the district.
3) To receive and allocate Project Funds to carryout priority, Research, Extension and related activity within the district.
4) To foster the organization and development of Farmers Interest Groups (FIGs) and Farmer Organizations FOC within the district.
5) To facilitate greater involvement of Private Sector firms and organization and providing inputs, technical support Agro-processing and Marketing services to Farmers.

6) To encourage agriculture lending institution to increase the availability of capital to resource poor and marginal farmers, especially Schedule Caste, Schedule Tribe and Women Farmers.
7) To encourage each line department, Krishi Vigyan Kendra and Zonal Research Station to establish Farmers Advisory Committee to provide feed back and input into their respective research and extension programmes.
8) To enter into contracts and agreements as appropriate to promote and support agriculture development activities within the district.
9) To identify other sources of financial support that would help ensure the financial sustainability of ATMA and its participating units.
10) To establish revolving funds / accounts for each participating unit and encourage each unit to make available technical services, such as artificial insemination, soil testing etc. on a cost recovery basis moving towards full cost recovery in a phased manner.
11) To arrange for the periodic audit of ATMA is financial account; and
12) To adopt and amend the rules and by - laws of the ATMA.

B) Key functions of ATMA Management Committee:

1) To carryout periodic Participatory Rural Appraisal (PRA) to identify the problem and constraints faced by farmers or different Socio-Economic Groups within the districts.
2) To prepare an integrated, Strategic and Extension Plan (SREP) for the district that would specify short and medium-term adaptive research as well technology validation and refinement and extension priorities for the district; these priorities should reflect the important constraints identified during the PRA.
3) To prepare annual action plans that would be submitted to the ATMA Governing Board for review, possible modification and approval.
4) To coordinate the execution of these annual work plans through participating line departments, ZRS, KVKs, NGOs,FIGs / FOs and allied institutions, including private sector firms.
5) To maintain appropriate project accounts for submission to Technology Dissemination unit (TDU) for audit purposes.
6) To establish coordinating mechanisms at the Block level, such as Farmer Information & Advisory Centers (FIAC), that would integrate extension and technology transfer activities at block and village levels.
7) To provide annual performance reports to the Governing Board outlining the various research, extension, and related activities that were actually carried out including targets achieved.
8) To provide secretariat assistance to the Governing Board and initiate action and policy direction, investment decisions and another guidance received from the Governing Board.

Block level

A) Key functions of Block Technology Team (B.T.T.):

i) To operationalize the SREP in each block and move towards single window extension system.
ii) To help district core team in up gradation of SREP.
iii) To prepare Block Action Plan detailing extension activities to be undertaken.
iv) To Coordinate the implementation of extension programmes detailed in the Block Action Plan.
v) To Facilitate formation of FIGs / FOs at the block level and below.

B) Key functions of Farmer Advisory Committee (FAC):

vi) To act as an agency for providing farmer feedback mechanism.
vii) To help setting block extension priorities and recommend resource allocation across programme areas.
viii) To recommend Block Action Plan for approval of ATMA GB.
ix) To review and provide advice to each implementation unit at block level.
x) FAC shall meet once in a month during the season and quarterly in lean season.
xi) To help in formation of Farmer Interest Groups at block level and below.

Village level

Key functions of village level officers

a) To identify documenting and incorporating indigenous knowledge through Rapid Rural Appraisal.
b) To identify innovative systems for soil, water conservation and management, soil fertility management, diversification or intensification etc.
c) To identify agricultural and related sectors graduate and encourage for establishment of input Agro-services Centre.
d) To promote formulation of farmers' organization/group to meet out demand of specialized area such as marketing, agro-processing, input supply etc., especially for resource poor & other disadvantaged groups of farmers.

e) To encourage the farmers for diversification / intensification to increase farm income.
f) To involve private sector dealer, volunteers in dissemination of technology.
g) To identify, document and incorporate success stories.
h) To create the awareness among the farmer community about NATP.
i) To act as catalyst for the farming community for successful implementation of programme.
j) To assist the BTT/FACs in assessing the gaps in adoption of technology and working out the required extension strategies to overcome the existing gaps.
k) To assist the BTT/FAC in identifying the local problem and felt needs of farming community.

In H.P. State, this ATMA model has just covered all the districts and its implementation system has not yet been matured in some districts. Accordingly, it is essential to popularize this model into the entire state through enhancement of structural strengthening and extension programs. Accordingly, various activities are included in the Master Plan to strengthen the extension service functions using the ATMA Model.

(4) Plans Prepared Under ATMA

1) Strategic Research and Extension Plan (SREP)

One of the first tasks of ATMA is to facilitate the preparation of SREP of the district, which is prepared through participatory methodologies such as Participatory Rural Appraisal (PRA) involving all the stakeholders and farmers. SREP contains detailed analysis of all the information on existing farming systems in the district and research-extension gap to be filled up. SREP prioritizes the research-extension strategies within the district and becomes the basis for development work at block/district level.

2) State Extension Work Plan (SEWP): Based on the research-extension strategies given in the SREPs, block/district level plans shall be developed by each ATMA institution. The SEWP developed at the state level shall contain a consolidated activity-wise plan incorporating all the District Agriculture Action Plans (DAAPs) in the state and state level activities to be carried out with activity-wise budgetary requirement as per the norms prescribed in the cafeteria of activities. It will also indicate all the other extension activities that may be undertaken from the resources provided under any other scheme of the Centre/State governments.

(5) Cafeteria of Activities

The cafeteria of activities includes cost norms and ceilings applicable for each activity. Under the cafeteria, activities to be undertaken at State and District level are categorized separately. The district level activities are further categorized in four groups namely, farmer oriented activities, farm information dissemination, research-extension-farmer (R-E-F) linkages and administrative expenses.

Under the scheme, funding shall be released to the States based on their Extension Work plans developed within the broad framework of the PFAE and areas indicated under the cafeteria of reform oriented activities. The resources required for the scheme shall be shared between centre and the state in the ratio of 90:10.

The activities carried out under ATMA are mentioned below.

1) Farmer Oriented Activities:

- Training of Farmers:
- Demonstration
- Exposure Visit:
- Mobilization of Farmer Groups:
- Reward & Incentive for Best Group
- Best Farmer Awards

2) Farm Information & Dissemination:

- District Level Kisan Mela/ Exhibitions
- Information dissemination through Printed Leaflets/ Local Advertisement
- Development of Technology Packages in C.D. form

3) Agriculture Technology Refinement, Validation & Adoption:

- Farmers-Scientist Interactions
- Field Days & Kisan Gosthis to Strengthen R-E-F- linkages
- Assessment, Refinement & Validation of technologies

E-2.3 State Agricultural Management and Extension Training Institute (SAMETI)

State Agricultural Management and Extension Training Institute (SAMETI) is registered as an autonomous institute with the mandate of capacity building of extension functionaries for promoting agricultural development. It conducts courses on participatory extension management, project management, watershed management, human resources management and information technology. It also provides consultancy in agricultural extension management. It provides facilities for conducting training, having well-equipped training halls with conference system and multimedia projection facility.

(1) Aims and Objectives of SAMETI

The main aims and objectives of SAMETI are as follows:

- To function as a State Agricultural Management and Extension Training Institute at state level and to provide extension management input for extension functionaries of agriculture and line departments.
- To develop systematic linkages between line departments, state universities and regional and national institutions of outstanding accomplishment in the field of agriculture.
- To study agricultural extension management systems and policies together with operational problems and constraints at all levels.
- To promote and develop the management tools for improving the effectives of agricultural extension services through the mechanism of personnel management, resource management and input management.
- To organize need based training for senior, middle and grass root level functionaries for developing skills in executing extension.

(2) Governing Council of SAMETI

Himachal Pradesh Government constituted the Governing Council of SAMETI. The Governing Council takes all major policy decisions, reviews and monitors the performance and progress. The directions of the Council are implemented by the institute authorities.

Table E-2.4 Governing Council of SAMETI

1	Financial Commissioner cum Secretary Agriculture to the Govt. of HP	Chairman
2	Director of Agriculture HP	Vice Chairman
3	Director of Horticulture HP	Member
4	Director of Animal Husbandry HP	Member
5	Director of Fisheries HP	Member
6	Director of Extension Edu. CSKKW Palampur.	Member
7	Director of Extension Edu. UHF Nauni Solan.	Member
8	Rep. of Directorate of Extension, GOI, MOA Krishi Bhawan NewDelhi.	Member
9	Rep. of National Institute of Agr. Ext. & Management (MANAGE) Hyderabad.	Member
10	Jt. Director of Agri. (Ext. & Trg) Department of Agriculture HP	Member
11	Director SAMETI Mashobra HP	Member Secretary

(3) Executive Council of SAMETI

The Executive Council takes decision with respect to routine matters and also scrutinizes the major policy proposals before the same are sent to Governing Council. The EC also reviews all financial and physical progress reports of SAMETI. Following are the members of Executive Council.

Table E-2.5 Executive Council of SAMETI

1	Director of Agriculture HP	Chairman
2	Director of Horticulture HP	Member
3	Director of Animal Husbandry HP	Member
4	Jt. Director of Agri. (Ext. & Trg) Department of Agriculture HP	Member
5	Director SAMETI Mashobra HP	Member Secretary

(4) Academic Committee

Academic Committee has been constituted by GC SAMETI to identify the training needs, finalize and evaluate the training programmes, to cater to the desired needs of sponsoring organizations / Agencies. All Line Departments. SAU and one representative from stakeholder are its formal members.

Table E-2.6 Academic Committee of SAMETI

1	Director of Extension Edu. UHF Nauni Solan.	Chairman
2	Director of Extension Edu. CSKKW Palampur.	Member
3	Director of Horticulture HP	Member
4	Director of Animal Husbandry HP	Member
5	Jt. Director of Agri. (Ext. & Trg) Department of Agriculture HP	Member
6	Principal EEI Nilokheri	Member
7	One project Director ATMA on rotation basis	Member

(5) Resource Bank Institutes:

Minutes of Understanding (MOU) has been signed with State Agriculture Horticulture Universities and developed linkages with state and National Institutes Collaborative workshops / trainings are also being organized by SAMETI with State Agricultural Universities, MANAGE Hyderabad and NIAM Jaipur, EEI Nilokheri. Computer applications Programmes are organized in collaboration with DOEACC Shimla.

Table E-2.7 Resource Bank Institutes of SAMETI

Area	Institute
H RD & Ext. Mangt.	MANAGE Hyderabad, EEI Nilokheri, UHF Nauni Solan, CSKKVV Palampur, RC Entrepreneurship Development Chandigarh.
Marketing Management	MANAGE, NIAM Jaipur, Agro Economic Research Centre Shimla, CITA (centre for international trade in Agriculture and Agro. Based industry)
Technical / Post Harvest Management	State Agricultural Universities, CPRI Shimla, Agr and Line Departments, Dir of Seed Cert Tamilnadu.
Information Technology	MANAGE Hyderabad, DOEACC Shimla.
Organic Farming Management	Uttaranchal Organic Commodity Board Dehradun, Morarka Foundation Jaipur, State Agricultural Universities

(6) Areas of Training

Mandate of SAMETI is to promote the extension and management tools for improving efficiency in extension services.

The training emphasis is laid on the following aspects:

- Extension Management Skills
- Participatory Approaches & PRA Tools
- Group Mobilization & team Building
- Human Resource management
- Farming System Approach
- Public Private partnership & Farmer led Ext
- Market led extension & Marketing Management
- It & Cyber Extension
- Gender Issues & Women Empowerment
- Project formulation and Management
- Quality control input Management programmes (seed Control order, fertilizer quality control, pesticide act etc.)

(7) Infrastructure Facilities of SAMETI

- **Administrative block is housed in** the old heritage building having beautiful lawns and surrounded by natural scenic beauty of snow peaks.
- **2-Seminar Halls are** fully equipped with conference system and teaching aids including multi media projection with seating capacity of 50 participants each.
- **One IT lab has** been established with 16 No's computers with internet and LAN Set up.
- **Library** is equipped with fascinating books on Indian history tradition culture as well as latest books on Extension, HRD, Marketing & other related areas.
- **Hostel:** All SAMETI 2 bedded rooms are provided with facilities like TV facilities etc. Capacity of SAMETI hostel is 38 participants and two sets for resource persons in addition to this, four spacious dormitories exist with the capacity of 8 persons each.
- **Hostel mess** is running on contract basis providing good nutritious food.
- SAMETI has latest **teaching IT Non IT equipments** including computers, Multi media projector, Lap top Printers, OHP, Direct projector, Slide projector, Photocopier, Scanner, Conference system etc. providing excellent training atmosphere.

(8) Proposal for the Involvement of SAMETI in the Action Plan

Since SAMETI has the excellent facilities to arrange trainings and workshops, along with the resource persons in various disciplines it is proposed that the following activities of the action plan shall be carried out in cooperation with SAMETI.

a) Arrangement of capacity building trainings on technical and management aspects of crop diversification for the extension trainers
   - Trainers for Capacity building
   - Arrangement of Hall
   - Training Materials

b) Periodical meetings and workshops among the researchers, extension officers and farmers at the state and district level
   - Arrangement of Hall
   - Training Materials

E-2.4 Constraints and their Countermeasures in Agricultural Extension System

Constraints and their Countermeasures in agricultural extension system are summarized below.

Table E-2.8 Constraints and their Countermeasures in Agricultural Extension

Present Conditions / Constraints	Potential / Opportunity	Future Strategy & Measures
1. Insufficient number of staff compared with sanctioned posts 2. Inefficient information system and untrained staff for state-wide project implementation and quick decision making 3. Not high & timely mobility of staff because of insufficient transportation means 4. Insufficient survey and measurement tools and instruments for planning & design 5. The present extension activities are more focused towards distribution of inputs and therefore, less attention is paid on extension. 6. The linkage between the extension-research-farmers are still lacking. 7. Lack of monitoring and evaluation system	i. Possibility of recruitment of post-graduates or university graduates seeking for job opportunities in the State ii. Availability of IT experts iii. The field extension officers will be more involved in the planning through suitable capacity building trainings. iv. The Himachal farmers are receptive & highly interested towards crop diversification and adaptation of new technologies. v. There are sufficient State and Central Research stations to carry out area oriented research. vi. The agricultural universities also shares the responsibility for planning, implementation and coordination of various extension education programmes in close collaboration with the State Departments of Agriculture, Animal Husbandry, Fisheries and other concerned departments.	1) Recruitment of qualified persons and posting them in vacant posts. 2) Capacity building of staffs shall be carried out on planning, implementation, monitoring and evaluation of crop diversification. 3) Necessary equipment and tools should be provided to department, district and block offices, and soil conservation offices for implementation of crop diversification 4) Organizing or strengthening of farmers' groups (marketing group) aiming at crop diversification is needed. 5) Periodical meetings and workshops should be conducted among the research institutes, extension departments and farmers' representatives at the state and district level. 6) Research & extension linkage shall be strengthened through field visits of researchers together with extension officers in order to cope up with on-going constraints in the field, and linking of research activities matching demands of the farmers. 7) Linkages with the State/ Central/International Institutions, NGOs, Farmers and Industrialists should be developed. 8) Proper monitoring and evaluation of extension activities should be carried out.

E.3 Agricultural Distribution, Subsidy and Farm Credit Services

E.3.1 Distribution of Agricultural Inputs

(1) Seeds

The distribution of seeds in H.P. State is shown below.

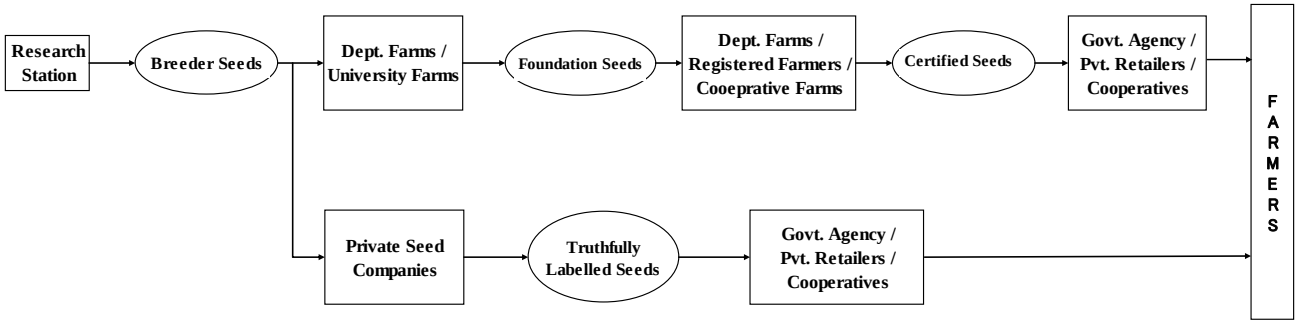


Fig. E-3.1 Distribution Flow of Seeds

The department of Agriculture procures about 6,000 M.T of wheat seeds every year from registered growers in the state. The seeds are procured immediately after the harvest in May and are properly stored. Similarly, the seeds of other crops are produced by designated farmers and procured. Certified seeds of high-yielding varieties procured for different crops, including vegetables, are distributed among the farmers. There are a lot of opportunities to develop sound technologies for production of quality seeds of vegetables, potato, ginger and food crops. For this purpose, linkage and cooperation have to be developed between the two state universities, department of agriculture and the farmers.

Table E-3.1 Consumption of Fertilizers, Certified Seeds and Pesticides (M.T)

Year	Fertilizers	Certified Seeds	Pesticides
1998-1999	38,557	378	150
1999-2000	37,343	367	196
2000-2001	35,552	353	232
2001-2002	40,165	367	222
2002-2003	42,500	366	210

(2) Fertilizers

Traditionally, the small farmers of H.P. have been using farmyard manure (FYM) as the main fertilizer, and for this purpose, cattle, sheep, goats and other farm animals are reared in their farmhouses. The State government while trying to popularize the use of chemical fertilizers in crop production, has introduced subsidy on the use of fertilizers by the farmers. The consumption of fertilizers was estimated as 42,500 M.T during the year 2002-2003 as shown above. The distribution flow of fertilizers is shown below.

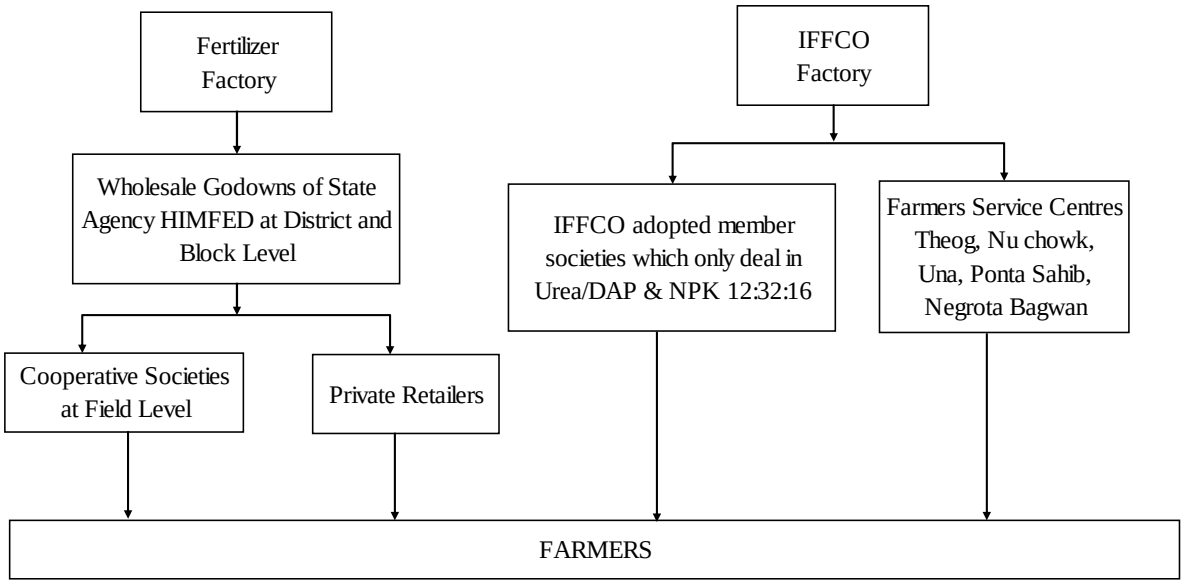


Fig. E-3.2 Distribution Flow of Fertilizers

(3) Pesticides

In H.P., the consumption of pesticides has been rather low, and mostly fruits and vegetable growers use the pesticides. The distribution flow of pesticides in the state is shown below.

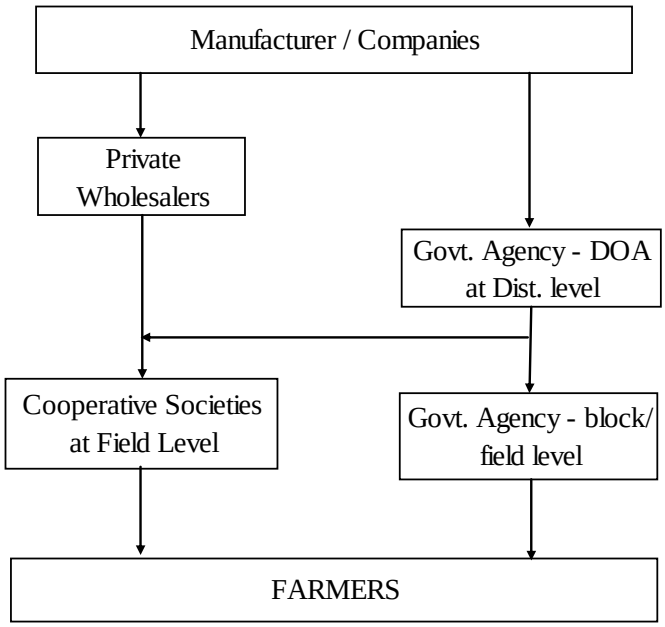


Fig. E-3.2 Distribution Flow of Pesticides

Integrated Pest Management (IPM) has also been adapted in the state with the help from the universities. The crops covered under IPM activities are paddy, tomato, cabbage, peas, cauliflower, beans, apple, plum, bear etc. Efforts are made through various extension agencies to make the farmers aware of the benefits of IPM and bio-control fertilizers. Presently, there are a limited number of quality control testing laboratories for checking fertilizers and pesticides.

(4) Farm Implements

Farm mechanization is limited to southwestern region where the land is mostly flat and less undulated.

In the hilly terrain, small tractors, power tillers and power sprayers are made available to the farmers on subsidy but mechanization is rather marginal and only some big orchard farmers use these implements. There is a high potential for giving farm equipment on hire. Special small farm equipment and implements which meets the needs of hill farming needs to be developed and popularized.

E-3.2 Agricultural Subsidy

The government is providing various types of subsidy/assistance to the welfare of small-scale and marginal-scale farmers as mentioned below.

a) The Government is providing 50% subsidy on cost of seeds, plant protection material and agricultural implements/machinery to S.C, S.T, backward areas, and I.R.D.P farmers. In case of plant protection material, 30% subsidy is provided to other small/marginal farmers.
b) On Nitrogenous Fertilizers, cost subsidy of @Rs 200/M.T., on 12:32:16 complex and on 15:15:15 @Rs. 500/M.T. is being given. In case of tea planters, subsidy is given on Ammonium Sulphate @ Rs.200 per M.T.
c) Biogas Models viz. Deenbandhu and Janta are being popularized on which subsidy @Rs 3,500 per plant upto 1 cu.m, and Rs.4,500 more than 1 cu.m is being given. Community biogas plants in Schools Hostels are also installed with a subsidy of @Rs 10,000 per plant.
d) Subsidy of @50% on the cost of Micro-Nutrients is being given to S.C. and S.T. Farmers.
e) Under Tank Irrigation Scheme, assistance provided to individual farmers for the construction of minimum 9 cubic meter capacity @ 25% subject to a maximum of Rs.8,000.
f) Community Irrigation Schemes for a group of 5 or more small and marginal farmers are also undertaken with 100% assistance by the Government.
g) Subsidy on Tractors upto 35 HP @ 25% limited upto Rs.30,000 only is provided. Beside, for Power Tillers of approved model subsidy of 25% limited to Rs.20,000 upto 8 H.P. and Rs.30,000 above 8 H.P. is being provided.
h) Sprinkler Irrigation subsidy of @50% to S.C./S.T./S.F./M.F./Women farmers subject to a maximum of Rs. 15, 000 per set and @30% to all other category farmers subject to a maximum of 10,000 per set.

The annual expenditure on various incentives to farmers is about Rs. 20 Crores.

E-3.3 Farm Credit Services

(1) Farm Credit Menus

Access to farm credit for farmers, mostly marginal and small farmers, is private banks for purchase of farm inputs. The Central Government instructed private banks to allocate 18% of the total finance to the agricultural sector and to apply advantageous interest rates which are lower than bank's prime lending rate with condition of the Government's subsidy to the banks. The advantageous rate is about 4.5 % lower the prime rate for short term loans and about 2% lower for term loans in India. However, the farmers in Himachal Pradesh are in a disadvantage position as compared to those of other States, since they have to pay a stamp duty of 3.5% of loan amount for working capital of more than Rs. 60,000 or a new investment of Rs. 100,000. In spite of the disadvantage, there is significant agricultural credit growth in the State. Institutional credit is being extensively distributed, however, insurance is requested for the farmer to pay.

Short term loans need to be repaid within one crop season covering the period from the time to buy seeds or other inputs to the time for selling the harvests to markets. The loan interest rate is 7% per annum only when a 2% subsidy is granted by the Government. The maximum limit of short term loan is Rs. 300,000. Loan can be sought on all the agricultural crops. The amount disbursed in 2005/06 was Rs. 868 million.

Term loans for a period of more than a year cover new investments such as construction of cold stores, marketing, land development, farm mechanization, diary, other animal husbandry activities like

poultry and piggery, raising plantations (orchards), buying vehicles for transporting agricultural goods and tractors, and purchasing land.

(2) Loan Processing

For getting loans timely and conveniently, the Government of India has instructed the banks to issue Kisan (Farmer) Credit Cards to the both owner and tenant farmers. In order to receive a loan from the bank, the following conditions need to be satisfied:

a. A guarantor who guarantees for the borrower;
b. Certificate of charge on land of the borrower by lending bank to the Revenue Department; and
c. Scale of finance in case of short term loans so as to calculate the cost of input on the activity to be financed.

(3) Lending Performance

According to the public announcement by the State Level Bankers' Committee of Himachal Pradesh on May 4, 2007, the total disbursement to the agricultural sector was Rs. 6.14 billion for the 9-month period in 2006/07 against the annual target of Rs. 9.10 billion. As the disbursement for the same period in 2005/06 was Rs. 5.59 billion, the Committee member banks recorded an increase by 9.7 %.

Table E-3.2 Loan Menu-wise Lending Targets and Achievements during April-December 2006/07

Unit: Million Rs

Loan Menu	Annual Lending	Disbursement	Achievement
Crop	4,255.1	3,128.4	73.5
Minor Irrigation	256.9	101.8	39.6
Land Development	380.5	168.8	44.4
Farm Mechanisation	640.5	407.0	63.5
Fruit Plantations	715.1	112.2	15.7
Floriculture	26.0	3.0	11.5
Animal Husbandry (Dairy)	744.5	435.6	58.5
Animal Husbandry (Others)	377.3	118.2	31.3
Fisheries	72.2	43.3	60.0
Forestry	25.8	5.3	20.6
Other Agriculture	823.3	809.5	98.3
Other Allied to Agriculture	773.4	802.1	103.7
Total	9,090.6	6,135.2	67.5

Source: State Level Bankers' Committee of Himachal Pradesh

E-3.4 Crop Insurance

Agriculture or crop insurance is important for the farmers especially when there is a large scale damage caused due to pests and diseases and vagaries of weather. Agriculture Insurance Company of India (AIC) was formed by the Central Government as an exclusive organization to implement National Agricultural Insurance Scheme (NAIS) – *Rashtriya Krishi Bima Yojana (RKBY)*. In Himachal Pradesh, NAIS was launched in 1999/00, and since then the company has devised and implemented insurance schemes relating to agriculture and allied subjects through commercial banks, cooperative banks and regional rural banks. Under the current guidelines of NAIS, it is not possible to cover vegetables and fruits, because the premium rates become very high for these crops, and it will put unnecessary extra burden on loan taking farmers whose crops are to be compulsorily insured. It is required for NAIS to make suitable modifications so as to cover a large number of crops including fruits and vegetables. In Himachal Pradesh, the crop insurance covering fruits and vegetables is under discussion.

Some farmers, however, know risks of the crop damages through their experiences and try to minimize the risks in such way as multi/mix cropping, rotational cropping patterns, etc. In Himachal Pradesh, Rs. 4.3 million was paid to 864 farmers in 2000/01, no claims in 2001/02, Rs. 44.6 million to 55,569 farmers in drought 2002/03, Rs. 15,000 to 370 farmers in 2003/04 and Rs. 255,000 to 897 farmers in 2004/05.

E-4 Proposed Institutional Development Plan

E-4.1 Strengthening of Department of Agriculture

(1) Description of the Component

The Department of Agriculture (DOA) has limited staff in number and equipment/tools for the implementation of crop diversification policy. In line with the national policy of decentralization, the department has already transferred the administrative responsibilities for planning, implementation and monitoring to the district and block level offices. There is a need to provide these offices with a package program consisting of capacity development and enhancement of planning and monitoring tools.

A Management Information System (MIS) to link the department-district-block offices by a computer network is proposed as a tool for planning and monitoring of agriculture diversification program. The information to be managed by the MIS, among others, are crop area, crop yield and production, irrigated and non-irrigated areas, and progress monitoring of each relevant project and program.

In this context, the program component has been worked out with its target, outputs, executing organization and proposed activities of this component as listed below:

Table E-4.1 Outline of Strengthening of Department of Agriculture

Item	Outline of Component
Target	Department, district and block agricultural officers will be able to implement crop diversification policy in an efficient and effective manner.
Outputs	1. Agricultural officers in department, districts and blocks will be able to work out a need-based crop diversification plan in prompt and realistic manner. 2. The agricultural officers will be able to renew, retrieve and examine data regularly on cropped area and production by using MIS. 3. The agricultural officers will be able to monitor the diversification progress, and to report it at any time.
Activities	Major activities 1. Capacity development of staffs on PCDA (Plan-Check-Do-Action) cycle in planning, implementation, monitoring and evaluation of crop diversification 2. Establishment of the MIS with staff training for implementation of crop diversification 3. Capacity development on the effective use and maintenance of the MIS system 4. Provision of equipment and tools to department, district and block offices, and soil conservation offices for implementation of crop diversification 5. Increasing the number of extension, and soil conservation staff in the department of agriculture, and filling up the vacancies.
Related Components	Strengthening of extension service functions
Executing Organization	Execution : Department of Agriculture / District and Block Agriculture Offices / Soil Conservation Divisional and Sub-divisional Offices

(2) Proposed Master Plan

The current situation, proposed plan, subjects to be executed, and the target persons are summarized in Table E-4.2.

Table E-4.2 Proposed Master Plan of Strengthening of Department of Agriculture

Activity	Current Situation	Proposed Plan	Subjects to be Executed	Schedule	Target Persons	Executing Institute
Capacity development of staffs on planning, implementation, monitoring and evaluation of crop diversification	• Insufficient capability & inadequate trainings on planning, implementation, monitoring & evaluation	• Capacity development trainings shall be carried out at regular interval on planning, implementation, monitoring and evaluation of crop diversification for extension staff.	• Formulation of programs/projects related to crop diversification • Formulation of monitoring and evaluation system	• Within first 2 years	• Staff of DOA for planning / Monitoring	• DOA
	• Insufficient capability & inadequate trainings on planning, implementation, monitoring & evaluation	• Capacity development trainings shall be carried out at regular interval on planning, implementation, monitoring and evaluation of infrastructure facilities for crop diversification for soil conservation staff.	• Formulation of infrastructure programs/ projects related to crop diversification • Formulation of monitoring and evaluation system	• Within first 2 years	• Staff of Soil conservation offices of DOA	• DOA
Establishment of Management Information System (MIS) for implementation of crop diversification	• No agriculture information database (Management Information System (MIS) in DOA	• Establishment of MIS system on cropping information with computer facilities at the state, district and block levels, and soil conservation offices.	• Preparation of MIS data base on agriculture information	• MIS System – First year	• Staff of DOA at State, District and Blocks for planning / Monitoring	• DOA
	• No MIS system & no updating in DOA	• Updating of information on yearly basis	• Operation and Management (O&M) of MIS data base	• Yearly data updating	• Staff of DOA at State, District and Blocks for planning / Monitoring	• DOA

Activity	Current Situation	Proposed Plan	Subjects to be Executed	Schedule	Target Persons	Executing Institute
Training of staffs for the effective use and maintenance of MIS system	• No such trainings since there is no MIS	• Capacity building trainings shall be carried out at regular interval on the effective use and maintenance of MIS system for both extension and soil conservation staffs.	• O&M of MIS data base	• Within first 2 years	• Staff of DOA at State, District and Blocks for planning / Monitoring	• DOA
Provision of necessary equipment and tools to department, district and block offices, and soil conservation offices for implementation of crop diversification	• Shortage of transportation facilities	• Transport vehicles such as pick-up van and motor cycles shall be provided for the 75 blocks.	• Provision of vehicles and motor cycles	• Within first 2 years	• Agricultural Extension Officers • Staff of Block Office	• DOA
	• Shortage of computers	• Data storage and maintenance equipment such as computers shall be provided for the 75 blocks.	• Provision of computers	• Within first 2 years	• Agricultural Extension Officers • Staff of Block Office	• DOA
	• Shortage of extension equipment	• Visual aids extension equipment such as projectors shall be provided for the 75 blocks.	• Provision of visual aids extension equipment	• Within first 2 years	• Block Offices of DOA	• DOA
	• Shortage of field survey and drawing equipment	• Survey & drawing equipment for soil conservation offices shall be provided.	• Provision of survey and drawing equipment	• Within first 2 years	• Soil Conservation office of DOA	• DOA
	• Project rooms at an inadequate level	• Project rooms renovation at DOA, district and soil conservation Offices at the district level	• Renovation of project rooms	• Within first 2 years	• DOA, District and Soil Conservation Offices at the district level	• DOA
Increasing the number of extension, and soil conservation staff in DOA, and filling up the vacancies.	• Shortage of number of staff	• Increasing the number of extension and soil conservation staff in the department.	• Extension and soil conservation staffs to be appointed at district and block offices	• Within first 2 years	• Extension and soil conservation staff of DOA	• DOA

(4) Proposed Plan

The action plan related to each activity and its requirements, and schedule are mentioned below.

Table E-4.3 Proposed Action Plan of Strengthening of Department of Agriculture

Activity	Proposed Plan	Target	Executed by	Remarks
Capacity development of staffs on planning, implementation, monitoring and evaluation of crop diversification	• Capacity building on planning, implementation, monitoring and evaluation of crop diversification for extensions staff.	• Staff of DOA for planning / Monitoring • PMU staff	• DOA	(1) see Table E-4.12(1) regarding implementation cost.
	• Capacity building trainings shall be carried out at regular interval on planning, implementation, monitoring and evaluation of infrastructure facilities for crop diversification for soil conservation staff.	• Staff of Soil conservation offices of DOA	• DOA	(1) see Table E-4.12(2) regarding implementation cost.
Establishment of the MIS for implementation of crop diversification	• Establishment of the MIS system with computer facilities at the state, district and block levels, and soil conservation offices. • Updating of information on yearly basis.	• District, Zonal and Block offices for extension work • Divisions and sub-divisional offices for soil conservation work	• DOA	(1) see Table E-4.12(3) regarding implementation cost.
Training of staffs for the effective use and maintenance of the MIS system	• Capacity development trainings shall be carried out at regular interval on the effective use and maintenance of the MIS system for both extension and soil conservation staff.	• Staff of District and Blocks for planning / Monitoring	• DOA	(1) see Table E-4.12(4) and (5) regarding implementation cost.
Provision of necessary equipment and tools to department, district and block offices, and soil conservation offices for implementation of crop diversification	• Transport vehicles shall be provided for the 75 blocks. • Data storage and maintenance equipment such as computers shall be provided for the 75 blocks. • Visual aids extension equipment such as projectors shall be provided for the 75 blocks. • Survey & maintenance equipment for soil conservation offices shall be provided. • Project Room Renovation at DOA, District and Soil Conservation Offices at the district level	• District and Blocks for planning / Monitoring	• DOA	(1) see Table E-4.12(6) and (7) regarding implementation cost.
Increasing the number of extension, and soil conservation staff in the department of agriculture, and filling up the vacancies.	• Increasing the number of extension and soil conservation staff in the department within the first 3 years period. • Each block needs a minimum of 2 additional extension officers (AEO) solely for the proposed crop diversification activities during the action plan period. • Increasing the number of additional 30 Assistant Engineer (1 person x 30 offices) & 60 Jr. Engineer (2 person x 30 offices)	• Agricultural Extension Officers • Soil Conservation Officers	• DOA	

(3) Planning on the Staffing Strength of Department of Agriculture

The extension staffing strength of DOA is very critical in the implementation of Master Plan and Action Plan. Especially the Agricultural Extension Officers (AEO) who are at the root level should

visit each and every farm household so as to implement the project more effectively. As on July 1, 2008 the staffing strength of AEOs was 313, which is expected to be increased within this financial year. The following planning is made with the existing staff strength of 313 AEOs as mentioned below.

1) The proposed vegetable diversification area is 30,200 ha for A/P and 51,300 for M/P and the incremental area from A/P to M/P is 21,100 ha.
2) New vegetable households (HH) is estimated based on the conversion of vegetable area of 0.19 ha, which is the average vegetable area estimated based on the family labor.
3) The extension activities are expected to be carried for 3 years for 1 family.
4) Each AEO is expected to cover atleast 300 households.

The number of AEOs estimated are shown in the following table.

Table E-4.4 Planning of Field Extension Staff (AEO) of DOA

Items	Action Plan	Incremental A/P to M/P	Master Plan
Intensive Crop Diversification Works			
Proposed Vegetable Diversification Area (ha) by Intensive Vegetable Extension	30,200	21,100	51,300
New Vegetable Farm Households (Ave. Conversion to Veg: 0.19 ha/HH)	159,000	111,000	270,000
New Veg. Farm Households/block	2,120	1,480	3,600
Period	10	5	15
Intensive Extension Target HH/block	636	888	720
Annual Target Farm HH (3 years for 1 family)			
Extension Requirement for New Veg. HH/AEO (HH)	300	300	300
Additionally Required AEO (persons)	2.1	3.0	2.4
Required AEO to be increased in the State	159	222	180
Present AEO for 75 blocks	313	313	313
Total AEO Requirement with Crop diversification	472	535	493

If we consider the entire Master plan period additionally 180 AEOs are needed additionally for crop diversification, and 159 AEOs are needed during the Action Plan Period. Since the government is also planning to increase AEOs by atleast 300 within this financial year, it might be sufficient to meet the requirement provided that atleast 180 AEOs are fully involved in intensive crop diversification works. During the Action Plan period atleast 159 AEOs or 2 AEO is needed for one block fully concentrating on crop diversification works. An estimation of the number of crop diversification sites is shown below.

Table E-4.5 Project Sites Estimation for AEO

No. of HH/Block (No.) Intensive Extension target	636
Farm Landholding size (ha)	0.69
Total Area (ha)	439
One project Area (ha)	20
No. of Sites	22
No. of AEOs / Block	2
Sites per AEO	11

Assuming that one project area is approx. 20ha, and 2 AEOs will be assigned in a block, 11 project sites shall be covered by one AEO.

Strengthening of General Extension Functions

As discussed in the Annex – E, the extension staff are involved in the input distribution & its

accounting, and atleast 40% of their time is spent on such works. If 50% or 100% of their input distribution activities are transferred to farmers groups or other institutions, then the general extension activities can be strengthened as shown below.

Table E-4.6 Strengthening of General Extension Functions

Contents	No. of AEOs		
	Action Plan	Incremental A/P to M/P	Master Plan
Present Condition			
Present AEO for 75 blocks	313	313	313
Present AEO/block	4.2	4.2	4.2
Out of AEO's present task, 40% occupies			
Farm input distribution & its accounting at present			
Input distribution work (equivalent to 40% personnel)	125	125	125
Other Extension activities (equivalent to 60% personnel)	188	188	188
Total	313	313	313
Case-A (Decrease the task by 50%)			
Half of the input distribution works to be transferred to farmers groups or other institutions			
Input distribution work (equivalent to 20% personnel)	63	63	63
Other Extension activities (equivalent to 80% personnel)	250	250	250
Total	313	313	313
Available manpower under present task conditions	376		
Case-B (Exclude the task from AEO)			
Half of the input distribution works to be transferred to farmers groups or other institutions			
Input distribution work (equivalent to 0% personnel)	0	0	0
Other Extension activities (equivalent to 100% personnel)	313	313	313
Total	313	313	313

(4) Strengthening of Soil and Water Conservation Division

As discussed in the Annex-H, quantity of irrigation development works to be executed by the DOA will increase to attain the required progress of crop diversification. As for farm road, DOA will expand road activities from construction of O&M road for irrigation to the proposed access farm road. For these engineering activities should be under the responsibilities of the Soil and Water Conservation (SWC) Division of DOA, and hence the capacity of the SWC division shall be strengthened including enhancement of Sub-divisional Soil Conservation offices and their staff through training and increase of staff number. The training to the SDSCO staff includes i) management and administration of the Project, ii) design of irrigation facilities and access farm road, iii) quality control of the works, and iv) supervision of the local consultant employed by outsourcing, and so on. For management of all the activities including engineering and administration, one Superintending Engineer is proposed to be appointed in the proposed organization. The proposed organization of SWC is summarized in Table E-4.7 and Fig. E-4.1.

Table E-4.7 Proposed Staff of Soil and Water Conservation

Position	Head Office	Divisional Office	Sub-divisional Office			Total
			for Regular Activities	for Master Plan	Sub-total	
SE	1	-	-		0	1
ASCO	1	-	-		0	1
DE	-	4	-		0	4
SDSCO	-	-	30		30	30
SMS	1	-	-		0	1
AE	-	-	30	30	60	60
JE	-	-	60	60	120	120
ADO	1	4	75	30	105	110
AEO	2	4	60	60	120	126
Map Officer	1	-	-		0	1
Chief Draftsman	1	4	-		0	5
Surveyor	-	-	60	60	120	120
Draftsman	2	8	30	30	60	70
Jr. Draftsman	2	8	30	30	60	70
Total	12	32			675	719

Note; SE; Superintending Engineer, ASCO; Assistant Soil Conservation Officer, DE; Divisional Engineer, SDSCO; Sub-divisional Soil Conservation Officer, SMS; Subject Matter Specialist, AE; Assistant Engineer, JE; Jr. Engineer, ADO; Agriculture Development Officer, AEO; Agriculture Extension Officer, RIDF; Rural Infrastructure Development Project (on-going) by Central & State Budget

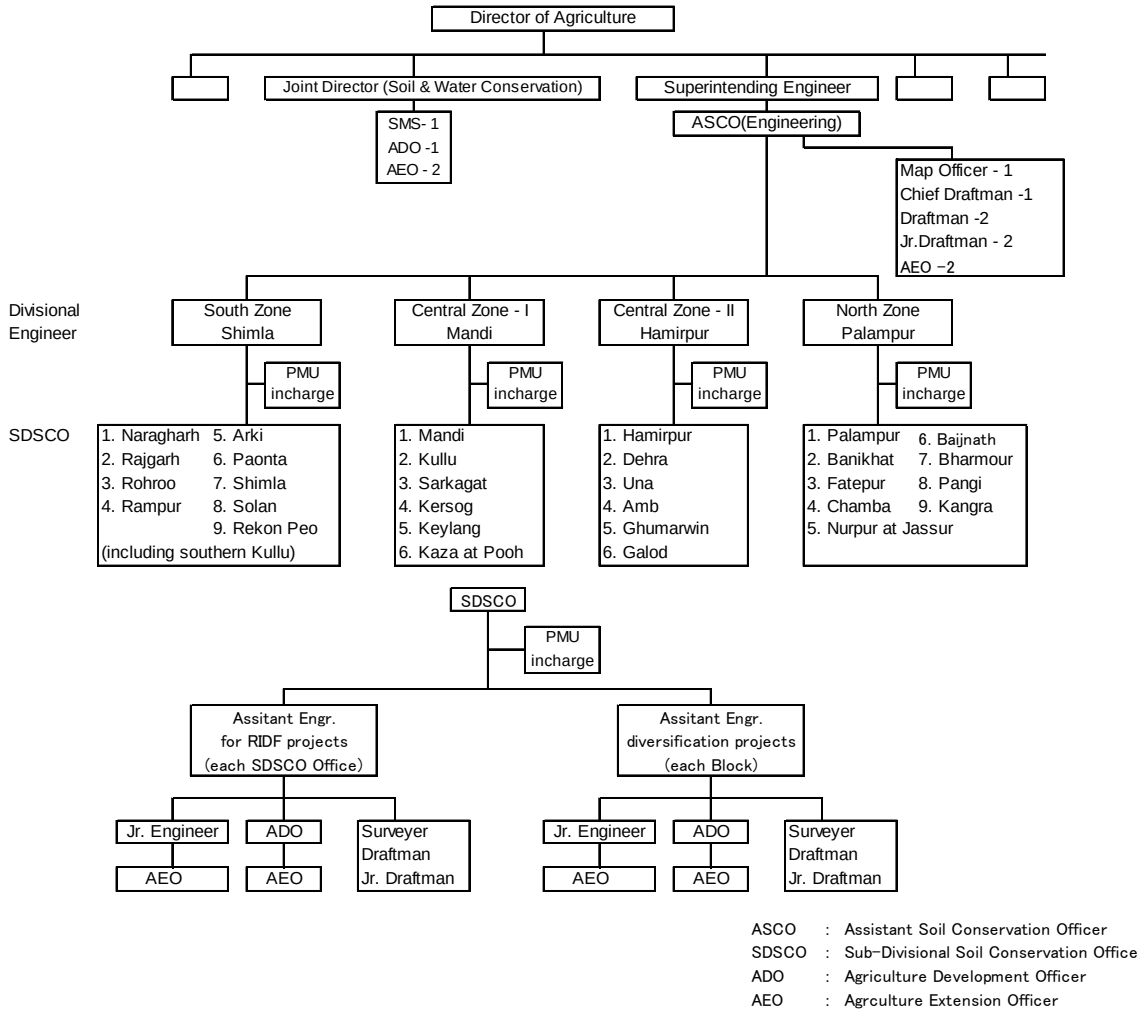


Fig. E-4.1 Proposed Organization of Soil Water Conservation

E-4.2 Strengthening of Extension Service Functions

(1) Description of the Component

In line with the national extension reform policy to match the various farmers' needs at the grass root level, the Agricultural Technology Management Agency (ATMA) model are being followed in India, and the model has covered all the 12 districts of the state. However, it is necessary to strengthen the functions of ATMA so that the extension service activities of the ATMA model become popular and user-friendly.

Also, a close communication between the extension departments and research institutes is essential to develop applicable farming techniques for crop diversification and to disseminate these newly developed techniques to the farmers. Therefore, this program is aimed at providing sustainable linkages among the extension departments, research institutes, universities, and farmers. The extension departments will collect from the farmers all the information on the constraints in the implementation of crop diversification and will provide these to the research institutes. The research institutes will then develop suitable countermeasures to solve these constraints. The extension departments and research institutes will play an important role in the dissemination and monitoring of the proposed countermeasures.

The experiences of Himachal Pradesh Crop Diversification Model shall also be disseminated to other sister hilly states of India by conducting interstate workshops.

Under this situation of agricultural extension system in the state, this component has been prepared. The target, outputs, executing organization and proposed activities of this component are listed below:

Table E-4.8 Outline of Strengthening of Extension Service Functions

Item	Outline of Component
Target	1. By ATMA model, the farmers will be able to access a wide range of extension services based on their requirements on agriculture, horticulture, animal husbandry etc. in a timely and effective manner. Synergy between public and private sector extension service providers will be ensured. 2. Farmers will be well motivated to achieve diversified agriculture. 3. A close linkage for crop diversification will be maintained between the research institutes and extension departments, and information on farmers' constraints and their countermeasures will be shared among them. 4. For improvement of productivity and quality of farm outputs, advanced farming practices developed by the researchers in the universities will be disseminated to the farmers in a timely manner through extension officers.
Outputs	1. Using ATMA model, the issues overlapping between the line departments and/or lack of extension service activities will be resolved, and the farmers will be able to contact the extension officers easily. 2. Innovative farmers will act as trainers of farmers who intend to practice diversified agricultural activities. The farmers will be able to receive immediate technical advices and guidance which they need in practicing diversification of agriculture. 3. Useful information on crop diversification will be available through television & radio networks, and Kisan (Farm) Call Center. 4. Farmers will be able to access easily to soil and plant diagnosis services, and to obtain technical advices in a proper and timely manner. 5. Farmers and their groups will be annually appraised in communities depending on their performance and achievement of diversified agriculture activities.. 6. Farmers' constraints or demands in crop diversification will be grasped by the researchers in the universities through extension officers in a timely manner. 7. Countermeasures against the farmers' constraints will be proposed to the extension officers.
Activities	<u>Major activities</u> 1. Coordinating the extension officers of the line departments under ATMA model, and conducting trainings of trainers

	2. Preparation of useful information on diversified agriculture and dissemination through television & radio networks, and popularization of existing Kisan (Farm) Call Center. 3. Improvement of soil diagnosis services of the DOA. 4. Information dissemination on subsidy by extension works 5. Periodical meetings and workshops among the research institutes, extension departments and farmers' representatives at the state and district level. 6. Field visits of researchers together with extension officers in order to cope up with on-going constraints in the field, and linking of research activities matching demands of the farmers. 7. Monitoring and Evaluation
Related components	Strengthening of Department of Agriculture
Executing Organization	Execution : 12 Districts ATMA / Department of Agriculture / Line Departments / Agricultural & Horticultural Universities and research institutes

Source : JICA Study Team

(2) Proposed Master Plan

The current situation, proposed plan, subjects to be executed, and the target persons are summarized in Table E-4.9.

Table E-4.9 Proposed Master Plan of Strengthening of Extension Service Functions

Activity	Current Situation	Proposed Plan	Subjects to be Executed	Schedule	Target Persons	Executing Institutes
(1) Coordinating the extension officers, and conducting trainings of trainers under ATMA model	• Extension activities on crop diversification are carried out independently by the line departments. • Very few capacity building trainings of extension officers are carried out on crop diversification	• Capacity development trainings on technical and management aspects of crop diversification • To disseminate the Himachal Pradesh Crop Diversification Model to other sister hilly states of India interstate workshops shall be conducted	• Technical and management aspects of crop diversification • Integrated farm management • Inter State workshop on progress of crop diversification activities in Himachal Pradesh and lessons learnt	• First 2 years	• Extension Staff of District and Block Offices / Line Departments • Extension officers of the 10 Hilly states	• DOA
(2) Preparation of audio-visual extension materials (preparation of more easily understandable information on diversified agriculture and dissemination through television & radio networks, and popularization of existing Kisan (Farm) Call Center)	• Crop diversification is not yet popularized.	• Strengthening of dissemination on more easily understandable and area specific (block level) information on crop diversification through television & radio networks on a regular basis • Popularization of Kisan Call Center	• Information on market-oriented high value vegetables for each area • Crop cultivation techniques for high value vegetables	• First 2 years	• Extension Staff of District and Block Offices • H.P. State farmers	• DOA

Activity	Current Situation	Proposed Plan	Subjects to be Executed	Schedule	Target Persons	Executing Institutes
(3) Provision of soil diagnosis services of the department of agriculture.	• Inadequate of soil diagnosis services • Superannuated equipment & facilities of soil testing laboratories	• Provision of equipment and facilities of the soil testing laboratories	• Soil diagnosis equipment • Mobile soil vans	• Within first 2 years	• H.P. State Soil Laboratories	• DOA
(4) Linkage among Research, Extension, and Farmers	• Poor linkage between extension and research activities • Meetings and workshops together with researchers and extension officers are held only based on the necessity.	• Implementation of periodical meetings and workshops for researchers, extension officers and farmers at the state and district level.	• Crop cultivation techniques for high value vegetables in relation to field problems	• Within first 2 years	• Extension Staff of District and Block Offices • H.P. State Agri. researchers • Farmers	• DOA
(5) Field visits of researchers together with extension officers (to cope up with on-going constraints in the field, and linking of research activities matching demands of the farmers)	• Poor extension and research linkage • Field visits together with researchers and extension officers are held only based on the necessity.	The researchers and extension officers shall conduct field visits together to analyze the constraints in the field and to link their research activities matching the demands of the farmers	• Constraints in the field related to crop diversification and research activities to be conducted • Demands of farmers for crop diversification	• Within first 2 years	• Extension Staff of District and Block Offices • H.P. State Agri. researchers • Farmers	• DOA
(6) Monitoring and Evaluation	• No monitoring of crop diversification	• Improvement of monitoring and evaluation	• Progress of crop diversification	• Continuous monitoring and yearly update.	• H.P. State extension officers	• DOA

(3) Proposed Action Plan

The action plan related to each activity and its requirements are mentioned below.

Table E-4.10 Proposed Action Plan of Strengthening of Extension Service Functions

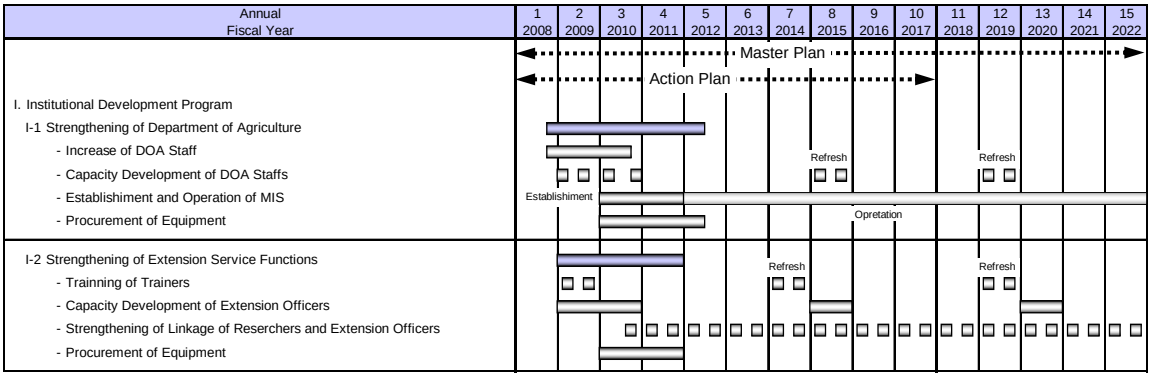
Activity	Subjects	Target	Executed by	Remarks
(1) Capacity development on technical and management aspects of crop diversification for the extension trainers	Capacity development trainings on technical and management aspects of crop diversification shall be conducted for the extension trainers at regular intervals.	• Extension officers of the 10 Hilly states	• DOA	(1) see Attachment E-3 regarding implementation cost.
	Himachal Pradesh Crop Diversification Model shall be disseminated to other sister hilly states of India interstate workshops shall be conducted for 2 times.	• Extension officers of the 10 Hilly states	• DOA	(1) see Attachment E-3 regarding implementation cost.
(2) Preparation of audio-visual materials (Preparation of more easily understandable information on crop diversification and dissemination through television & radio networks, and popularization of	More easily understandable and area specific (block level) information on crop diversification shall be prepared by the Department of Agriculture, and shall be disseminated through television & radio networks on a regular basis. Kisan Call Center shall be	• Extension Staff of District and Block Offices • H.P. State farmers	• DOA	(1) see Attachment E-3 regarding implementation cost.

existing Kisan (Farm) Call Center)	popularized.			
(3) Provision of equipment and facilities of soil testing laboratories	The equipment and facilities of the soil testing laboratories need to be provided.	• H.P. State Soil Laboratories	• DOA	(1) see Attachment E-3 regarding implementation cost.
(4) Linkage among Research, Extension, and Farmers	Periodical meetings and workshops shall be organized among the researchers, extension officers and farmers at the state and district level.	• Extension Staff of District and Block Offices • H.P. State Agri. researchers • Farmers	• DOA	(1) see Attachment E-3 regarding implementation cost.
(5) Field visits of researchers and extension officers (to cope up with on-going constraints in the field, and linking of research activities matching demands of the farmers	The researchers and extension officers shall conduct field visits together to analyze the constraints in the field and to link their research activities matching the demands of the farmers	• Extension Staff of District and Block Offices • H.P. State Agri. researchers • Farmers	• DOA	(1) see Attachment E-3 regarding implementation cost.
(6) Monitoring and Evaluation	Monitoring and evaluation of all the extension activities shall be carried out	• H.P. State extension officers	• University	

E-4.3 Provisional Schedule for Program Implementation

Implementation schedule is shown in Table E-4.11.

Table E-4.11 Implementation Schedule



E-4.4 Preliminary Cost Estimate

Preliminary cost was calculated for strengthening of Department of Agriculture as well as Extension Services Functions as shown in Attachment E-1 to E-3, and summarized as follows:

Table E-4.12 Cost Estimate for Strengthening of Department of Agriculture

(Unit: Rs.)

Item	Total
(1) Capacity development on planning, implementation, monitoring and evaluation (for Extension staff)	834,000
(2) Capacity development on planning, implementation, monitoring and evaluation (for Soil Conservation Staff)	564,000
(3) Establishment of the Management Information System (MIS) with computer facilities at the state, district and block levels	24,600,000
(4) Capacity development on the effective use and maintenance of the MIS system (extension staff)	2,550,000
(5) Capacity development on the effective use and maintenance of the MIS system (Soil conservation)	1,560,000
(6) Provision of necessary equipment and tools	230,000,000
(7) Survey & drawing equipment for soil conservation offices (see attached Table B for soil conservation equipment)	49,300,000
Total	309,408,000

Remarks) refer Attachments E-1 and E-2 for details

Table E-4.13 Cost Estimate for Strengthening of Extension Service Functions

(Unit: Rs.)

Item	Total
(1) Capacity development on technical and management aspects of crop diversification for the extension trainers	218,196,000
(2) Preparation o f Audio-Visual Materials	1,400,000
(3) Strengthening of Equipment and Facilities of Soil Testing Laboratories	7,000,000
(4) Linkage among Research, Extension and Farmers	254,000
(5) Field Visits of the Researchers and Extension Officers	60,000
(6) Monitoring and Evaluation of all the Extension Activities	20,160,000
Total	247,070,000

Remarks) refer Attachments E-3 for details

(2) Cost Disbursement

Disbursement of both costs described above is taken place in 2009 and 2010, according to the implementation schedule as shown in Table E-4.11. Therefore cost disbursement is estimated as follows.

Table E-4.14 Cost Disbursement for Institutional Development Program

(Unit: Rs. million)

Programs	2009	2010	Total
Strengthening of Department of Agriculture	206	103	309
Strengthening of Extension Services	164	82	247
Total	370	185	556

Attachment E-1 Cost Breakdown for Strengthening of Department of Agriculture (1/2)

(Unit: Rs.)

Item	Quantity		Unit Cost	Amount	Period
(1) Capacity development on planning, implementation, monitoring and evaluation (for Extension staff)					
Trainers for Capacity Development	5 days x 12 districts x 2 times/year x 1 year	120	3,000	360,000	1 year
Arrangement of Hall	12 districts x 2 times/year x 1 year	24	1,000	24,000	1 year
Training Materials	450 persons (AEOs) x 2 times/year x 1 year	900	500	450,000	1 year
Sub-Total Cost				**834,000**	
(2) Capacity development on planning, implementation, monitoring and evaluation (for Soil Conservation Staff)					
Trainers for Capacity Development	12 districts x 2 persons x 5 days x 1 time	120	3,000	360,000	1 year
Arrangement of Hall	12 districts x 2 times/year x 1 year	24	1,000	24,000	1 year
Training Materials	180 persons (60 AEs & 120 JEs) x 2 times/year x 1 year	360	500	180,000	1 year
Sub-Total Cost				**564,000**	
(3) Establishment of the Management Iinformation System (MIS) with computer facilities at the state, district and block levels (Extension & Soil Conservaion Staff)					
Establishment of Computer Ssystem for the MIS System	5 system engineers x 6 months x 1 year (including training)	30	200,000	6,000,000	1 year
MIS System (computers with O/S at State, District and Block Levels) - Extension	Computers with OS (75 blocks + 12 districts + 1 Zone level + 2 at State Level)	90	150,000	13,500,000	1 year
MIS System (Computers with O/S at State, District and Block Levels) - Soil Conservation	Computers with OS (30 Sub-divisions + 4 Divisions)	34	150,000	5,100,000	1 year
				24,600,000	
(4) Capacity development on the effective use and maintenance of the MIS system (extension staff)					
Trainers for Capacity Development	1 man-day x 12 districts x 5 days x 1 time/year	60	3,000	180,000	1 year
Arrangement of Hall	12 districts x 2 time/year x 5 days x 1 year	120	1,000	120,000	1 year
Training Materials	450 AEO personnel x 5 days x 2 time/year x 1 year	4,500	500	2,250,000	1 year
Sub-Total Cost				**2,550,000**	
(5) Capacity development on the effective use and maintenance of the MIS system (Soil conservation)					
Trainers for Capacity Development	3 persons x 30 offices x 1 time/year x 5 days x 1 year	180	3,000	540,000	1 year
Arrangement of Hall	12 districts x 2 time/year x 5 days x 1 year	120	1,000	120,000	1 year
Training Materials	180 persons (60 AEs & 120 JEs) x 2 time/year x 5 days x 1 year	1,800	500	900,000	1 year
Sub-Total Cost				**1,560,000**	
(6) Provision of necessary equipment and tools					
Multi-utlity-vehicle (MUV)	75 Blocks	75	1,000,000	75,000,000	2 years
Pick-up Van - Extension	12 districts + 1 zone + 3 state level	16	1,000,000	16,000,000	2 years
Pick-up Van- Soil conservation	30 Sub-divisions + 4 Divisions	34	1,000,000	34,000,000	2 years
Motor Cycles - Extension	75 blocks x 10 per block	750	60,000	45,000,000	2 years
Motor Cycles - Soil Conservation	30 Sub-divisions x 8 per office	240	60,000	14,400,000	2 years
Office equipment & furnitures (printer, fax machine, meeting table, chairs) - Extension	75 blocks	75	100,000	7,500,000	2 years
Office equipment & furnitures (printers, fax machine, meeting table, chairs) - Soil Conservation	30 Sub-division offices	30	100,000	3,000,000	2 years
Visual aids extension equipment (projectors, digital cameras)	75 Blocks + 12 districts + 1 Zone level + 2 at State Level	90	200,000	18,000,000	2 years
Small & portable farm machinery for trials	12 districts	12	1,000,000	12,000,000	2 years

Attachment E-1 Cost Breakdown for Strengthening of Department of Agriculture (2/2)

(Unit: Rs.)

Item	Quantity		Unit Cost	Amount	Period
Project Room Renovation at DOA, District and Divisional Soil Conservation Offices	DOA (1), District (12), and Divisional Soil Conservation Offices (4)	17	300,000	5,100,000	2 years
Sub-Total Cost				**230,000,000**	
(7) Survey & drawing equipment for soil conservation offices (see attached Table B for soil conservation equipment)					
Topographic survey equipment (division level)	4 divisions x 1 set	4	1,058,000	4,232,000	2 years
Topographic survey equipment (sub-division level)	30 sub-divisions x 1 set	30	571,000	17,130,000	2 years
Meteo-hydrological equipment (division level)	4 divisions x 1 set	4	22,000	88,000	2 years
Meteo-hydrological equipment (sub-division level)	30 sub-divisions x 1 set	30	17,000	510,000	2 years
Drawing equipment including Auto CAD, plotter and computer (division level)	4 divisions x 1 set	4	1,210,000	4,840,000	2 years
Drawing equipment including Auto CAD, plotter and computer (sub-division level)	30 sub-divisions x 1 set	30	750,000	22,500,000	2 years
Sub-Total Cost				**49,300,000**	
Total Cost				**309,408,000**	

Attachment E-2 Soil Conservation Equipment

Name of the equipment	Division Level			Sub-Division Level		
	Nos.	Unit Cost (Rs.)	Total (Rs.)	Nos.	Unit Cost (Rs.)	Total (Rs.)
Topographic survey equipment						
Total Station	1	1,000,000	1,000,000	-	-	
Measuring Tape (steel 30 m)	3	1,000	3,000	6	1,000	6,000
Portable GPS	1	55,000	55,000	2	55,000	110,000
Theodolite				1	400,000	400,000
Auto Level (Model-2024 (24X)				1	32,000	32,000
Plan table				2	6,500	13,000
Survey Staff				2	2,000	4,000
Survey Pole				6	1,000	6,000
Sub total			**1,058,000**			**571,000**
Meteo-hydrological Survey equipment						
Water Quality Testing Kit	1	12,000	12,000			
Water Level Gauge A-120 m (for tube well)	1	10,000	10,000			
Current Meter				1	10,000	10,000
Rain Gauge				1	2,000	2,000
Eqiupment for Sediment				1	5,000	5,000
Sub-Total			**22,000**			**17,000**
Drawing equipment						
Plotter (A0 size)	1	1,000,000	1,000,000			
Digital Planimeter	1	60,000	60,000			
Computer with OS	1	150,000	150,000	1	150,000	150,000
Auto CAD Software				1	150,000	150,000
Ploter (A2 size)				1	450,000	450,000
Sub-Total			**1,210,000**			**750,000**
Grand Total			**2,290,000**			**1,338,000**

Attachment E-3 Cost Breakdown for Strengtheing of Extension Service Function

Item	Quantity		Unit Cost (Rs.)	Amount (Rs.)	Period
(1) Capacity development on technical and management aspects of crop diversification for the extension trainers					
Employment of Local Consultants	75 blocks x 3 persons x 12 months x 2 years	5,400	40,000	216,000,000	2 yeas
Trainers for Capacity Development	2 days x 12 districts x 1 time/year x 1 year	24	3,000	72,000	1 year
Arrangement of Hall	12 districts x 2 times/year x 1 year	24	1,000	24,000	1 year
Training Materials	450 persons x 4 times/year x 1 year	1,800	500	900,000	1 year
Interstate Workshop	10 States x 2 persons x 1 time x 2 years	40	30,000	1,200,000	2 years
Sub-total Cost				**218,196,000**	
(2) Preparation of audio-vidual materials					
Preparation of Materials *1	10 outputs x 2 years	20	20,000	400,000	2 years
Preparation of Video Programs *2	5 outputs x 2 years	10	100,000	1,000,000	2 years
Sub-total Cost				**1,400,000**	
(3) Provision of equipment and facilities of soil testing laboratories					
Strengthening of Facilities	11 laboratories	11	200,000	2,200,000	2 years
Mobile Testing Vans	4 districts x 1 number	4	1,200,000	4,800,000	2 years
Sub-total Cost				**7,000,000**	
(4) Linkage among Research, Extension, and Farmers					
Arrangement of Hall	2 times/year x 2 years	4	1,000	4,000	2 years
Workshop Materials	50 person (12 x 3 + 2 + 2 + 10) x 5 times/year x 2 years	500	500	250,000	2 years
Sub-total Cost				**254,000**	
(5) Field visitis of the researchers and extension officers					
Transport	3 times x 20 persons x 2 years	120	500	60,000	2 years
(6) Monitoring and evaluation of all the extension activities (collection of MIS information)					
Employment of Consultants	12 districts x 2 man-month x 12 months x 2 years	576	35,000	20,160,000	2 years
Total Cost				**247,070,000**	

Note:

*1: Audio-visual materials include leaf-lets, brochures, booklets and manuals. Those would be more easily understandable and area specific (block level) information on crop diversification by the Department of Agriculture, and dissemination through television & radio networks on a regular basis; Popularization of Kisan Call Center.

*2: Video Programs would be prepared through out-sourcing basis.

ANNEX-F

Marketing

THE STUDY ON DIVERSIFIED AGRICULTURE FOR ENHANCED FARM INCOME IN THE STATE OF HIMACHAL PRADESH

FINAL REPORT

ANNEX-F
MARKETING

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ANNEX-F MARKETING

F-1 Background of Market Supply of Vegetables and Fruits

Since the road network expansion and upgrading programs in India are progressing well, it is expected that service areas of the current logistics systems of vegetables and fruits will be extended to long-distance destinations, although it is difficult to be reached in the earlier times. Moreover, if the modernization of rail freight transportation system, which is presently under planning stage, is executed, the vegetables and fruits from northern India can be transported not only to Delhi, but also to the other markets with a population of more than 10 million such as Mumbai and Calcutta, by reducing the transportation time to markets and by maintaining the freshness of the vegetables and fruits.

In the recent years, Government of India has been promoting the deregulation of agricultural sector and the integration of domestic markets of farm products in order to encourage the competitiveness of agricultural markets. Besides, a suitable environment is created to attract the investments for the improvement of marketing infrastructures, and the modernization and strengthening of existing markets. Corresponding to this national policy, 14 State Governments including Andra Pradesh, Maharastra, Punjab, Rajastan, Himachal Pradesh, etc. have already revised the Agricultural Produce Marketing Committee (APMC) Law, and nowadays the marketing of farm products are freely opened to the private sector. As a result, domestic and foreign investors have entered into the agribusiness by making full use of merits born from deregulation of the market.

Up to date, the Reliance Industries Ltd. in Mumbai has established a chain of 135 retail stores in major megalopolis targeting people in the middle-income bracket newly created with the rapid economic growth in India. This company has started providing such services as farm input supply and technical assistance to farmers, aiming to direct purchase of their farm products meeting the quality standard of retailed perishables, and thereby the realization of its rural farm center concept is promoted. Besides, construction of cold chain facilities by the Field Fresh Company of Bharti Investment Group, and connecting of villages through e-kiosk facilities by Choupal Fresh Company of Indian Tobacco Group are also expanding the marketing channels of farm products to the major cities.

In order to meet such demands of farm products, the government side is also promoting modernization, and information exchange through the home page of agricultural marketing network through which the information on all the major markets is published. According to the wholesale farm products market handbook of all the States prepared by the Ministry of Agriculture in 2004, the wholesale markets in India in accordance with APMC law specifications include 2,148 first class markets, 2,813 second class markets, 1,024 markets without any class, and totally 5,985 markets. The wholesale markets in the 11 major cities are shown in Table F-1.1.

Table F-1.1 Wholesale Markets in Major Cities of India

City	State	1st Class Markets	2nd Class Markets	No class Markets	Horticulture Products Markets*1
Mumbai	Maharastra	5	1	3	4
Delhi	Delhi	10	11	0	7
Calcutta	West Bengal	0	0	14	4
Chennai	Tamilnadu	0	0	4	1
Bangalore	Calcutta	5	9	0	10
Hyderabad	Andra Pradesh	9	0	3	7
Ahmedabad	Gujarat	6	13	0	7
Pune	Maharastra	11	31	0	12
Surat	Gujarat	10	27	0	1
Kanpur	Uttar Pradesh	7	2	0	2
Jaipur	Rajastan	10	0	0	1

*Note: *1 Markets, which are handling horticultural crops such as vegetables, fruits, flower, etc., in 1st, 2nd, and no class markets*
Source: Directory of Wholesale Agricultural Produce Assembling Markets in India, 2004, Ministry of Agriculture

F-2 Organization of Himachal Pradesh State Agricultural Marketing Board (HPSAMB)

Aiming at the smooth implementation of market activities as well as promotion of farmers' benefits, the Himachal Pradesh Agricultural and Horticulture Produce marketing Act was established, and in the Act private trading and contract farming are also included. In Himachal Pradesh, 10 Agricultural Produce Marketing Committee (APMC) have been established, and cover 12 Districts under the supervision of the HPSAMB, in order to conduct the smooth marketing of agricultural produce. Organization of the Board and 10 APMC are shown in Fig.F-2.1 and their staffing is shown in Table F-2.1.

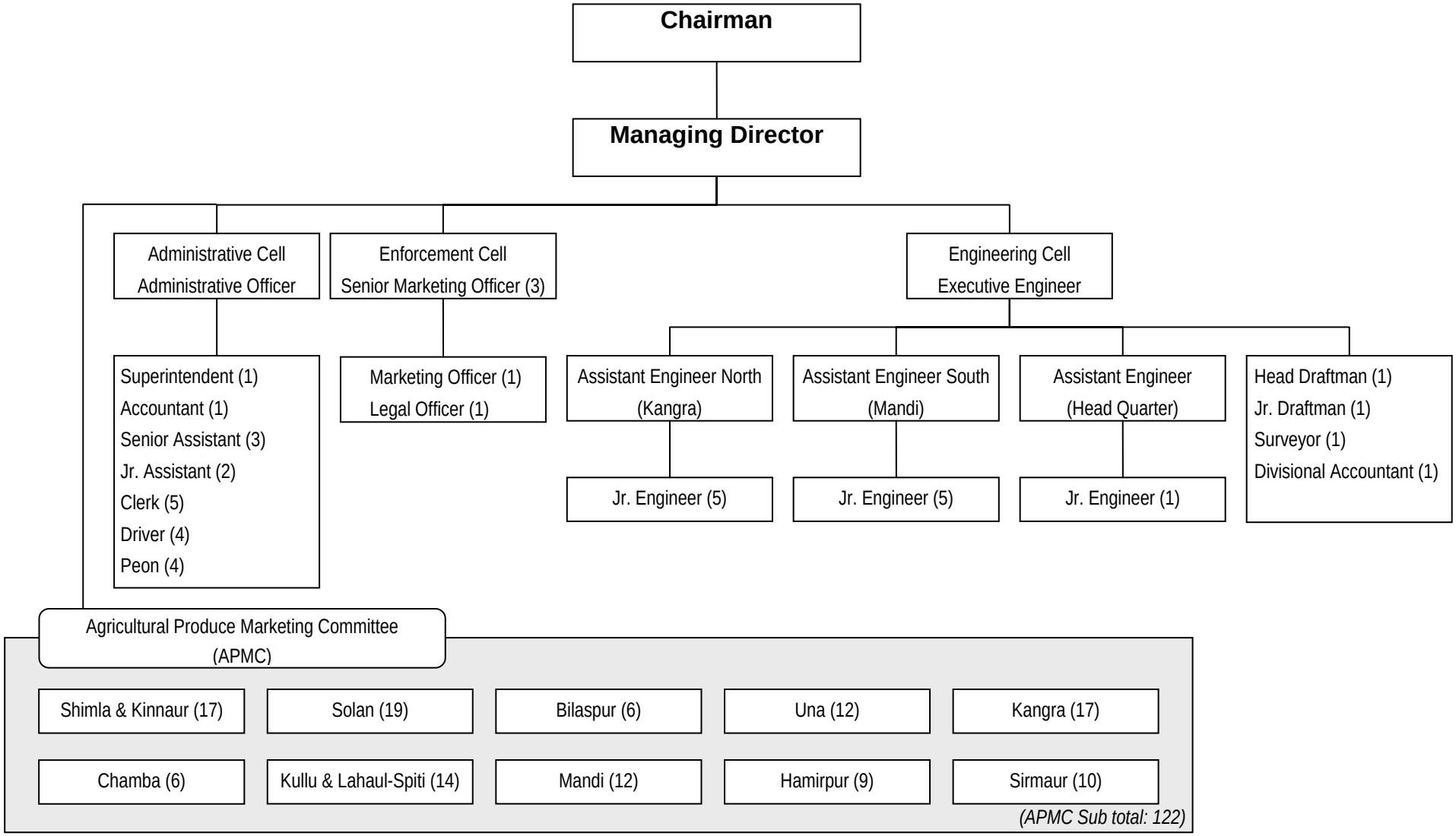


Fig. F-2.1 Organization and Staffing of Himachal Pradesh State Agricultural Marketing Board

Table F-2.1 Staffing of Himachal Pradesh State Agriculture Marketing Board and 10 Agricultural Produces

Office	Position	Sanctioned Posts	Presently Filled up Posts
Marketing Board	Chairman	1	1
	Managing Director	1	1
	Senior Marketing Officer	3	3
	Marketing Officer	1	1
	Lega Officer	1	1
	Executive Engineer	1	1
	Assistant Engineer (HQ)	1	1
	Jr. Engineer	1	1
	Assistant Engineer (North)	1	1
	Jr. Engineer	5	5
	Assistant Engineer (South)	1	1
	Jr. Engineer	5	5
	Head of Draftman	1	1
	Jr. Draftman	1	1
	Surveyor	1	1
	Divisional Accountant	1	1
	Administrative Officer	1	1
	Superintendant	1	1
	Accountant	1	1
	Senior Assistant	3	3
	Jr. Assistant	2	2
	Clerak	5	5
	Driver	4	4
	Pean	4	4
	Sub-total	47	47
APMC Bilaspur	Secretary	1	1
	Assistant Secretary	-	-
	Market Supervisor	1	1
	Other staff	9	4
	Sub-total	11	6
APMC Chamba	Secretary	1	1
	Assistant Secretary	-	-
	Market Supervisor	1	1
	Other staff	9	4
	Sub-total	11	6
APMC Hairpur	Secretary	1	1
	Assistant Secretary	-	-
	Market Supervisor	1	1
	Other staff	11	7
	Sub-total	13	9
APMC Kangra	Secretary	1	1
	Assistant Secretary	1	1
	Market Supervisor	3	2
	Other staff	22	13
	Sub-total	27	17
APMC Kullu & LS	Secretary	1	1
	Assistant Secretary	1	-
	Market Supervisor	3	2
	Other staff	20	11
	Sub-total	25	14
APMC Mandi	Secretary	1	1
	Assistant Secretary	1	1
	Market Supervisor	3	1
	Other staff	19	9
	Sub-total	24	12
APMC Shimla&Kinnaur	Secretary	1	1
	Assistant Secretary	1	1
	Market Supervisor	4	3
	Other staff	22	12
	Sub-total	28	17
APMC Sirmaur	Secretary	1	1
	Assistant Secretary	-	-
	Market Supervisor	1	1
	Other staff	12	8
	Sub-total	14	10
APMC Solan	Secretary	1	1
	Assistant Secretary	1	1
	Market Supervisor	3	3
	Other staff	22	14
	Sub-total	27	19
APMC Una	Secretary	1	1
	Assistant Secretary	-	-
	Market Supervisor	1	1
	Other staff	11	10
	Sub-total	13	12
Total		240	169

Source: H. P. Strate Agricultural Marketing Board, September 2008

Each APMC has the responsibility for control of regulated (primary market) and sub-market (secondary market) yards. Currently, there are 39 market yards including regulated and sub-market yards in the State. Organization. Staff of Marketing Board is 47 persons, while staff in 10 APMCs is 122 persons as shown in Table F-2.1. Compared with the sanctioned posts, the existing number of staff is limited so that it is difficult to manage market yards smoothly and effectively. Especially, each APMC has limited staff for price collection from each market yard concerned.

In each APMC, there are several Commission Agents that sell produce to buyers through auction. Buyers are imposed to pay 6% of sold amount that is 5% of commission fee for each Commission Agent (CA) and 1% of market fee for APMC. Payment from CA to APMC has been done every 15 days. This market fee has been saved in APMC, and then utilized for improvement of system as well as operation and maintenance for APMC. Meanwhile 25% out of total market fee mentioned above is credited as Marketing Development Fund in the Board. This Marketing Development Fund is utilized for the discharge of functions entrusted to the Board under the Act. Income and expenditure for Marketing Board and APMCs are shown in the following Table F-2.2:

Table F-2.2 Income and Expenditure of Marketing Board and APMCs

(Unit: Rs.)

MB / APMC	2006/07		2007/08	
	Income	Expenditure	Income	Expenditure
Marketing Board	51,952,744	32,103,017	58,361,938	20722,751
APMC Bilaspur	4,200,839	4,889,131	4,,143,766	3,585,184
APMC Chamba	3,724,653	465,032	6,376,087	3,331,643
APMC Hamirpur	5,585,860	3,850,254	6,542,896	3,535,382
APMC Kangra	24,900,181	16,546,374	20,699,441	27,536,057
APMC Kullu	16,902,736	14,276,608	18,184,468	19,152,443
APMC Mandi	22,918,963	18,836,230	23,386,315	25,446,304
APMC Shimla	45,839,951	37,266,304	59,555,978	71,268,868
APMC Sirmaur	9,564,636	8,063,334	7,019,036	7,206,868
APMC Solan	25,446,436	25,646,706	22,846,409	19,022,689
APMC Una	6,864,104	6,661,715	8,893,831	13,872,190

Remarks) see Table F-2.3 for the details on income and expenditure for APMCs
Source) Himachal Pradesh State Agricultural Marketing Board, 2008

Table F-2.3 Income and Expenditure for the Fiscal Year of 2006/07

No.	APMC	Income				
		Receipt from Check Post (1)	Receipt from Market Yard (2)	Sub-total (3)=(1)+(2)	Other Income (4)	Total (5)=(3)+(4)
1	Bilaspur	1,354,552	2,097,254	3,451,806	749,033	4,200,839
2	Chamba	700,389	2,316,299	3,016,688	707,965	3,724,653
3	Hamirpur	946,306	3,570,076	4,516,382	1,069,478	5,585,860
10	Kangra	956,925	19,667,710	20,624,635	4,275,546	24,900,181
4	Kullu	6,400,285	7,610,812	14,011,097	2,891,639	16,902,736
6	Mandi	5,913,247	13,032,892	18,946,139	3,972,824	22,918,963
7	Shimla	17,412,430	22,154,442	39,566,872	6,273,079	45,839,951
8	Sirmour	539,570	8,126,402	8,665,972	898,664	9,564,636
9	Solan	1,039,065	18,898,223	19,937,288	5,509,146	25,446,434
5	Una	0	5,751,437	5,751,437	1,112,667	6,864,104
	Total	18,991,065	49,179,067	68,170,132	12,680,889	80,851,021

Note:
Other income: Interest, Rental fee for shop in market yard, others

(Unit: Rs.)

No.	APMC	Expenditure								
		Salary, Wages, Med. Ta, and	Refund of committee Loan	Office Expenditure	Income Tax	Motor, Vehicle, Taxi	Works	Mukhya Mantri Path Yojna	20% of Share and Liscence Fee	Total
1	Bilaspur	1,651,684	1,500,000	348,612	-	-	87,500		1,301,335	4,889,131
2	Chamba	1,461,623	-	340,153	-	511,671	1,536,140		800,734	4,650,321
3	Hamirpur	1,863,185	-	443,069	-	-	395,600		1,148,400	3,850,254
4	Kangra	2,782,741	-	886,015	-	162,356	9,000,691		3,714,571	16,546,374
5	Kullu	2,867,182	-	1,012,578	-	641,720	4,885,790		4,868,338	14,275,608
6	Mandi	2,837,592	-	3,309,012	-	575,298	10,262,253		1,852,075	18,836,230
7	Shimla	4,293,222	-	1,674,256	-	217,569	13,810,872		17,270,385	37,266,304
8	Sirmaur	2,041,917	-	683,651	-	-	2,812,570		2,525,196	8,063,334
9	Solan	4,538,276	5,773,700	7,229,334	-	212,005	1,893,391		6,000,000	25,646,706
10	Una	1,682,417	-	675,094	-	-	3,263,631		1,040,573	6,661,715
	Total	26,019,839	7,273,700	16,601,774	0	2,320,619	47,948,438	0	40,521,607	140,685,977

Source: Himachal Pradesh Marketing Board, 2007

F-3 Market System and Distribution Channels of Vegetables and Fruits

Vegetable and fruits are distributed to market yards in and outside the state of Himachal Pradesh, as shown in Fig. F-2.1:

(1) Village (farm land) to Market Yard

In principal, farmers themselves carry their produces to the market yards which they select. It is not necessary for farmers to carry to the nearest market yard. Farmers are able to select market yard, where their produces will be sold in better price, or to select commission agents who are familiar to the farmers. While, some farmers request traders or other transporters to carry their produces to other market yards located in the other states such as Punjab, Haryana, Delhi, etc. In distribution channels between farmers and Commission Agents, there are the followings:

1) Farmers => Commission Agents (Transportation arranged by Farmers)

This channel is the most popular channel. Individual farmers or farmers' groups will bring their products to Commission Agents directly. In this case, farmers can select Commission Agents by themselves.

2) Commission Agents => Farmers (Transportation arranged by CA)

Commission Agents arrange transportation for farmers. Commission Agents will pick up farmers products at farmers' field or villages directly. In this case farmers do not need to bring their products. This way is very easy way for farmers. Further it is not necessary for farmers to do grading and packing. Commission Agents can arrange containers, and pick up products without grading and packing from farmers directly. Then commission agents will do grading and packing at market yard (see the right photo), in order to sell more valuable products to buyers.

Commission Agents come from not only market yard in the District or the State of Himachal Pradesh, but also outside the District and State.

3) Farmers => Middleman => Commission Agents

Some villagers arrange collection point for farmers' products near villages, and collect products from farmers (see the right photo). Those villagers select market yard, which they can sell them in higher market price on behalf of farmers. Generally they take products to market yard outside the Himachal State such as Delhi, Chandigarh, Haryana.

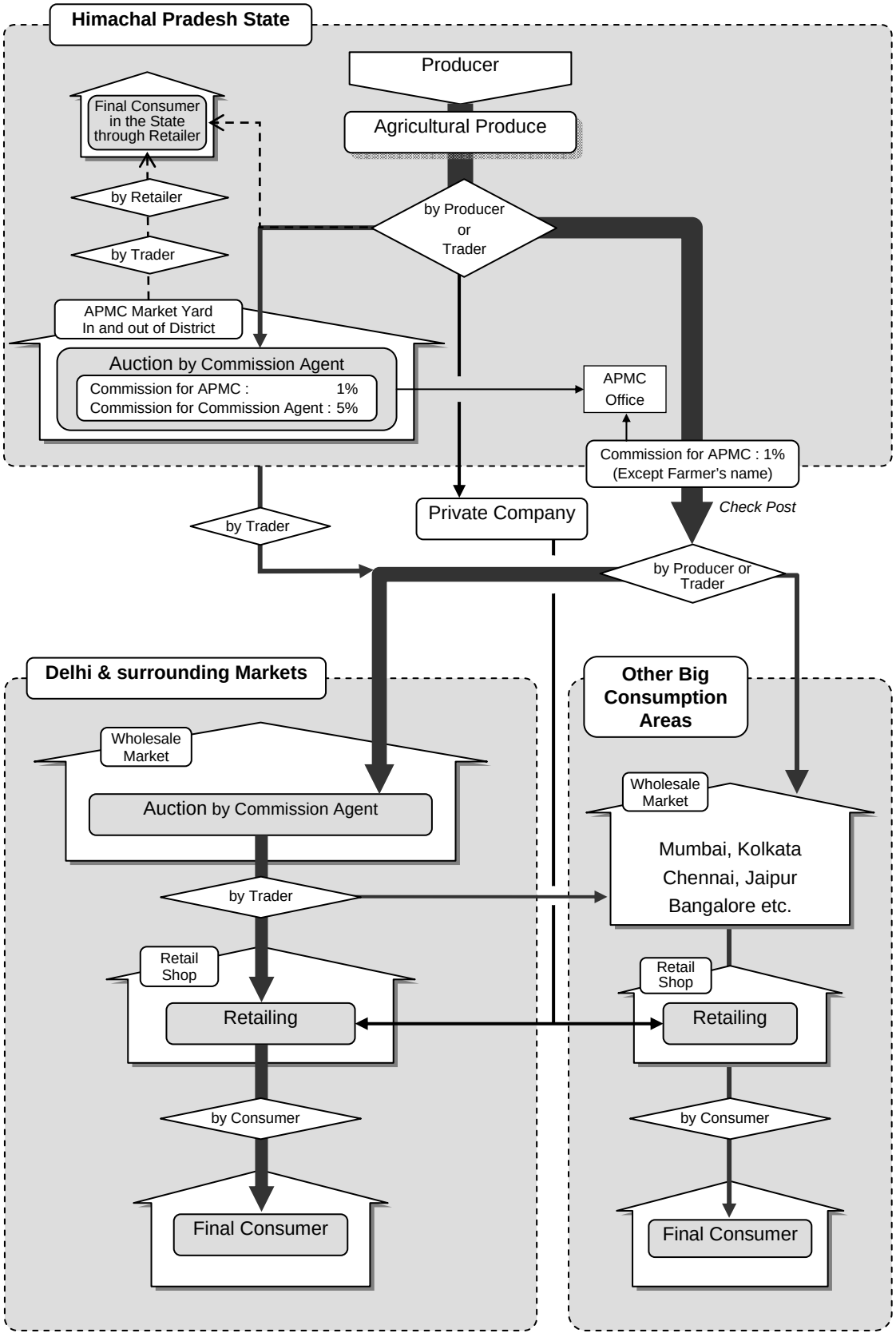


Fig. F-3.1 Current Distribution Channel of Agricultural Produce

(2) Auction at Market Yard

In principal, farmers themselves carry their produces to the market yards which they select. It is not necessary for farmers to carry to the nearest market yard. Farmers are able to select market yard, where their produces will be sold in better price, or to select commission agents who are familiar to the farmers. While, some farmers request traders or other transporters to carry their produces to other market yards located in the other states such as Punjab, Haryana, Delhi, etc.

Commission Agents arrange auction for their products. Normally each commission agent arrange different auction. Buyers can attend any kind of auction, according to their requirement (see the right photo).

Commission Agents have a responsibility to record all the results of their auction. Market supervisor(s) of APMC collect those information, thus inform market price (daily max. and min.) in major market yards to AGMARKNET (to be described later) and Directorate of Agriculture.

As described later, daily market prices at major market yards of major crops (cereals, vegetables, fruits, etc.) are shown in the Web Site of AGMARKNET, while information on daily prices of major crops are disseminated through radio and newspaper through Directorate of Agriculture.

(3) Market Yard to Consuming Area (retail market)

Buyers take products to retail markets or wholesale market at consuming areas outside the H.P. Their transportation means is mainly truck. Meanwhile some farmers use public bus to send their products to Delhi or other consuming sites. Regarding railway, there are three routes such as (i) Kalka to Shimla, (ii) Pathankot to Joginder , and (iii) Sirhind to Una as described in Section H.1.2. Those routes are mainly utilized for tourism and commuting, not for transporting agricultural products.

(4) Consuming Area

Vegetables are sold at fruits and vegetable shops, vendors, other retail shops, etc. Further big super markets are also selling vegetables in big cities such as Delhi, Chandigarh, etc.

In case of vegetables, the state consumption and trading loss are assumed at approximately 20% of the state production. The remaining vegetables of 80% are assumed to be marketed outside of the State. Out of them, about 85% are consumed in Delhi, Haryana, Punjab and Chandigarh around the State and the balance of 15% are marketed in other big consuming area such as Munbai, Kolkata and Chennai. (See Fig. F-3.1)

Meanwhile the direct purchase has been gradually disseminated, according to the revision of the APMC Act in 2006. Currently, some private companies such as Reliance Fresh, ADANI, ITC (e-Chopal), etc. (see the right photo) have some direct purchase of vegetables from progressive farmers in Bilaspur and Hamirpur for their future actual entry into Himachal Pradesh.

Further these private companies are trying to gain some ground

for marketing fruits, especially apple. Their priority areas are Shimla, Kinnaur, and Kullu, which are major producing area of apple.

(5) Sunday Market

Sunday-Markets are also operated in Shimla and Solan every Sunday (see the below photos). In these markets, farmers are able to supply their fresh produces to consumers directly, while consumers can buy fresh vegetables in cheaper prices rather than retailers.

Sunday Market in Shimla

Sunday Market in Solan

(6) Distribution Channel in Other Major States

The farm produce moves through different market functionaries so as to reach the ultimate consumer. The effectiveness of a particular channel determines the level of market efficiency. The preference for a specific marketing channel shows its relative importance. A particular marketing channel also determines the level of price spread and farmer's share in consumer's rupee. The length of a specific marketing channel depends upon the form of final produce needed for the consumption. Typical distribution channels in major markets such as Haryana, Punjab, Uttar Pradesh, West Bengal, and Maharashtra are shown as follows

1) HARYANA

It was observed that commission agents were playing a lead role in the market transactions and were involved in all the market channels. However, the following four marketing channels have been identified

- **Channel-1:** Farmers-Commission agents-Wholesalers-Retailers-Hawkers/vendors-Consumers
- **Channel-2:** Farmers-Commission agents-Wholesalers-Hawkers/vendors-Consumers
- **Channel-3:** Farmers-Commission agents-Wholesalers- Consumers
- **Channel-4:** Farmers-Commission agents- Retailers- Consumers
- **Channel-5:** Farmers-Commission agents- -Hawkers/vendors-Consumers
- **Channel-6 :** Farmers – Retailers – Consumers
- **Channel-7:** Farmers- Consumers

The farmers were also found to be selling small produce directly to the consumers and retailers. Similarly farmers were also transacting in the local mandis.

2) PUNJAB

The different market functionaries in the market are commission agents, wholesalers and retailers who were found to be interacting with consumers through different marketing channels. The following specific channels have been identified

- **Channel-1:** Farmers-Commission agents-Wholesalers-Retailers-Consumers
- **Channel-2:** Farmers-Commission agents-Wholesalers-Hawkers/vendors-Consumers
- **Channel-3:** Farmers-Commission agents-Wholesalers- Consumers
- **Channel-4:** Farmers-Commission agents- Retailers- Consumers
- **Channel-5:** Farmers-Commission agents- -Hawkers/vendors-Consumers
- **Channel-6 :** Farmers – Retailers – Consumers
- **Channel-7:** Farmers- Consumers

The farmers were also found to be selling small produce directly to the consumers and retailers. Similarly farmers were also transacting in the local *mandi.*

3) UTTAR PRADESH

The following channels have been identified in Uttar Pradesh for the disposal of different vegetables

- **Channel 1: Producers–consumer (village sale)**
- **Channel 2:Producer–retailer–consumer (local sale)**
- **Channel 3: Producer–Trader–commission agent–retailer–consumer.**
- **Channel 4: Producer–commission agent–retailer–consumer**
- **Channel 5: Producer–primary wholesaler–secondary wholesaler– retailer– consumer**

4) WEST BENGAL

Different marketing channels are found in West Bengal. The supply chain has multi dimensions. The major ones are as follows

- **Channel 1:** The major production by marginal farmers is sold in near by Established Markets
- **Channel 2:** Farmers directly sell to consumers in local *hat*
- **Channel 3:** Farmers sell to retailers in the market.
- **Channel 4:** The small and big farmers sell directly to the wholesaler in the local market place and then retailers purchase it from the wholesalers.
- **Channel 5:** Collection agents purchase the produce from farmers' doorstep or from the field itself and then take the produce to the auction yard where commission agents sell it to the wholesaler
- **Channel 6:** The produce which comes from the outside state is delivered to Howrah or Sealdah and collection agents take it to the auction yard. Commission agent auction it to the wholesaler and it is further sold to retailers in different markets
- **Channel -7:** The produce from near by districts is directly procured by collection agents and is auctioned at the auction yard to the wholesalers.

5) MAHARASHTRA

In Maharashtra, the following major marketing channels are found. However the concept of farm fresh whereby sale to consumer is made from super markets / big Malls is also taking shape.

- **Channel-1:** Farmers- Retailers- Consumers

- **Channel-2:** Farmers- Village merchants-Commission agents Wholesalers-Hawkers/vendors- Consumers
- **Channel-3:** Farmers-Wholesalers- Retailers- Consumers
- **Channel-4:** Farmers-Wholesalers- Hawkers / Vendors – Consumers
- **Channel-5:** Farmers-Commission agents- -Hawkers/vendors-Consumers
- **Channel-6:** Farmers - Collecting agents - Farm Fresh /vegetable super markets/ malls - Consumers

(8) Market Cost (Market Fee / Commission Fee / Transportation Cost)

In market yard, farmers bring their products to CA. Each CA carries out auction of farmers' produces with buyers on behalf of farmers so that buyers will be able to buy at an auction at a higher price and they have to pay CA 5% of commission fee as well as 1% of market fee. Meanwhile, CA pays the money to farmers and does not give any charge to farmers. In general, farmers can select any CA by considering their performance. In some areas such as Kullu, Lahaul & Spiti, Shimla, etc., farmers, who cultivate peas, potatoes, and apples, organize their cooperative (growers' society), in order to hold certain bargaining transporters as well as CA. Particularly Lahaul Potato Growers Co-op. marketing cum Processing Society Ltd., which is a kind of farmers' cooperative stationed in Lahaul & Spiti District, has promoted an agricultural processing business such as juice, jam, pickles, etc. As some case, small traders called as mini traders directly procure vegetables from farmers and bring them to market yards.

(9) Market Information System

Currently market information in the H.P. is disseminated through various media such as radio, newspaper, internet, etc.

Major market information is market price and arrival quantity of crops. Market supervisor of APMC collects maximum and minimum daily market price as well as arrival quantity of major crops including vegetables and fruits from Commission Agents as shown below:

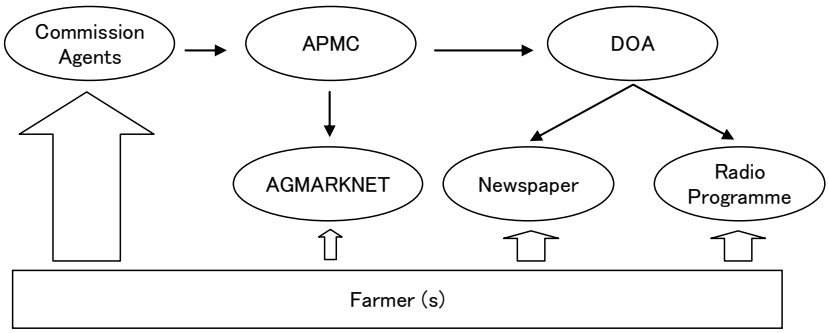


Fig. F-4.1 Distribution Flow of Market Price Information

1) AGMARKNET[1]

This AGMARKNET (Agriculture Marketing Information System Network) envisage linking all important agricultural produce markets in the Country, State Agricultural Marketing Board,

[1] AGMARKNET: http://agmarknet.nic.in/

State Government, and Directorate of Marketing & Inspection, Delhi for effective information exchange. Available market information concerning crop diversification, which is available in AGMARKNET, is shown as follows:

Table F-4.1 Available Information in AGMARKNET

Items	Remarks
i. Market Price - Weekly / Monthly - Market-wise - State / District-wise	- Average price is available. - There is some difference compared with similar information from Marketing Board or APMC.
ii. Arrival Quantity - Weekly / Monthly - Market-wise - State / District-wise	- Weekly and monthly arrival quantity is not same as the information from APMC.
iii. Daily price	- Maximum and Minimum daily price from some market yards, not from all market yards
iv. Outline of APMC	- Out of 39 market yards, only 7 market yards (Bilaspur, Hamirpur, Nadaun (Hamirpur), Paonta Sahib, Shimla, Solan, Una) are available. - Information is not sufficient.

2) Newspaper

Each APMC provide local newspaper daily market information. Farmers can check market rate of the previous day. However it is difficult to apply the information for decision of shipping place.

3) Radio

Directorate of Agriculture provides the daily information of market rate to Radio. Listeners can get price information on the same day. However price information, which is broadcasted, is limited. Namely DOA will give APMC-wise price information for 21 kinds of crops to the radio station. During its air time, the information to be broadcasted is around for 10 kinds of products. Further the information is one-sidedly broadcasted and it's only one time broadcasting. So it is not easy for listeners to use for their business, and it is not so attractive.

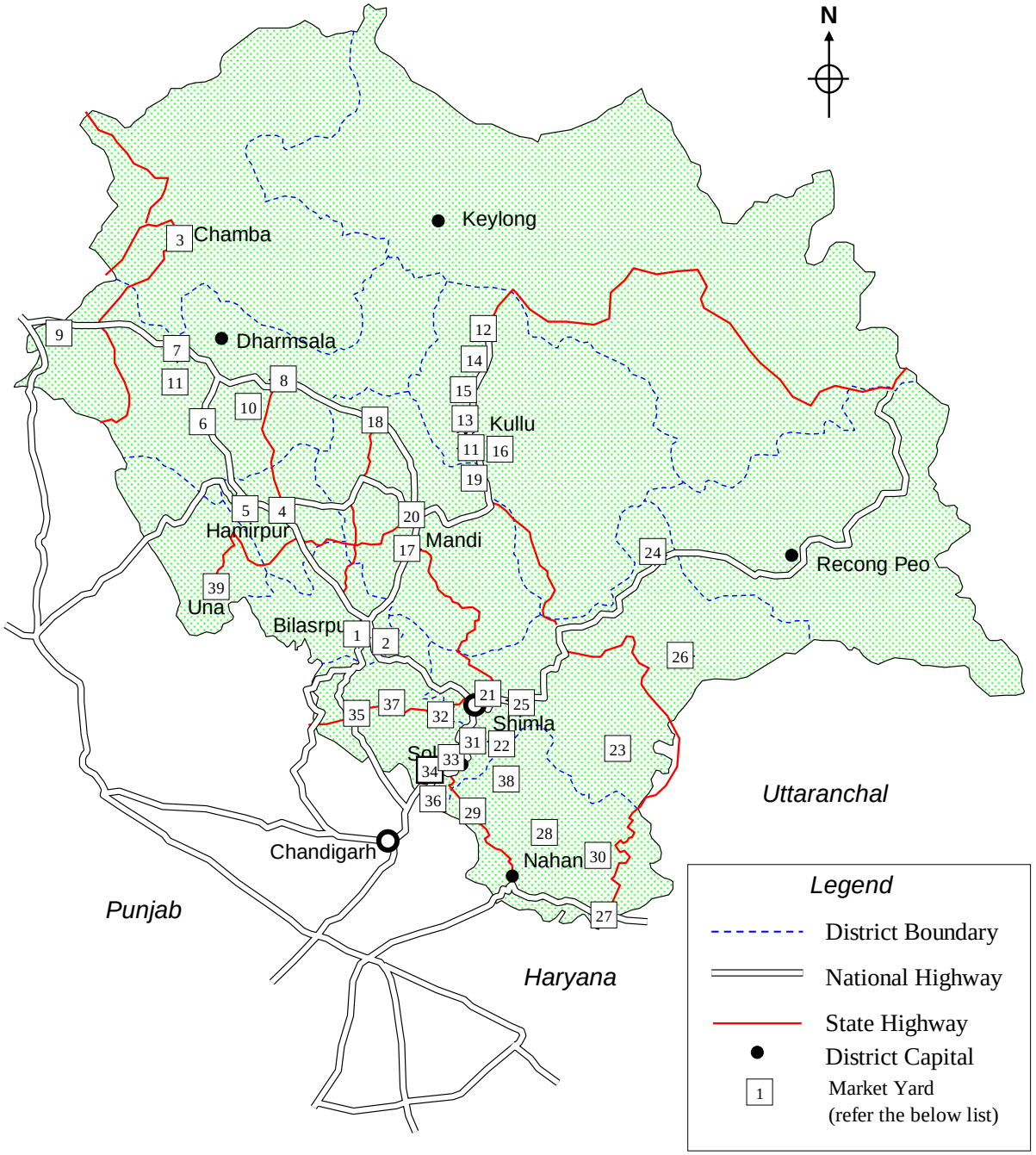
F-4 Market Yard

Currently, there are 39 market yards including regulated and sub-market yards in the State as shown in Table F-4.2 and those locations are shown in Fig. F-4.1.

Table F-4.2 List of Existing Market Yards (as of Sep 2008)

APMC	Market Yard		District	Tehsil	Category	Year of Establishme	Remarks
1 Bilaspur	1.1 Bilaspur	1	Bilaspur	Bipaspur Sadar	RMY	2002	
	1.2 Namhol	2		Bipaspur Sadar	SM	2001	seasonal operation
2 Chamba	2.1 Chamba	3	Chamba	Chamba	RMY	2002	
3 Hamirpur	3.1 Dosarka (Hamirpur)	4	Hamirpur	Hamirpur	RMY	1987	
	3.2 Naduan	5		Naduan	SM	2002	
4 Kangra	4.1 Kangra	6	Kangra	Kangra	RMY	1981	
	4.2 Baijnath	7		Baijnath	SM	1989	
	4.3 Palampur	8		Palampur	private	1987	
	4.4 Jassur	9		Nurpur	SM	1984	
	4.5 Nagrota Bagwan	10		Kangra	SM	1982	
5 Kullu and L & Spiti	5.1 Bhuntar	11	Kullu	Kullu	RMY	1992	
	5.2 Chauri Bihal	12		Manali	SM	1978	seasonal opearation (May to Nov)
	5.3 Kullu	13		Kullu	SM	1986	
	5.4 Patilikuhal	14		Manali	SM	1995	seasonal operation (Jun to Oct)
	5.5 Bandrol	15		Kullu	SM	2001	seasonal operation (May to Oct)
	5.6 Banjar	16		Banjar	SM	2007	seasonal operation (May to Oct)
6 Mandi at Dhanotu	6.1 Dhanotu	17	Mandi	Sundanagar	RMY	2002	
	6.2 Jogindarnagar	18		Jogindarnagar	SM	2003	
	6.3 Takoli	19		Sadar Mandi	SM	1998	seasonal operation
	6.4 Mandi	20		Sadar Mandi	SM	na	
7 Shimla and Kinnaur	7.1 Dhalli (Shimla)	21	Shimla	S. Rural	RMY	1994	seasonal operation (Mar. to Nov.)
	7.2 Koti	22		S. Rural	SM	2000	seasonal operation, function not well due to link road
	7.3 Nerva	23		Chopal	SM	2006	seasonal operation
	7.4 Rampur	24		Rampur	SM	2001	
	7.5 Theog	25		Theog	SM	1982	seasonal operation
	7.6 Rohroo	26		Rohroo	SM	2007	
8 Simour	8.1 Paonta Sahib	27	Simour	Paonta Sahib	RMY	1997	
	8.2 Dadahu	28		Renuke	SM	1984	
	8.3 Sarahan	29		Pachhad	SM	2001	
	8.4 Bagthan	30		Nohra	SM	2007	
9 Solan	9.1 Solan	31	Solan	Solan	RMY	2002	
	9.2 Banalgi	32		Kasauli	SM	2002	seasonal operation
	9.3 Chakki ka mour	33		Kasauli	SM	1978	seasonal operation
	9.4 Dharmpur	34		Kasauli	SM	2001	seasonal operation
	9.5 Nalagarh	35		Nalagarh	SM	1980	seasonal, mainly for paddy, wheat, pulses,
	9.6 Parwanoo	36		Kasauli	SM	1987	Terminal Market Yard, mainly for apple
	9.7 Ramshahar	37		Ramshahar	SM	1988	seasonal operation
	9.8 Rajgarh	38	Sirmour	Rajgarh	SM	2001	seasonal operation
10 Una	10.1 Una	39	Una	Una	RMY	1987	

Note) RMY: Regulated Market Yard, SM: Sub-Market Yard
Source) Himachal Pradesh State Agricultural Marketing Board and Agricultural Produce Marketing Committees (APMC), 2008



District		Market Yard
Bilaspur	1	Bilaspur
	2	Namhol
Chamba	3	Chamba
Hamirpur	4	Hamirpur
	5	Naduan
Kangra	6	Kangra
	7	Baijnath
	8	Palampur
	9	Jassur
	10	Nagrota Bagwan
Kullu and L & Spiti	11	Bhuntar
	12	Chauri Bihal
	13	Kullu

District		Market Yard
Kullu and L & Spiti	14	Patilikuhal
	15	Bandrol
	16	Banjar
Mandi at Dhanotu	17	Dhanotu
	18	Jogindarnagar
	19	Takoli
	20	Mandi
Shimla and Kinnaur	21	Dhalli
	22	Koti
	23	Nerva
	24	Rampur
	25	Theog
	26	Rohroo

District		Market Yard
Simour	27	Paonta Sahib
	28	Dadahu
	29	Sarahan
	30	Bagthan
Solan	31	Solan
	32	Banalgi
	33	Chakki ka mour
	34	Dharmpur
	35	Nalagarh
	36	Parwanoo
	37	Ramshahar
	38	Rajgarh
Una	39	Una

Remark) In December 2008, Jawala Ji. (Kangra), Kkhegsu (Kullu and L&Spiti), Nahan (Sirmour), and Santoshgrah (Una) are newly functional.

Fig. F-4.2 Locations of Existing Market Yards in the State of Himachal Pradesh

Market yard is categorized into Regulated Market Yard and Sub-Market Yard. The office of APMC is established in Regulated Market Yard. Meanwhile Sub-market yard has no office for APMC. Market supervisor is stationed in sub-market yard. There are some sub-market yards, in which no market supervisor is stationed due to staff shortage. Facilities in market yards are generally old, narrow, and crowded. Furthermore, basic infrastructures such as toilet, garbage pit, loading and unloading space, etc. are insufficient.

Some market yards have functioned seasonally for transaction of vegetables and fruits. Some seasonable market yards have permanent facilities such as auction platform, etc. As shown in the photos, there are no activities in off-season, but they are lively with auction activities in on-season. For instance, Patlikohul sub-market yard is used as market yard for apple. Namely this market yard is lively during the peak season from August to October.

Date: January 15, 2008
Place: Patlikohul Market Yard
Subject: There is no transaction in January.

Date: September 6, 2008
Place: Patlikohul Market Yard
Subject: Apples are transacted during the period from June to September.

Some seasonal sub-market yard has no permanent facilities, then commission agents prepare their tents during the period of dealing seasonal agricultural products such as apple as shown in the right photo.

In general, there are no basic infrastructure such as toilet, garbage pit, office, restaurant, etc. at seasonal sub-market yard. Features in regulated market yard as well as sub-market yards are shown in Table F-4.3

Table F-4.3 Features of Regulated and Sub-Market Yards (1/8)

		Bilaspur		Chamba	Hamirpur
		Bilaspur	Namhol	Chamba	Dosarka
(i) Staff					
1 Secretary	no.	1		1	1
2 Assistant Secretary					
3 Market Supervisor	no.	1		1	1
4 Other staff	no.	15		11	13
5 Total	no.	17		13	15
(ii) Vehicle	no.				-
(iii) Lot area	m²	1167Sq.Ft		2.10 Bigha	3,450
(iv) Non-business day		Sunday			-
(v) Major Market season					
1 Vegetables	M to M	July to October	Sep to Jan	January to June	Jan to Jun
2 Fruits	M to M			January to June	Jan to Jun
(vi) Facilities and Serivces					
1 Newspapers for market rate		Yes		N0	Punjab Keseri Danik Jagran Amar Ujala
2 Information Notice Board / Electric	Yes or No	Yes		N0	Yes
3 Display Board	Yes or No	Yes		N0	No
4 Internet access to:					
- AGMARKNET	Yes or No	Yes		Yes	Yes
- Department of Agriculture	Yes or No	Yes		No	Yes
- Marketing Board	Yes or No	No		No	Yes
5 Are the prices displayed on the Notice Board?	Yes or No	Yes		No	Yes
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	Yes		No	Yes
7 Ancillary facilities					
- Computers	no	2		1	2
- Auction platform	m²	No	1	2	40
- Loading / Unloading	m²				200
- Parking	m²	No		1	150
- Grading and analysing laboratory	Yes or No	No		No	No
- Mechanical grader	Yes or No	No		No	Yes
- Rest house of farmers	Yes or No	Yes		Yes	Yes
- Bank	Yes or No	No		No	No
- Input/Sundry shops	Yes or No	Yes		No	No
- Canteen	Yes or No	Yes		No	No
- Toilet	Yes or No	Yes		Yes	Yes
- Post Office	Yes or No	No		No	No
- Ordinary storage	no and m²	Yes		No	No
- Cold storage	no and m²	No	Yes	No	No
8 Institutions					
- Commission agents		10		4	
No. of unions	no	No			-
Total CA	no	10		4	10
- Traders				2	
No. of unions	no	No			-
Total registered traders	no	No		2	14
- Outside Buyers	no	No			
- Petty buyers (retailers)	no				

Remarks)

1 : One computer set was supplied, but not functioned due to shortage of staff.*

Parking: Figure in parenthesis means the area for both loading/unloading and parking

Table F-4.3 Features of Regulated and Sub-Market Yards (2/8)

		Hamirpur	Kangra			
		Naduan	Kangra	Baijnath	Palampur	Jassur
(i) Staff						
1 Secretary	no.	-	1	-	-	-
2 Assistant Secretary			1			
3 Market Supervisor	no.	-	2	-	-	-
4 Other staff	no.	1	13	2	3	3
5 Total	no.	1	17	2	3	3
(ii) Vehicle	no.	-	1(Jeep type)			
(iii) Lot area	m²	2,020	4,289	5,359	3,807	10,816
(iv) Non-business day		-	2	2	2	2
(v) Major Market season						
1 Vegetables	M to M	Jan to Jun	April to June	April to June	April to June	April to June
2 Fruits	M to M	Jan to Jun	Jan.to December	Jan.to Dec.	Jan.to Dec.	Jan.to Dec.
(vi) Facilities and Serivces						
1 Newspapers for market rate		Report to Dosarka	Amar (Jjala) Dirya Himachal Radio (Dharmashala)			
2 Information Notice Board / Electric	Yes or No	No	No	No	No	No
3 Display Board	Yes or No	No	No	No	No	No
4 Internet access to:						
- AGMARKNET	Yes or No	Yes	Yes	No	No	No
- Department of Agriculture	Yes or No	Yes	Yes	No	No	No
- Marketing Board	Yes or No	Yes	Yes	No	No	No
5 Are the prices displayed on the Notice Board?	Yes or No	Yes	No	No	No	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	Yes	No	No	No	No
7 Ancillary facilities						
- Computers	no	1	1			
- Auction platform	m²	50	300			
- Loading / Unloading	m²	500				
- Parking	m²	50				
- Grading and analysing laboratory	Yes or No	No	No	No	No	No
- Mechanical grader	Yes or No	Yes	No	No	No	No
- Rest house of farmers	Yes or No	No	Yes	Yes	No	No
- Bank	Yes or No	No	No	No	No	No
- Input/Sundry shops	Yes or No	No	No	No	No	No
- Canteen	Yes or No	No	Yes	Yes	Yes	Yes
- Toilet	Yes or No	Yes	Yes	Yes	Yes	Yes
- Post Office	Yes or No	No	No	No	No	No
- Ordinary storage	no and m²	No	No	No	No	No
- Cold storage	no and m²	No	No	No	No	No
8 Institutions						
- Commission agents						
No. of unions	no	-	-	-	-	-
Total CA	no	8	36	8	18	28
- Traders						
No. of unions	no	-	-	-	-	-
Total registered traders	no	8	10	2	8	15
- Outside Buyers	no					
- Petty buyers (retailers)	no					

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (3/8)

		Kangra	Kullu and Lahaul Spiti			
		Nagrota Bagwan	Bhuntar	Chauri Bihal	Kullu	Patlikhal
(i) Staff						
1 Secretary	no.	-	-	-	1	-
2 Assistant Secretary		-	-	-	-	-
3 Market Supervisor	no.	-	1	-	1	-
4 Other staff	no.	1	2	1	13	1
5 Total	no.	1	3	1	14	1
(ii) Vehicle	no.		-	-	1	-
(iii) Lot area	m²	4,228	4,000	10,000	12,000	5,000
(iv) Non-business day		2	Saturday	-	non	Sat
(v) Major Market season						
1 Vegetables	M to M	April to June	May - Oct	May - Nov	May - Sep	Jun - Oct
2 Fruits	M to M	Jan.to Dec.	Jun - Oct	Jun - Nov	Jun - Oct	Jun - Oct
(vi) Facilities and Serivces						
1 Newspapers for market rate			-	-	- (from 2008)	-
2 Information Notice Board / Electric	Yes or No	No	Yes	No	No	No
3 Display Board	Yes or No	No	No	No	No	No
4 Internet access to:						
- AGMARKNET	Yes or No	No	Yes	No	Yes	No
- Department of Agriculture	Yes or No	No	Yes	No	Yes	No
- Marketing Board	Yes or No	No	Yes	No	Yes	No
5 Are the prices displayed on the Notice Board?	Yes or No	No	Yes	No	No	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No	Yes	No	No	No
7 Ancillary facilities						
- Computers	no		1	-	3	-
- Auction platform	m²		1,200	temporary	300	156
- Loading / Unloading	m²		1,500	temporary	4,000	1,000
- Parking	m²		(1,500)	temporary	(4,000)	(1,000)
- Grading and analysing laboratory	Yes or No	No	No	No	No	No
- Mechanical grader	Yes or No	No	No	No	No	No
- Rest house of farmers	Yes or No	Yes	Yes	No	Yes	No
- Bank	Yes or No	No	No	No	No	No
- Input/Sundry shops	Yes or No	No	Yes	No	No	No
- Canteen	Yes or No	Yes	Yes	temporary	No	temporary
- Toilet	Yes or No	Yes	Yes	Yes	Yes	Yes
- Post Office	Yes or No	No	No	No	No	No
- Ordinary storage	no and m²	No	No	No	No	No
- Cold storage	no and m²	No	No	No	No	No
8 Institutions						
- Commission agents						
No. of unions	no	-	1	-	1	-
Total CA	no	8	37	4	12	22
- Traders						
No. of unions	no	-	-	-	-	-
Total registered traders	no	3	37	4	12	22
- Outside Buyers	no		22	2	4	9
- Petty buyers (retailers)	no		40		more than 30	12

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (4/8)

		Kullu and Lahaul Spiti		Mandi		
		Bandrol	Banjar	Dhanotu	Jogindar nagar	Takoli
(i) Staff						
1 Secretary	no.	-	-	1	-	-
2 Assistant Secretary		-	-	1	-	-
3 Market Supervisor	no.	-	-	1	-	1
4 Other staff	no.	1	1	6	1	2
5 Total	no.	1	1	9	1	3
(ii) Vehicle	no.	-	-	1	-	-
(iii) Lot area	m²	10,000		6,600	800	7,700
(iv) Non-business day		-		Sun	Sun	Sat
(v) Major Market season						
1 Vegetables	M to M	May - Oct	May - Oct	Mar to Oct	Mar to Oct	Mar to Sep
2 Fruits	M to M	Jun - Oct	Jun - Oct	May to Sep	May to Sep	Jun to Oct
(vi) Facilities and Serivces						
1 Newspapers for market rate		-	-	Punjab Kesri Amar Ujala Divya Himachal Dainik Jagaran	After a delay of one month, market rates are reported to APMC.	Reported to the APMC by tel.
2 Information Notice Board / Electric	Yes or No	No	No	Yes	No	Yes
3 Display Board	Yes or No	No	No	No	No	No
4 Internet access to:						
- AGMARKNET	Yes or No	No	No	Yes	No	No
- Department of Agriculture	Yes or No	No	No	Yes	No	No
- Marketing Board	Yes or No	No	No	Yes	No	No
5 Are the prices displayed on the Notice Board?	Yes or No	No	No	Yes	No	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No	No	Yes	No	No
7 Ancillary facilities						
- Computers	no	-	-	1	-	1
- Auction platform	m²	-	-	800	200	600
- Loading / Unloading	m²	1,500		200	100	200
- Parking	m²	(1,500)		(200)	(100)	(200)
- Grading and analysing laboratory	Yes or No	No	No	No	No	No
- Mechanical grader	Yes or No	No	No	No	No	No
- Rest house of farmers	Yes or No	No	No	Yes	No	No
- Bank	Yes or No	No	No	Yes	No	No
- Input/Sundry shops	Yes or No	No	No	Yes	No	Yes
- Canteen	Yes or No	temporary	temporary	Yes	No	No
- Toilet	Yes or No	temporary	temporary	Yes	Yes	Yes
- Post Office	Yes or No	No	No	No	No	No
- Ordinary storage	no and m²	No	No	No	No	No
- Cold storage	no and m²	No	No	No	No	No
8 Institutions						
- Commission agents						
No. of unions	no	-	-	1	-	1
Total CA	no	68	9	32	3	24
- Traders						
No. of unions	no	-	-		-	-
Total registered traders	no	68	9	32	3	24
- Outside Buyers	no	12	8	-	-	-
- Petty buyers (retailers)	no	35	20	200	50	125

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (5/8)

		Mandi	Shimla and Kinnaur				
		Mandi	Dhalli (Shimla)	Koti	Nerva	Rampur	Theog
(i) Staff							
1 Secretary	no.	-	1				
2 Assistant Secretary		-					
3 Market Supervisor	no.	1	3				
4 Other staff	no.	1	13	1			1
5 Total	no.	2	17	1			1
(ii) Vehicle	no.	-					
(iii) Lot area	m²	300	54.4Bigha	200			10,000
(iv) Non-business day		Sun	Sunday	Sun			Sun
(v) Major Market season							
1 Vegetables	M to M	Mar to Oct	April to July	Jun-Oct			Jun-Oct
2 Fruits	M to M	May to Sep	July to November	Jun-Oct			Jun-Oct
(vi) Facilities and Serivces							
1 Newspapers for market rate		Reported to the APMC by tel.	Yes				
2 Information Notice Board / Electric	Yes or No	No	No	No			No
3 Display Board	Yes or No	No	No	No			No
4 Internet access to:							
- AGMARKNET	Yes or No	No	Yes	No			No
- Department of Agriculture	Yes or No	No	Yes	No			No
- Marketing Board	Yes or No	No	Yes	No			No
5 Are the prices displayed on the Notice Board?	Yes or No	No	No	No			No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No	No	No			No
7 Ancillary facilities							
- Computers	no	1	3	No	1	1	1*
- Auction platform	m²	100	5000Sq.Ft.	200			400
- Loading / Unloading	m²	No					
- Parking	m²	No	No	No			800
- Grading and analysing laboratory	Yes or No	No	No	No			No
- Mechanical grader	Yes or No	No	No	No			No
- Rest house of farmers	Yes or No	No	Yes	Yes			Yes
- Bank	Yes or No	No	Yes	No			No
- Input/Sundry shops	Yes or No	No	Yes	No			No
- Canteen	Yes or No	No	Yes	No			No
- Toilet	Yes or No	Yes	Yes	Yes			Yes
- Post Office	Yes or No	No	No	No			No
- Ordinary storage	no and m²	No	No	Yes			Yes
- Cold storage	no and m²	No	No	No			No
8 Institutions							
- Commission agents							
No. of unions	no	1	2	-			1
Total CA	no	22	50	6			20
- Traders							
No. of unions	no	-	1	-			1
Total registered traders	no	22	6	1			22
- Outside Buyers	no	-					1
- Petty buyers (retailers)	no	150					

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (6/8)

		Simaur				Solan	
		Paonta Sahib	Dadahu	Sataun	Sarahan	Solan	Banalgi
(i) Staff							
1 Secretary	no.	1				1	-
2 Assistant Secretary						1	-
3 Market Supervisor	no.	2				1	-
4 Other staff	no.	9				9	1
5 Total	no.	12				12	1
(ii) Vehicle	no.					1	-
(iii) Lot area	㎡	34.17Bigha				10,000	800
(iv) Non-business day		Last Friday				Last Satuday	No
(v) Major Market season							
1 Vegetables	M to M	June to August				Apr - Nov	Jun - Oct
2 Fruits	M to M	June to July				May - Oct	May - Jun
(vi) Facilities and Serivces							
1 Newspapers for market rate		No				Diavia Himachal Punjab keshri Danik Bhasar	Daily report to Solan APMC by telephone
2 Information Notice Board / Electric	Yes or No	No				Yes	No
3 Display Board	Yes or No	No				No	No
4 Internet access to:							
- AGMARKNET	Yes or No	Yes				Yes	No
- Department of Agriculture	Yes or No	Yes				by Fax	No
- Marketing Board	Yes or No	Yes				by Fax	No
5 Are the prices displayed on the Notice Board?	Yes or No	No				Yes	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No				No	No
7 Ancillary facilities							
- Computers	no	3				6 (1 for internet	No
- Auction platform	㎡	4500Sq.mt /2500Sq.mt.				1,100	
- Loading / Unloading	㎡					9,000	
- Parking	㎡	No				(9,000)	
- Grading and analysing laboratory	Yes or No	No				No	No
- Mechanical grader	Yes or No	No				No	No
- Rest house of farmers	Yes or No	Yes				Yes	Yes
- Bank	Yes or No					No	No
- Input/Sundry shops	Yes or No					No	No
- Canteen	Yes or No	Yes				Yes	Yes
- Toilet	Yes or No	Yes				Yes	Yes
- Post Office	Yes or No					No	No
- Ordinary storage	no and ㎡	Yes				No	No
- Cold storage	no and ㎡					No	No
8 Institutions							
- Commission agents							
No. of unions	no					1	1
Total CA	no	13				50	6
- Traders							
No. of unions	no					-	-
Total registered traders	no	13				50	6
- Outside Buyers	no					200～400	
- Petty buyers (retailers)	no					included	included

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (7/8)

		Solan				
		Chakki Ka Mour	Dharampur	Nalagarh	Parwanoo	Rajgarh
(i) Staff						
1 Secretary	no.	-	-	-	-	-
2 Assistant Secretary		-	-	-	-	-
3 Market Supervisor	no.	-	-	1	1	1
4 Other staff	no.	1	1	1	2	1
5 Total	no.	1	1	2	3	2
(ii) Vehicle	no.	-	-	-	-	-
(iii) Lot area	m²	20,000	800	21,000	75,000	800
(iv) Non-business day		No	No	No	No	No
(v) Major Market season						
1 Vegetables	M to M	Jun - Oct	Jun - Oct	Sep - Dec	-	Apr - Nov
2 Fruits	M to M	May - Jun	May - Jun	-	Sep - Nov	-
(vi) Facilities and Serivces						
1 Newspapers for market rate		Daily report to Solan APMC by telephone	Daily report to Solan APMC by telephone	Daily report to Solan APMC by telephone	Daily report to Solan APMC by telephone	Daily report to Solan APMC by telephone
2 Information Notice Board / Electric	Yes or No	No	No	No	Yes	No
3 Display Board	Yes or No	No	No	No	No	No
4 Internet access to:						
- AGMARKNET	Yes or No	No	No	No	No	No
- Department of Agriculture	Yes or No	No	No	No	No	No
- Marketing Board	Yes or No	No	No	No	No	No
5 Are the prices displayed on the Notice Board?	Yes or No	No	No	No	Yes	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No	No	No	No	No
7 Ancillary facilities						
- Computers	no	No	No	No	No	No
- Auction platform	m²					
- Loading / Unloading	m²					
- Parking	m²					
- Grading and analysing laboratory	Yes or No	No	No	No	No	No
- Mechanical grader	Yes or No	No	No	No	No	No
- Rest house of farmers	Yes or No	Yes	Yes	No	Yes	Yes
- Bank	Yes or No	No	No	No	No	No
- Input/Sundry shops	Yes or No	Yes	No	No	No	No
- Canteen	Yes or No	Yes	Yes	No	Yes	No
- Toilet	Yes or No	Yes	Yes	Yes	Yes	Yes
- Post Office	Yes or No	No	No	No	No	No
- Ordinary storage	no and m²	No	No	No	No	No
- Cold storage	no and m²	No	No	No	No	No
8 Institutions						
- Commission agents						
No. of unions	no	1	1	1	1	1
Total CA	no	11	14	16	48	12
- Traders						
No. of unions	no	-	-	-	-	-
Total registered traders	no	11	14	16	48	12
- Outside Buyers	no	15	50～70	20	70	20
- Petty buyers (retailers)	no	included	included	included	included	included

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

Table F-4.3 Features of Regulated and Sub-Market Yards (8/8)

		Solan	Una
		Ramshahar	Una
(i) Staff			
1 Secretary	no.	-	1
2 Assistant Secretary		-	
3 Market Supervisor	no.	-	1
4 Other staff	no.	-	10
5 Total	no.	-	12
(ii) Vehicle	no.	-	
(iii) Lot area	m²	2,400	25 kanal 1 marla
(iv) Non-business day		No	2
(v) Major Market season			
1 Vegetables	M to M	-	April to June; Oct.to Mar.
2 Fruits	M to M	May - Aug	January to December
(vi) Facilities and Serivces			
1 Newspapers for market rate		-	Yes
2 Information Notice Board / Electric	Yes or No	No	Yes
3 Display Board	Yes or No	No	No
4 Internet access to:			
- AGMARKNET	Yes or No	No	Yes
- Department of Agriculture	Yes or No	No	Yes
- Marketing Board	Yes or No	No	Yes
5 Are the prices displayed on the Notice Board?	Yes or No	No	No
6 Are the producers able to read the information displayed on the Notice Board?	Yes or No	No	No
7 Ancillary facilities			
- Computers	no	No	1
- Auction platform	m²		
- Loading / Unloading	m²		
- Parking	m²		
- Grading and analysing laboratory	Yes or No	No	No
- Mechanical grader	Yes or No	No	No
- Rest house of farmers	Yes or No	Yes	Yes
- Bank	Yes or No	No	No
- Input/Sundry shops	Yes or No	No	No
- Canteen	Yes or No	No	No
- Toilet	Yes or No	Yes	Yes
- Post Office	Yes or No	No	No
- Ordinary storage	no and m²	No	No
- Cold storage	no and m²	No	No
8 Institutions			
- Commission agents			
No. of unions	no		26
Total CA	no		1
- Traders			
No. of unions	no		No
Total registered traders	no		No
- Outside Buyers	no		No
- Petty buyers (retailers)	no	included	

Remarks)

1 : One computer set was supplied, but not functio*

Parking: Figure in parenthesis means the area for b

F-5 Arrival Quantity and Wholesale Price of Vegetables

F-5.1 Arrival Quantity

Arrival quantity of total vegetables at all the market yards is estimated around 160,000 tons recently. Arrival quantity in three APMCs such as Solan, Shimla, Kullu, and Kangra occupy over 50% of total quantity.

Table F-5.1 Arrival Quantity of Vegetables and Fruits in Himachal Pradesh in the past 5 Years

APMC	Vegetables (ton)					Fruits (ton)				
	2001/02	2002/03	2003/04	2004/05	2005/06	2001/02	2002/03	2003/04	2004/05	2005/06
Bilaspur	-	1,368	1,571	1,477	2,632	-	595	599	444	3,312
Chamba	-	-	-	1,530	3,235	-	-	-	128	1,255
Hamirpur	10,778	12,762	11,881	10,431	9,708	3,486	3,409	2,446	3,468	2,265
Kangra	15,198	16,647	17,664	26,421	26,054	5,917	6,412	7,038	6,522	7,422
Kullu/Lahaul-Spiti	642	1,137	1,244	34,103	27,585	2,166	1,559	1,667	11,856	24,410
Mandi	13,310	11,016	11,526	9,264	13,567	5,356	5,817	5,517	6,009	4,603
Shimla/ Kinnaur	15,492	25,606	38,649	39,742	27,642	6,150	9,224	11,372	18,647	24,784
Sirmaur	1,244	1,592	2,387	5,119	6,589	616	592	1,087	1,058	6,557
Solan	2,640	22,295	24,145	29,053	35,185	24,857	23,878	32,110	47,191	21,779
Una	1,099	1,668	2,980	8,883	8,007	3,396	354	2,834	2,144	3,977
Total	60,403	94,091	112,047	166,023	160,204	51,944	51,840	64,670	97,467	100,364

Source: Himachal Pradesh Agricultural Marketing Board

Market yards function as wholesale markets to supply vegetables to consumers in the relevant districts as well as outside districts and the State. Particularly, Dhali regulated market yard in APMC Shimla is the biggest market yard, which function as export market to supply outside the State. Arrival quantity in APMC Hamirpur is only for local consumption, but not for outside Hamirpur District. Arrival quantities of major vegetables in 2006 and 2007 by APMC are shown in Fig. F-5.1 and F-5.2.

Vegetables transacted in APMCs are limited, that is around 10 to 15% out of total production has been marketed through APMCs in H.P. Remaining vegetables are directly marketed to other markets outside H.P.

Furthermore, the share of Himachal Pradesh fruits and vegetables in the main consumption market of Azadpur Wholesale Market is shown in Attachment-F-8 to F-16, and summarized as shown in Table F-5.2.

Table F-5.2 Share of Himachal Pradesh Fruits & Vegetables in Azadpur Wholesale Market

Year	Season	Potato		Tomato		Cauliflower		Green Peas	
		Arrival Quant. (ton)	Share (%)	Arrival Quant. (ton)	Share (%)	Arrival Quant. (ton)	Share (%)	Arrival Quant. (ton)	Share (%)
2004/05	Summer	9,627.5	9.1	3,387.1	8.7	10,486.0	92.9	2,734.3	78.3
	Rainy	50,138.5	30.2	14,055.9	29.5	4,396.3	24.4	6,129.2	86.9
	Winter	7,014.4	3.0	44.9	0.1	6.9	0.0	2,012.7	4.3
	Yearly	66,780.4	13.2	17,487.9	11.6	14,889.2	26.7	10,876.2	19.1
2005/06	Summer	6,316.4	6.0	518.0	1.3	8,645.3	83.4	5,718.0	76.5
	Rainy	26,793.9	17.1	17,232.6	33.9	5,010.4	25.9	6,591.6	88.2
	Winter	5,082.1	2.4	136.4	0.2	104.0	0.4	1,471.2	4.1
	Yearly	38,192.4	8.1	17,887.0	10.9	13,759.7	24.3	13,780.8	27.3
2006/07	Summer	7,405.0	7.6	1,010.2	3.2	11,180.3	84.5	5,699.9	95.8
	Rainy	21,273.8	13.9	14,495.2	32.8	3,969.2	21.0	5,954.7	96.4
	Winter	6,534.8	6.8	162.8	5.6	0.3	0.0	251.2	1.9
	Yearly	35,213.6	10.2	15,668.2	14.9	15,149.8	35.7	11,905.8	47.6

Attention: In 2006/07 winter, the data between Jan-Mar. 2007 was not included. / Source: Azadpur Wholesale Vegetables and Fruits Market

F-5.2 Wholesale Price

(1) Wholesale Price in the H.P.

Wholesale prices are decided by auction, which is carried out at wholesale market yard. Those wholesale prices in market yards have been checked and recorded by auction recorder, the staff of APMC. The auction recorder checks the selling price to buyers as wholesale price (or market rate). Then, each APMC record daily maximum and minimum prices of major crops. These wholesale prices are informed to AGMARKNET[1], Directorate of Agriculture, radio station, and major news papers on a daily basis. Generally fluctuation of market price is affected by arrival volume, however actual fluctuation of the price is varied depending on arrival volume, quantity, requirement of buyers, etc. For example, fluctuation patterns of monthly maximum and minimum market rates as well as arrival quantity of peas by APMC during the period of 2006 and 2007 are as shown in Attachment F-1 and F-2 (and Attachment F-3 to F-9 in detail). As shown in those figures, information on price and arrival quantity is quite limited, further fluctuation of wholesale price in each APMC is not properly linked with arrival quantity.

Daily records of wholesale price by market yards of APMCs are not complete due to shortage of computer sets as well as staff in each APMC. Therefore, information obtained from AGMARKNET is not practical for checking market price, thus required to be improved. As mentioned in Fig.F-4.1, the most reliable market source for farmers is Commission Agents. Meanwhile daily wholesale price in each market yard is relatively fluctuated, so it is difficult for users to predict future market. It is also required to add a function to show price trend for analyzing future market.

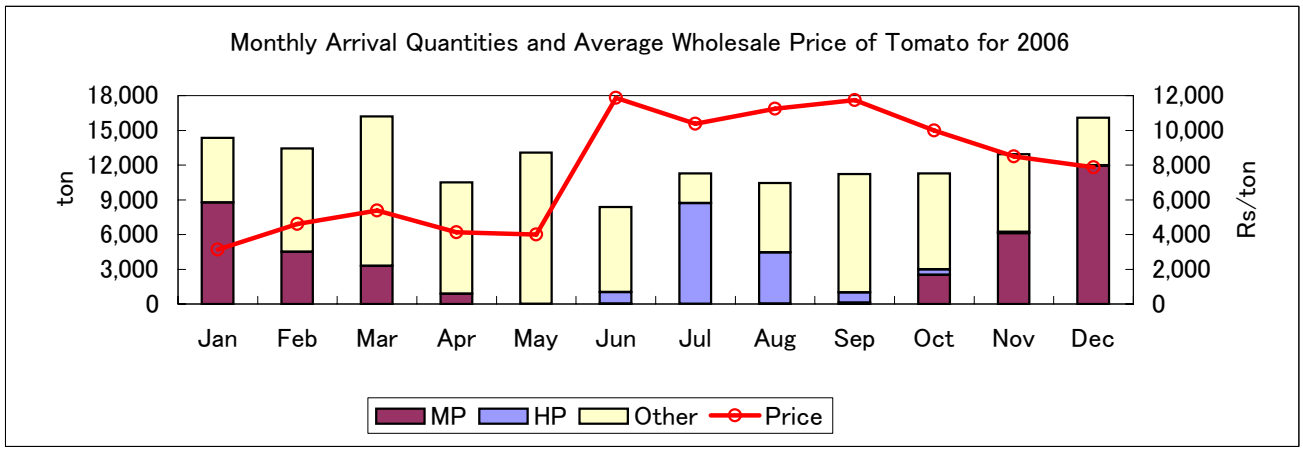
(2) Wholesale Price at Major Wholesale Markets outside the H.P.

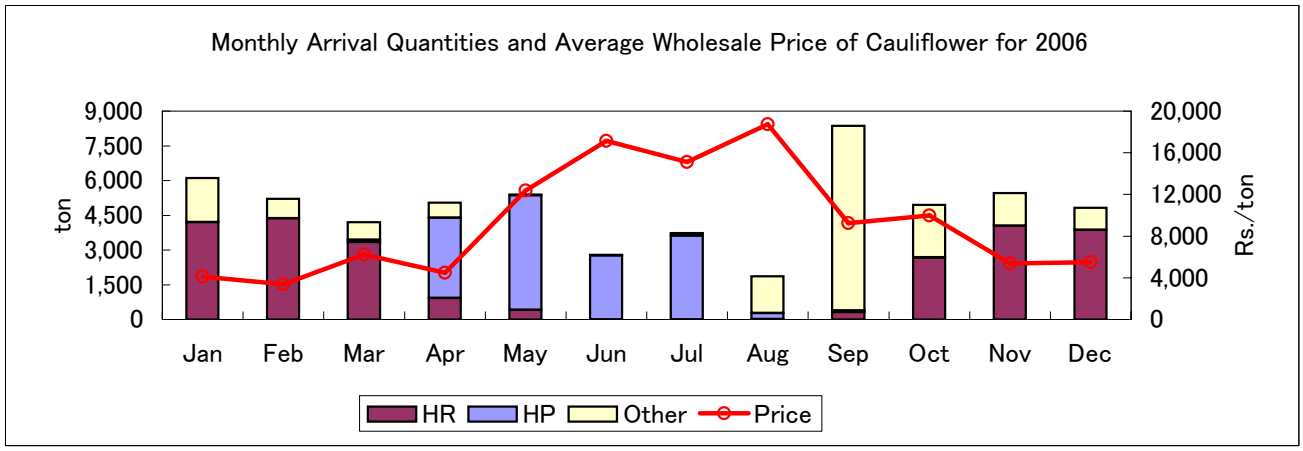
AGMARKNET provides daily, weekly, and monthly wholesale prices of several commodities in several wholesale market yards of the whole country. However those availabilities are also limited due to same reason mentioned above. It is not practical for farmers to get daily price information for market yards outside the state of Himachal Pradesh through internet service. In this current situation, daily and monthly information on wholesale price and arrival quantity are limitedly available in particular major wholesale market yards. Further those information is not available through internet service. Accordingly the most reliable information source concerning wholesale price must be commission agents in each market yard as well as the relevant APMCs.

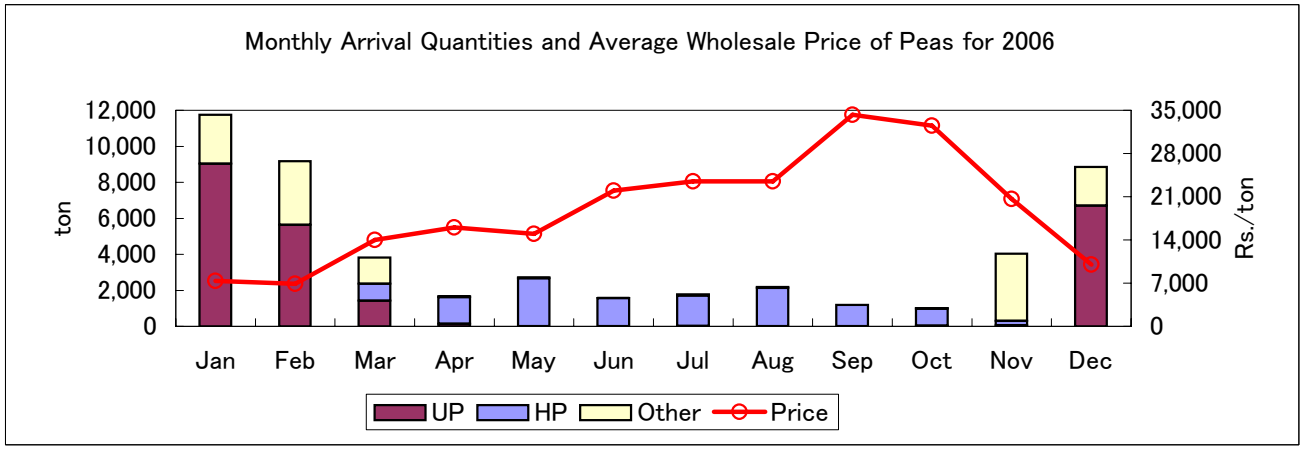
Fig. 5.1 to Fig. 5.3 show monthly arrival quantity and wholesale price in wholesale markets, which are located in big consuming areas outside H.P. such as Azadpur (Delhi), Ludhiana (Punjab), and Panipat (Haryana). Further share of commodities shipped from H.P. in each wholesale market is also shown in those figures.

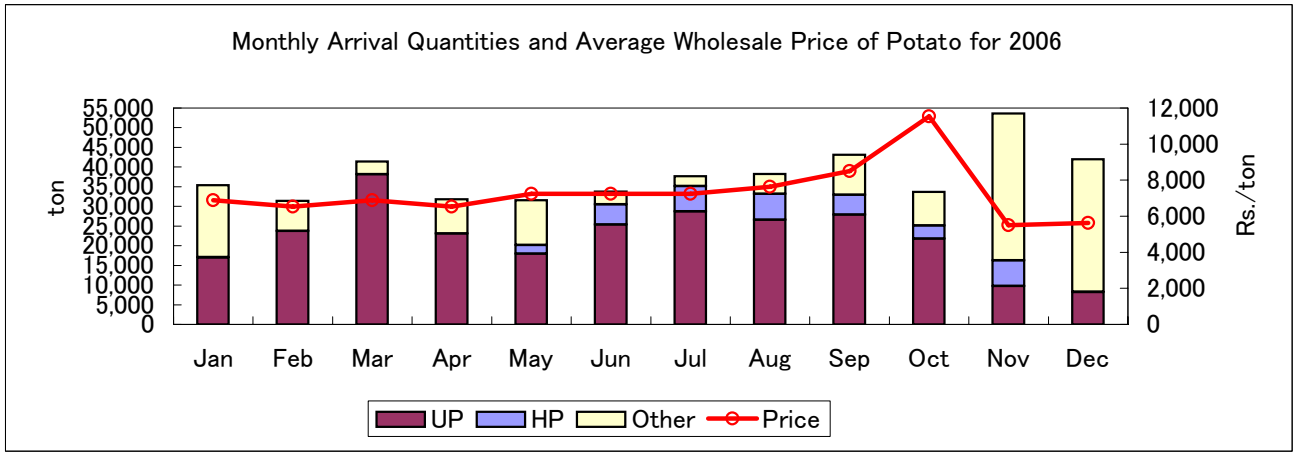
As shown in those figures, fluctuation of wholesale price is clearly linked with arrival quantity. Namely arrival quantity in off-season goes down, while wholesale price shoots up. Particularly this trend is remarkable for peas and cauliflower.

[1] Refer to http://agmarknet.nic.in/,



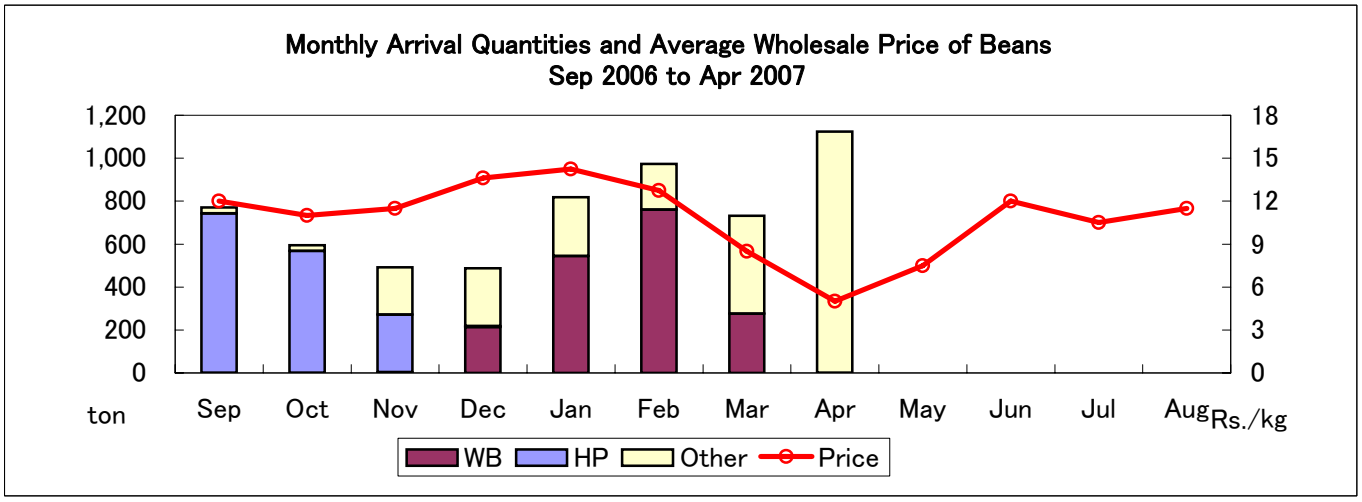


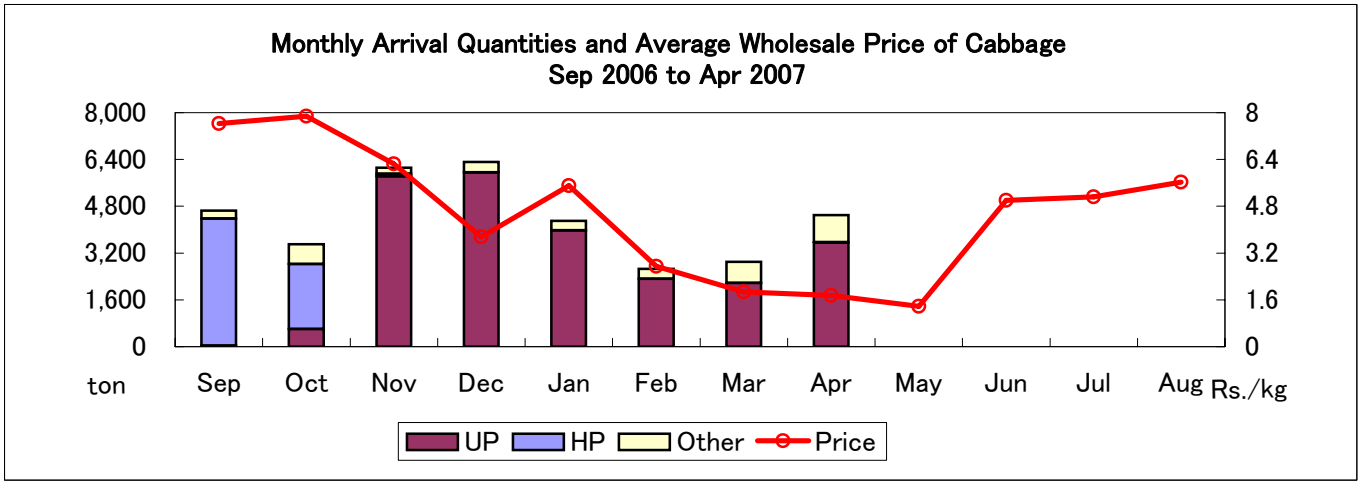


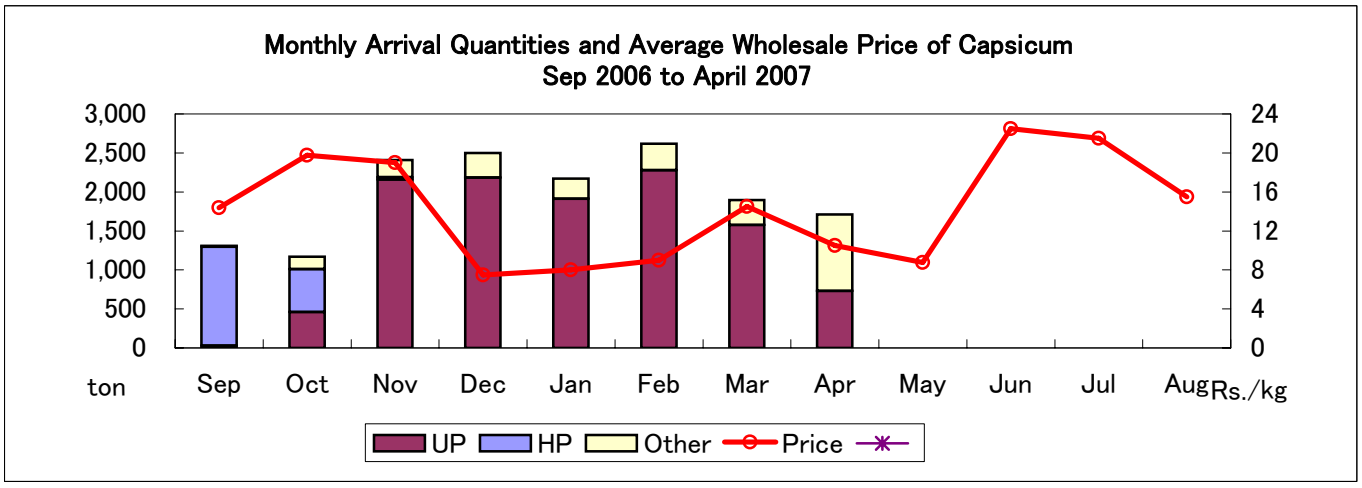


Source) Internal Data of Azadpur Wholesale Market, 2007

Fig. F-5.1 Monthly Arrival and Average Wholesale Price of Major Vegetables in Azadpur (1/2)

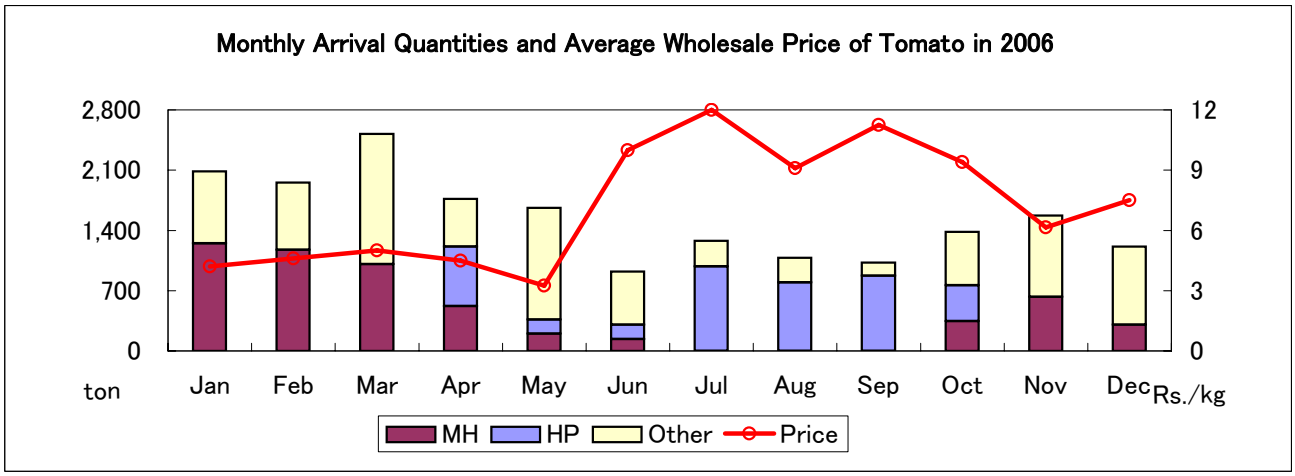


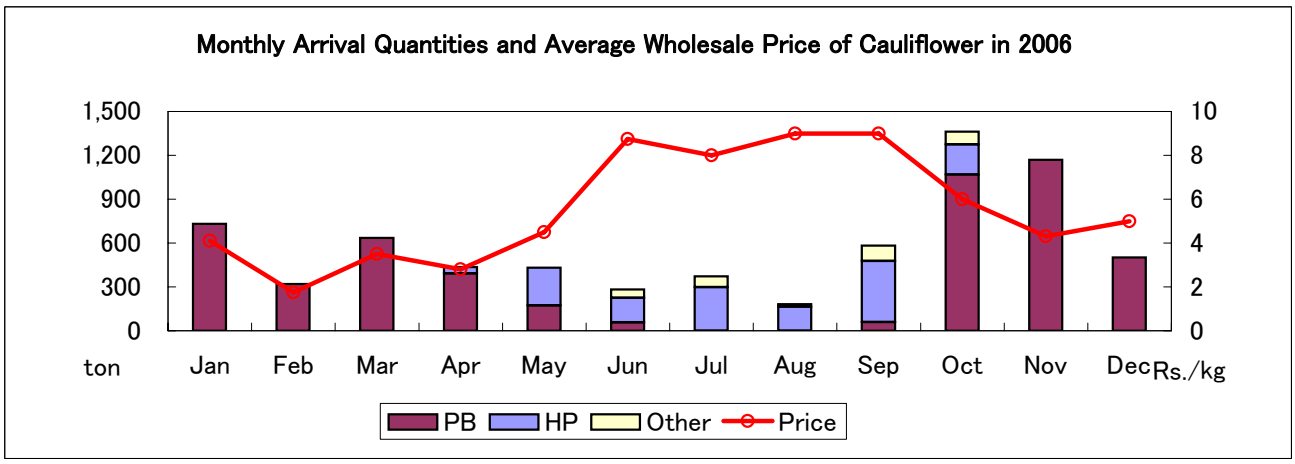


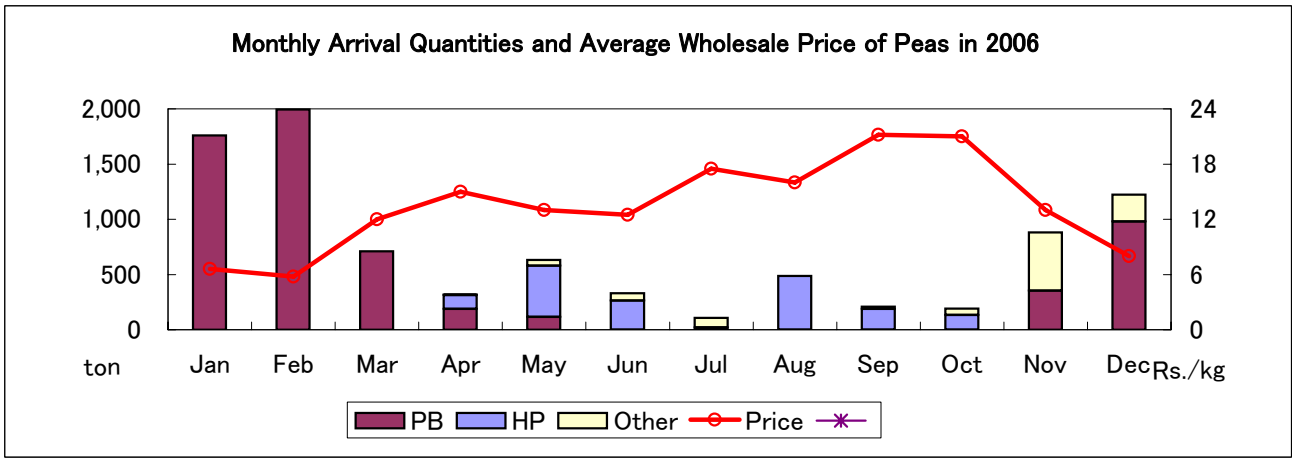


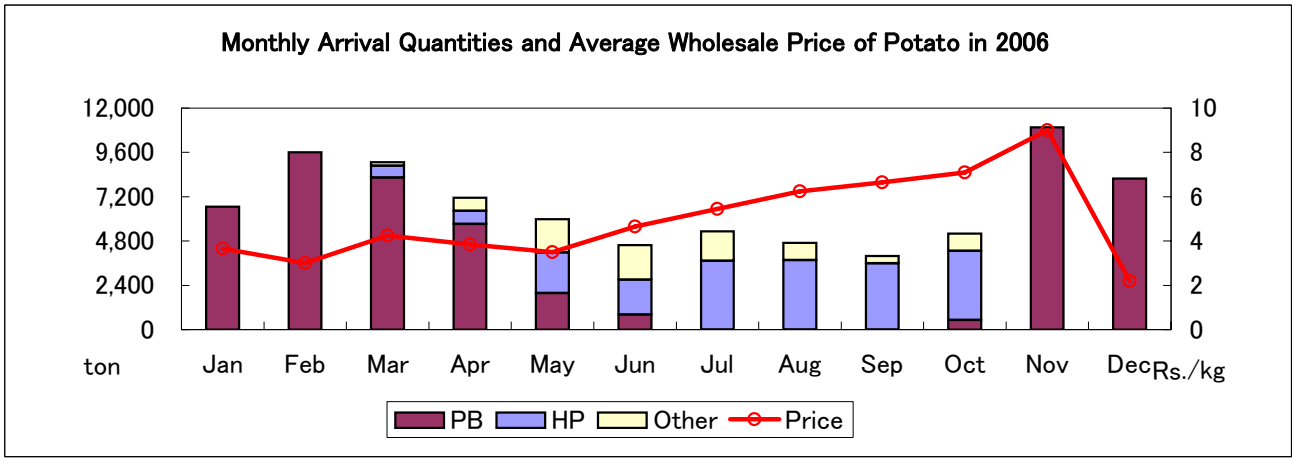
Note: HP: Himachal Pradesh, UP: Uttar Pradesh, WB: West Bengal
Source: Compiled by JICA Study Team

Fig. F-5.1 Monthly Arrival and Average Wholesale Price of Major Vegetables in Azadpur (2/2)



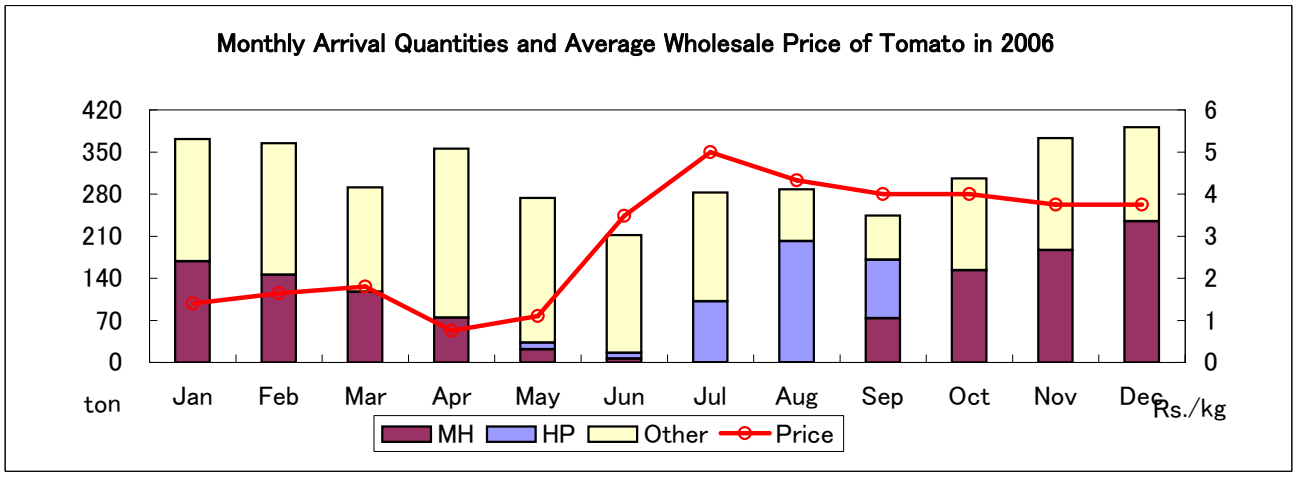


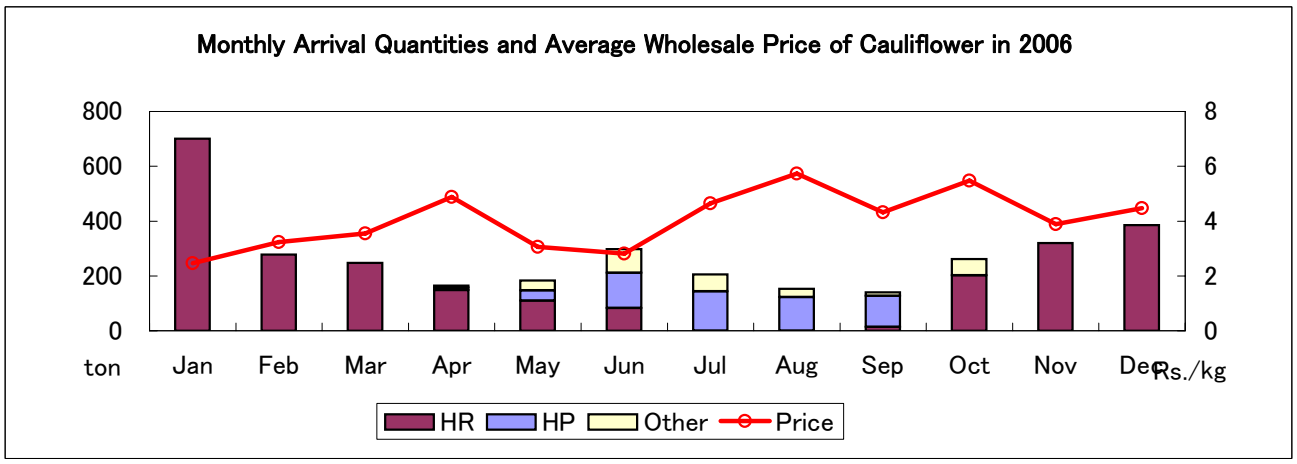


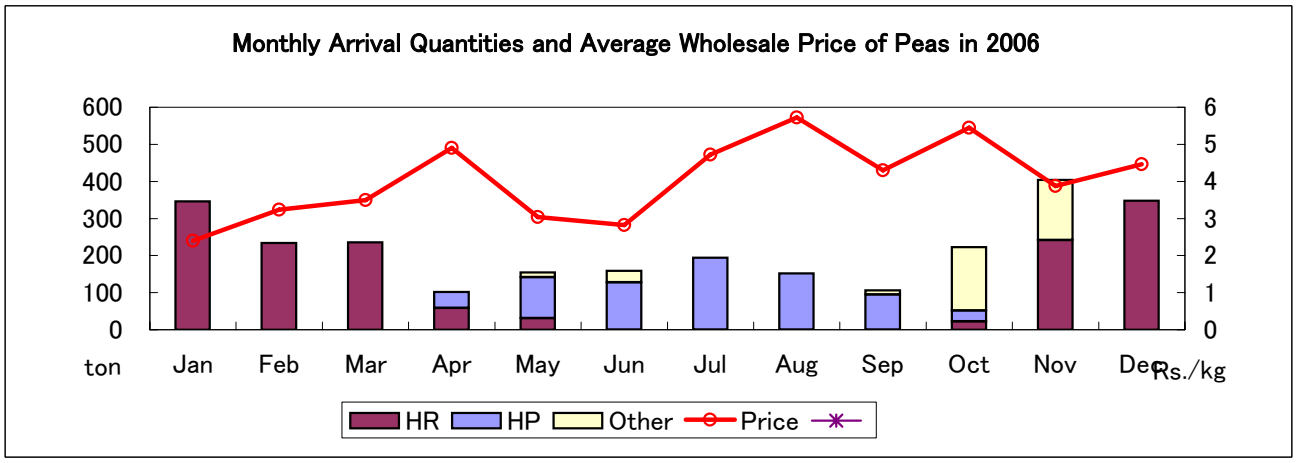


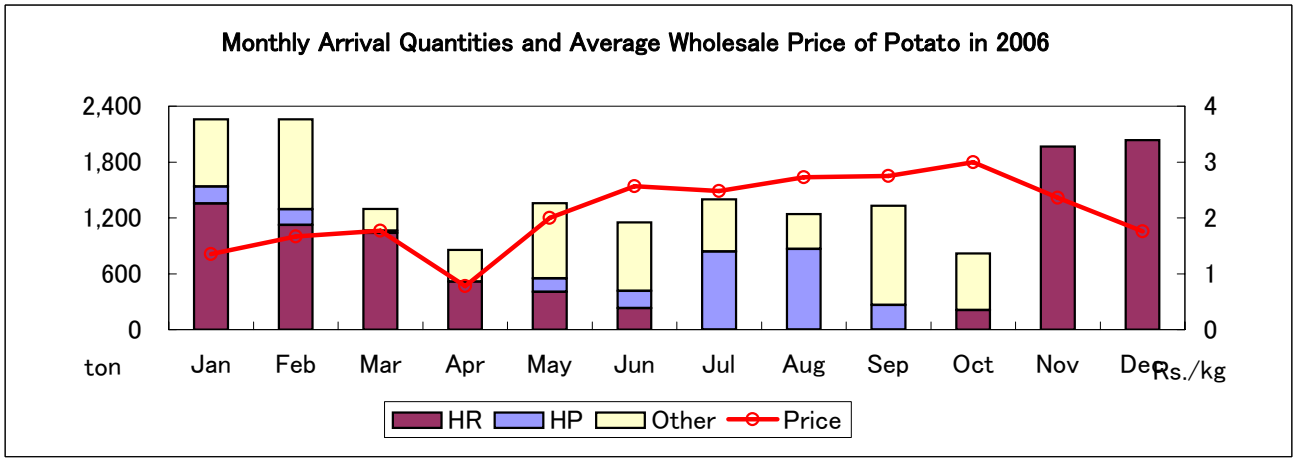
Note: HP: Himachal Pradesh, MH: Maharashtra, PB: Punjab, WB: West Bengal
Source: Compiled by JICA Study Team

Fig. F-5.2 Monthly Arrival and Average Wholesale Price of Major Vegetables in Ludhiana









Note: HP: Himachal Pradesh, MH: Maharashtra, HR: Haryana

Source: Compiled by JICA Study Team

Fig. F-5.3 Monthly Arrival and Average Wholesale Price of Major Vegetables in Panipat

F-6 Constraints and Countermeasures

Currently, Directorate of Agriculture and Marketing Board have periodically carried out extension activities concerning promotion of grading and packing activities for farmers. Farmers have been educated through routine extension activities as well as special programme such as awareness camps, field visits, etc. However, those activities have not really shown them importance and impact of grading and packing.

While some farmers have less motivation to improve their situation, because their produces are completely sold out even if no grading is done, and thus they are satisfied with their situation. Therefore they are not so willing to do grading and packing.

In the future they could face some competition with other states such as Uttarkand, Jamu & Kasimir, Maharashtra, Punjab, Haryana, Rajastan, etc. Accordingly it is strongly expected that Himachal farmers get more competitive power for agricultural commodities. So it is necessary to not only improve their quality but also create their brand or trademark for specified commodity.

In order to improve the current situation mentioned above, it is expected to implement the following activities.

(1) Trials of grading and packaging by farmers' groups
(2) Establishment of authorized standard for vegetables
(3) Branding and public relations campaign of vegetable and fruits to be produced in the state
(4) Strengthening market information system
(5) Enhancement of monitoring activities
(6) Mutual cooperation with Directorate of Agriculture, Directorate of Horticulture, and Marketing Board to create differentiated produces
(7) Staff training

Table F-6.1 Constraints and their Countermeasures in Marketing of Vegetable and Fruits

Present Conditions / Constraints	Potential / Opportunity	Future Strategy & Measures
1. It is not easy for farmers to get market price information, which is disseminated by AGMARKNET. 2.1 Data in AGMARKNET is not updated properly. 2.2 Data collection from each market yard is not enough. 2.3 Daily collection of price data is limited. 2.4 AGMARKNET is not known broadly in the Marketing Board 2.5 Data is not managed properly by the Board. 2.6 Data filing system is poor. 2.7 Data supplied from APMCs is not filed properly. 3.1 It is difficult for farmers to negotiate market price with	i. High vegetable demand in Delhi metropolitan & surrounding states, especially in the off-season ii. Increase of exotic vegetable demands because of increase of middle class people in Delhi metropolitan & urban area iii. There is a regular demand in the markets of the surrounding areas. iv. Private retailers start to buy directly from farmers because of deregulation and provide quality guidance to farmers	1. Improvement on O&M for system on data inputting 2. Capacity building of staff of Marketing Board and APMC 3. Promotion of organizing farmers

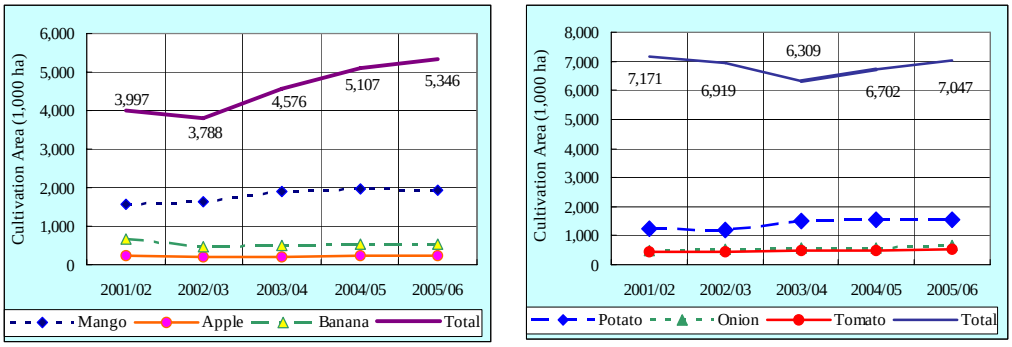
traders, because farmers have no organization. 3.2 Some farmers have too strong connection with traders. 4. Major farmers have no high consciousness concerning quality control and improvement. 5. Some market yards have no sufficient facilities such as office toilet, store, etc.		4.1 Preparation of quality standard 4.2 Preparation of brand 5. New construction of Market Yard

F-7 Current Demand of Horticulture Crops in India

F-7.1 Cultivated Area of Fruits and Vegetables

The changes of cultivation area of major fruits and vegetables in India (2001/02 ~ 20005/06) are shown in Table F-7.1 and Fig. F-7.1 below.

Fig. F-7.1 Trend of Fruits and Vegetables Cultivated Area



Fruits Vegetables

Table F-7.1 Cultivated Area of Fruits and Vegetables

Unit: 1,000 h

Items		2001/02	2002/03	2003/04	2004/05	2005/06
Vegetables	Potato	1,222	1,210	1,485	1,542	1,566
	Onion	500	530	554	594	658
	Tomato	460	460	503	498	522
	Others	4,989	4,719	3,767	4,068	4,291
	Total	7,171	6,919	6,309	6,702	7,047
Fruits	Mango	1,580	1,623	1,907	1,962	1,926
	Apple	240	193	201	231	236
	Banana	680	475	499	530	539
	Others	1,497	1,497	1,969	2,385	2,646
	Total	3,997	3,788	4,576	5,108	5,347

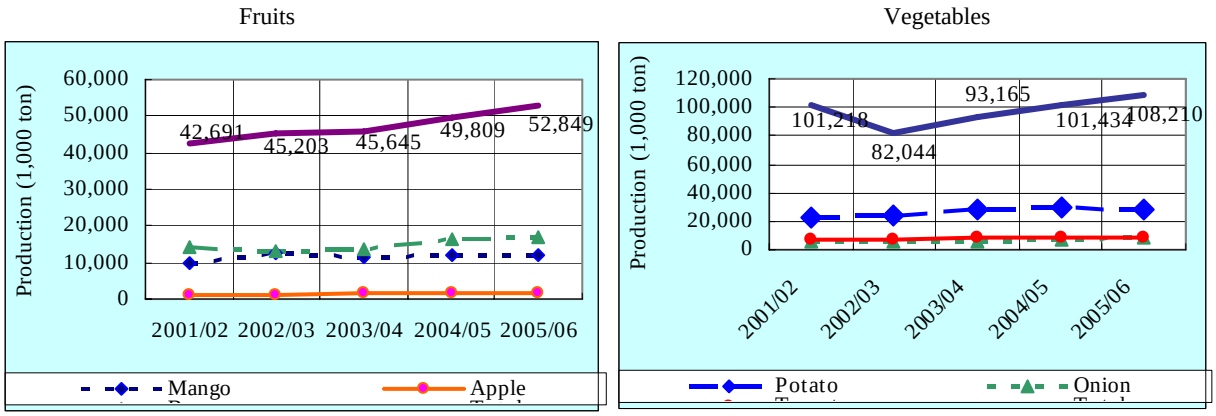
Source: India Horticultural Statistical Database

Fruits cultivation area is increasing from 4.0 million ha in 2001/02 to 5.3 million ha in 2005/06, and vegetable cultivation area is stable and around 7 million ha during 2001/02-2005/06

F-7.2 Production of Vegetables and Fruits

The changes in the production quantity of major vegetables and fruits in India for the five years period (2001/02 ~ 20005/06) are shown in Fig. F-7.2 and Table F-7.2. The fruit production has constantly increased for the last five years, while the vegetable production has recovered increasing trend since 2002/03 when affected by the sever drought condition. The leading States of fruits production are Maharastra, Andra Pradesh, Tamil Nadu, Karnataka and Gujarat. On the other hand, those of vegetable production are West Bengal, Uttar Pradesh, Bihar, Orissa and Tamil Nadu.

Fig. F-7.2 Change of Vegetables and Fruits Production



Source: India Horticultural Statistical Database

Table F-7.2 Change of Fruit and Vegetable Production

Unit: 1,000 tons

Items		2001/02	2002/03	2003/04	2004/05	2005/06
Vegetables	Potato	22,488	23,920	27,626	29,189	28,870
	Onion	5,250	5,450	6,268	7,515	8,233
	Tomato	7,240	7,460	8,126	8,638	9,064
	Others	66,240	58,124	51,145	56,093	61,043
	Total	101,218	82,044	93,165	101,434	108,210
Fruits	Mango	10,060	12,733	11,490	11,805	11,908
	Apple	1,230	1,348	1,522	1,738	1,842
	Banana	14,210	13,304	13,857	16,225	16,641
	Others	17,191	17,818	18,758	20,239	22,458
	Total	42,691	45,203	45,645	49,809	52,849

Source: India Crop Cultivation Statistics

F-7.3 Crop-wise Production in Fruits and Vegetables in Leading States

Based on the crop statistical data in 2004/05, the crop-wise leading states are listed up in Table F-7.3 for vegetables and Table F-7.4 for fruits.

Himachal Pradesh state is ranked second in apple in annual fruit production and peas in annual vegetable production. The State produces 30 % of apple production in India and 9 % of peas. Competitor of Himachal Pradesh state is Jammu & Kashmir for apple and Uttar Pradesh for peas.

Table F-7.3 Crop-wise Leading States of Vegetable Production in 2004/05

(Unit: Area:'000ha, Production: '000ton)

Crop	India		Firstly Ranked State			Secondly Ranked State			Thirdly Ranked State		
	Area	Production	State	Area	Production	State	Area	Production	State	Area	Production
Egg plant	543	9,031	WB	153	2,757	OR	128	1,854	BR	54	1,031
Cabbage	243	5,471	WB	75	1,983	OR	34	932	BR	37	578
Cauliflower	270	5,026	WB	66	1,666	BR	60	939	OR	45	639
Okra	369	3,658	WB	66	719	BR	56	714	OR	71	620
Peas	287	2,270	UP	139	1,147	MP	18	199	HP	16	177
Tomato	530	9,515	AP	84	1,602	OR	100	1,332	KA	45	1,188
Onion	694	9,228	MH	154	1,879	GJ	85	1,877	BR	50	1,012
Potato	1,520	28,697	UP	445	9,987	WB	321	7,107	BR	309	5,703
Sweet Potato	123	1,072	OR	47	394	UP	21	252	WB	26	208
Tapioca	245	7,839	TN	127	4,857	KL	91	2,568	AP	16	322

Note: AP; Andhra Pradesh, AS; Assam, BR; Bihar, GJ; Gujarat, HP; Himachal Pradesh, KA; Karnataka, KL; Kerala,, MH; Maharashtra, MP; Madhya Pradesh, OR; Orissa, PB; Punjab, TN; Tamil Nadu, UP; Uttar Pradesh, UR; Utranchal, and WB; West Bengal

Source: National Horticultural Board http://nhb.gov.in/

Table F-7.4 Crop-wise Leading States of Fruits Production in 2005/06

(Unit: Area:'000ha, Production: '000ton)

Crop	India		Firstly Ranked State			Secondly Ranked State			Thirdly Ranked State		
	Area	Production	State	Area	Production	State	Area	Production	State	Area	Production
Apple	227	1,814	JK	100	1,152	HP	89	540	UR	29	112
Banana	569	18,845	TN	95	4,648	MH	73	4,609	GJ	49	2,499
Citrus	744	6,154	AP	188	2,228	MH	249	2,469	PB	26	365
Grape	65	1,647	MH	45	1,275	KA	10	193	TN	3	85
Guava	167	1,737	MH	31	224	BR	28	199	UP	16	158
Litchi	63	392	BR	28	200	WB	8	75	AS	5	35
Mango	2,081	12,658	AP	460	3,306	UP	252	2,673	KA	125	1,237
Papaya	68	2,138	AP	11	871	GJ	8	323	WB	10	264
Pineapple	83	1,282	WB	13	379	AS	11	161	KA	3	135
Pomegranate	113	821	MH	91	594	KA	12	139	GJ	4	38
Sapota	140	1,114	MH	63	256	GJ	25	236	KA	23	250

Note: AP; Andhra Pradesh, AS; Assam, BR; Bihar, GJ; Gujarat, HP; Himachal Pradesh, KA; Karnataka, KL; Kerala,, MH; Maharashtra, MP; Madhya Pradesh, OR; Orissa, PB; Punjab, TN; Tamil Nadu, UP; Uttar Pradesh, UR; Utranchal, and WB; West Bengal

Source: National Horticultural Board http://nhb.gov.in/

Among others horticulture crops, spice crops were grown in 2.4 million ha throughout the country with the total production of 3.7 million tons in 2005/06. The top leading state is Rajastan, followed by Andra Pradesh, Kelara, Karnataka and Madhya Pradesh.

F-8 Future Projected Demands of Major Vegetables around the State

F-8.1 Demand Projection Method

(1) Demand Projection Formula

Demand of major vegetables was projected based on the demand function program prepared by Agro-economic Research Centre of Himachal Pradesh University. In 2006, prior to calculation for demand projection, the Centre conducted the interview survey targeted for marketers and consumers, in order to collect basic data on parameters to be required for the demand projection. This survey was carried out in the main consuming centres of Himachal vegetables that are Delhi, Chandigarh, and other four markets from neighbouring States such as Haryana and Punjab.

Calculation for demand projection was carried out, applying some parameters such as monthly per-capita expenditure, relative price changes, and population projection during the period from 2005/06 to 2024/25.

Economic concept of consumer demand refers to the quality of goods or services that consumers is willing and able to buy at a specified price. Household demand for vegetables depends on the size of the family, family's disposable income, etc. The manner of including the variables in the demand function was to convert household data into per capita consumption of various vegetables.

Formula for demand projection is summarized as follows:

$Y_p = (a_1 + b_1xX) \times c_1 + (a_2 + b_2xX) \times c_2 + (a_3 + b_3xX) \times c_3$

$Y_a = Y_p P$

Y_p : Annual demand per capita for vegetable

Y_a : Annual total demand for vegetable

P : Population

a_1、a_2、a_2 : intercept

b_1、b_2、b_3 : Regression coefficients for vegetables in summer, rainy, and winter

c_1、c_2、c_3 : Number of month for summer, rainy, and winter

X : Monthly Per-Capita Expenditure (MPCE)

(2) Parameters for Demand Projection Formula

Regarding demand projection formula described above, details of parameters are shown as follows:

1) Population (P)

Census of India has projected the population of whole country, based on the population census in 2001. Population projections for Delhi, Punjab, Chandigarh, and Haryana are shown in Attachment F-19.

2) Intercept (a_1、a_2、a_2), Regression Coefficient (b_1、b_2、b_3)

Based on the field survey carried out by the University, intercept and regression coefficient are available as shown in Attachment F-21.

3) Monthly per Capita Consumption Expenditure (MPCE, X)

Based on the results of the University's survey, Monthly per Capita Consumption Expenditure (MCPE) was projected as shown in Attachment F-20.

4) Number of month for Summer, Rainy, and Winter (c_1、c_2、c_3)

Period of summer, rainy, and winter, which are applied for demand projection, is as follows:

-Summer: 4 months

- Rainy: 3 months

-Winter: 5 months

Further relationship between those seasons and Kharif/Rabi are shown as follows:

Table F-8.1 Period of Summer, Rainy, Winter, Kharif, and Rabi

Month	Season for Demand Projection			MP, AP	
	Summer	Rainy	Winter	Kharif	Rabi
January			↓		↓
February			↓		↓
March	↑				↓
April	↓				↓
May	↓				↓
June	↓			↑	
July		↑		↓	
August		↓		↓	
September		↓		↓	
October			↑	↓	
November			↑		↑
December			↑		↑

F-8.2 Future Demand for Vegetables in Delhi and Surrounding States

Regarding demand projection, target markets of Himachal vegetables include the national capital Delhi and Chandigarh regions as well as two states that are Haryana and Punjab surrounding the State of Himachal Pradesh, where urbanization growth is occurring now. The future demand of principal vegetables in Delhi and other states mentioned above was estimated based on population, per-capita consumption expenditure, etc. The results of demand projection by markets are shown in Attachments F-22 to F-29, and thus summarized as shown in the below table.

Table F-8.2 Total Demand of Major Vegetables in Delhi and Surrounding States

(Unit: ton)

Year/Season		Strategic Vegetables				Other Commercial Vegetables			**Total**
		Cauliflower	Pea	Tomato	Potato	Cabbage	Capsicum	Beans	
2005 /06	Summer	83,340	87,027	298,422	411,372	100,825	73,743	42,457	1,097,186
	Rainy	65,044	73,984	243,985	440,382	74,839	59,733	47,620	1,005,587
	Winter	144,456	126,213	194,691	535,943	137,259	22,167	35,491	1,196,220
	Total	292,840	287,224	737,098	1,387,697	312,923	155,643	125,568	**3,298,993**
2017 /18	Summer	119,792	155,635	442,266	656,101	144,445	124,726	63,965	1,706,930
	Rainy	104,627	133,348	381,421	688,250	107,854	104,423	66,978	1,586,901
	Winter	198,858	198,730	329,418	882,634	201,341	34,666	50,202	1,895,849
	Total	423,277	487,713	1,153,105	2,226,985	453,640	263,815	181,145	**5,189,680**
	Increment	45%	70%	56%	60%	45%	70%	44%	**57%**
2022 /23	Summer	141,585	200,474	527,868	802,369	169,707	157,221	76,123	2,075,347
	Rainy	129,047	172,380	462,214	833,661	128,601	134,254	77,385	1,937,542
	Winter	229,424	240,065	410,220	1,086,307	237,094	42,717	58,399	2,304,226
	Total	500,056	612,919	1,400,302	2,722,337	535,402	334,192	211,907	**6,317,115**
	Increment	18%	26%	21%	22%	18%	27%	17%	**22%**

Remarks: Summer: March to June, Rainy: July to September, Winter: October to February
Note: Modified by the JICA study team, based on the result calculated by Agro-Economic Research Centre
Source: Agro-Economic Research Centre, Himachal Pradesh University, 2008 and modified by JICA study team

The cities of Mumbai and Kolkata which possess the city population of above 10 millions are estimated to have the vegetable demand equal to Delhi, and it is considered that both cities will be the future target markets of the Himachal Pradesh vegetables, taking into consideration of the progress of the long distance transportation network and the cold chain services.

F-8.3 Future Demand of Major Vegetables for Share of Himachal Pradesh

Based on the result of the interview survey for share of Himachal vegetables in major markets in Delhi, Punjab, Haryana, and Chandigarh carried by Agro-Economic Research Centre in 2005, future demand for Himachal vegetables was estimated in Attachment F-28, and summarized in the below table.

Table F-8.3 Demand Projection of Major Vegetables for Share of H.P.

(Unit: ton)

Year/Season		Strategic Vegetables				Other Commercial Vegetables			**Total**
		Cauliflower	Pea	Tomato	Potato	Cabbage	Capsicum	Beans	
2005/06	Summer	14,088	21,591	46,912	25,830	15,201	0	3,687	127,309
	Rainy	28,521	55,756	141,401	102,807	40,096	20,834	22,744	412,159
	Winter	0	2,035	183	3,632	1,844	393	1,065	9,152
	Total	42,609	79,382	188,496	132,269	57,141	21,227	27,496	**548,620**
2017/18	Summer	19,366	39,910	69,142	42,075	21,785	0	5,692	197,970
	Rainy	45,204	100,473	220,520	161,514	57,444	36,373	32,203	653,731
	Winter	0	3,586	293	6,308	3,244	565	1,506	15,502
	Total	64,570	143,969	289,955	209,897	82,473	36,938	39,401	**867,203**
	Increment	52%	81%	54%	59%	44%	74%	43%	**58%**
2022/23	Summer	22,388	52,189	82,375	51,933	25,596	0	6,841	241,322
	Rainy	55,384	129,862	266,964	196,031	68,299	46,745	37,298	800,583
	Winter	0	4,529	356	7,918	4,094	665	1,752	19,314
	Total	77,772	186,580	349,695	255,882	97,989	47,410	52,732	**1,061,219**
	Increment	20%	30%	21%	22%	19%	28%	34%	**22%**

Note: Modified by the JICA study team, based on the result calculated by Agro-Economic Research Centre
Remarks:
**1: Three seasons such as summer, rainy, and winter were used only for demand projection. The periods for three seasons are shown as follows: Summer: March to June, Rainy: July to September, Winter: October to February*
In this report, Kharif and Rabi are generally used for indicating agricultural season. The periods of Kharif and Rabi are shown as follows: Kharif: June to October, Rabi: November to May
**2: Provisionally, three seasons of summer, rainy, and winter could be linked for reference with two cultivation seasons of Kharif and Rabi as follows: Kharif includes Rainy season, Rabi includes Summer and Winter seasons.*
Source: Agro-Economic Research Centre, Himachal Pradesh University, 2008 and modified by JICA study team

F-8.4 Future Production to be Required in Himachal Pradesh

Based on the sharing demand of Himachal vegetables mentioned above, and also some assumption concerning local consumption in H.P. as well as marketing and transportation loss, net production to be required in H.P. is estimated in Attachment F-28 as shown in the below table.

Table F-8.4 Summary Production Projection to be additionally Required for Major Vegetables in H.P.

(Unit: ton)

Year/Season		Strategic Vegetables				Other Commercial Vegetables	**Total**
		Cauliflower	Pea	Tomato	Potato		
2017/18	Kharif	21,000	115,000	102,000	81,000	65,000	
	Rabi	7,000	42,000	1,000	1,000	7,000	
	Total	**28,000**	**157,000**	**103,000**	**82,000**	**61,000**	**431,000**
2022/23	Kharif	33,000	189,000	159,000	123,000	99,000	
	Rabi	10,000	75,000	17,000	15,000	13,000	
	Total	**43,000**	**264,000**	**176,000**	**138,000**	**103,000**	**724,000**

Remarks i. Kaharif season: June to October, Rabi season: November to May
ii. Increment in existing vegetable cultivated area is also considered
iii. The local consumptions in the State and transportation loss is assumed at approximately 20% of total products. The remaining vegetables of 80% are assumed to be marketed outside of the State (Delhi and Surrounding States 85% and other big consumption area 15%).

Source: Agro-Economic Research Centre, Himachal Pradesh University, 2008 and modified by JICA study team

F-8.5 Strategic Crops and Target Markets for Crop Diversification

(1) Strategic Crops

In examining marketing potential for increasing the production of strategic crops (potato, tomato, cauliflower and peas), a special attention should be paid to the variation of growing seasons for the respective crops in the State according to:

1) Different agro-climatic conditions,
2) Maximum potential of crop yield,
3) Possibility of maximizing crop profitability by shifting crop planting as well as rotational cropping,
4) Harvesting times in order to match with the highest market price period, and
5) Introduction of exotic vegetables

Major vegetables grown in Himachal Pradesh are potato, tomato, cauliflower and peas. Also, these crops are the main trading crops in Azadpur wholesale market in Delhi as well as other markets in Punjab and Haryana States. From the farmers' point of view, however, they commonly prefer multiple cropping of several crops to monoculture of a specific crop to reduce risks born from changes in climate and market situation as well as outbreak of pest and diseases.

In this regard, these four major crops are to be selected as the strategic crop for the districts where the suitability for crop growth is secured, and further multiple cropping patterns should be established in combination with other minor vegetables and food grain crops according to local conditions including micro-climate, irrigation potential and so on.

Moreover, exotic vegetables such as broccoli, red cabbage, lettuce, asparagus, celery, Swiss chard, parsley, Brussels sprouts, paprika, Chinese cabbage, etc. have been gradually disseminated in some big consuming areas that is Delhi, Mumbai (Mahasashtra), Kolkata (West Bengal), Chandigarh (Punjab),

etc. It is said that demand of these vegetables is still limited, further direct purchase of those vegetables from farmers, not through wholesale market, could be popular.

While in Himachal Pradesh, some aggressive farmers produce broccoli, paprika, etc. in Bilaspur, Solan, Kullu, Mandi, etc. They have directly sold their produces to buyers (wholesalers, retailers, hotels, etc.) in Delhi or other big consuming area.

Exotic Vegetables in Mandi District

Date: September 14, 2008
Place: Karsog, Mandi
Subject: Exotic vegetables (paprika, parsley, Lettuce) to be marketed to Delhi or Chandigarh

Date: September 14, 2008
Place: Karsog, Mandi
Subject: Selection and grading of paprika

Date: September 14, 2008
Place: Karsog, Mandi
Subject: Field of broccoli

District-wise data concerning the cropping season, crop production records, features of crop varieties and as well as monthly arrivals and wholesale price fluctuation of commodities in Azadpur wholesale market in Delhi are taken into account in terms of potato, tomato, cauliflower and peas with available data. The results of this examination are summarized below.

Strategic Crops	Future Production Potential
Potato	1) Almost throughout the year, potato forwarded from Uttar Pradesh, Punjab, and Haryana keeps the largest share in Azadpur wholesale market (Data provided by Azadpur APMC). 2) Potatoes grown in Zone-3 and Zone-4 can get a share to some extent in Delhi during the period from August to October. 3) There is also high possibility to produce seed potato in Zone-4 for the potato growers in the State.
Tomato	1) The existing cropping pattern of Zone-1, Zone-2, and Zone-3 is most suitable for forwarding tomato to Delhi during the period from June to December. 2) Promotion of growing recommended varieties in the same season can contribute to further increase in market share. 3) Tomato marketed from Maharashtra State is a strong competitor for tomatoes. But profit-taking is secured as the wholesale price in Delhi still maintain the highest level.
Cauliflower	1) For Himachal Pradesh cauliflower in Zone-3 and Zone-4, the most profitable marketing period is between May and October. 2) By introducing recommended varieties, harvesting time of cauliflower in Zone-1 and Zone-2 can be extended to this most profitable period.
Peas	1) During June to November, Himachal Pradesh peas can monopoly the demand in Delhi. 2) Within the Zone-2, Zone-3 and Zone-4 of State, each Zone can share this advantage by growing peas according to its suitable season. Zone-1has also this possibility when the demand of Delhi will drastically increase.

Source: JICA Study Team

(2) Target Markets

As shown in Section 2.16, it is quite sure that demand of vegetables shall significantly increase in the future. However these potential is not only for Himachal vegetables, but also for other states vegetables. In this case, it is proposed that the following points be considered for avoiding competitive situation with vegetables to be marketed from other states.

- Farmers should produce vegetables with pride and responsibility. Further farmers do grading and/or packing, but not by Commission Agents or traders. Consequently it is expected that Himachal vegetables be acknowledged as quality vegetables by consumers.
- Quality vegetables should be constantly supplied under the authorized standard.
- Brand / trademark of Himachal vegetables should be registered and applied.
- Consumers' request, preference, demand, etc. should be taken through antenna shop (or pilot shop) in big consuming area.

1) Big consuming market in megalopolises and local big towns

There will be a significant increase in demand for vegetables in the future, especially retail markets in megalopolises with an urban population of more than five millions. During the period of Rabi season, their market demands for vegetables are fulfilled by the leading States, in which there are huge vegetable producing areas. In due consideration of the current shares of leading States in vegetable markets of these big cities, Himachal vegetables have less chance to compete in any markets during the period from the plain between November and March. Instead of competing with mega-share holders, the selection of strategic vegetables should be focused on whether such crops can be marketed during the off-season people starting from April and lasting until October. Additionally several consuming areas in Punjab, Haryana, Chandigarh, etc. situated next to the state of Himachal Pradesh are also expected to increase local demand of vegetables.

2) Local markets in Himachal Pradesh

In the State of Himachal Pradesh, during the period from April to June as well as December and January, a lot of tourists visit and enjoy the best nature of the State. In the future, increased production of vegetables is expected to meet additional demand in the State. In other words, it is expected that tourists recognize good quality and taste of Himachal vegetables, and procure them preferably. Additionally, it is possible to get valuable information concerning their preference and promising crops.

3) Private retailers

It is said that private retailers such as Reliance Fresh, ADANI, ITC, etc. will proceed their actual business on vegetable in Himachal Pradesh. In such a case, farmers are strongly requested to cultivate their produces with pride and responsibility, thus improve quality of their vegetables.

F-8.6 Future Production to be Required in Master Plan and Action Plan

Meanwhile, the following table shows future target production at the stage of MP (2022/23) and AP (2017/18), considering the irrigation type such as full irrigation, life saving irrigation, and rainfed:

Table F-8.5 Production Projection to be additionally Required for Major Vegetables for Master Plan

(Unit: ton)

Year	Season	Type	Cauliflower	Peas	Tomato	Potato	Other Major Commercial Vegetables
2022 /23	Kharif	Full	26,000	153,000	129,000	100,000	71,000
		Life Saving	3,000	19,000	16,000	12,000	10,000
		Rainfed	4,000	17,000	14,000	11,000	9,000
		Total	**33,000**	**189,000**	**159,000**	**123,000**	**90,000**
	Rabi	Full	10,000	75,000	17,000	15,000	13,000
		Life Saving	0	0	0	0	0
		Rainfed	0	0	0	0	0
		Total	**10,000**	**75,000**	**17,000**	**15,000**	**13,000**
	All Seasons	Full	36,000	228,000	146,000	115,000	84,000
		Life Saving	3,000	19,000	16,000	12,000	10,000
		Rainfed	4,000	17,000	14,000	11,000	9,000
		Total	**43,000**	**264,000**	**176,000**	**138,000**	**103,000**

Remarks:
(1) see Attachment F-29.
(2) Other major commercial vegetables: such as cabbage, capsicum, and beans, which were considered for demand projection (see Table F-7.3)

Table F-8.6 Production Projection to be additionally Required for Major Vegetables for Action Plan

(Unit: ton)

Year	Season	Type	Cauliflower	Peas	Tomato	Potato	Other Major Commercial Vegetables
20017 /18	Kharif	Full	17,000	93,000	83,000	66,000	41,000
		Life Saving	2,000	12,000	10,000	8,000	7,000
		Rainfed	2,000	10,000	9,000	7,000	5,000
		Total	**21,000**	**115,000**	**102,000**	**81,000**	**53,000**
	Rabi	Full	7,000	42,000	1,000	1,000	7,000
		Life Saving	0	0	0	0	0
		Rainfed	0	0	0	0	0
		Total	**7,000**	**42,000**	**1,000**	**1,000**	**7,000**
	All Seasons	Full	24,000	135,000	84,000	67,000	48,000
		Life Saving	2,000	12,000	10,000	8,000	7,000
		Rainfed	2,000	10,000	9,000	7,000	5,000
		Total	**28,000**	**157,000**	**103,000**	**82,000**	**60,000**

Remarks:
(1) see Attachment F-29
(2) Other major commercial vegetables: such as cabbage, capsicum, and beans, which were considered for demand projection (see Table F-7.3)

F-8.7 Target Crop Conversion Area by Irrigation Type

In order to catch up this target production in 2017/18 and 2022/23, required cropped areas for respective strategic crops was preliminarily estimated on the basis of projected crop yields. Crop yields for Master Plan and Action plan have been estimated based on the potential yields of major vegetable crops estimated from the research data. The projected crop yields are given in Table F-8.7.

Table F-8.7 Target Yields of Major Vegetables for Action Plan and Master Plan

Crop	Current Yield 2005/06	Potential Yield Evaluated by Study Team	Target Yield for Planning	
			Action Plan 2017/18	Master Plan 2022/23
Peas	10.4 ton/ha	13.0 ton/ha	**10.4 ton/ha**	**10.4 ton/ha**
Potato	11.5 ton/ha	20.0 ton/ha	**14.7 ton/ha**	**16.0 ton/ha**
Tomato	30.0 ton/ha	40.0 ton/ha	**31.4 ton/ha**	**32.0 ton/ha**
Cauliflower	15.9 ton/ha	21.0 ton/ha	**16.5 ton/ha**	**16.8 ton/ha**
Maize	2.5 ton/ha	4.6 ton/ha	**4.0 ton/ha**	**4.0 ton/ha**
Rice	2.1 ton/ha	4.0 ton/ha	**3.5 ton/ha**	**3.5 ton/ha**
Wheat	1.9 ton/ha	3.5 ton/ha	**3.0 ton/ha**	**3.0 ton/ha**

Remarks :Target Yield for 2022-23 is estimated as approx. 80% of the Potential Yield
Source: JICA Study Team

Based of the above production projection and projected crop yields, target crop conversion areas up to 2017/18 for Action Plan and 2022/23 for Master Plan have been estimated as given below.

Table F-8.8 Target Crop Conversion Area

(Unit: ha)

Year	Irrigation Type	Cauli-flower	Peas	Tomato	Potato	Other Commercial Vegetables	Sub-Total	Other Vegetables	Total
2017/18	Full Irrigation	1,400	12,900	2,600	1,000	2,900	20,800	2,800	23,600
	Life Saving	200	1,300	400	0	500	2,400	1,000	3,400
	Rainfed	200	1,200	400	0	300	2,200	1,000	3,200
	Total	**1,800**	**15,400**	**3,400**	**1,000**	**3,800**	**25,400**	**4,800**	**30,200**
2022/23	Full Irrigation	2,100	21.900	4,500	2,000	5,100	35,600	5,200	40,800
	Life Saving	200	2,300	600	0	800	3,900	1,000	4,900
	Rainfed	200	2,700	700	0	900	4,600	1,000	5,600
	Total	**2,600**	**26,900**	**5,800**	**2,000**	**6,800**	**44,100**	**7,200**	**51,300**

Remarks: (1) Modified by the JICA study team, based on the result calculated by Agro-Economic Research Centre
(2) Other major commercial vegetables: cabbage, capsicum, and beans for demand projection
*(3) *: Based on production projection for potato, cropped areas to be required in 2017/18 and 2022/23 are estimated at 5,800ha and 9,200ha, respectively. It is, however, conservatively estimated that cropped areas in those period might be 1,000ha and 2,000ha, considering the current situation, in which potato cultivation has been stagnant. As a result, the remaining crop conversion areas of 4,800ha and 7,200ha could be allotted for other vegetables.*
(4) Other vegetables: onion, garlic, okra, cucurbits, egg plant, etc.
Source: Agro-Economic Research Centre, Himachal Pradesh University, 2008 and modified by JICA study team

As shown in the above table, it is estimated that about **51,300 ha** of the crop conversion from food grain to the strategic crops is required in the State.

Cropped area for vegetables to be required in A/P (2017/18) and M/P (2022/23) are respectively shown in the following table:

Table F-8.9 Cropped Area to be Required

(Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Other Commercial Vegetables	Sub-Total	Other Vegetables	Total
2005/06	3,200	19,500	8,300	15,000	9,300	55,300	17,700	**73,000**
2017/18	5,000	34,900	11,700	16,000	13,100	80,700	22,500	**103,200**
2022/23	5,800	46,400	14,100	17,000	16,100	99,400	24,900	**124,300**

Remarks: (1) Cropped area in 2005/06 in the State of H.P. is estimated 73,000ha, based on the data from DOA.
(2) Other major commercial vegetables: cabbage, capsicum, and beans for demand projection
(3) Other vegetables: onion, garlic, okra, cucurbits, egg plant, etc.
(4) Modified by the JICA study team, based on the result calculated by Agro-Economic Research Centre

Source: Agro-Economic Research Centre, Himachal Pradesh University, 2008 and modified by JICA study team

F-9 Market System Improvement

F-9.1 Market System Improvement for the Master Plan

(1) Proposed Program Component

As shown in the results of workshop (Fig. 4.1.2 in Main Report), it is clearly recognized that "Market-oriented Quality Improvement" and "Sales Promotion" are hardly attractive for promotion of crop diversification. However, crop diversification aims at not only increased production but also increased profit, therefore it is understandable that the following points should be considered.

1) Easy access to the marketing information system from the internet
2) Formulation of integrated information system
3) Establishment of standard criteria on grading
4) Registration of brand / trademark

Market information concerning daily market price (max and min), arrival quantity, etc. is available in the limited market yards. All market yards are expected to be connected to the internet, thus market information will be available in every market yard. Furthermore, the trend of market price as well as arrival quantity can be easily predicted by individual users.

Also, a market information system with cellular phone is proposed to be established in order to react to the daily market situation. The concept of the market information system is shown in Fig. F-9.1 below.

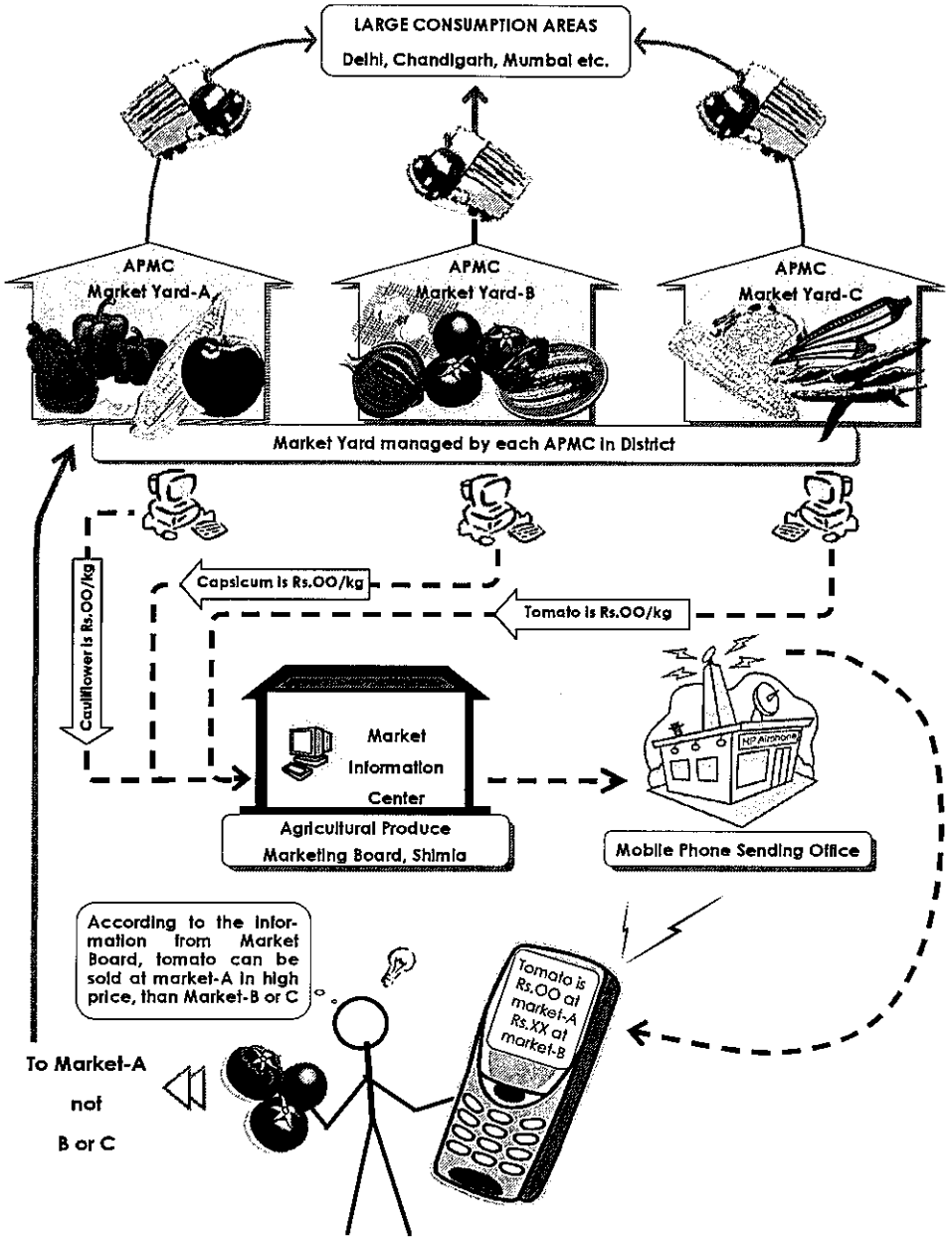


Fig. F-9.1 Market Information System with Cellular Phone

There are no standard criteria for vegetables and fruits grading in the state. It is necessary to establish a uniform grade as well as standard criteria for agricultural commodities in order to strengthen the bargaining power on the prices of these commodities. Furthermore, it is necessary to promote the use of plastic containers for easy transportation and mitigation of transportation and marketing losses.

Date: March 27, 2008
Place: Shimla
Subject: Unequal strawberry with simple plastic box

Date: April 7, 2008
Place: Pune, Maharashtra
Subject: Uniform strawberry with nice carton box

Date: June 11, 2008
Place: Shimla
Subject: Plastic containers

Constraints during Marketing Activities

The target, outputs, executing organization and proposed activities of this component are listed below:

Table F-9.1 Outline of Market System Improvement

Item	Outline of Component
Target	Farmers as well as other stakeholders will be able to obtain sufficient market information, and to trade farm produces efficiently.
Outputs	1. Market information to be required by producers as well as marketers will be available timely. 2. Market yards and other market facilities will be rehabilitated or newly constructed. 3. Loss on collection and marketing will be reduced. 4. Brand name of Himachal vegetables is broadly recognized and vegetables trade will be boosted.
Activities	1. Capacity development for staff of Agricultural Marketing Board and APMCs 2. Preparation and dissemination of quality standard 3. Improvement and enhancement of the system for recording and two-way communication of marketing information among producers and marketers 4. Provision of computer system and improvement of marketing network 5. New construction or rehabilitation of market yards and other market facilities 6. Market promotion through branding, advertisement, campaign, agricultural fair, etc.
Related Components	Strengthening of DOA, Strengthening of extension service functions
Execution Organization	Execution: H. P. State Agricultural Marketing Board / Agricultural Produce Market Committee Supporting: Department of Agriculture / Department of Horticulture

(2) Proposed Master Plan

The proposed plan related to each activity is mentioned below.

Table F-9.2 Proposed Master Plan for Market System Improvement

Activity / Subjects	Target	Executed by	Type / Venue	Schedule
(1) Capacity development for staff of Marketing Board and APMC - Technical and management aspects of market system improvement	- Staff of Marketing Board - District staff	Marketing Board - External expert - Staff of DOA	Workshop at DOA	2 years
(2) Preparation of quality standard - Quality standard for HP vegetables	- Staff of Marketing Board	Marketing Board - External expert	Practice at Marketing Board	1 year
(3) Guidance for quality standard	- Extension officer (all)	DOA with District and MB	Awareness camp at each district	One time Every year
(4) Workshop on market promotion	- APMC staff - CA - Traders - Farmers	MB / APMC - District staff - MB staff	Awareness camp at each APMC	One time Every year
(5) Improvement and enhancement of the system and two-way communication of marketing and other technical information - How to record marketing information - Maintenance of data base in AGAMRKNET	- APMC staff	Marketing Board - MB staff - DOA staff	Workshop at DOA	- 1st and 2nd years
(6) Establishment of new market information system	- Staff of Marketing Board	Marketing Board - External expert - Staff of DOA	Practice at MB	1 year MB
(7) Provision of computer set	- Market yards except seasonal market yard	DOA / MB		- 1st year
(8) New construction of market yards and collection centres - Review of 5-year plan of MB - Preparation of Detailed Plan Report (DPR) - Construction or rehabilitation	- 12 Districts - 10 APMCs	MB and APMC	Market yard managed by Marketing Board Collection centre managed by DOA	One market yard in each APMC within 2 years, and one collection centre in each district within 2 years

F-9.2 Market System Improvement for the Action Plan

Activities and requirements for the A/P of market system improvement plan are presented below.

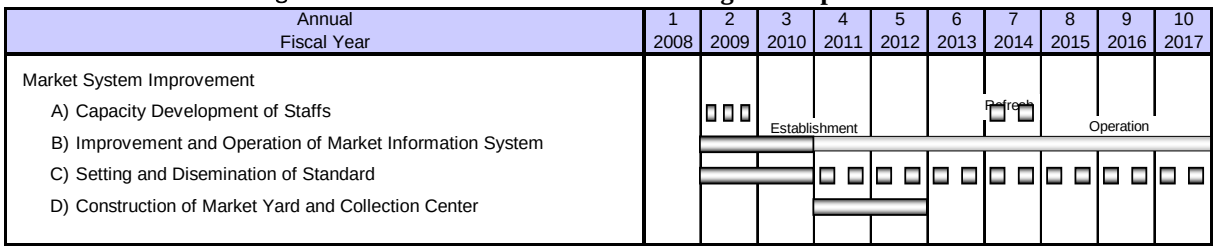
Table F-9.3 Proposed Action Plan for Market System Improvement

Activity	Subjects	Target	Executed by	Remarks
(1) Capacity development	- Improvement of filing system - Management of data from APMC - Feed back to operation and maintenance at APMCs - Quality standard - Proposed post-harvest activities	- Senior Marketing Officers - Marketing officer - District Agricultural Officer - SMSs, DOA	DOA - External expert - Staff of DOA	(1) This activity is included in capacity development for strengthening of department of agriculture (Attachment E-1) as well as capacity development for strengthening of extension service function (Attachment E-3)
(2) Preparation of quality standard	- Preparation of quality standard for HP vegetables - Central quality standard to be referred. - Brand and trademark also to be considered. - Opinions from stakeholders to be considered.	- Staff of Marketing Board	Marketing Board - External expert - Staff of DOA	(1) Steering committee at state level should be arranged periodically. (2) see Attachment F-30 regarding implementation cost
(3) Guidance for quality standard	- Dissemination of quality vegetables - Dissemination of quality standard - Dissemination of market information system	- Extension officers (all)	DOA with District and MB	(1) This activity is included in capacity development for strengthening of department of agriculture (Attachment E-1) as well as capacity development for strengthening of extension service function (Attachment E-3)
(4) Workshop on market promotion	- Dissemination of quality vegetables - Dissemination of quality standard - Dissemination of proposed post-harvest activities - Dissemination of market information system - To collect brand name or trade mark from the public - Registration of brand name or trademark	- APMC staff - CA - Traders - Farmers	MB / APMC - District staff - MB staff	(1) Progress of preparation of quality standard should be reported. (2) see Attachment F-30 regarding implementation cost
(5) Staff training for system operation	- How to record marketing information - Maintenance of data base in AGAMRKNET	- APMC staff	Marketing Board - MB staff - DOA staff	(1) see Attachment F-30 regarding implementation cost
(6) Establishment of new market information system	- Establishment of new market information system, linking mobile phone and AGMARKNET	- Staff of Marketing Board	Marketing Board - External expert - Staff of DOA	(1) Steering committee at state level should be arranged periodically. (2) see Attachment F-30 regarding implementation cost
(7) Provision of computer set	- Market yards except seasonal market yard	DOA / MB	DOA / MB	(1) see Attachment F-30 regarding implementation cost
(8) New construction of market yards and collection centres	- Review of 5-year plan of MB - Preparation of Detailed Plan Report (DPR) - Construction or rehabilitation	- 10 APMCs for market yard (each APMC) - 12 Districts for collection centres (each district)	Market yard by Marketing Board Collection centers by DOA	(1) see Attachment F-30 regarding implementation cost

F-9.3 Provisional Schedule for Program Implementation

Implementation schedule for market system improvement is prepared as shown in Fig. F-9.2 below.

Fig. F-9.2 Provisional Schedule for Program Implementation



It is expected that dissemination for market system improvement should be broadly carried out in the project area. Namely there are no regional difference concerning market system, depending on the category.

F-9.4 Preliminary Cost Estimate

(1) Preliminary Cost Estimate

Based on the implementation schedule and category-wise characteristics mentioned above, preliminary cost was estimated as follows:

Table F-9.4 Cost Estimate of Each Activity for Market System Improvement

(Unit: Rs.)

	1st Year	2nd Year	3rd Year	4th Year	Total
(1) Preparation of quality standard	1,800,000	-	-	-	1,800,000
(2) Workshop on market promotion (4 years)	230,000	230,000	230,000	230,000	920,000
(3) Staff Training for system operation	80,000	80,000	80,000	80,000	320,000
(4) Establishment of new market information system	4,000,000	-	-	-	4,000,000
(5) Provision of computer set	3,300,000	-	-	-	3,300,000
(6) New construction of market yards	60,000,000	60,000,000	-	-	120,000,000

Remark) refer Attachments F-30 for details

(2) Cost Disbursement

Cost disbursement is estimated, applying the following conditions:

(i) Each training program is formulated for government staff.

(ii) Dissemination to farmers is carried out by training program for vegetable promotion.

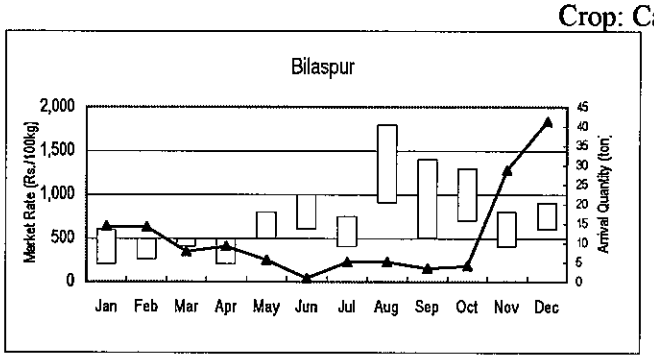
(iii) Disbursement is done according to the implementation schedule as shown in Table F-9.5.

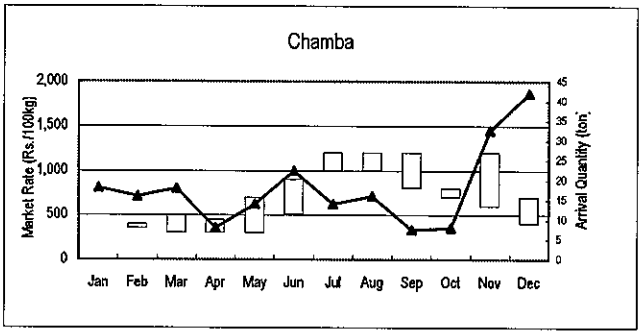
Table F-9.5 Cost Disbursement for Market System Improvement

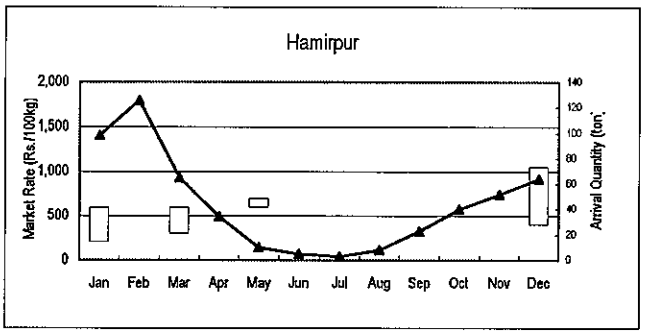
(Unit: Rs. million)

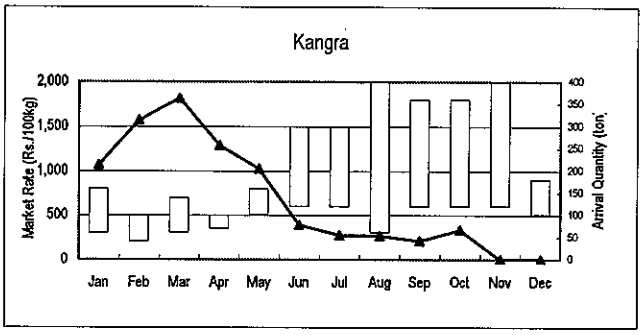
	2009	2010	2011	2012	Total
(1) Preparation of quality standard	1.8	-	-	-	1.8
(2) Workshop on market promotion (4 years)	0.23	0.23	0.23	0.23	0.92
(3) Staff training for system operation	0.08	0.08	0.08	0.08	0.32
(4) Establishment of new market information system	4.0	-	-	-	4.0
(5) Provision of computer set	3.3	-	-	-	3.3
(6) New construction of market yards	60.0	60.0	-	-	120.0
Total	69.41	60.31	0.31	0.31	130.34

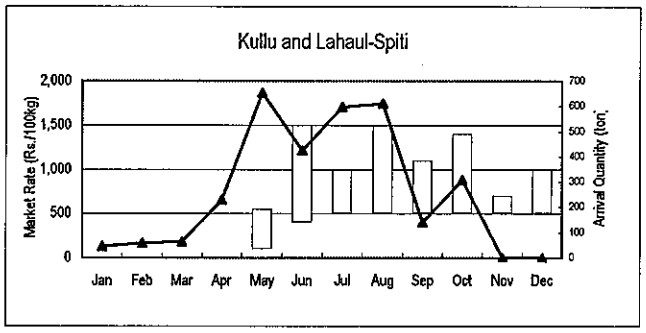
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (1/7)
Crop: Cauliflower

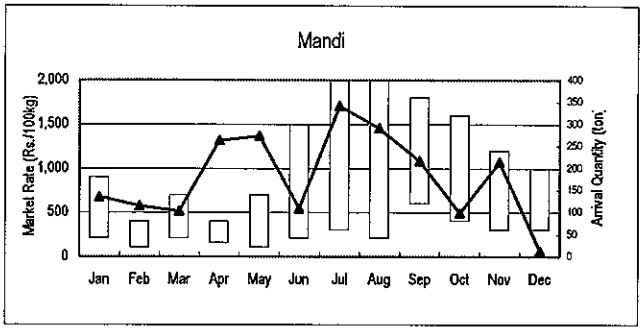


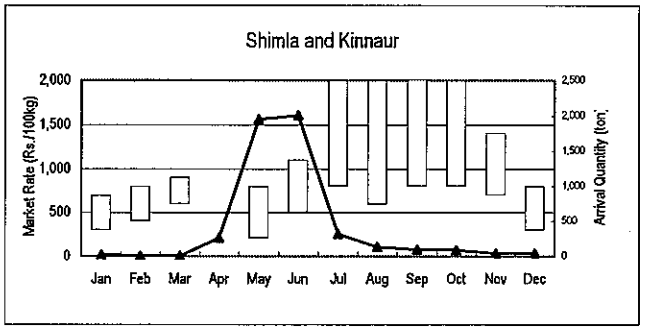


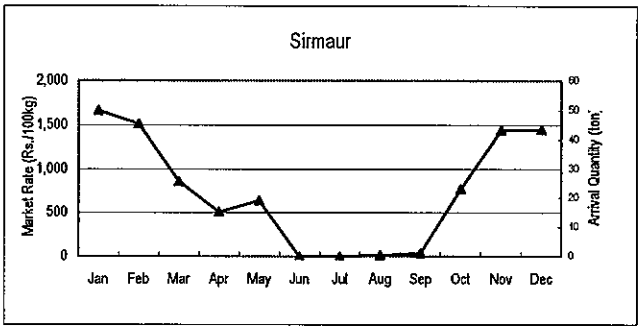


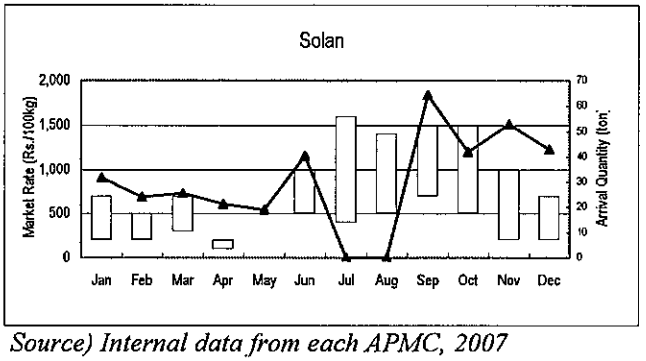


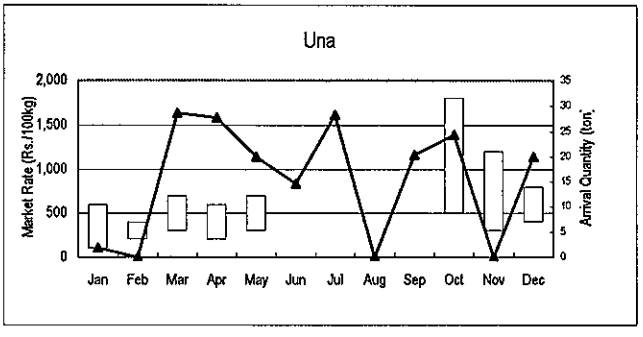












Source) Internal data from each APMC, 2007

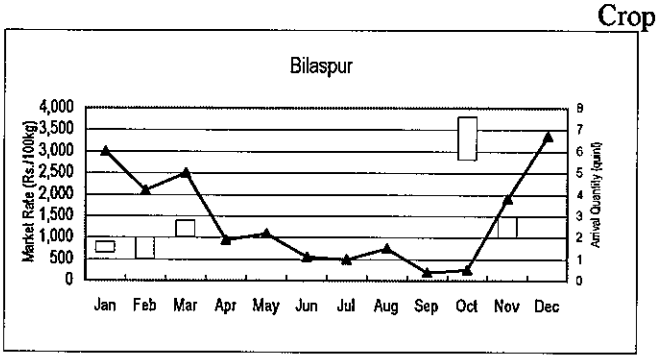
Monthly Max. Wholesale Price

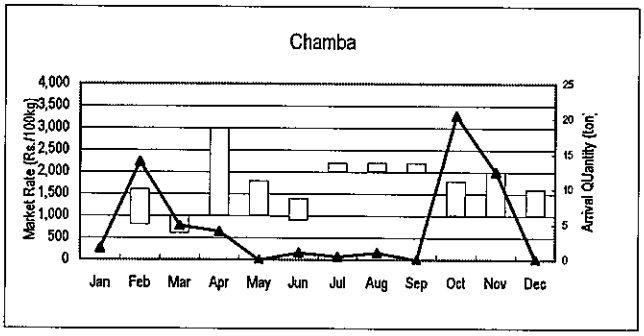
Monthly Min. Wholesale Price

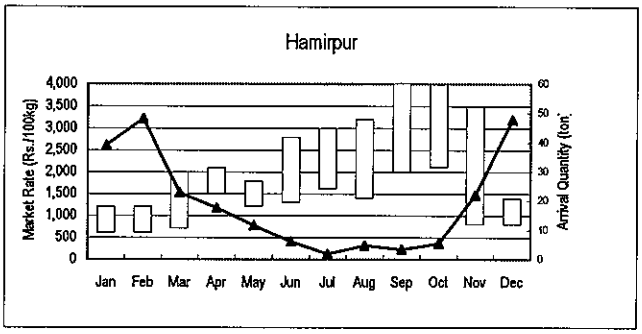
Arrival quantity (Unit 100kg: Quintal)

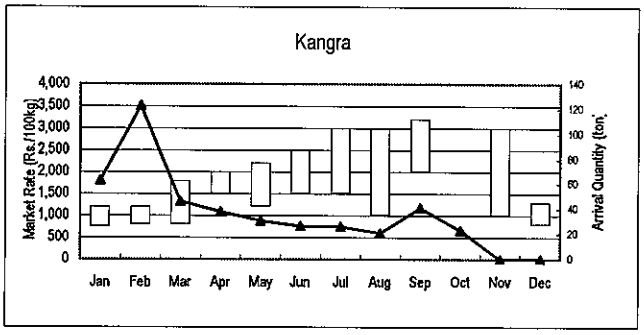
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (2/7)

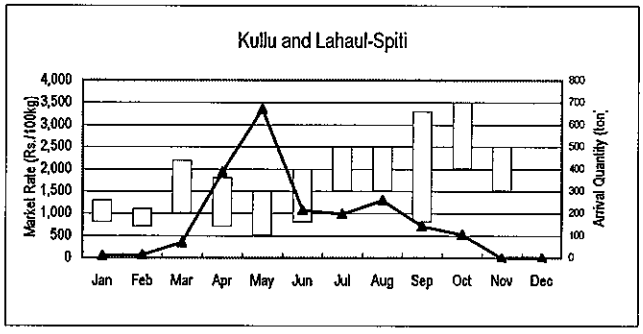
Crop: Peas

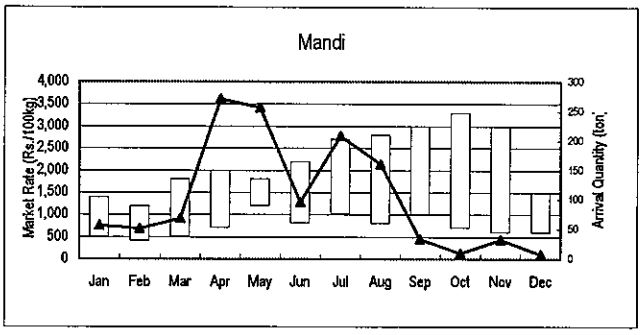


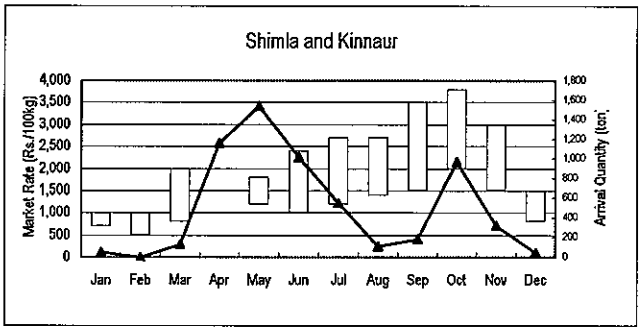


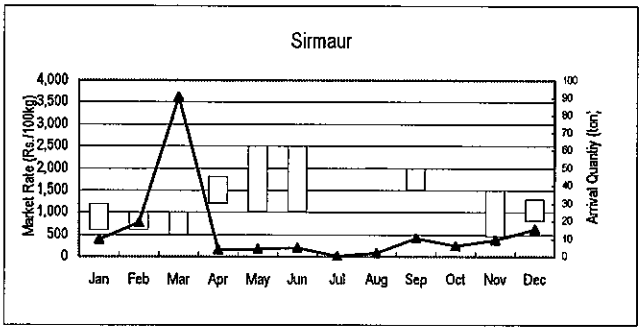


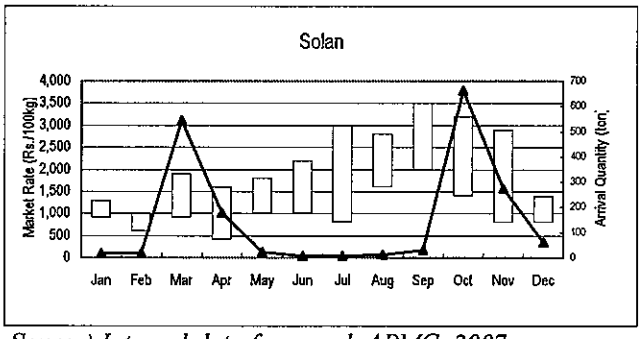


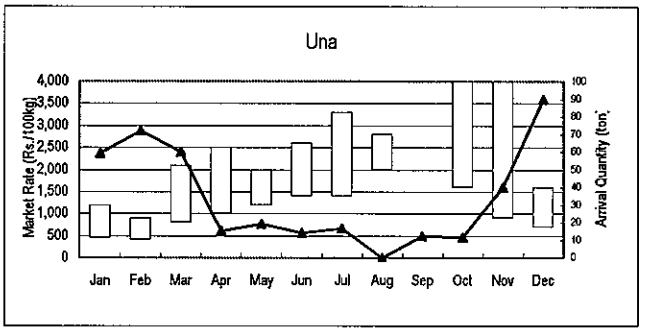












Source) Internal data from each APMC, 2007

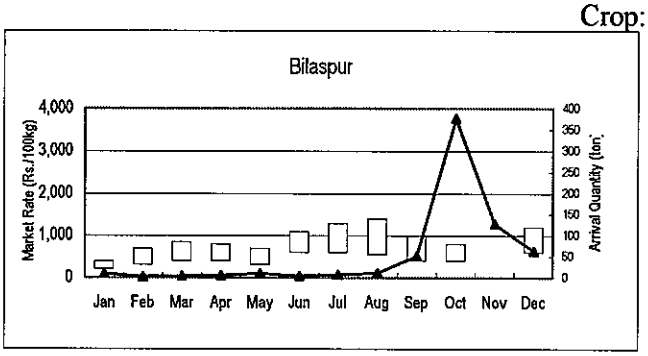
Monthly Max. Wholesale Price

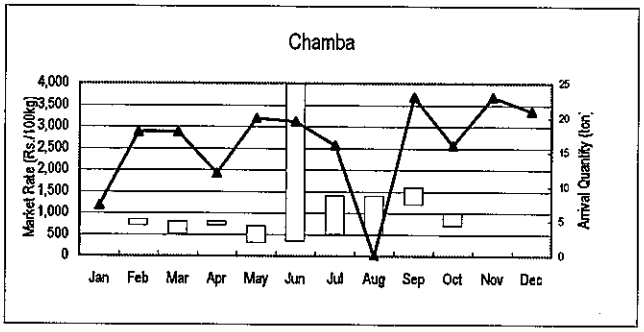
Monthly Min. Wholesale Price

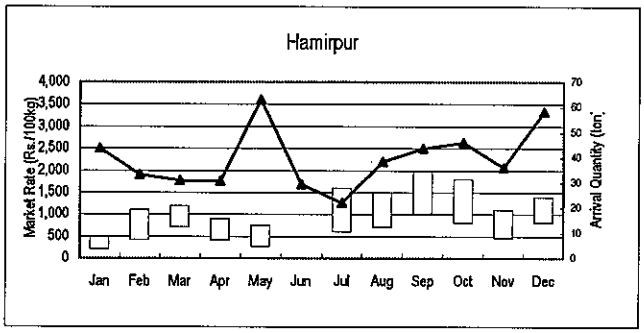
Arrival quantity (Unit 100kg: Quintal)

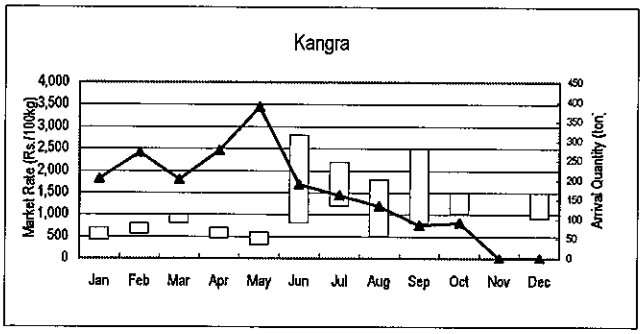
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (3/7)

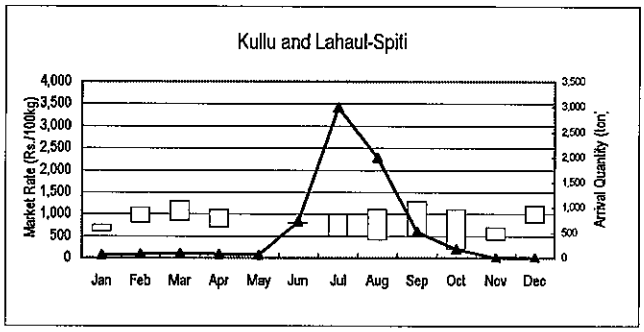
Crop: Tomato

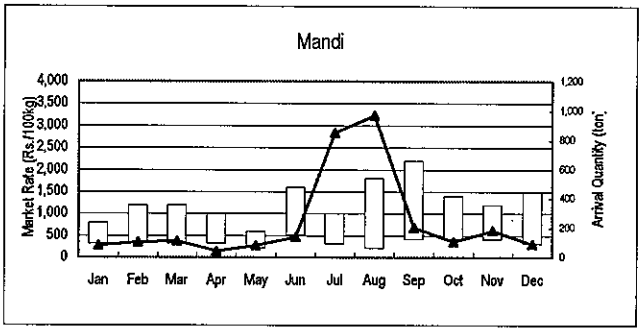


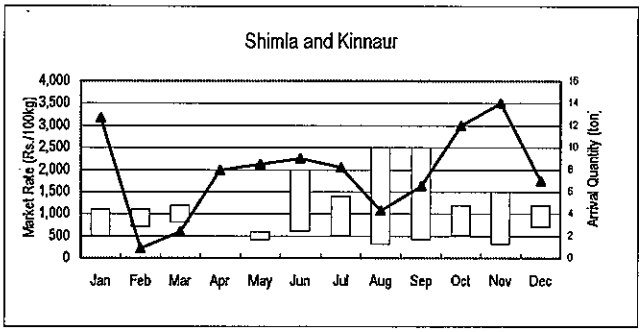


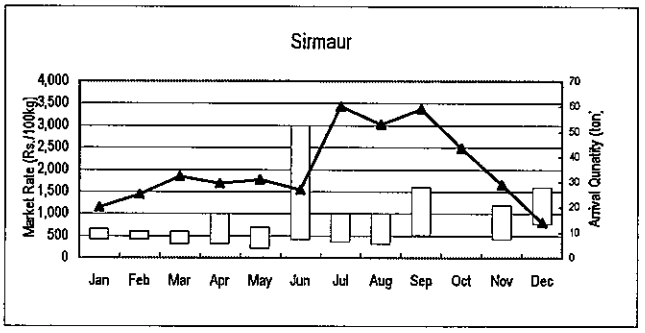


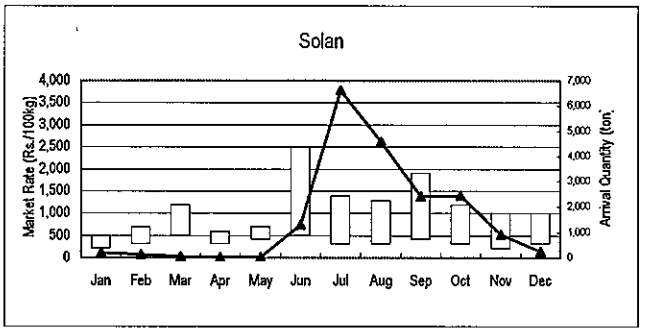


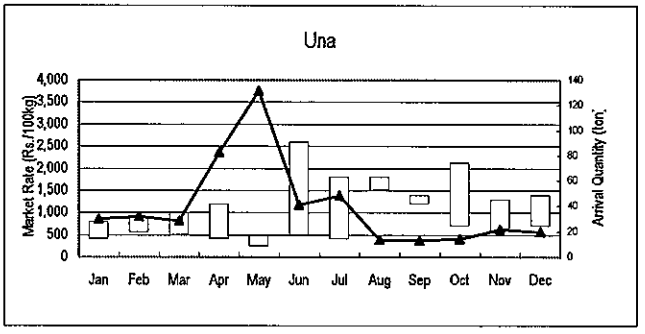












Source) Internal data from each APMC, 2007

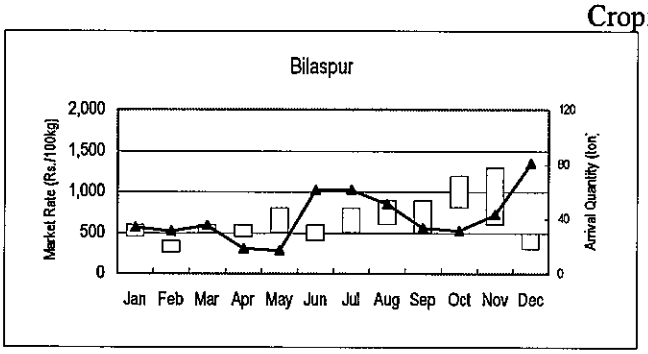
Monthly Max. Wholesale Price

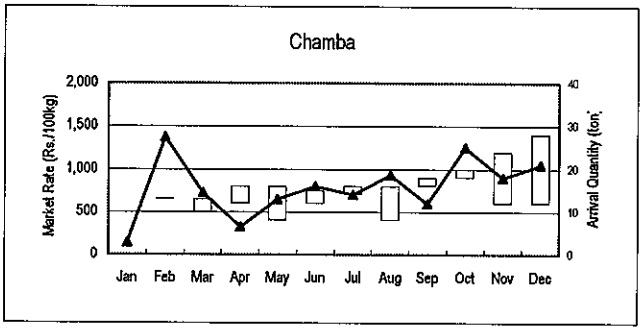
Monthly Min. Wholesale Price

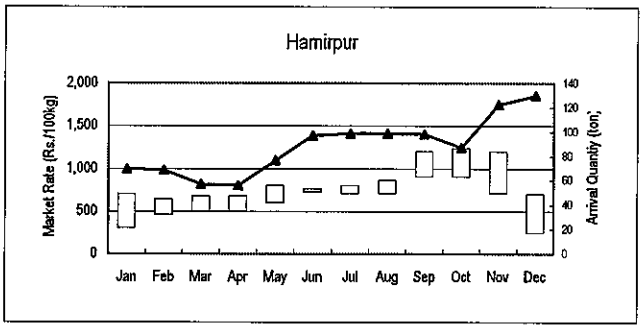
Arrival quantity (Unit 100kg: Quintal)

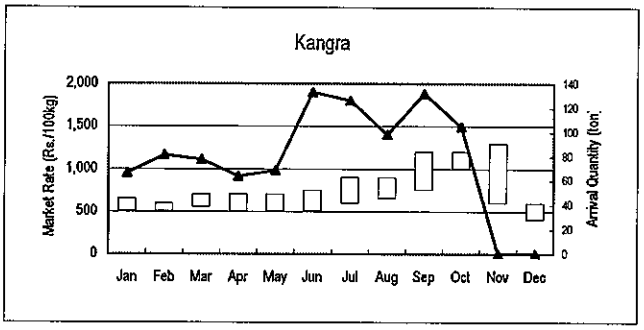
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (4/7)

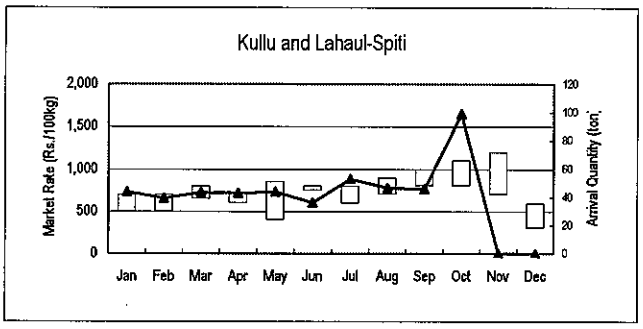
Crop: Potato

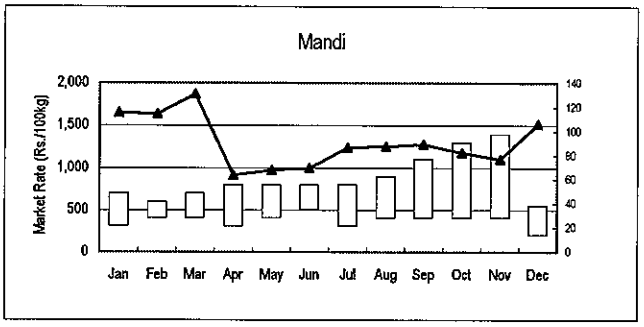


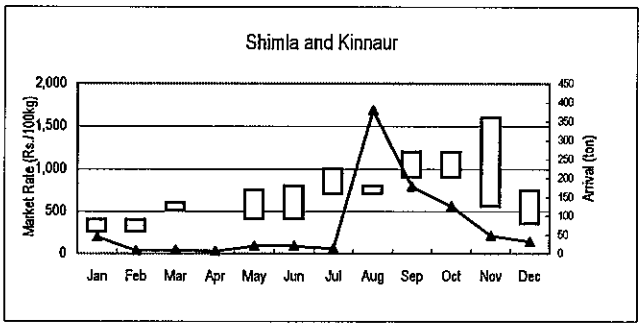


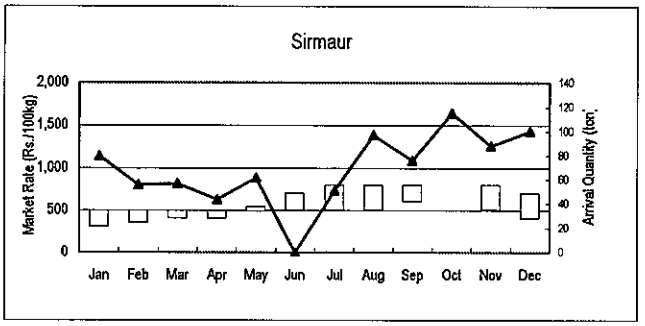


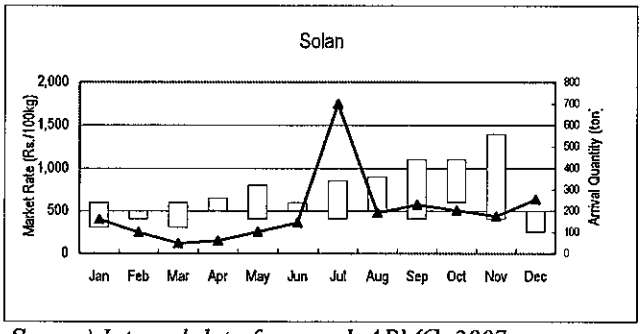


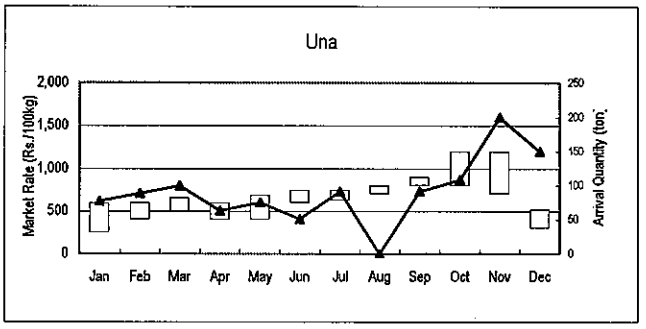












Source) Internal data from each APMC, 2007

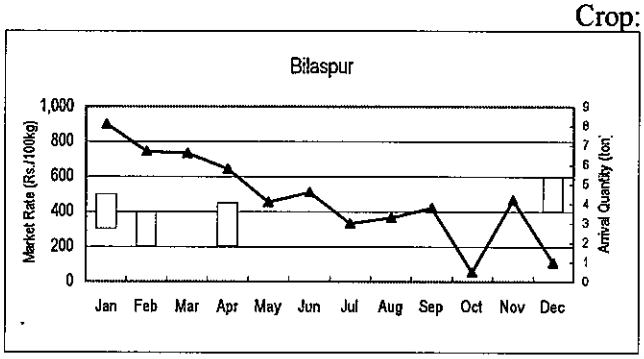
Monthly Max. Wholesale Price

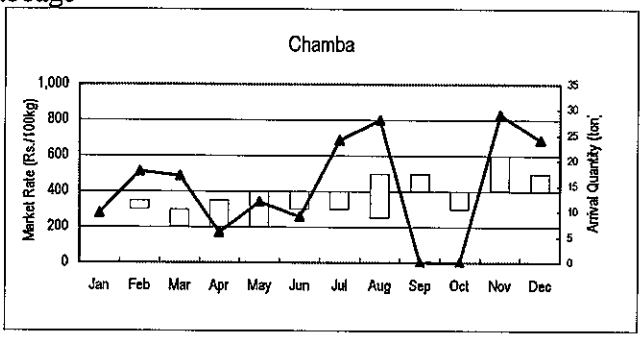
Monthly Min. Wholesale Price

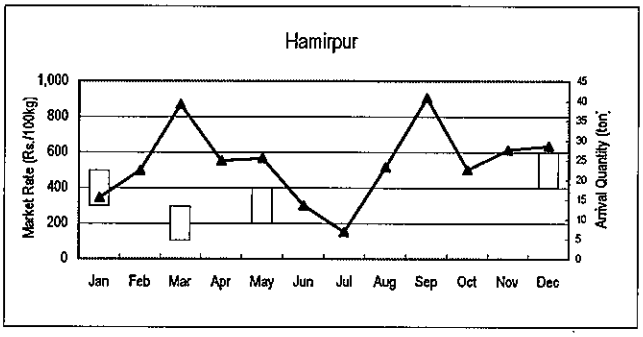
Arrival quantity (Unit 100kg: Quintal)

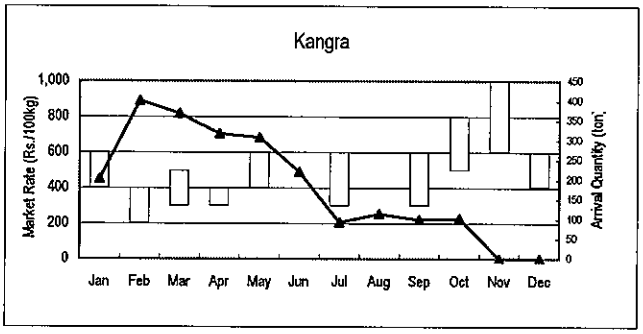
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (5/7)

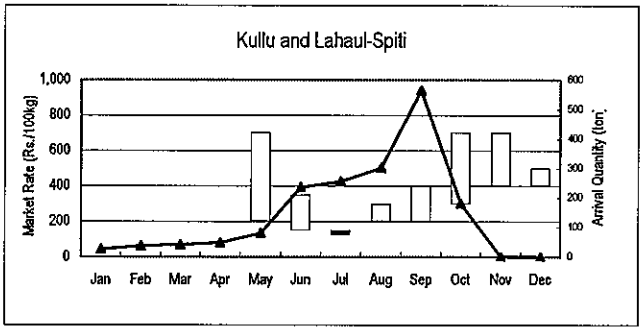
Crop: Cabbage

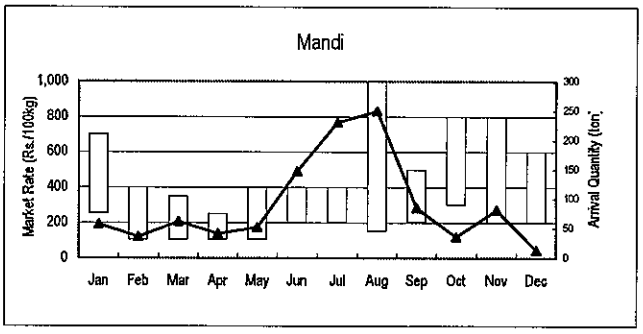


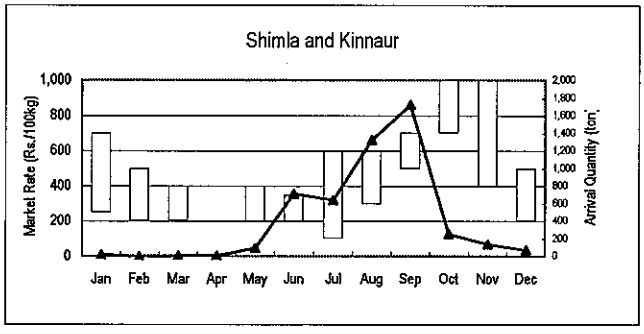


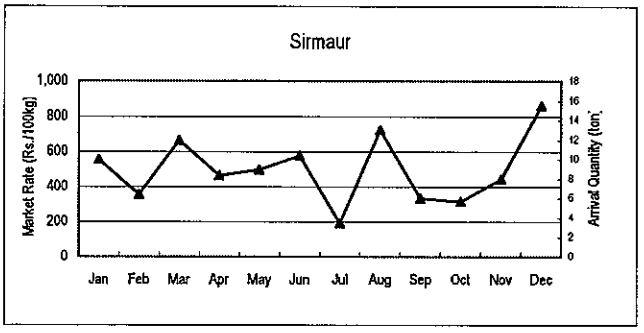


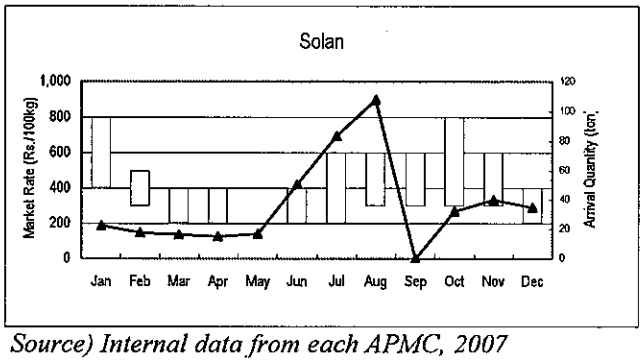


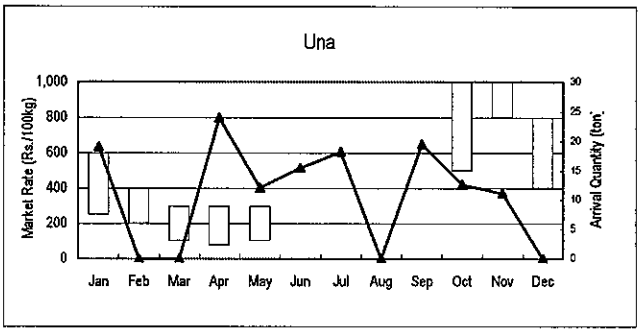












Source) Internal data from each APMC, 2007

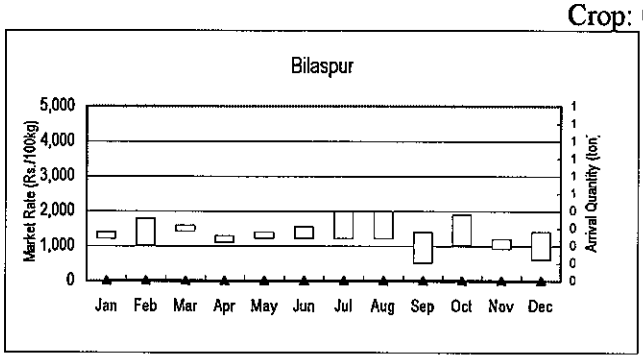
Monthly Max. Wholesale Price

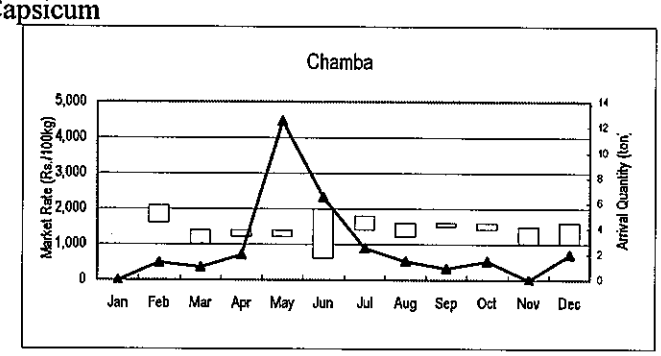
Monthly Min. Wholesale Price

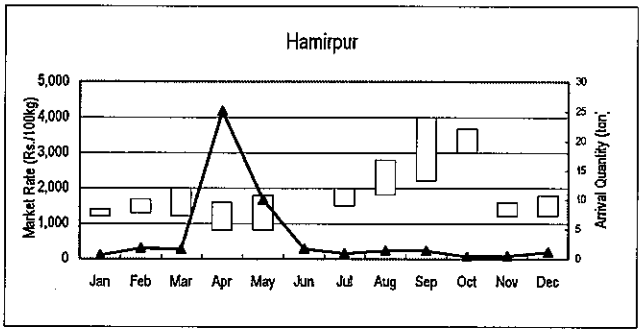
Arrival quantity (Unit 100kg: Quintal)

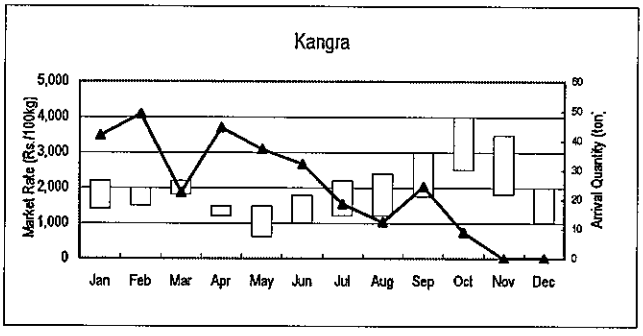
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (6/7)

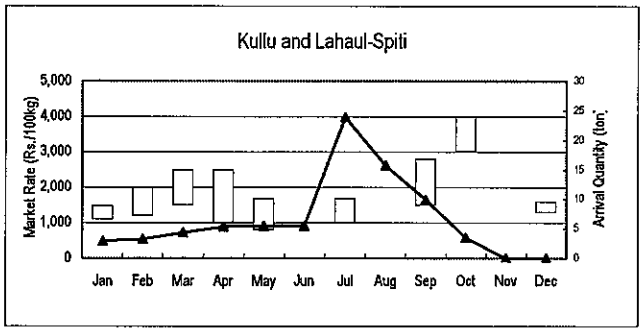
Crop: Capsicum

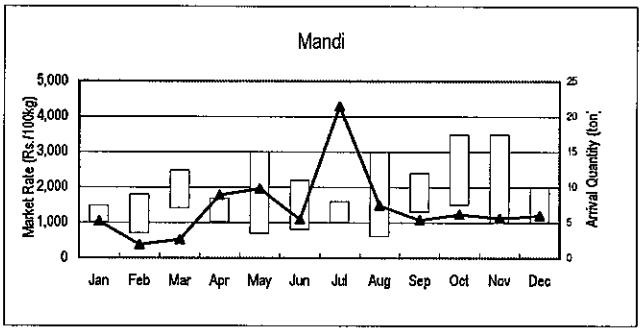


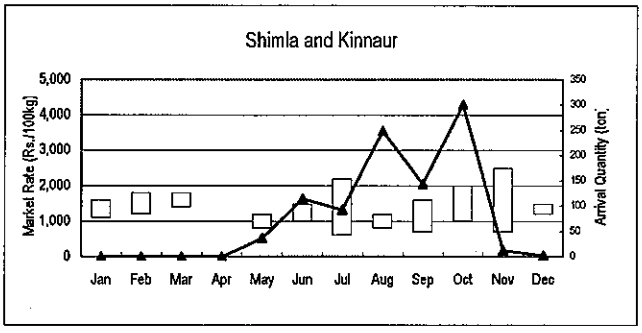


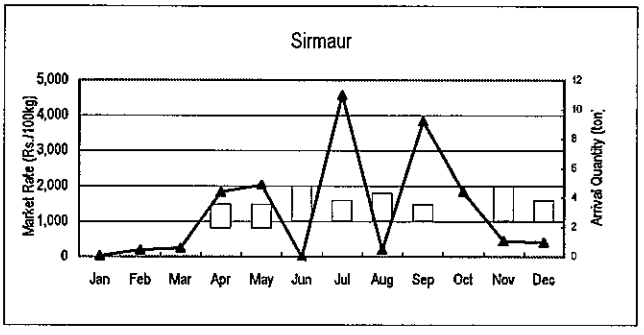


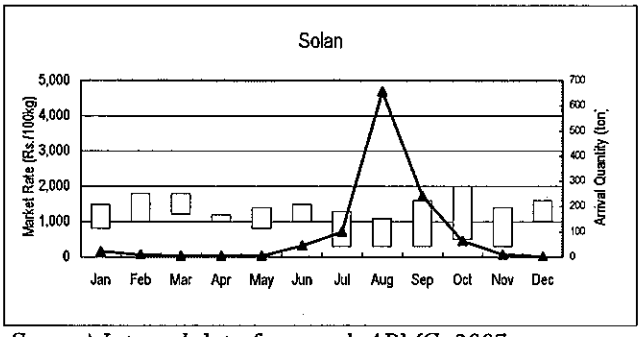


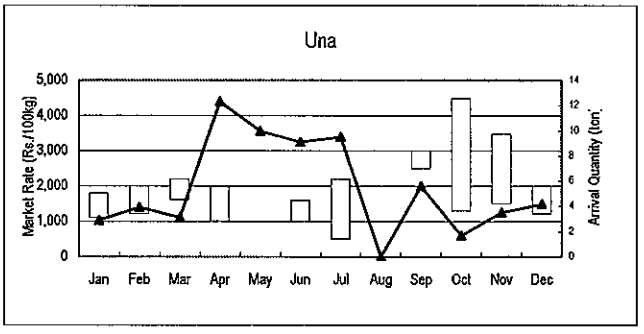












Source) Internal data from each APMC, 2007

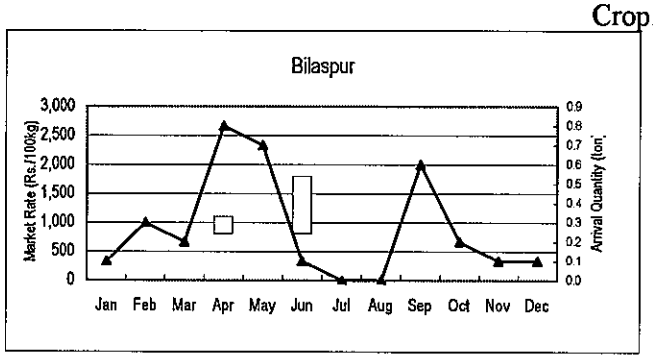
Monthly Max. Wholesale Price

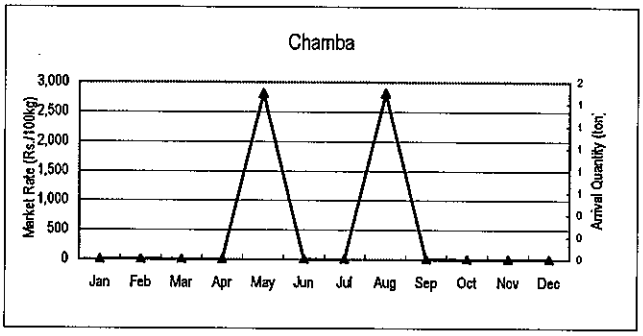
Monthly Min. Wholesale Price

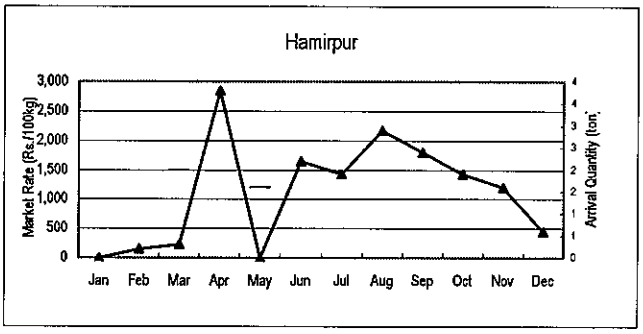
Arrival quantity (Unit 100kg: Quintal)

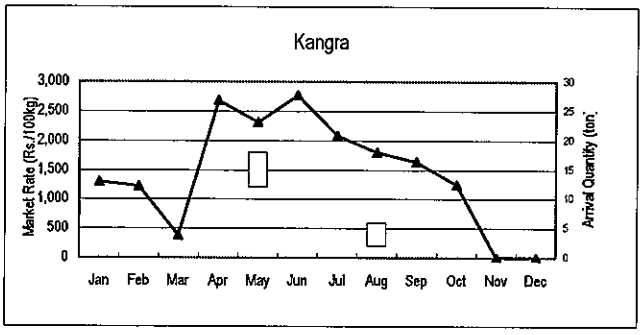
Attachment F-1 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2006 by APMCs (7/7)

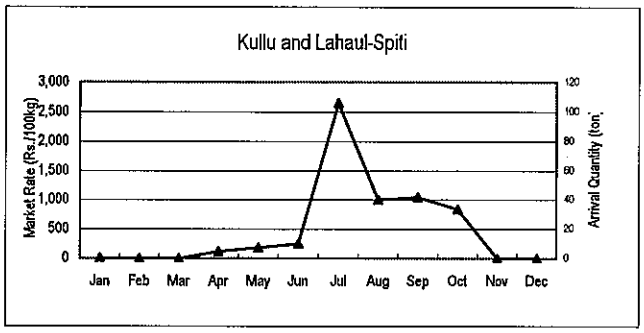
Crop: Beans

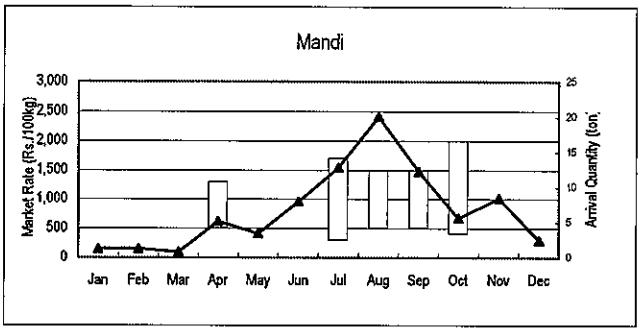


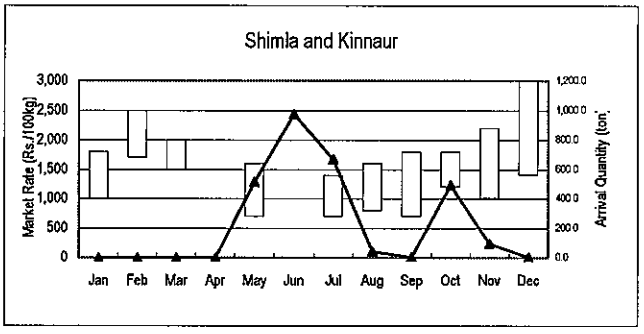


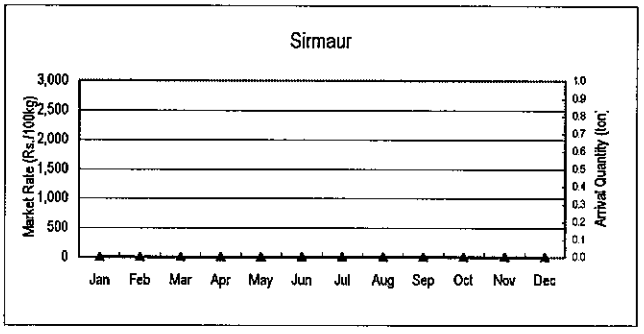


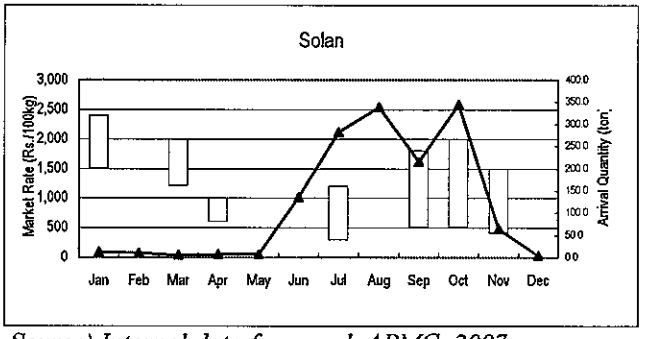


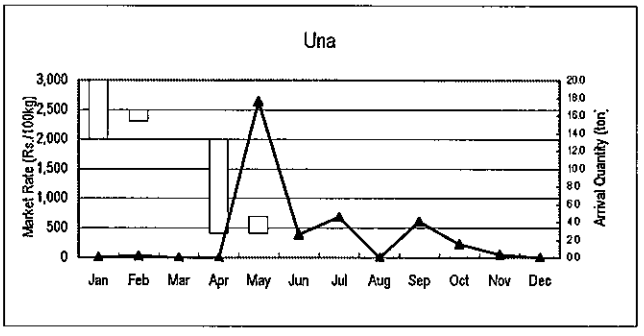












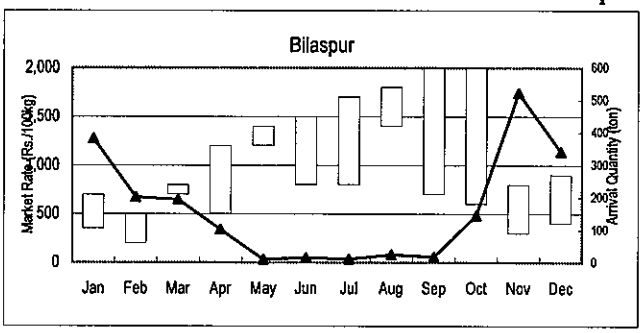
Source) Internal data from each APMC, 2007

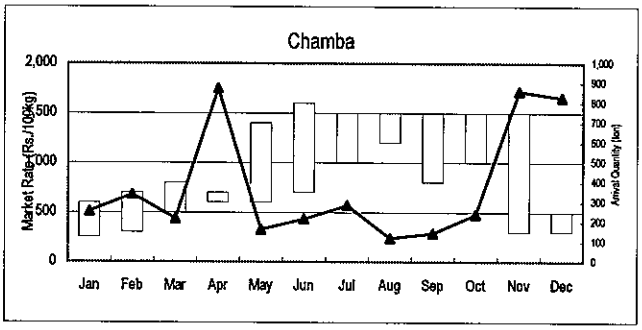
Monthly Max. Wholesale Price

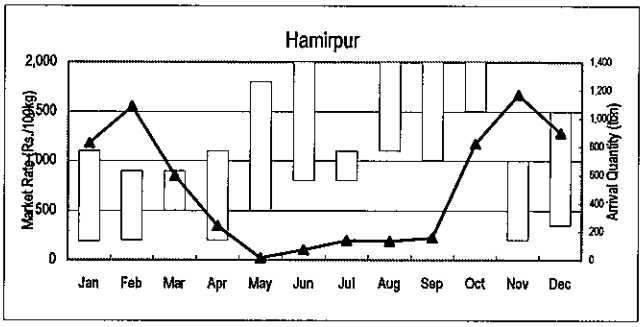
Monthly Min. Wholesale Price

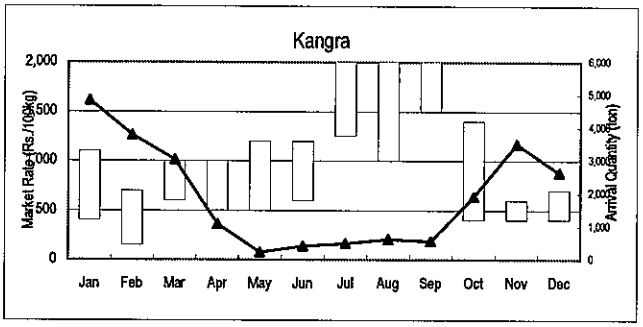
Arrival quantity (Unit 100kg: Quintal)

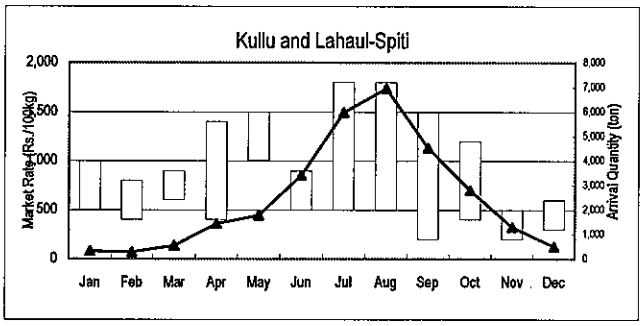
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (1/7)
Crop: Cauliflower

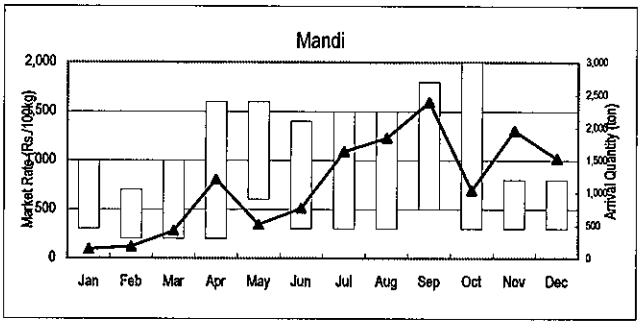


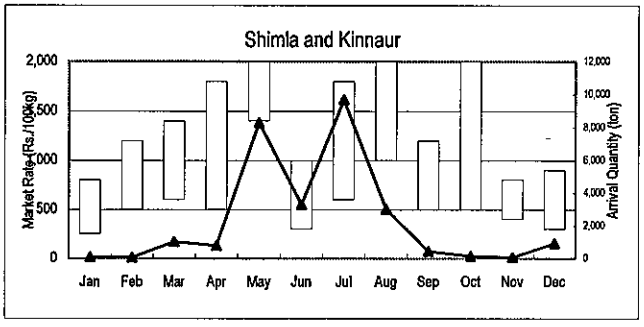


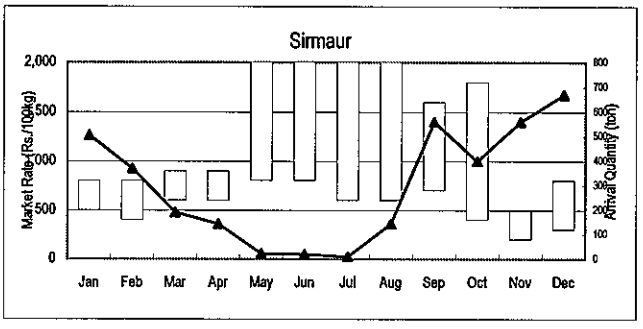


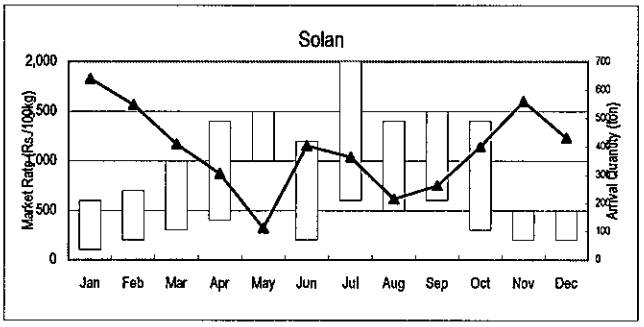


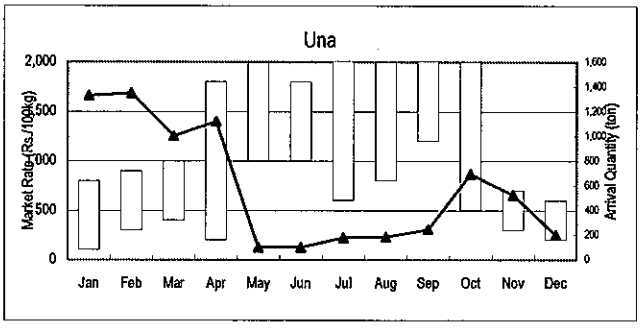










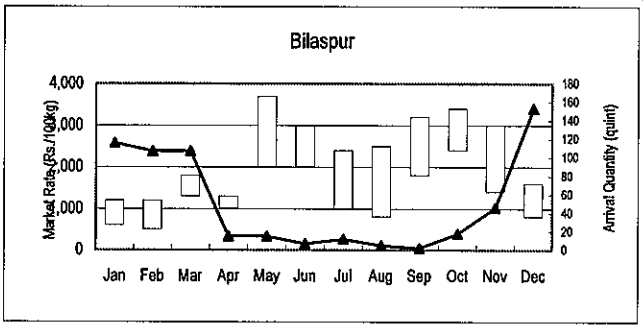


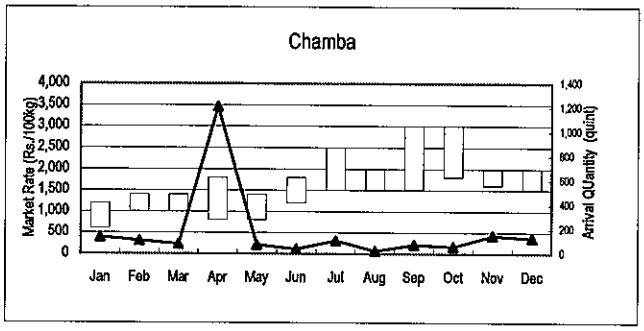
Monthly Max. Wholesale Price

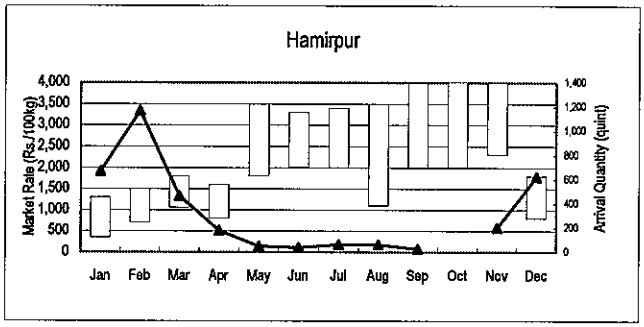
Monthly Min. Wholesale Price

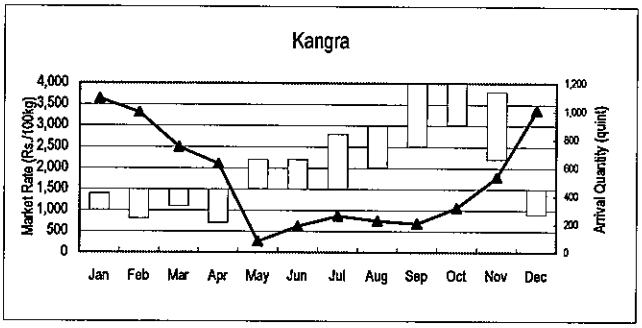
Arrival quantity (Unit 100kg: Quintal)

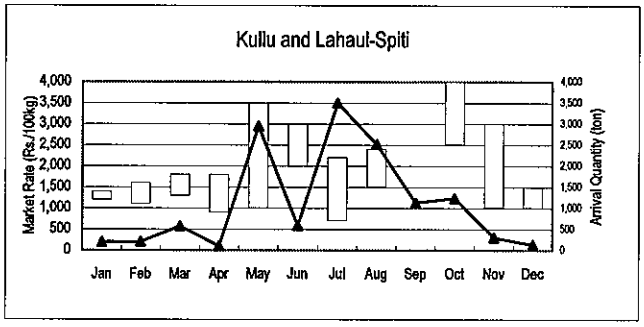
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (2/7)
Crop: Peas

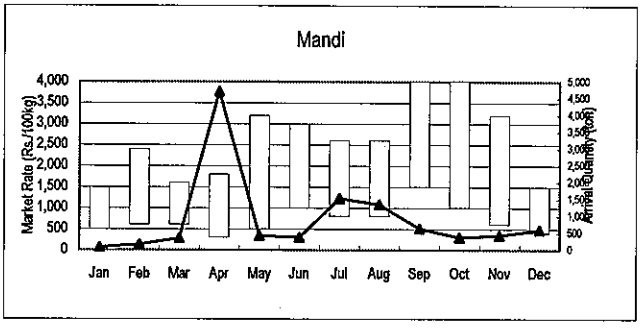


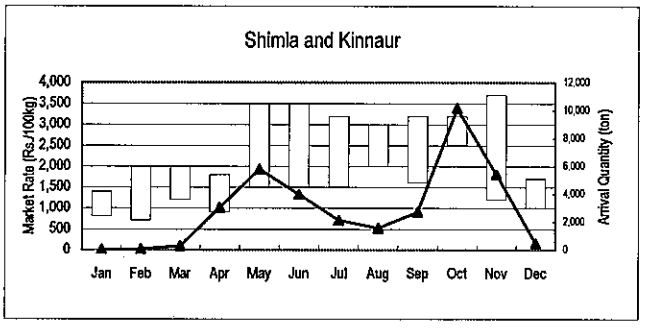


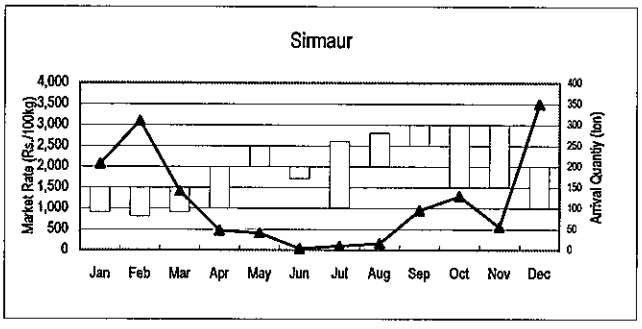


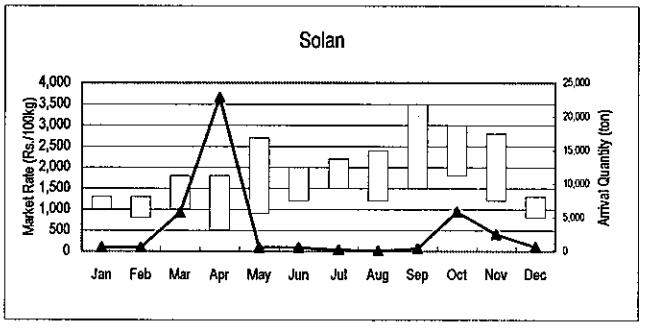


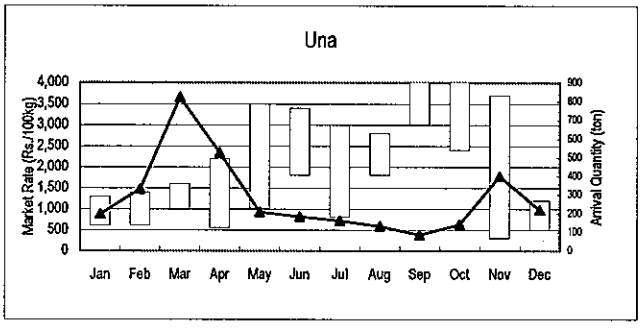










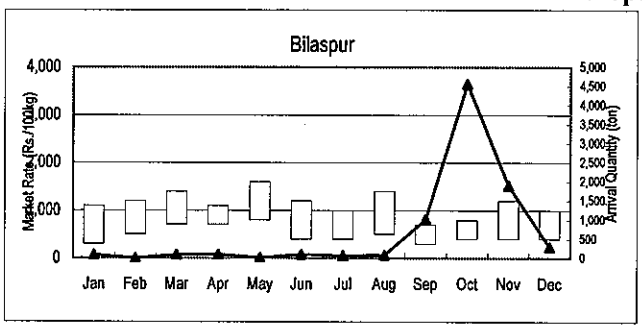


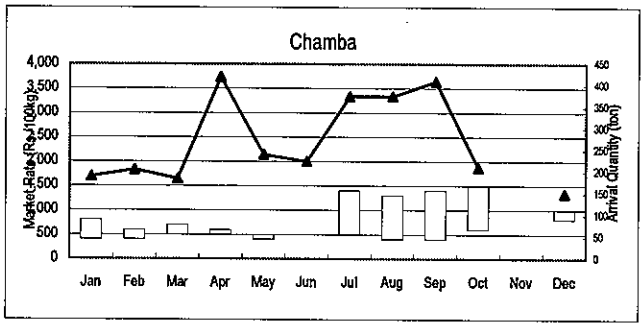
Monthly Max. Wholesale Price

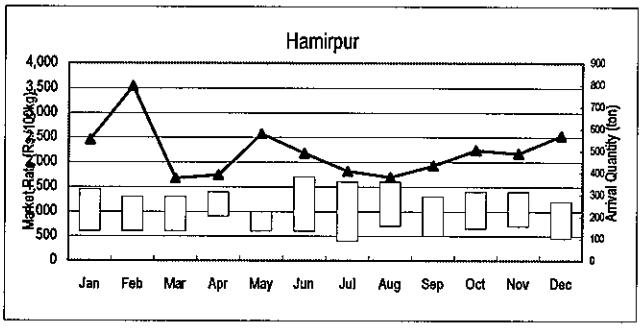
Monthly Min. Wholesale Price

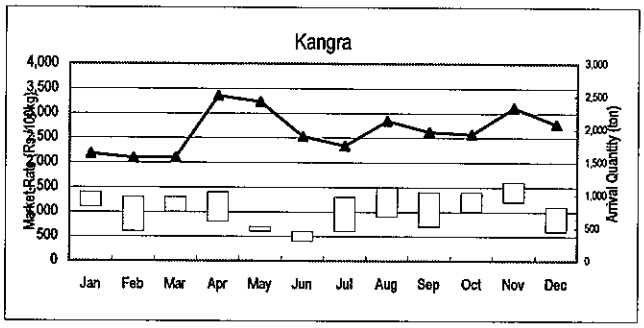
Arrival quantity (Unit 100kg: Quintal)

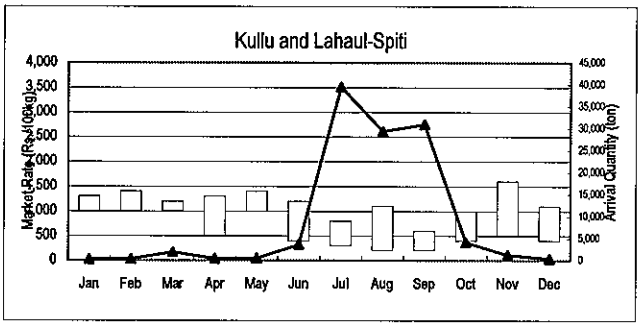
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (3/7)
Crop: Tomato

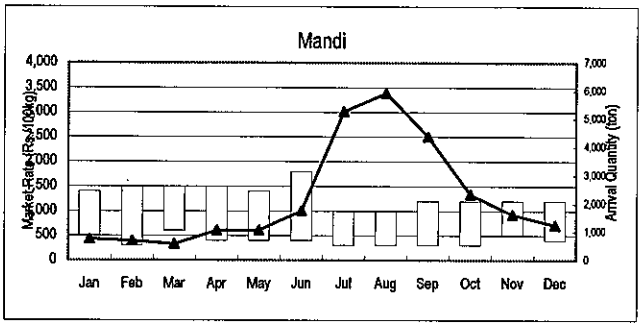


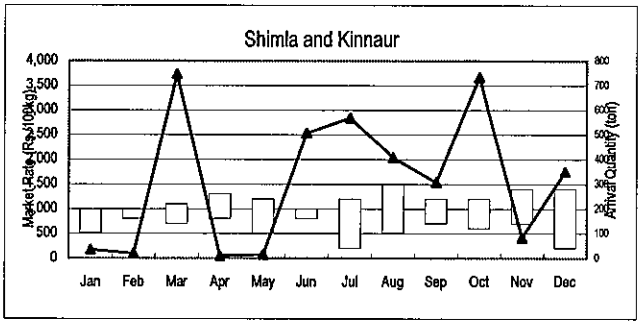


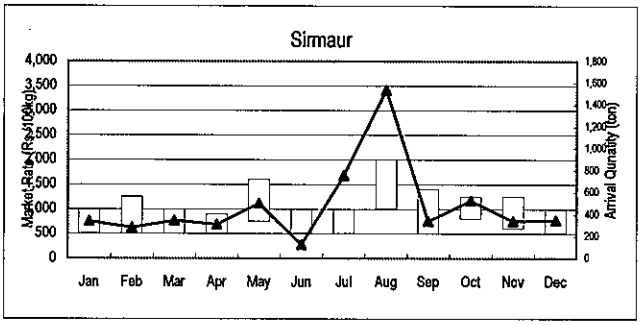


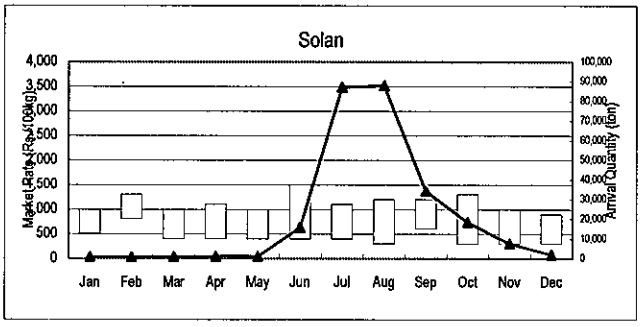


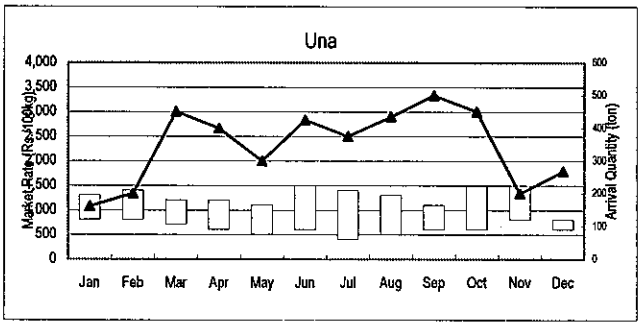










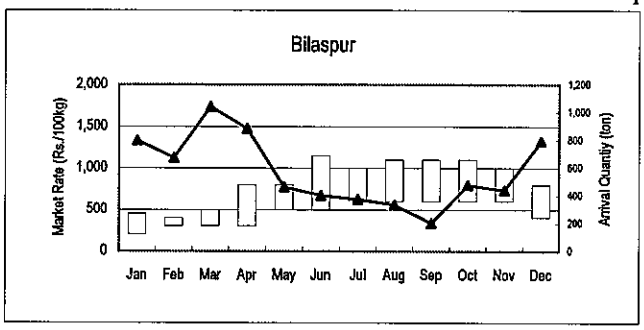


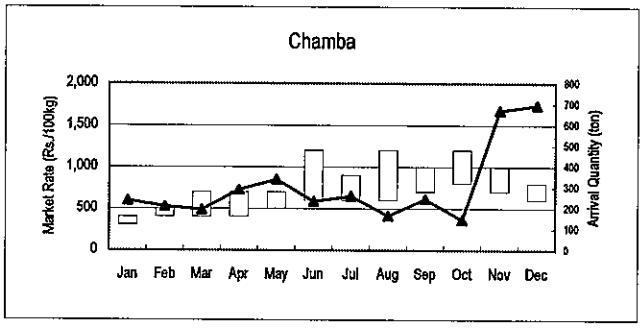
Monthly Max. Wholesale Price

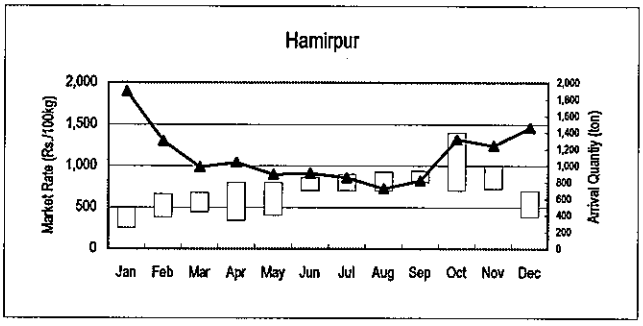
Monthly Min. Wholesale Price

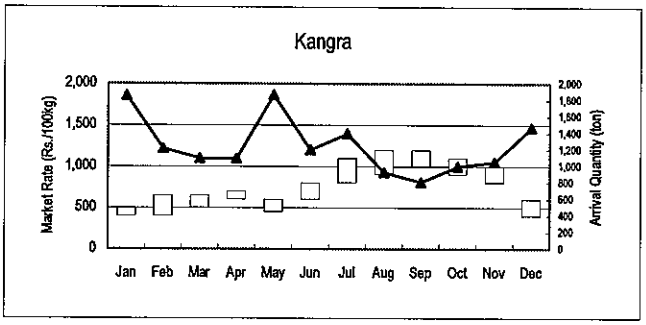
Arrival quantity (Unit 100kg: Quintal)

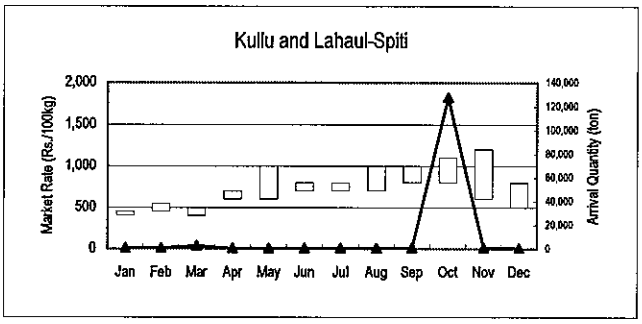
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (4/7)
Crop: Potato

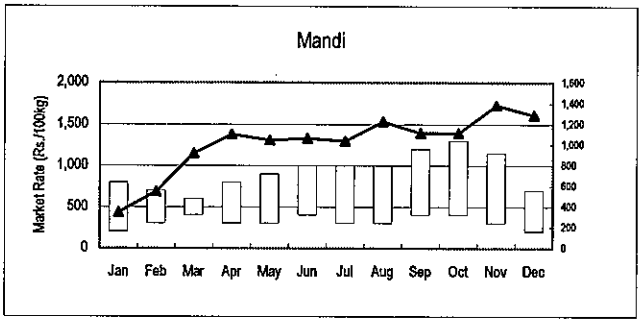


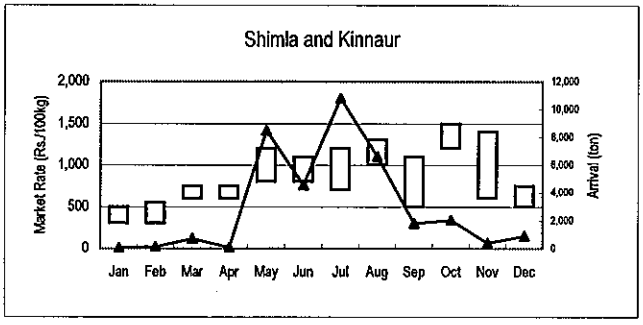


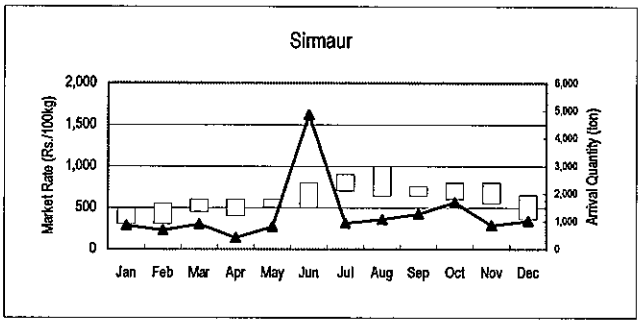


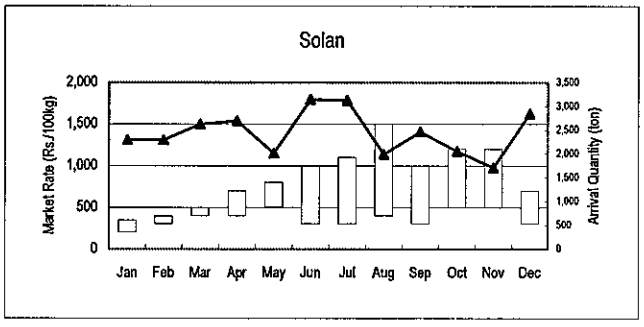


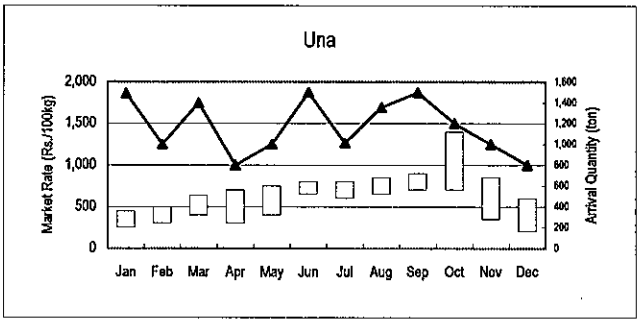










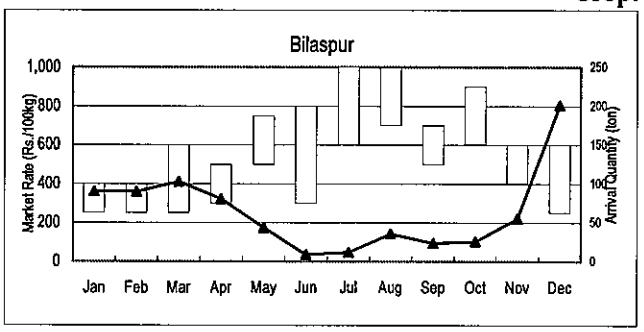


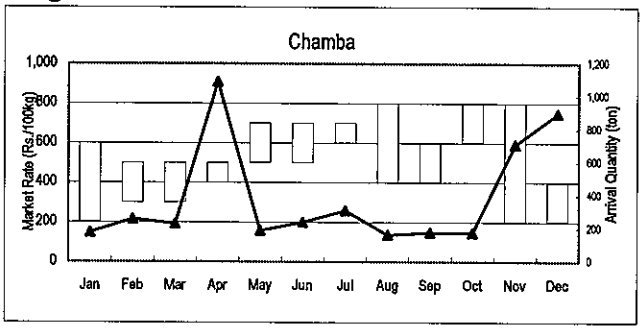
Monthly Max. Wholesale Price

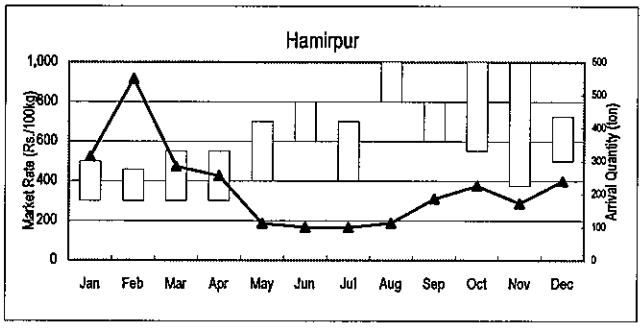
Monthly Min. Wholesale Price

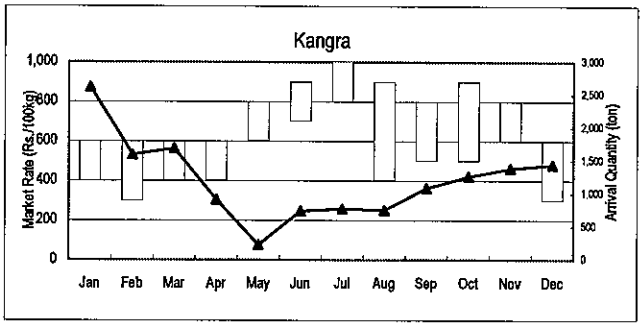
Arrival quantity (Unit 100kg: Quintal)

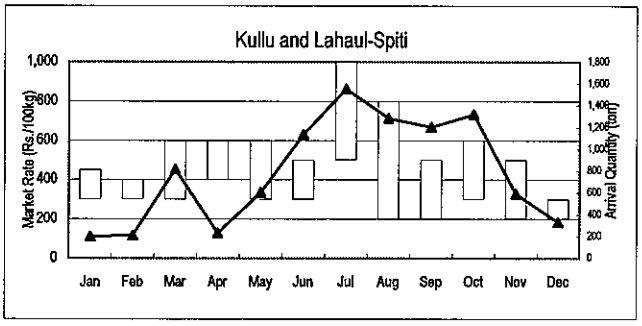
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (5/7)
Crop: Cabbage

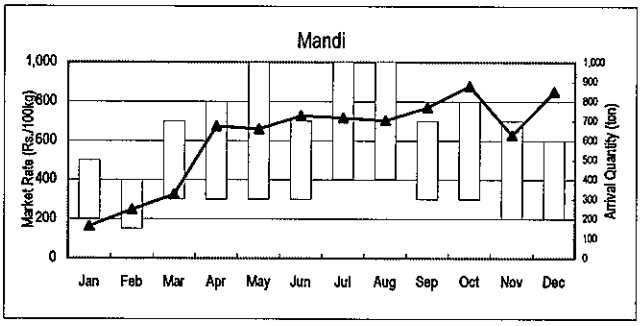


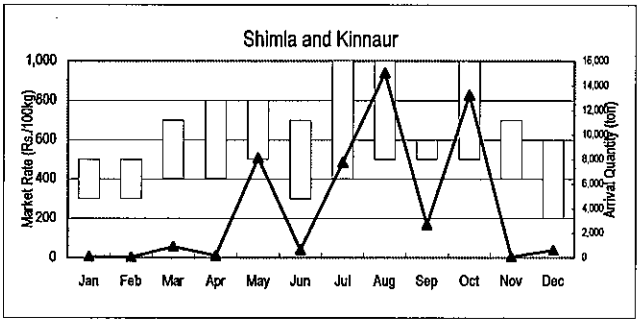


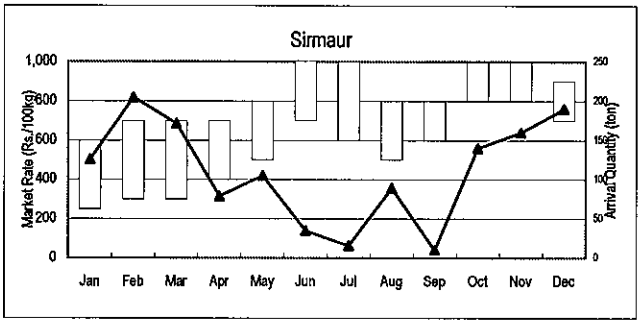


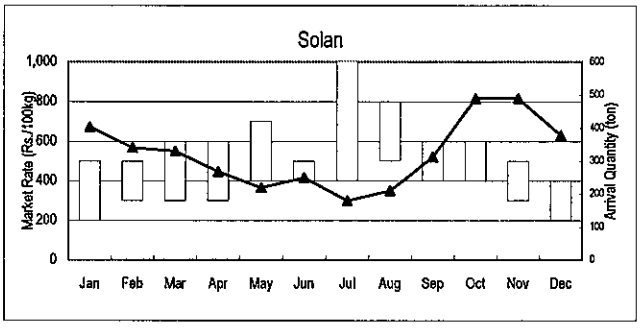


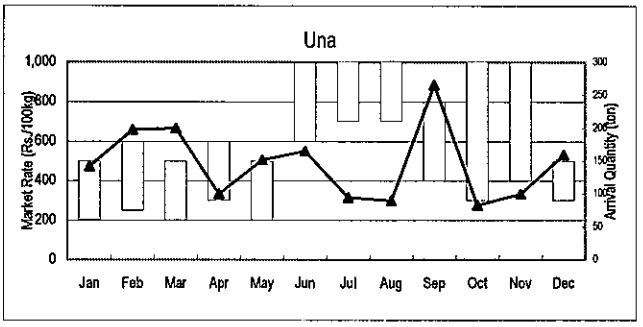






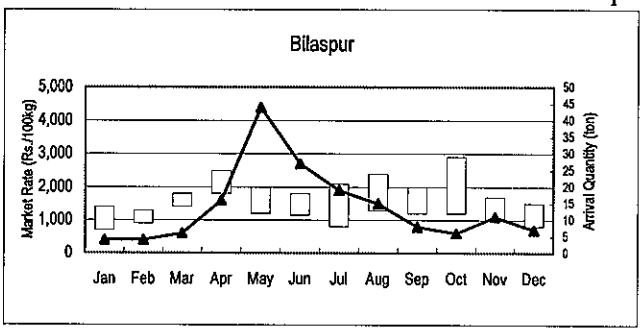


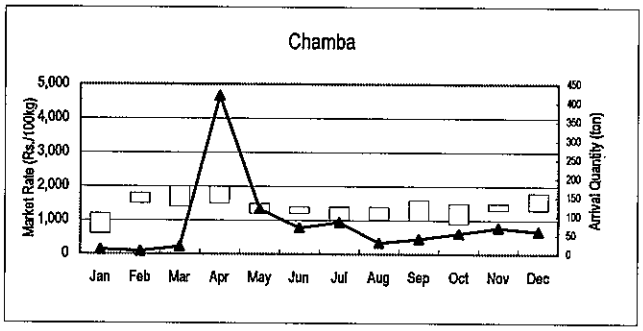


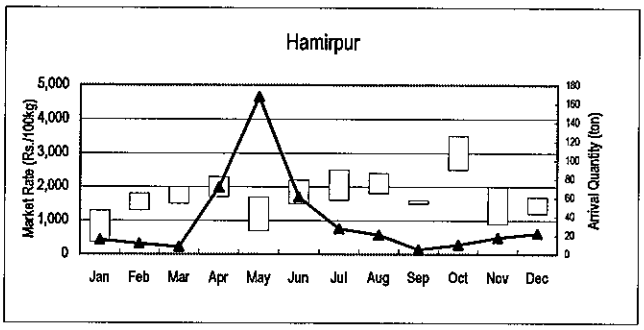


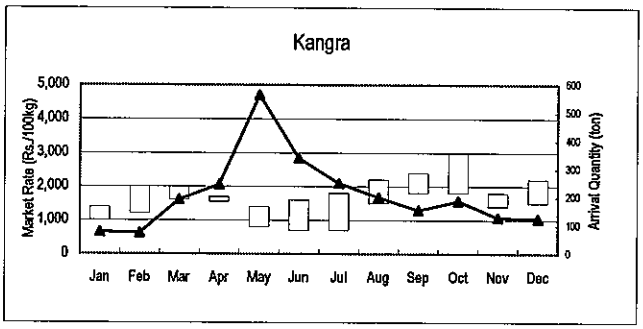
Monthly Max. Wholesale Price
Monthly Min. Wholesale Price
Arrival quantity (Unit 100kg: Quintal)

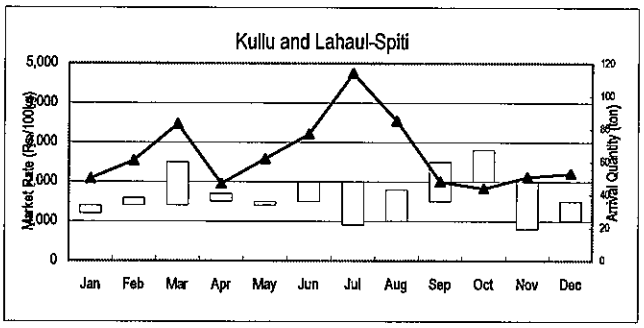
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (6/7)
Crop: Capsicum

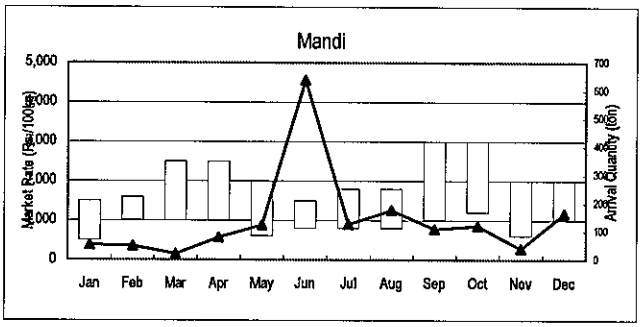


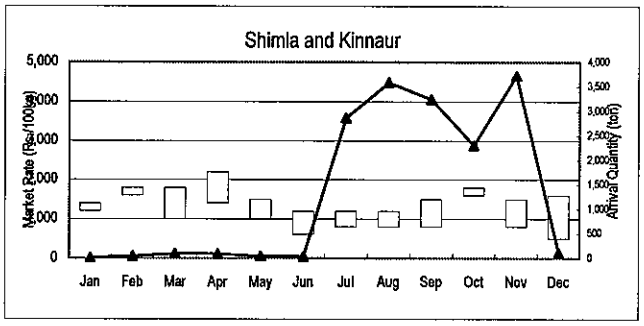


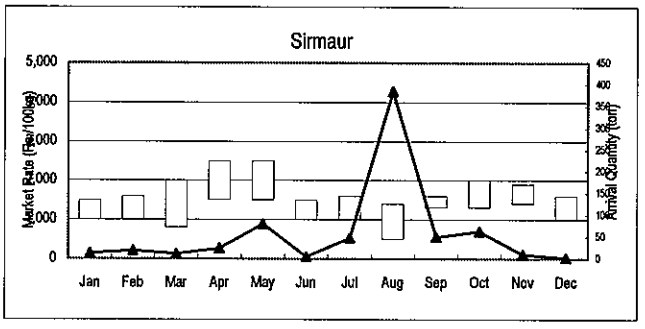


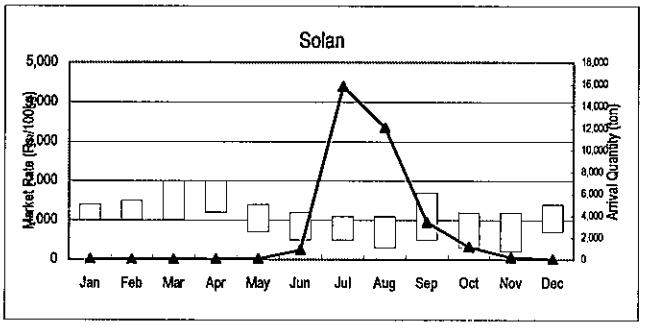


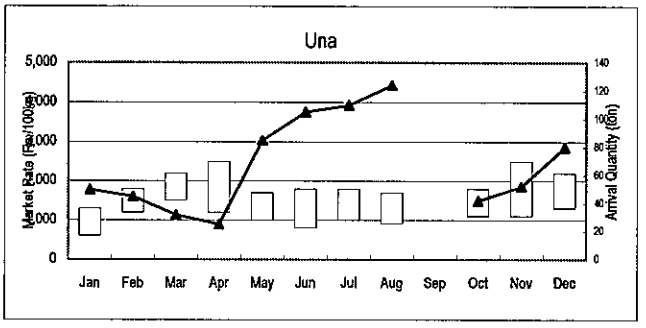










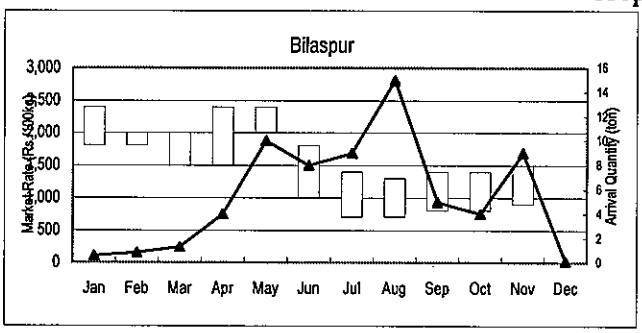


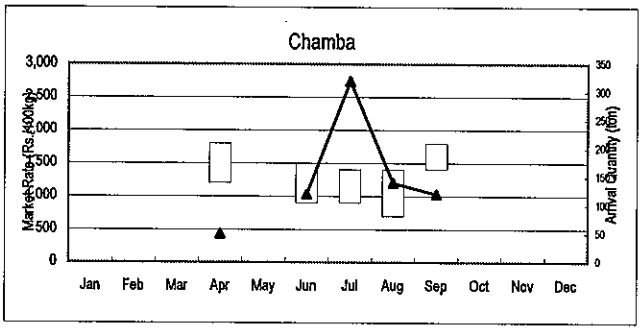
Monthly Max. Wholesale Price

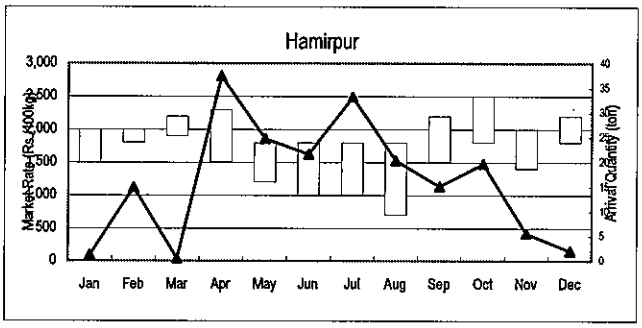
Monthly Min. Wholesale Price

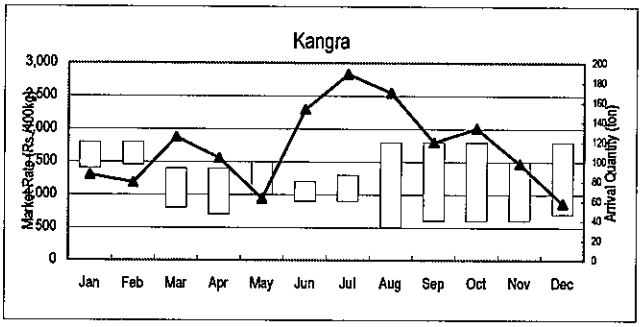
Arrival quantity (Unit 100kg: Quintal)

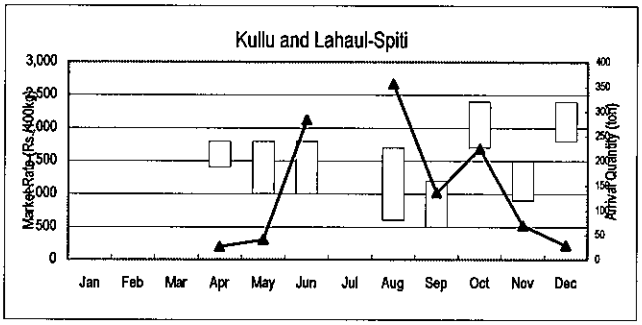
Attachment F-2 Monthly Max. and Min. Wholesale Price and Arrival Quantity in 2007 by APMCs (7/7)
Crop: Beans

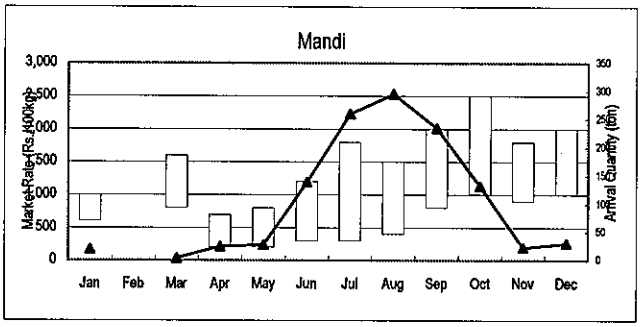


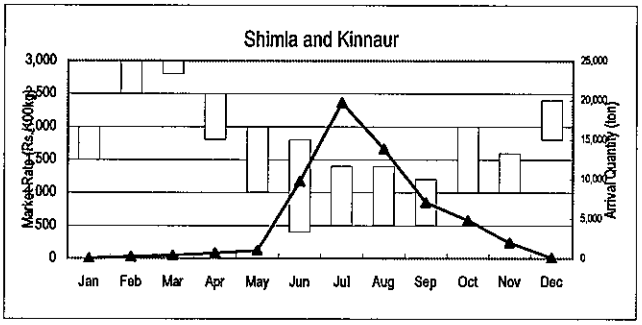


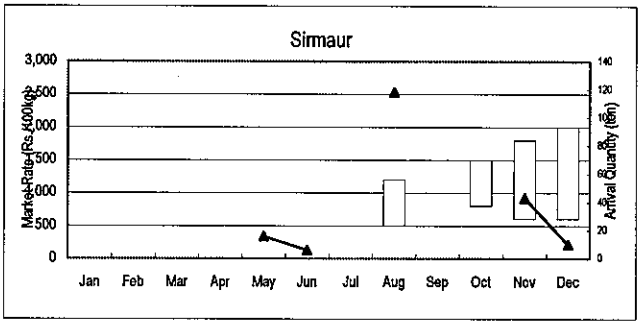


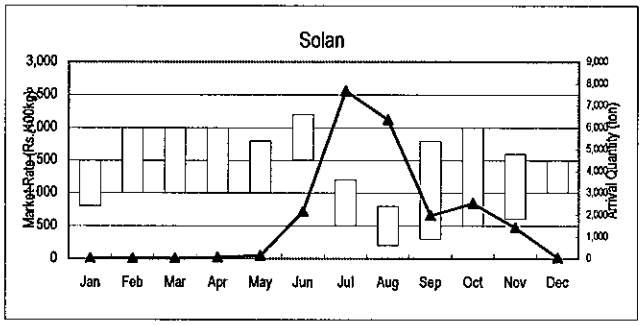


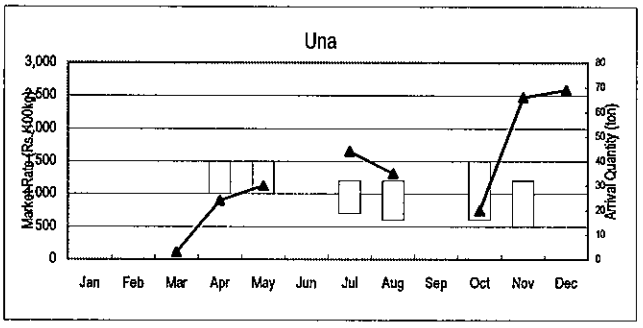












Monthly Max. Wholesale Price

Monthly Min. Wholesale Price

Arrival quantity (Unit 100kg: Quintal)

Attachment F-3 Monthly Average Wholesale Market Prices of Major Vegetables by Different Merket Yards (Beans)

Commodity : Beans

(Unit: Rs. /kg)

		APMC										Delhi	
		Bilaspur	Chamba	Hamirpur	Kangra	Kullu & Lauhal	Mandi	Shimla& Kinnaur	Sirmaur	Solan	Una	Azadpur	Shahdra
2006	Jan							14.0		19.5	25.0		
	Feb							21.0			24.0		
	Mar			15.0				17.5		16.0			
	Apr												5.7
	May			12.0	15.0			11.5			5.5		
	Jun	13.0											
	Jul						10.0	10.5		7.5			
	Aug				4.0		10.0	12.0					9.3
	Sep											15.0	11.3
	Oct						12.0	15.0		12.5			12.1
	Nov							16.0		9.5			6.0
	Dec							22.0					11.0
2007	Jan	21.0		17.5	16.0		8.0	17.5		11.5			12.5
	Feb	19.0		19.0	16.3			27.5		15.0			
	Mar	17.5		20.5	11.0		12.0	29.0		15.0			14.7
	Apr	19.5	15.0	19.0	10.5	16.0	4.5	21.5		15.0	12.5		10.0
	May	22.0		15.0	12.5	14.0	5.0	15.0		14.0	12.5		11.0
	Jun	14.0	12.0	14.0	10.5	14.0	7.5	11.0		18.5			
	Jul	10.5	11.5	14.0	11.0		10.5	9.5		8.5	9.5		
	Aug	10.0	10.5	12.5	11.5	11.5	9.5	9.5	8.5	5.0	9.0		7.6
	Sep	11.0	16.0	18.5	12.0	8.5	14.0	8.5		10.5			
	Oct	11.0		21.5	12.0	20.5	17.5	15.0	11.5	12.5	10.5		13.5
	Nov	12.0		17.0	10.5	12.0	13.5	13.0	12.0	11.0	8.5		12.0
	Dec			20.0	12.5	21.0	15.0	21.0	13.0	12.5			13.2
2008	Jan												15.9
	Feb												18.1
	Mar												
	Apr												
	May												
	Jun												
	Jul												
	Aug												
	Sep												
	Oct												
	Nov												
	Dec												

Attachment F-4 Monthly Average Wholesale Market Prices of Major Vegetables by Different Merket Yards (Cabbage)

Commodity : Cabbage

(Unit: Rs. /kg)

		Bilaspur	Chamba	Hamirpur		Kangra			Kullu & Lauhal		Mandi	Shimla	Sirmaur		Solan	Una		Delhi			Punjab						Haryana		
		Bilaspur	Chamba	Nadaun	Hamirpur	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla	Paonta Sahib	Nahan	Solan	Una	Chandigarh	Shahdara	Keshopur	Azadpur	Gurdaspur	Pathankot	Jalandhar	Ludhiana	Sahnewal	Ambala City	Jagadhri	Yamuna Nagar
2006	Jan	4.0			4.0			5.0			4.8	4.8			6.0	4.3	3.2			5.0	8.3	4.6	2.9		2.7		2.5	3.1
	Feb	3.0	3.3					3.0			2.5	3.5			4.0	3.0	2.8			2.9	2.7	3.2	2.5	2.4	2.1		2.3	2.8
	Mar		2.5		2.0			4.0			2.3	3.0			3.0	2.0	2.5			2.6	2.5	3.0	3.5				2.3	
	Apr																2.8			2.7		3.9	2.8	2.6				
	May		3.0		3.0			5.0		4.5	2.5	3.0				2.0				2.4	2.5	4.6	2.5		3.5		2.4	
	Jun		3.5							2.5	3.0	2.8			3.0		4.6			2.5			3.1	3.9			2.7	
	Jul		3.5					4.5		1.4	3.0	3.5			4.0		5.2			5.1			2.8	4.0	6.4		2.9	3.9
	Aug		3.8							2.5	5.8	4.5			4.5		4.9			6.7	7.0		2.9	3.7	5.5		3.1	4.6
	Sep																			6.7	5.0	7.4	3.8	4.7	5.7		4.1	5.7
	Oct		3.5					6.5		5.0	5.5	8.5			5.5	7.5				10.6		5.5	3.8	6.3			5.2	6.3
	Nov		5.0					8.0		5.5	5.0	7.0			4.5	9.0				6.9		3.7	3.4	6.0	4.0		4.0	5.0
	Dec	5.0	4.5		5.0			5.0		4.5	4.0	3.5			3.0	6.0				7.0		3.5	2.8		3.4		3.3	3.6
2007	Jan	3.3	4.0		4.0			5.0		3.8	3.5	4.0		4.3	3.5	3.5				4.0	4.1	3.1	2.9		3.2		2.7	2.5
	Feb	3.3	4.0		3.8			4.5		3.5	2.8	4.0		5.0	4.0	4.3				4.9	3.8	2.7	2.6				2.9	2.6
	Mar	4.3	4.0		4.3			5.0		4.5	5.0	5.5		5.0	4.5	3.5				6.4	5.0	3.4	2.8				3.2	3.2
	Apr	4.0	4.5		4.3			5.0		5.0	5.5	6.0		5.5	4.5	4.5				4.8	3.7	3.8	3.4	2.5	2.5		3.9	3.9
	May	6.3	6.0		5.5			7.0		4.5	6.5	6.5		6.5	5.5	3.5	3.7			4.0	3.8		3.5	2.9	3.4		3.1	3.4
	Jun	5.5	6.0		7.0			8.0		4.0	5.0	5.0		9.0	4.5	8.0	3.5			3.8	2.5		3.5	4.6	3.9		3.3	4.2
	Jul	8.5	6.5		5.5			10.5		7.5	7.3	8.0		8.0	9.5	9.5				7.9			5.6	5.7	7.7		5.7	6.6
	Aug	8.5	6.0		10.0			6.5		5.0	7.3	7.5		6.5	6.5	9.0				10.3			5.5	6.6	8.2		5.0	7.3
	Sep	6.0	5.0		7.0			6.5		3.5	5.0	5.5		7.0	5.0	6.0				6.5			4.7	5.6	6.3		4.4	6.3
	Oct	7.5	7.0		8.3			7.0		4.5	5.5	7.5		9.0	5.0	7.5				7.6			4.9		6.9		4.5	5.1
	Nov	5.0	5.0		6.9			7.0		3.5	4.5	5.5		9.0	4.0	7.0				5.6			3.6		5.1		3.7	4.1
	Dec	4.3	3.0		6.1			4.5		2.5	4.0	4.0		8.0	3.0	4.0				3.3								
2008	Jan	3.02	3.61	3.81	3.91	3.81	3.42	3.77	2.87	2.57	2.53		4.00	3.48	2.80	3.03		4.12	3.53	3.07			2.25	4.77		3.16		2.25
	Feb	3.81		4.96	4.22	4.93	4.25	4.37	2.77	2.93	3.74	3.25	4.62	3.38	3.43	3.90		3.89	3.53	3.67			2.47	2.50		5.11		2.60
	Mar	3.54		4.52	4.26	4.96	3.81	4.61	3.03	3.52	3.26	4.38	3.61	3.87	3.09	3.52		2.71	3.38	3.40			2.98	2.86		6.30		2.81
	Apr	2.81		4.74	4.23		4.40	4.29	4.92	4.35	3.42		3.28	3.29	3.50	3.13		2.67	2.94	3.30			2.61	2.68		4.90		
	May	2.85		4.38	3.96		3.76	3.92	3.24	3.42	2.95		3.33	3.76	2.89	2.69		3.30	2.50	3.11			2.67	2.48		5.49		1.60
	Jun	3.94		4.53	4.37		3.66	4.34		2.85	2.69	4.05	3.45	3.74	2.59	3.95		4.09	2.73	3.14			3.35	3.15		6.23		1.68
	Jul	4.31		5.45	5.51	4.31	4.40	5.13	3.36	3.10	3.89	4.29	4.66	4.79	4.32	5.24		7.31	8.83	4.03			3.61	4.09		5.32		4.00
	Aug	5.53		8.62	7.38	6.95	5.42	7.14	4.52	6.34	5.04	5.23	9.43	9.31	5.04	7.49		8.69		8.27			5.00	6.22		6.21		6.02
	Sep	7.79	7.36	11.35	10.58	8.50	7.29	8.48	6.42	7.12	6.69	5.89	12.05	11.43	4.75	9.66		8.82		10.52			6.00	8.11		9.15		7.77
	Oct																											
	Nov																											
	Dec																											

Attachment F-5 Monthly Average Wholesale Market Prices of Major Vegetables by Different Merket Yards (Capsicum)

Commodity : Capsicum

(Unit: Rs. /kg)

		Bilaspur	Chamba	Hamirpur		Kangra			Kullu & Lauhal		Mandi	Shimla	Sirmaur		Solan	Una		Delhi			Punjab			Haryana
		Bilaspur	Chamba	Nadaun	Hamirpur	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla& Kinnaur	Paonta Sahib	Nahan	Solan	Una	Chandigarh	Keshopur	Shahdara	Azadpur	Gurdaspur	Pathankot	Ludhiana	Ambala City
2006	Jan	13.0			13.0			18.0		13.0	12.5	13.5		13.8	11.5	14.5	10.0			7.6	14.0			
	Feb	14.0	18.5		15.0			17.5		16.0	12.5	15.0		15.0	14.0	16.0	9.7			9.1	11.7	7.2	10.6	
	Mar	15.0	12.0		16.0			20.0		20.0	19.5	16.0		12.3	15.0	19.0	10.4			14.6	12.3	7.0	13.5	
	Apr	12.5	8.5		12.9			13.0		11.6	11.4			9.6	11.0		8.8			10.3	7.5	10.5	8.7	
	May	13.0	13.0		13.0			10.5		12.5	18.5	10.0		11.5	11.0		6.8			7.8	8.8	6.2	7.1	
	Jun	13.8	13.0		17.8			14.0		23.9	15.0	12.5		15.0	12.5	13.0	7.3			14.7	10.8	5.3	12.9	
	Jul	16.0	16.0		17.5			17.0		13.5	13.0	14.0		13.0	8.0	13.5	7.7			16.2	10.8	7.2	8.3	
	Aug	16.0	14.0		23.0			18.0		14.9	18.0	10.0		14.0	7.0		7.4			15.5	9.3		10.3	
	Sep	19.2			28.1			24.9		22.4	15.5			14.1	9.5					18.2	13.0		16.4	
	Oct	14.5	15.0		33.5			32.5		35.0	25.0	15.0		14.1	12.5	29.0				21.4			24.8	
	Nov	10.5	12.5		14.0			26.5		14.4	22.5	16.0		15.0	8.5	25.0				14.2	12.8		11.5	
	Dec	10.0	13.0		15.0			15.0		14.5	15.0	13.5		13.0	13.0	16.0				8.8	14.0			
2007	Jan	10.5	9.0		8.3			12.0		13.0	10.0	13.0		12.5	12.0	9.5				7.8	13.6			
	Feb	11.0	16.5		15.5			16.0		15.0	13.0	17.0		13.0	12.5	15.0				8.9	14.0			
	Mar	16.0	17.0		17.5			18.0		19.5	17.5	14.0		14.0	15.0	18.5				9.8	14.5	10.3		
	Apr	21.5	17.5		20.0			16.3		16.0	17.5	18.0		20.0	16.0	18.5				12.2	16.5		10.5	
	May	16.0	13.5		12.0			11.0		14.5	13.0	12.5		20.0	10.5	13.5	9.9			8.3	11.0		8.8	
	Jun	14.8	13.0		18.5			11.5		17.5	11.5	9.0		12.5	8.5	13.0	6.8			6.5	9.4	7.9	79.5	
	Jul	14.5	12.0		20.5			12.5		14.5	13.0	10.0		13.0	8.0	14.0				10.0		11.6	10.4	
	Aug	18.5	12.0		21.0			18.5		14.0	13.0	10.0		9.5	7.0	13.0				10.8		10.1	10.0	
	Sep	16.0	13.0		15.5			21.0		20.0	20.0	11.5		14.5	11.0					12.2		9.0		
	Oct	20.5	12.0		30.0			24.0		24.0	21.0	17.0		16.5	7.5	14.5				11.7				
	Nov	13.5	14.0		14.5			16.0		14.0	13.0	11.5		16.5	7.0	18.0	7.2			8.8				
	Dec	11.5	15.5		14.5			18.5		12.5	15.0	10.5		13.0	10.5	17.5				7.7				
2008	Jan	13.48		15.57	15.18	17.50	19.44	17.25	15.17		14.20		16.33	16.00	11.88	18.80		11.78	11.84	8.88			6.00	10.42
	Feb	17.69		23.03	23.50	21.38	20.00	23.21	23.00	20.00	22.70	23.50	19.41	20.00	17.06	19.67		18.02	16.45	12.67			11.44	16.38
	Mar	13.64		17.17	20.52	19.29	10.73	20.54	18.06	21.00	17.20	18.63	13.52	19.20	17.68			8.47	8.63	7.80			9.90	11.23
	Apr	14.40		19.73	21.99		19.69	23.16	17.89	21.50	19.55		13.30	30.00		18.00		17.10	15.63	9.05			12.35	10.54
	May	15.53		15.33	14.93		10.84	16.60	14.71	17.33	14.14		12.17	12.55		15.05		13.00	13.77	8.40			10.14	8.21
	Jun	13.21		14.49	17.02		11.65	16.08	17.99	11.00	12.47		11.30	8.69	7.54	13.90		14.81	13.17	9.65			8.99	6.02
	Jul	15.76		30.00	23.57	25.56	20.28	21.77	21.32	19.00	17.30	22.34	13.49	13.80	14.44	19.86		22.44	23.55	13.37			16.17	11.71
	Aug	17.50		30.00	24.84	26.75	23.12	28.39	19.16	11.50	20.18	13.84	15.12	20.46	11.94	22.18			25.99	23.29			18.93	11.16
	Sep	16.10	21.69		22.12	30.00	18.88	32.26	24.56	20.00	21.17	22.35	20.86	26.54	16.96				31.18	29.36			20.53	12.83
	Oct																							
	Nov																							
	Dec																							

Attachment F-6 Monthly Average Wholesale Market Prices of Major Vegetables by Different Merket Yards (Cauliflower)

Commodity : Cauliflower

(Unit: Rs. /kg)

				Hamirpur		Kangra			Kullu & Lauhal				Sirmaur				Chandigarh	Delhi			Punjab							Haryana			
		Bilaspur	Chamba	Nadaun	Hamirpur	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla& Kinnaur	Nahan	Paonta Sahib	Solan	Una	Chandigarh	Keshopur	Shahdara	Azadpur	Gurdaspur	Pathankot	Amritsar	Jalandhar	Ludhiana	Sahnewal	Jagadhri	Ambala Cantt	Ambala City	Yamuna Nagar
2006	Jan	4.0			4.0			5.5			5.5	5.0			4.5	3.5	2.6			4.4	4.9	3.0		3.7	3.8	4.3	3.7			3.7
	Feb	3.8	3.8					3.5			2.5	6.0			3.5	3.0	2.9			3.2	2.5	2.5		4.4	2.5		1.0			
	Mar	4.5	4.0		4.5			5.0			4.5	7.5			5.0	5.0	3.5			4.8	3.9	3.0		3.5	2.9	3.0	3.5			3.3
	Apr																3.0			5.0	2.7	3.8		2.9	2.8		3.5			2.8
	May	6.5	5.0		6.5			6.5		3.3	4.0	5.0				5.0				10.7	4.5	4.8		3.8	4.3	5.5	4.5			4.3
	Jun	8.0	7.0					10.5		9.5	8.5	8.0			7.5		11.0			16.5				6.5	9.8		5.9			8.0
	Jul	5.8	11.0					10.5		7.5	11.5	14.0			10.0		7.1			15.3	9.4	8.9		6.5	7.8	10.1	6.9			8.8
	Aug	13.5	11.0					11.5		10.0	11.0	13.0			9.5		12.5			14.2	10.2	8.4		10.6	11.7	12.6	10.9			12.6
	Sep																			9.0	10.2	9.4		9.8	9.5	9.5	8.4			8.6
	Oct	10.0	7.5					12.0		9.5	10.0	14.0			10.0	11.5				9.3	7.4	7.0		6.7	6.7	6.2	6.3			6.8
	Nov	6.0	9.0					13.0		6.0	7.5	10.5			6.0	7.5				5.2	4.8	3.7		4.7	5.0	3.4	3.4			3.1
	Dec	7.5	5.5		7.3			7.0		7.5	6.5	5.5			4.5	6.0				5.4	5.3	3.9		4.9		3.9	3.3			3.4
2007	Jan	5.3	4.3		6.5			7.5		7.5	6.5	5.3	6.5		3.5	4.5				4.5	5.0	4.6		4.6		3.7	2.9			3.1
	Feb	3.5	5.0		5.5			4.3		6.0	4.5	8.5	6.0		4.5	6.0				6.0	4.5	3.1		4.1			3.0			3.6
	Mar	7.5	6.5		7.0			8.0		7.5	6.0	10.0	7.5		6.5	7.0				5.9	3.8	8.9		4.7			4.6			4.5
	Apr	8.5	6.5		6.5			7.5		9.0	9.0	11.5	7.5		9.0	10.0				10.9	2.3	8.4		5.1	9.0	6.4	5.4			5.1
	May	13.0	10.0		11.5			8.5		12.5	11.0	17.0	16.0		12.5	15.0	8.8			13.8				11.5		8.1	6.5			9.6
	Jun	11.5	11.5		15.0			9.0		7.0	8.5	6.5	16.0		7.0	14.0	8.1			11.5		13.2		11.4	5.9	9.5	6.0			7.2
	Jul	12.5	12.5		9.5			18.8		11.5	9.0	12.0	15.0		15.0	15.0				15.1		13.2		7.5	7.3	8.3	7.8			9.2
	Aug	16.0	13.5		16.5			16.0		11.5	9.0	15.0	15.0		9.5	14.0				15.6		13.9		9.4	10.7	12.0	8.3			11.1
	Sep	13.5	11.5		16.5			19.5		8.5	11.5	8.5	11.5		10.5	17.5				11.7		9.0		10.2	9.2	12.3	7.4			9.6
	Oct	13.0	12.5		18.5			9.0		8.0	11.5	12.5	11.0		8.5	12.5				7.9		10.8		7.3		6.3	5.1			6.7
	Nov	5.5	9.0		6.0			5.0		3.5	5.5	6.0	3.5		3.5	5.0				5.0		8.5		2.7		3.6	3.3			2.9
	Dec	6.5	4.0		9.3			5.5		4.5	5.5	6.0	5.5		3.5	4.0				4.6										
2008	Jan	4.62	4.85	4.90	5.22	4.48	4.25	4.68	4.40	4.16	4.37		3.57	3.30	3.40	4.51		5.22	4.30	3.63				3.73	5.48			2.80	2.57	3.16
	Feb	9.37		7.31	7.69	8.69	7.84	8.21	5.84	5.95	6.78	6.00	7.43	5.36	6.00	6.16		9.79	5.85	5.20				6.72	5.85			4.92	3.41	4.01
	Mar	5.67		4.94	5.29	6.11	5.85	6.26	4.95	4.60	4.03	6.68	5.33	3.87	4.27	4.53		3.87	3.43	3.27			54.60	5.58	5.99			3.80	3.88	3.18
	Apr	9.63		9.29	8.75		7.08	9.07	6.52	7.46	8.43	6.42	7.25	7.33	3.49	8.02		10.38	8.42	6.80			64.00	7.16	6.78			5.45	7.72	4.13
	May	8.45			8.79		6.85	7.00	5.23	5.79	7.25	5.91	6.74	6.42	4.05	7.91		14.51	8.78	9.53				7.07	6.87			5.86	5.51	6.00
	Jun	9.53		13.44	13.75		9.60	10.31	6.18	7.85	8.62	5.26	13.30	12.59	6.85	13.30		17.12	12.14	12.28				9.00	8.64			5.17	2.67	7.03
	Jul	7.33		18.45	15.72	13.17	9.40	15.57	13.44	11.70	11.79	8.50	18.00	16.25	10.55	16.40		26.97	24.29	13.50				11.55	7.36			6.18	6.98	11.02
	Aug	12.11		19.51	22.61	14.67	12.28	14.96	14.16	13.39	14.57	9.47	24.13	15.77	14.79	15.39			22.44	14.42				15.17	17.17			9.49	8.64	15.32
	Sep	18.38	22.18	23.25	22.63	17.52	15.23	16.01	13.19	12.47	15.16		18.84	19.43	12.02	22.12			15.12	13.58				14.43	16.30			11.36	11.09	14.08
	Oct																													
	Nov																													
	Dec																													

Attachment F-7 Monthly Average Wholesale Market Prices of Major Vegetables by Different Market Yards (Peas)

Commodity : Peas

(Unit: Rs. /kg)

		Bilaspur	Chamba	Hamirpur		Kangra			Kullu & Lauhal		Mandi	Shimla	Sirmaur		Solan	Una	Delhi		Punjab				Haryana				Chandigarh
		Bilaspur	Chamba	Nadaun	Hamirpur	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla	Paonta Sahib	Nahan	Solan	Una	Shahdara	Azadpur	Jalandhar	Gurdaspur	Pathankot	Ludhiana	Ambala Cant	Ambala City	Jagadhri	Yamuna nagar	
2006	Jan	7.8			9.0			9.8		10.5	9.5	8.5		9.0	11.0	8.3		7.8		8.5	5.9	5.8			7.3	7.1	6.5
	Feb	7.5	12.0		9.0			10.0		9.0	8.0	7.5		8.0	8.0	6.5		6.5	6.3		2.9	5.7			4.9	4.8	6.1
	Mar	12.0	8.0		13.5			13.0		16.0	11.5	14.0		7.5	14.0	14.5		8.8	9.0	8.0	5.9	9.6			8.8	7.3	7.8
	Apr																	14.9	17.4	18.0	7.8	17.1			15.6	14.2	15.2
	May		14.0		15.0			17.0		10.0	15.0	15.0		17.5	14.0	16.0		16.7	13.0		23.6	11.3			13.3	12.7	10.8
	Jun		11.5		20.5			20.0		14.0	15.0	17.0		17.5	16.0	20.0		22.4	15.8			16.2			14.7	14.3	16.1
	Jul		21.0		23.0			22.5		20.0	18.5	19.5			19.0	23.5		26.9	18.6		23.3	20.8			18.0	14.2	15.4
	Aug		21.0		23.0			20.0		20.0	18.0	20.5		20.0	22.0	24.0		23.0	18.7		22.5	19.4			18.4	14.6	16.9
	Sep																	28.1	20.9			25.1			20.4	16.6	
	Oct	33.0	14.0		30.5					27.5	20.0	29.0			23.0	28.0		29.3	25.1		30.0	24.6			23.2	21.4	
	Nov	12.5	15.0		21.5			20.0		20.0	18.0	22.5		9.8	18.5	24.5		21.2	7.2	12.0	5.1	16.0			10.0	11.2	
	Dec		13.0		11.0			10.5			10.5	11.5		10.5	11.0	11.5		8.7	8.4	7.4	4.9				7.8	8.3	
2007	Jan	9.0	9.0		8.3			12.0		13.0	10.0	11.0		12.0	11.5	9.5		7.9	8.6		7.1				6.6	7.6	
	Feb	8.5	12.0		11.0			11.5		13.5	15.0	13.5		11.5	10.5	10.0		7.3	9.3		10.5				6.5	6.6	
	Mar	15.5	12.0		14.3			13.0		15.5	11.0	16.0		12.0	14.0	13.0		11.7	10.4		14.0				8.6	8.9	
	Apr	11.5	13.0		12.0			11.0		13.5	10.5	13.5		15.0	11.5	13.8		12.7	10.9			9.3			9.5	10.0	
	May	28.5	11.0		26.5			18.5		22.5	18.5	25.0		22.5	18.0	22.5		21.4	14.7			17.3			14.7	14.8	
	Jun	25.0	15.0		26.5			18.5		25.0	20.0	25.0		18.5	16.0	26.0		24.3	23.9			19.4			17.9	16.4	20.0
	Jul	17.0	20.0		27.0			21.5		14.5	17.0	23.5		18.0	18.5	19.0		22.9	18.6			16.5			17.2	15.5	
	Aug	16.5	17.5		23.0			25.0		19.5	17.0	25.0		24.0	18.0	23.0		25.4	19.2			18.1			17.2	18.4	
	Sep	25.0	22.5		30.0			32.5		47.5	37.5	24.0		27.5	25.0	45.0		30.3	26.4			19.3			20.4	20.6	
	Oct	29.0	24.0		35.0			35.0		32.5	27.5	28.5		22.5	24.0	39.5		29.3	23.8						19.4	17.6	
	Nov	22.0	18.0		31.5			30.0		20.0	19.0	24.5		22.5	20.0	20.0		19.4	15.3						12.6	14.8	24.0
	Dec	12.0	17.5		13.0			12.0		12.5	9.5	13.5		15.0	10.5	8.5		11.6							19.4	17.6	
2008	Jan		11.08	10.86	10.54	10.96	10.46	10.89	11.71	12.09			11.50	9.81	8.84	9.54		9.24	8.26			11.03	6.69	7.52		7.74	
	Feb			11.21	11.14	12.18	11.00	12.23	13.46	14.21		13.50	11.05	10.35	9.66	11.52	9.27	8.46	10.09			6.66	7.23	7.57		8.04	
	Mar			13.33	13.68	14.07	12.56	15.80	14.60	15.32		13.64	12.61	12.21	12.07	12.21	6.92	9.39	12.27			7.12	7.38	6.52		8.04	
	Apr			19.31	24.11		18.32	20.04	16.84	19.11		17.91	13.09	15.33		15.59	16.71	21.27	20.40			16.55	10.81	16.59		12.46	
	May			27.33	27.07		22.46	23.76	17.61	17.57		17.51	21.05	29.12		24.16	20.43	25.42	19.20			18.55	14.96	18.99		15.74	
	Jun			26.51	25.42		16.29	24.86	15.64	20.75		16.10	17.95	29.07		21.82	19.26	28.13	16.43			14.49	11.29	13.46		11.50	
	Jul			27.66	29.78	26.45	21.50	25.48	18.16	22.53		12.99	25.81	30.00	22.50	25.34	30.30	28.55	18.70			21.25	15.04	17.40		15.63	
	Aug			31.45	34.33	29.00	28.38	30.71	23.94	22.00		41.35	29.38	40.00		31.14	34.52	29.30	22.27			23.70	19.19	20.82		22.26	
	Sep		29.00	37.15	47.00		29.44	40.76	27.76	44.00		43.29	39.00			36.20	43.13	65.31	23.67			29.54	20.52	24.78		26.28	
	Oct																										
	Nov																										
	Dec																										

Attachment F-8 Monthly Average Wholesale Market Price of Major Vegetables by Different Market Yards (Potato)

Commodity : Potato

(Unit: Rs. /kg)

		Bilaspur	Chamba	Hamirpur		Kangra			Kullu & Lauhal		Mandi	Shimla	Sirmaur		Solan	Una	Delhi			Haryana				Punjab		
		Bilaspur	Chamba	Nadaun	Hamirpur	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla	Paonta Sahib	Nahan	Solan	Una	Azadpur	Keshopur	Shahdara	Ambala Cantt	Ambala City	Yamuna Nagar	Panipat	Amrisar	Jalandhar	Ludhiyana
2006	Jan	5.3			5.0			5.8		6.0	5.0	3.3		4.0	4.5	4.3	6.8									
	Feb	3.3	6.6		5.5			5.5		6.0	5.0	3.3		4.3	4.5	5.0	5.5									
	Mar	5.5	5.8		5.9			6.3		7.3	5.5	5.5		4.5	4.5	5.8	5.7									
	Apr																5.1									
	May	6.5	6.0		7.0			6.0		6.3	6.0	5.8		5.1	6.0	5.5	5.8									
	Jun	5.0	6.8		7.4			6.3		7.8	6.5	6.0		6.0	5.5	6.8	7.4									
	Jul	6.5	7.5		7.5			7.5		7.0	5.5	8.5		6.5	6.3	6.9	7.1									
	Aug	7.5	6.0		7.8			7.8		8.0	6.5	7.5		6.5	7.0	7.5	6.7									
	Sep																8.4									
	Oct	10.0	9.5		10.7			11.0		9.5	8.5	10.5			8.5	10.0	9.5									
	Nov	9.5	9.0		9.5			9.5		9.5	9.0	10.8		6.5	9.0	9.5	9.1									
	Dec	4.0	10.0		4.7			5.0		4.5	3.8	5.5		5.5	3.8	4.1	5.3									
2007	Jan	3.3	3.5		3.8			4.5		4.3	5.0	4.0		4.0	2.8	3.5	3.6	3.2	2.8	2.5	2.3	2.5	2.3	2.41		
	Feb	3.5	4.5		5.2			5.3		5.0	5.0	4.3		4.3	3.5	4.0	4.0	4.1	3.1	2.9	2.7	2.8	2.3	2.69		
	Mar	4.0	5.5		5.6			5.8		4.5	5.0	6.8		5.3	4.5	5.2	5.3	5.4	4.8	3.7		3.3	3.4	4.43		
	Apr	5.5	5.5		5.7			6.5		6.5	5.5	6.8		5.0	5.5	5.0	5.9	5.4	5.1	4.2		3.7	5.0	4.15		4.63
	May	6.5	6.0		6.0			5.3		8.0	6.0	10.0		5.5	6.5	5.8	6.5	5.9	5.6	5.1	6.6	4.5		5.05		4.50
	Jun	8.3	9.0		7.8			7.0		7.5	7.0	9.5		6.5	6.5	7.3	8.1	6.5	5.8	6.0		4.6		5.96		
	Jul	8.0	7.5		8.0			9.5		7.5	6.5	9.5		8.0	7.0	7.0	8.2	6.8	6.7	6.9		5.1	5.5	8.24		4.92
	Aug	8.5	9.0		8.1			10.5		8.5	6.5	11.5		8.2	9.5	7.5	8.3	7.3	7.5	8.2	7.0	5.1	5.4			5.86
	Sep	8.5	8.5		8.7			11.0		9.0	8.0	8.0		7.0	6.5	8.0	9.0	7.7	7.0	8.1	8.5	5.2	5.5	9.05		9.88
	Oct	8.5	10.0		10.5			10.0		9.5	8.5	13.5		7.0	8.5	10.5	9.2	8.1	7.3	7.8	5.8	5.7	5.5	9.53		
	Nov	8.0	8.5		8.6			9.0		9.0	7.3	10.0		6.8	8.5	6.0	6.4	7.3	6.7	4.1	5.4	5.0	6.5			
	Dec	6.0	7.0		5.4			5.0		6.5	4.5	6.3		5.1	5.0	4.0	4.8	5.4	5.3	3.4	4.0	3.5				4.98
2008	Jan	4.74	5.58	5.00	5.00	5.28	4.63	5.24	5.34	6.04	4.35		4.05	3.94	3.69	4.43	4.0	4.4	4.3	2.8	3.0	2.9	3.6	9.32		3.39
	Feb	5.11		5.58	5.68	5.57	4.06	5.23	6.23	6.10	4.77	6.25	4.81	4.46	4.17	5.10	4.2	4.8	4.5	3.5	3.3	3.0	3.9	8.53		3.62
	Mar	5.08		6.08	6.05	6.72	4.85	6.30	6.32	6.14	4.84	5.65	5.48	5.06	4.40	5.26	3.5	4.7	4.1	4.0	3.8	3.4	4.0	4.88	4.55	3.42
	Apr	4.75		6.06	6.04		5.25	6.21	6.14	5.88	4.84		4.63	4.96	4.50	4.91	3.6	4.5	3.8	3.6	3.8	3.1	2.8	4.69	3.47	
	May	3.87		5.67	5.87		5.18	5.52	5.70	5.77	4.56	5.92	4.84	4.62	4.47	4.11	4.0	4.4	3.9	3.4	3.9	3.2	2.5	4.59		
	Jun	5.07		5.89	6.04		5.04	5.77	5.13	5.46	4.97	5.12	5.24	5.43	5.38	4.32	5.6	4.6	4.2	4.5	4.5	3.2	3.2	4.16	3.54	4.71
	Jul	4.79		5.82	6.06	5.75	5.39	5.92	4.63	4.59	4.71	4.77	5.55	5.31	5.05	4.64	7.1	6.9	4.2	4.5	5.0	3.3	3.3	4.92	3.04	5.42
	Aug	4.48		4.94	5.31	5.75	4.65	5.47	6.05	6.98	4.74	5.77	5.29	5.17	6.00	4.44	7.9		4.2	5.7	5.7	3.2	3.5	5.24	3.11	6.80
	Sep	4.72	7.74	5.56	6.31	5.75	4.50	5.93	6.37	6.63	4.93	7.02	5.59	5.58	7.64	5.21	7.8		4.7	5.4	7.0	3.2	3.4	6.47	3.06	7.60
	Oct																									
	Nov																									
	Dec																									

Attachment F-9 Monthly Average Wholesale Market Prices of Major Vegetables by Different Merket Yards (Tomato)

Commodity : Tomato

(Unit: Rs. /kg)

		Bilaspur		Chamba	Hamirpur		Kangra			Kullu & Lauhal		Mandi	Shimla	Sirmaur		Solan	Una	Punjab						Haryana					Delhi		
		Bilaspur	Namhol	Chamba	Hamirpur	Nadaun	Palampur	Jassour	Kangra	Bhuntar	Kullu	Mandi	Shimla	Paonta Sahib	Nahan	Solan	Una	Gurdaspur	Pathankot	Jalandhar	Ludhiana	Amrisar	Sahnewal	Jegadhri	Ambala Cantt	Ambala City	Panipat	Yamuna Nagar	Azadpur	Keshopur	Shahdara
2006	Jan	3.0			3.5				5.5		6.8	5.5	9.0		5.3	3.5	6.0	6.5	4.3	5.2	3.8		4.8	2.6				3.8			
	Feb	5.0		7.8	7.5				6.8		9.8	7.5	10.0		5.0	5.0	7.3	7.6	4.5	5.4	4.5		5.0	2.7				5.0			
	Mar	6.3		6.5	9.5				9.0		10.8	7.5			4.5	8.5	7.5	7.3	8.7	6.1	5.1		5.8	4.5				5.7			
	Apr												5.0					5.6	8.4	5.1	3.9			3.7				4.3			
	May	5.0		5.0	5.1				4.5			4.0	13.0		4.5	5.5	3.8	3.4		3.3	3.0		2.9	2.4				5.0			
	Jun	8.5		21.8					18.0		8.0	10.5	9.5		17.0	15.0	15.5	6.7		8.5	10.2		9.1	7.0				12.1			
	Jul	9.5		9.5	11.0				17.0		7.5	6.5	14.0		6.8	8.5	11.0	11.1		9.3	7.7		8.5	6.0				6.2			
	Aug	9.8		9.5	11.0				11.5		7.5	10.0			6.5	8.0	16.5	9.6	13.9	7.4	6.8		10.1	7.9				6.5			
	Sep												8.5					12.4	15.0	10.6	9.6		12.7	9.2				10.1			
	Oct	6.0		6.5	13.0				12.5		6.5	9.0	9.0			7.5	14.1	10.4	11.1	9.0	8.3		11.5	9.4				9.4			
	Nov				2.8						5.5	8.0	9.5		6.0	6.0	9.5	10.3	10.8	7.8	7.0		8.0	6.2				8.0			
	Dec	9.0			11.0				12.0		10.0	9.0			11.8	6.5	10.5	9.5	10.7	9.5			9.7	6.2				8.8			
2007	Jan	7.0		6.0	10.3				12.5		11.5	9.5	7.5		7.5	7.5	10.5	10.8	9.1	8.2			10.2	6.3				6.9			
	Feb	8.5		5.0	9.5				9.5		12.0	9.0	9.0		8.8	10.5	11.0	8.4	8.9	5.5				5.3				5.6			
	Mar	10.5		6.0	9.5				11.5		11.0	10.5	9.0		7.5	7.0	9.5	8.6	7.6	6.0				5.9				6.4			
	Apr	9.0		5.5	11.5				11.0		9.0	9.5	10.5		7.0	7.5	9.0	9.9	10.5	6.9	5.5		5.9	5.4				5.1			
	May	12.0		4.5	8.0				6.5		12.0	9.0	8.5		11.8	7.0	8.0	6.2	9.4	4.8	4.2		4.0	4.4				4.7			
	Jun	8.0		7.3	11.5				5.0		8.0	11.0	9.0		7.5	9.5	10.5	8.4	11.5	6.0	7.9		7.2	4.1				5.3			
	Jul	7.0		9.5	10.0				9.5		5.5	6.5	7.0		7.5	7.5	9.0		10.6	7.3	9.1		7.9	4.9				6.1			
	Aug	9.5		8.5	11.5				12.0		6.5	6.5	10.0		15.0	7.5	9.0		12.6	7.9	9.6		9.1	6.8				8.1			
	Sep	5.0		9.0	9.0				10.5		4.0	7.5	9.5		9.5	9.0	8.5		12.4	6.0	7.2		9.4	4.6				6.7			
	Oct	6.0		10.5	10.3				12.0		7.0	7.5	9.0		10.3	8.0	10.5		13.2	6.0			9.4	5.3				7.6			
	Nov	8.0			10.5				14.0		10.5	8.5	10.5		9.3	6.5	11.5		12.8	6.5			10.3	5.3				6.8			
	Dec	7.0		9.0	8.3				8.5		7.5	8.0	8.0		7.5	6.0	7.0														
2008	Jan	5.13	3.08	8.44	8.53	8.93	8.95	7.55	8.16	10.18	9.19	7.73		7.72	6.96	5.53	8.34			5.81	5.96				4.23	4.16	3.46	4.62	5.01	6.58	4.41
	Feb	12.80			12.62	13.33	13.95	11.48	12.59	14.23	14.63	12.38	8.00	10.87	11.87	11.60	11.88			9.05	8.22	12.00			5.91	7.72	7.54	6.45	7.66	14.17	9.44
	Mar	12.77			11.50	14.14	11.17	9.28	11.35	12.64	13.42	11.49	12.42	8.25	9.76	10.39	11.83			9.89	9.75	9.95			6.72	10.27	9.62	6.69	6.89	11.32	7.52
	Apr	13.17			13.91	14.61		12.85	14.75	15.01	17.10	13.22		14.08	16.74	11.53	12.72			8.70	8.04	12.31			7.06	7.92	7.77	7.42	7.70	11.59	7.26
	May	5.80			5.81	6.15		6.73	5.68	6.90	6.64	5.80		4.82	4.10	4.62	3.82			4.53	3.34	4.69			3.39	2.69	2.40	3.50	2.67	5.90	3.28
	Jun	3.67			4.02	5.25		4.85	4.31	4.73	4.19	3.17		5.20	5.55	4.32	4.67			3.20	3.65	2.98			3.20	2.39	3.44	1.67	5.11	5.06	3.97
	Jul	7.97			9.51	10.89	8.84	8.62	8.96	6.08	5.61	6.35	4.05	8.84	12.29	6.85	9.80			7.06	7.05	10.55			5.22	6.45	8.51	5.80	9.33	12.03	7.72
	Aug	10.21			10.59	10.84	10.27	8.99	11.89	6.75	8.20	9.35	5.44	8.93	10.50	8.42	11.87			10.39	6.90	10.70			7.11	7.07	9.50	7.69	9.40		8.21
	Sep	9.05	12.61	12.36	16.65	16.11	17.34	12.25	14.73	9.51	9.51	11.50		13.15	14.51	11.84	13.71			10.39	7.52	11.27			7.39	8.40	10.14	10.88	12.75		10.90
	Oct																														
	Nov																														
	Dec																														

Attachment F-10 Monthly Arrival Quantity of Potato at Azadpur Wholesale Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2004	4	25.7	1,163.6	27,125.5	0.0	0.0	0.0	9,033.1	2.9	7.6	688.6	9.2	0.0	0.0	0.0	0.0	0.0			38,056.2
	5	19.2	1,998.7	19,748.3	57.0	2,888.9	0.0	10,500.2	0.0	0.0	785.6	0.0	0.0	0.0	0.0	15.0	0.0			36,012.9
	6	119.2	1,884.0	7,647.4	130.0	6,738.6	408.9	14,480.9	63.3	0.0	469.7	21.1	0.0	0.0	0.0	12.8	0.0			31,975.9
Summer Total		164.1	5,046.3	54,521.2	187.0	9,627.5	408.9	34,014.2	66.2	7.6	1,943.9	30.3	0.0	0.0	0.0	27.8	0.0	0.0	0.0	106,045.0
	7	461.8	1,248.9	5,406.2	130.7	12,728.6	314.0	17,390.3	236.7	0.0	344.7	0.0	0.0	0.0	0.0	0.0	0.0			38,261.9
	8	215.7	837.7	3,724.7	9.8	17,761.3	73.5	16,170.0	72.5	98.3	242.7	0.0	1,313.8	17.1	0.0	0.0	0.0			40,537.1
	9	270.0	1,396.8	5,822.6	0.0	11,276.6	22.6	17,550.6	35.8	40.0	75.4	144.4	5,142.3	438.5	0.0	0.0	15.1			42,230.7
	10	286.5	1,264.1	4,088.3	0.0	8,372.0	1.5	20,788.1	41.2	51.6	257.7	583.2	8,839.4	264.9	14.2	0.0	0.0			44,852.7
Monsoon Total		1,234.0	4,747.5	19,041.8	140.5	50,138.5	411.6	71,899.0	386.2	189.9	920.5	727.6	15,295.5	720.5	14.2	0.0	15.1	0.0	0.0	165,882.4
	11	87.7	751.9	50,096.4	0.0	6,977.9	0.4	6,844.3	12.6	0.0	26.7	44.2	1,443.5	32.9	0.0	5.1	11.8			66,335.4
	12	9.2	404.8	53,253.9	0.0	36.5	2.2	814.9	0.0	0.0	540.6	12.0	15.7	0.0	0.0	0.0	0.0			55,089.8
2005	1	2.3	547.0	36,687.5	0.0	0.0	0.0	4,704.5	0.0	0.0	628.0	30.2	0.0	0.0	0.0	9.4	0.0			42,608.9
	2	193.0	1,495.4	9,471.8	0.0	0.0	3.3	21,418.3	2.5	0.0	731.8	25.3	0.0	0.0	0.0	0.0	0.0			33,341.4
	3	273.5	1,071.2	11,318.4	0.0	0.0	0.0	22,603.8	0.0	0.0	717.9	61.0	0.0	0.0	0.0	0.0	15.1			36,060.9
Winter Total		565.7	4,270.3	160,828.0	0.0	7,014.4	5.9	56,385.8	15.1	0.0	2,645.0	172.7	1,459.2	32.9	0.0	14.5	26.9	0.0	0.0	233,436.4
Yearly Total		1,963.8	14,064.1	234,391.0	327.5	66,780.4	826.4	162,299.0	467.5	197.5	5,509.4	930.6	16,754.7	753.4	14.2	42.3	42.0	0.0	0.0	505,363.8
	4	124.3	811.9	13,656.2	0.0	12.8	0.0	23,644.3	6.2	0.0	815.3	33.0	0.0			16.9	12.8			39,133.7
	5	41.1	323.2	20,893.3	11.3	805.4	0.0	14,105.9	0.0	0.0	562.6	32.5	0.0			0.0	0.0			36,775.3
	6	36.5	593.4	4,684.2	7.2	5,498.2	73.0	17,719.1	35.6	0.0	620.0	14.9	0.0			0.0	0.0			29,282.1
Summer Total		201.9	1,728.5	39,233.7	18.5	6,316.4	73.0	55,469.3	41.8	0.0	1,997.9	80.4	0.0	0.0	0.0	16.9	12.8	0.0	0.0	105,191.1
	7	139.7	723.7	1,785.2	421.5	4,893.1	272.9	24,384.5	205.3	0.0	1,100.1	0.0	16.3			14.3	0.0			33,956.6
	8	52.6	730.7	1,513.4	61.4	9,625.5	40.8	22,643.6	113.8	14.0	1,284.9	32.7	2,656.4			0.0	0.0			38,769.8
	9	66.7	817.1	2,258.4	0.0	5,539.3	0.0	20,425.1	6.0	0.0	827.5	138.8	9,144.1			14.5	0.0			39,237.5
	10	49.7	2,043.3	3,879.3	0.0	6,736.0	13.6	18,546.8	47.2	20.6	319.8	870.0	11,885.6			0.0	0.0			44,411.9
Monsoon Total		308.7	4,314.8	9,436.3	482.9	26,793.9	327.3	86,000.0	372.3	34.6	3,532.3	1,041.5	23,702.4	0.0	0.0	28.8	0.0	0.0	0.0	156,375.8
	11	32.8	1,353.9	44,498.0	0.0	5,007.4	0.0	3,671.6	12.6	0.0	0.0	40.8	1,173.7			0.0	0.0			55,790.8
	12	14.9	797.1	41,574.4	0.0	59.5	4.3	5,387.2	0.5	0.0	613.1	0.0	27.8			0.0	0.0			48,478.8
2006	1	63.0	2,982.2	14,897.4	0.0	15.2	2.4	17,032.3	1.2	0.0	377.2	4.5	0.0			0.0	0.0			35,375.4
	2	25.3	1,174.9	6,068.8	0.0	0.0	1.1	23,792.7	0.0	18.7	293.7	25.6	0.0			17.0	0.0			31,417.8
	3	56.2	491.9	2,026.8	0.0	0.0	0.0	38,180.2	1.8	0.0	610.4	35.2	0.0			0.0	13.2			41,415.7
Winter Total		192.2	6,800.0	109,065.4	0.0	5,082.1	7.8	88,064.0	16.1	18.7	1,894.4	106.1	1,201.5	0.0	0.0	17.0	13.2	0.0	0.0	212,478.5
Yearly Total		702.8	12,843.3	157,735.4	501.4	38,192.4	408.1	229,533.3	430.2	53.3	7,424.6	1,228.0	24,903.9	0.0	0.0	62.7	26.0	0.0	0.0	474,045.4
	4	31.5	201.3	8,102.8	9.0	0.0	0.0	23,080.5	0.0	0.0	332.3	0.0	0.0			29.2	20.6			31,807.2
	5	11.6	104.8	11,052.4	0.0	2,248.5	0.0	17,947.3	0.0	0.0	224.1	9.0	0.0			0.0	0.0			31,597.7
	6		115.4	2,218.1	17.8	5,156.5	239.7	25,386.4	0.0	0.0	467.6	145.0	0.0			0.0	0.0			33,746.5
Summer Total		43.1	421.5	21,373.3	26.8	7,405.0	239.7	66,414.2	0.0	0.0	1,024.0	154.0	0.0	0.0	0.0	29.2	20.6	0.0	0.0	97,151.4
	7	15.8	961.3	469.9	117.4	6,377.0	357.4	28,737.4	176.3	0.0	449.7	0.0	0.0			0.0	0.0			37,662.2
	8	18.8	159.3	489.7	19.5	6,514.9	65.4	26,640.2	112.7	64.1	618.8	26.4	3,408.1			106.3	0.0			38,244.2
	9	202.3	161.7	355.6	0.0	5,086.2	10.0	27,873.1	45.9	0.0	350.6	362.0	8,597.2			89.1	9.0			43,142.7
	10	38.1	1,099.8	709.1	0.0	3,295.7	1.9	21,827.1	55.5	0.0	184.3	382.6	6,098.7			13.5	8.9			33,715.2
Monsoon Total		275.0	2,382.1	2,024.3	136.9	21,273.8	434.7	105,077.8	390.4	64.1	1,603.4	771.0	18,104.0	0.0	0.0	208.9	17.9	0.0	0.0	152,764.3
	11	20.2	465.7	34,602.7	0.0	6,436.6	0.0	9,795.1	10.3	30.3	62.1	64.7	2,135.0			0.0	15.0			53,637.7
	12	4.2	667.8	32,653.1	0.0	98.2	0.0	8,236.4	0.0	0.0	175.6	175.0	0.0			0.0	0.0			42,010.3
2007	1																			0.0
	2																			0.0
	3																			0.0
Winter Total		24.4	1,133.5	67,255.8	0.0	6,534.8	0.0	18,031.5	10.3	30.3	237.7	239.7	2,135.0	0.0	0.0	0.0	15.0	0.0	0.0	95,648.0
Yearly Total		342.5	3,937.1	90,653.4	163.7	35,213.6	674.4	189,523.5	400.7	94.4	2,865.1	1,164.7	20,239.0	0.0	0.0	238.1	53.5	0.0	0.0	345,563.7

Attachment F-11 Monthly Arrival Quantity of Tomato at Azadpur Wholesale Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2004	4	1,050.9	5,518.3	4.5	0.0	0.0	6.0	157.4	3,392.8	689.2	300.6	507.2	42.6			0.0	54.1	0.0		11,723.6
	5	1,970.0	9,874.7	0.0	0.0	0.0	0.0	904.2	107.4	9.0	0.0	0.0	0.0			0.0	0.0	0.0		12,865.3
	6	289.0	9,039.9	24.4	0.0	3,387.1	33.5	1,608.5	62.5	0.0	0.0	0.0	9.5			0.0	0.0	0.0		14,454.4
Summer Total		3,309.9	24,432.9	28.9	0.0	3,387.1	39.5	2,670.1	3,562.7	698.2	300.6	507.2	52.1	0.0	0.0	0.0	54.1	0.0	0.0	39,043.3
	7	23.6	345.3	21.0	0.0	10,496.8	237.4	574.5	37.7	137.6	34.3	509.4	141.3			0.0	0.0	0.0		12,558.9
	8	1.1	402.4	3.8	15.7	3,052.9	7.9	46.9	105.2	380.2	11.2	7,204.7	179.7			0.0	0.0	0.0		11,411.7
	9	11.8	11.4	0.0	11.0	366.7	1.8	3.3	109.9	84.0	156.2	10,296.0	47.2			0.0	0.0	0.0		11,099.3
	10	19.8	86.6	0.0	0.0	139.5	6.7	12.8	883.9	67.3	5,379.4	5,943.2	31.2			34.5	0.0	0.0		12,604.9
Monsoon Total		56.3	845.7	24.8	26.7	14,055.9	253.8	637.5	1,136.7	669.1	5,581.1	23,953.3	399.4	0.0	0.0	34.5	0.0	0.0	0.0	47,674.8
	11	11.3	83.1	0.1	0.0	30.2	17.0	54.9	934.0	93.4	5,170.6	6,232.1	159.1			10.0	0.0	0.0		12,795.8
	12	62.9	393.8	13.7	0.0	14.7	10.0	456.0	1,800.5	101.5	5,791.8	5,241.3	16.1			0.0	0.0	0.0		13,902.3
2005	1	120.3	858.1	0.0	0.0	0.0	0.0	607.5	1,534.2	181.2	6,364.8	3,644.2	47.2			0.0	110.9	26.3		13,494.7
	2	76.6	2,245.9	0.0	0.0	0.0	12.3	312.8	1,305.7	75.4	6,092.8	1,976.3	101.0			24.5	517.0	93.4		12,833.7
	3	199.9	2,896.8	24.6	0.0	0.0	38.2	77.9	1,761.8	525.1	2,807.4	1,873.2	11.6			64.0	760.5	209.7		11,250.7
Winter Total		471.0	6,477.7	38.4	0.0	44.9	77.5	1,509.1	7,336.2	976.6	26,227.4	18,967.1	335.0	0.0	0.0	98.5	1,388.4	329.4	0.0	64,277.2
Yearly Total		3,837.2	31,756.3	92.1	26.7	17,487.9	370.8	4,816.7	12,035.6	2,343.9	32,109.1	43,427.6	786.5	0.0	0.0	133.0	1,442.5	329.4	0.0	150,995.3
	4	935.6	3,098.2	16.8	0.0	0.0	0.0	152.3	4,303.5	1,320.1	840.7	840.2	11.2			91.6	177.2		0.0	11,787.4
	5	1,045.8	10,793.0	0.3	0.0	0.9	0.0	237.6	259.3	0.0	9.1	0.0	0.0			0.0	0.0		0.0	12,346.0
	6	50.6	13,360.4	0.0	0.0	517.1	5.0	859.0	3.8	0.0	0.0	0.0	0.0			0.0	0.0		0.0	14,795.9
Summer Total		2,032.0	27,251.6	17.1	0.0	518.0	5.0	1,248.9	4,566.6	1,320.1	849.8	840.2	11.2	0.0	0.0	91.6	177.2	0.0	0.0	38,929.3
	7	4.6	1,695.9	0.0	0.0	8,782.9	182.0	438.0	2.9	26.8	11.8	709.5	74.3			6.0	0.0		0.0	11,934.7
	8	30.9	34.0	0.0	148.8	6,066.7	143.3	35.2	0.0	118.2	209.2	3,214.1	244.6			32.0	0.0		0.0	10,277.0
	9	10.4	15.1	6.6	0.0	1,914.6	1.6	16.1	139.0	9.7	3,728.5	5,792.5	0.0			0.0	0.0		0.0	11,634.1
	10	14.6	31.7	38.0	57.7	468.4	0.0	18.5	216.0	0.0	14,635.4	1,501.2	0.0			38.8	0.0		0.0	17,020.3
Monsoon Total		60.5	1,776.7	44.6	206.5	17,232.6	326.9	507.8	357.9	154.7	18,584.9	11,217.3	318.9	0.0	0.0	76.8	0.0	0.0	0.0	50,866.1
	11	19.3	523.2	19.1	46.4	130.4	2.2	48.8	1,262.0	0.0	7,161.6	4,033.7	0.0			0.0	14.8		0.0	13,261.5
	12	11.7	847.0	0.0	86.6	6.0	0.0	50.2	2,702.9	0.0	12,420.3	1,413.2	0.0			0.0	0.0		0.0	17,537.9
2006	1	93.4	1,884.8	0.0	13.5	0.0	1.7	171.3	2,139.8	266.1	8,771.7	996.2	0.0			0.0	0.0		0.2	14,338.7
	2	184.8	2,681.0	0.0	81.1	0.0	452.5	803.2	1,308.4	240.3	4,519.6	1,008.7	40.8			0.0	2,112.2		0.0	13,432.6
	3	32.0	1,254.5	0.0	8.0	0.0	211.1	574.0	2,137.5	2,687.7	3,296.2	735.4	51.8			66.3	5,155.2		0.0	16,209.7
Winter Total		341.2	7,190.5	19.1	235.6	136.4	667.5	1,647.5	9,550.6	3,194.1	36,169.4	8,187.2	92.6	0.0	0.0	66.3	7,282.2	0.0	0.2	74,780.4
Yearly Total		2,433.7	36,218.8	80.8	442.1	17,887.0	999.4	3,404.2	14,475.1	4,668.9	55,604.1	20,244.7	422.7	0.0	0.0	234.7	7,459.4	0.0	0.2	164,575.8
	4	155.0	3,956.5		0.0	0.0	0.0	295.0	3,685.9	853.2	897.6	54.1	0.0			0.0	611.4		0.0	10,508.7
	5	164.3	12,003.4	21.7	0.0	0.0	0.0	438.0	432.6	0.0	13.0	6.4	0.0			0.0	0.0		0.0	13,079.4
	6	26.7	5,730.8	62.4	0.0	1,010.2	0.0	246.1	857.0	0.0	15.2	286.2	153.3			0.0	0.0		0.0	8,387.9
Summer Total		346.0	21,690.7	84.1	0.0	1,010.2	0.0	979.1	4,975.5	853.2	925.8	346.7	153.3	0.0	0.0	0.0	611.4	0.0	0.0	31,976.0
	7	8.2	537.9	403.0	0.0	8,698.2	0.0	88.5	23.2	9.5	4.8	795.2	704.4			0.0	0.0		0.0	11,272.9
	8	1.3	40.8		54.6	4,417.8	0.0	23.9	125.4	358.6	40.7	3,637.0	1,748.6			5.9	0.0		0.0	10,454.6
	9	2.1	13.5	18.6	37.7	890.2	0.0	10.0	410.6	91.7	112.9	8,052.1	1,570.1			23.7	0.0		0.0	11,233.2
	10	8.4	120.7	36.6	72.7	489.0	0.0	35.2	1,642.9	0.0	2,506.0	5,881.3	483.5			0.0	2.1		0.0	11,278.4
Monsoon Total		20.0	712.9	458.2	165.0	14,495.2	0.0	157.6	2,202.1	459.8	2,664.4	18,365.6	4,506.6	0.0	0.0	29.6	2.1	0.0	0.0	44,239.1
	11	27.5	820.9	20.8	8.2	133.2	0.0	50.5	573.2	0.0	6,097.3	5,156.9	27.1			12.7	5.6		0.0	12,933.9
	12	39.2	1,595.1	0.9	17.0	29.6	0.0	420.5	624.5	209.4	11,939.0	1,195.5	0.0			14.4	0.0		0.0	16,085.1
2007	1																			0.0
	2																			0.0
	3																			0.0
Winter Total		66.7	2,416.0	21.7	25.2	162.8	0.0	471.0	1,197.7	209.4	18,036.3	6,352.4	27.1	0.0	0.0	27.1	5.6	0.0	0.0	29,019.0
Yearly Total		432.7	24,819.6	564.0	190.2	15,668.2	0.0	1,607.7	8,375.3	1,522.4	21,626.5	25,064.7	4,687.0	0.0	0.0	56.7	619.1	0.0	0.0	105,234.1

Attachment F-12 Monthly Arrival Quantity of Onion at Azadpur Wholesale Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2004	4	740.0	60.9	10.4		0.0		23.2	3,387.0	15,542.6	2,518.8	5,767.0	0.0	0.0		34.8	0.0		1,447.9	29,532.6
	5	427.2	2,328.0	9.0		0.0		100.4	27,568.2	4,460.2	2,524.5	746.5	11.0	0.0		13.9	0.0		0.0	38,188.9
	6	293.3	1,801.1	24.3		6.5		122.5	45,891.8	56.3	779.5	80.5	0.0	0.0		13.7	0.0		0.0	49,069.5
Summer Total		1,460.5	4,190.0	43.7	0.0	6.5	0.0	246.1	76,847.0	20,059.1	5,822.8	6,594.0	11.0	0.0	0.0	62.4	0.0	0.0	1,447.9	116,791.0
	7	240.3	1,337.8	22.7		39.3		243.8	35,173.0	404.2	1,086.0	1,284.2	0.0	0.0		0.0	0.0		0.0	39,831.3
	8	145.7	2,557.7	0.0		7.4		152.6	16,535.3	2,660.2	1,573.8	6,297.7	0.0	0.0		34.5	0.0		0.0	29,964.9
	9	142.0	1,605.6	8.7		0.0		110.0	7,534.7	2,239.9	1,597.4	13,136.0	1,166.4	9.9			0.0		0.0	27,550.6
	10	34.1	461.8	10.5		0.0		130.4	8,560.9	2,004.8	2,200.0	15,239.1	578.0	61.2		28.4	0.0		0.0	29,309.2
Monsoon Total		562.1	5,962.9	41.9	0.0	46.7	0.0	636.8	67,803.9	7,309.1	6,457.2	35,957.0	1,744.4	71.1	0.0	62.9	0.0	0.0	0.0	126,656.0
	11	156.4	2,379.0	34.3		0.0		242.7	29,602.3	779.6	1,004.4	6,905.6	309.7	14.1		14.0	0.0		0.0	41,442.1
	12	47.6	1,151.2	0.0		0.0		95.6	25,802.4	764.8	1,433.9	8,192.0	10.5	2.5		0.0	10.9		0.0	37,511.4
2005	1	4.5	602.7	0.0		0.0		81.4	7,438.2	3,947.0	1,159.4	16,144.0	0.0	0.0		6.5	0.0		0.0	29,383.7
	2	10.1	28.4	0.0		0.0		24.6	1,027.6	11,637.0	1,019.5	8,340.8	0.0	0.0		0.0	0.0		0.0	22,088.0
	3	10.6	115.4	0.0		0.0		23.6	788.2	10,956.8	1,839.4	13,579.9	0.0	0.0		44.9	15.0		0.0	27,373.8
Winter Total		229.2	4,276.7	34.3	0.0	0.0	0.0	467.9	64,658.7	28,085.2	6,456.6	53,162.3	320.2	16.6	0.0	65.4	25.9	0.0	0.0	157,799.0
Yearly Total		2,251.8	14,429.6	119.9	0.0	53.2	0.0	1,350.8	209,309.6	55,453.4	18,736.6	95,713.3	2,075.6	87.7	0.0	190.7	25.9	0.0	1,447.9	401,246.0
	4	11.0	46.7	0.0		0.0		29.9	5,089.9	3,846.2	6,187.3	17,529.2	17.2	0.0		73.5	0.0		0.0	32,830.9
	5	418.4	2,820.1	6.2		0.0		190.6	21,952.9	321.7	6,121.3	5,438.9	26.9	0.0		11.4	0.0		0.0	37,308.4
	6	254.0	3,839.0	0.0		0.0		302.6	34,780.5	131.1	1,729.2	892.7	0.0	0.0		13.5	12.2		0.0	41,954.8
Summer Total		683.4	6,705.8	6.2	0.0	0.0	0.0	523.1	61,823.3	4,299.0	14,037.8	23,860.8	44.1	0.0	0.0	98.4	12.2	0.0	0.0	112,094.1
	7	164.9	3,991.4	13.0		0.0		273.7	30,296.7	145.4	2,082.1	355.4	0.0	0.0		0.0	0.0		0.0	37,322.6
	8	171.4	2,925.3	0.0		15.0		227.6	26,725.8	349.4	2,941.6	906.4	0.0	0.0		0.0	0.0		0.0	34,262.5
	9	49.4	1,375.5	0.0		0.0		75.7	11,493.1	1,270.7	2,304.5	9,061.7	44.4	0.0		0.0	0.0		0.0	25,675.0
	10	17.9	712.3	15.4		0.0		65.4	13,183.3	728.5	3,336.2	6,234.6	451.6	0.0		0.0	0.0		0.0	24,745.2
Monsoon Total		403.6	9,004.5	28.4	0.0	15.0	0.0	642.4	81,698.9	2,494.0	10,664.4	16,558.1	496.0	0.0	0.0	0.0	0.0	0.0	0.0	122,005.3
	11	63.9	998.3	155.0		0.0		13.9	33,905.6	64.3	276.0	232.2	0.0	0.0		0.0	0.0		0.0	35,709.2
	12	5.5	1,321.3	0.0		0.0		51.4	22,196.8	130.0	1,001.2	9,828.9	0.0	0.0		0.0	0.0		0.0	34,535.1
2006	1	132.7	583.4	0.0		0.0		41.7	5,230.1	571.0	1,273.2	17,007.4	0.0	0.0		0.0	0.0		2,334.0	27,173.5
	2	761.7	78.3	48.0		0.0		60.6	303.9	2,951.6	672.0	10,915.6	0.0	17.0		0.0	0.0		18,355.5	34,164.2
	3	331.0	96.1	0.0		0.0		171.7	317.5	201.9	741.7	15,313.1	0.0	0.0		0.0	0.0		23,537.1	40,710.1
Winter Total		1,294.8	3,077.4	203.0	0.0	0.0	0.0	339.3	61,953.9	3,918.8	3,964.1	53,297.2	0.0	17.0	0.0	0.0	0.0	0.0	44,226.6	172,292.1
Yearly Total		2,381.8	18,787.7	237.6	0.0	15.0	0.0	1,504.8	205,476.1	10,711.8	28,666.3	93,716.1	540.1	17.0	0.0	98.4	12.2	0.0	44,226.6	406,391.5
	4	1,564.8	118.7	0.0		0.0		32.8	3,483.6	1,787.5	4,660.3	11,339.8	0.0	0.0		20.3	0.0		0.0	23,007.8
	5	98.5	914.1	3.9		0.0		103.6	17,492.6	1,689.2	5,481.4	3,787.1	9.0	0.0		15.6	0.0		0.0	29,595.0
	6	239.0	1,695.6	4.5		0.0		106.4	24,049.3	264.2	4,177.1	1,149.8	12.3	0.0		0.0	0.0		0.0	31,698.2
Summer Total		1,902.3	2,728.4	8.4	0.0	0.0	0.0	242.8	45,025.5	3,740.9	14,318.8	16,276.7	21.3	0.0	0.0	35.9	0.0	0.0	0.0	84,301.0
	7	88.9	608.4	15.0		23.4		215.0	20,645.0	746.6	2,856.8	3,704.7	17.1	0.0		13.1	16.8		0.0	28,950.8
	8	539.8	1,053.3	0.0		20.7		308.3	19,551.0	1,405.6	2,488.1	8,390.4	15.9	0.0		9.0	0.0		0.0	33,782.1
	9	155.4	1,285.6	0.0		0.0		82.0	14,618.1	714.2	2,283.7	9,704.0	15.5	0.0		0.0	0.0		0.0	28,858.5
	10	79.0	1,744.2	29.3		0.0		138.2	17,256.8	977.1	3,634.7	8,370.3	293.1	0.0		12.9	14.0		0.0	32,549.6
Monsoon Total		863.1	4,691.5	44.3	0.0	44.1	0.0	743.5	72,070.9	3,843.5	11,263.3	30,169.4	341.6	0.0	0.0	35.0	30.8	0.0	0.0	124,141.0
	11	29.6	3,234.5	8.8		0.0		64.3	45,596.9	47.4	1,015.6	523.0	12.8	0.0		0.0	0.0		0.0	50,532.9
	12	17.8	1,675.7	16.3		0.0		24.8	20,127.7	4,197.4	1,992.7	4,415.0	0.0	0.0		0.0	0.0		0.0	32,467.4
2007	1																			0.0
	2																			0.0
	3																			0.0
Winter Total		47.4	4,910.2	25.1	0.0	0.0	0.0	89.1	65,724.6	4,244.8	3,008.3	4,938.0	12.8	0.0	0.0	0.0	0.0	0.0	0.0	83,000.3
Yearly Total		2,812.8	12,330.1	77.8	0.0	44.1	0.0	1,075.4	182,821.0	11,829.2	28,590.4	51,384.1	375.7	0.0	0.0	70.9	30.8	0.0	0.0	291,442.3

Attachment F-13 Monthly Arrival Quantity of Cauliflower at Azadpur Wholesale Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2004	4	47.6	436.5	6.9	0.0	3,071.5	0.0	212.3	3.3	0.0	0.0	0.0	0.0			0.0	0.0		0.0	3,778.1
	5	3.1	8.7	0.0	6.0	4,116.1	0.0	30.3	0.0	0.0	4.0	0.0	0.0			0.0	0.0		0.0	4,168.2
	6	6.8	12.3	0.0	0.2	3,298.4	0.0	19.8	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	3,337.5
Summer Total		57.5	457.5	6.9	6.2	10,486.0	0.0	262.4	3.3	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11,283.8
	7	0.9	4.0	0.0	0.0	3,139.2	0.0	39.6	0.6	0.0	13.7	0.0	11.7			0.0	0.0		12.6	3,222.3
	8	20.3	29.7	0.0	0.0	633.4	80.0	137.4	302.2	9.3	212.5	24.0	74.7			0.9	5.4		92.8	1,622.6
	9	156.3	1,203.3	0.8	0.0	330.2	45.5	251.1	5,007.4	6.0	189.0	4.6	2.8			0.0	0.0		8.1	7,205.1
	10	578.6	2,475.1	0.1	0.0	293.5	26.3	912.3	1,713.1	0.0	4.1	0.0	0.0			0.0	0.0		0.0	6,003.1
Monsoon Total		756.1	3,712.1	0.9	0.0	4,396.3	151.8	1,340.4	7,023.3	15.3	419.3	28.6	89.2	0.0	0.0	0.9	5.4	0.0	113.5	18,053.1
	11	692.6	3,149.3	0.0	0.0	6.9	0.0	616.3	26.2	0.0	5.0	0.0	0.0			0.0	0.0		0.0	4,496.3
	12	769.2	3,688.0	2.2	0.0	0.0	0.0	207.0	10.1	0.0	0.0	0.0	0.0			0.0	0.0		0.0	4,676.5
2005	1	810.6	3,562.9	6.4	0.0	0.0	0.0	480.5	22.3	1.3	0.0	0.0	0.0			0.0	0.0		0.0	4,884.0
	2	552.5	4,893.6	0.0	0.0	0.0	0.0	464.2	6.9	0.0		0.0	5.6			3.2	0.0		2.0	5,928.0
	3	573.9	5,427.3	0.0	6.2	0.0	3.1	485.4	12.5	0.0	0.2	0.0	0.0			0.0	0.0		0.0	6,508.6
Winter Total		3,398.8	20,721.1	8.6	6.2	6.9	3.1	2,253.4	78.0	1.3	5.2	0.0	5.6	0.0	0.0	3.2	0.0	0.0	2.0	26,493.4
Yearly Total		4,212.4	24,890.7	16.4	12.4	14,889.2	154.9	3,856.2	7,104.6	16.6	428.5	28.6	94.8	0.0	0.0	4.1	5.4	0.0	115.5	55,830.3
	4	171.8	656.2	0.0	0.0	908.1	20.5	758.0	5.7	0.0	0.0	0.0				0.0			0.0	2,520.3
	5	9.7	19.7	0.0	0.0	3,851.9	3.6	41.6	2.3	0.0	0.0	0.0				0.0			0.0	3,928.8
	6	1.0	2.8	0.0	4.7	3,885.3	0.0	28.0	0.0	0.0	0.0	0.0				0.0			0.0	3,921.8
Summer Total		182.5	678.7	0.0	4.7	8,645.3	24.1	827.6	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10,370.9
	7	3.1	0.0	0.0	0.0	4,064.5	1.5	24.6	0.0	0.2	47.1	0.4				0.6			15.6	4,157.6
	8	8.2	5.6	0.0	0.0	679.3	3.2	47.0	109.3	4.4	1,110.9	42.9				2.3			8.5	2,021.6
	9	20.3	110.9	0.0	0.0	212.2	0.0	39.0	5,051.1	1.8	1,224.9	37.8				1.5			1.6	6,701.1
	10	212.4	2,009.4	0.0	0.0	54.4	5.6	711.4	2,922.0	0.0	533.8	0.0				0.6			0.7	6,450.3
Monsoon Total		244.0	2,125.9	0.0	0.0	5,010.4	10.3	822.0	8,082.4	6.4	2,916.7	81.1	0.0	0.0	0.0	5.0	0.0	0.0	26.4	19,330.6
	11	665.4	5,190.8	3.1	5.0	0.0	0.0	1,068.9	254.9	0.0	17.7	0.0				0.0			0.0	7,205.8
	12	794.5	2,876.7	0.0	0.0	0.0	0.0	480.0	1.4	0.4	0.0	0.0				0.0			0.0	4,153.0
2006	1	1,269.1	4,197.9	8.3	0.0	0.0	0.2	600.1	5.4	20.6	0.0	10.7				0.8			0.9	6,114.0
	2	420.5	4,369.0	0.0	1.6	0.0	3.7	413.1	3.7	0.5	0.0	0.0				1.4			0.1	5,213.6
	3	337.3	3,344.6	30.9	0.0	104.0	1.2	381.7	6.4	0.0	0.0	0.0				0.0			0.1	4,206.2
Winter Total		3,486.8	19,979.0	42.3	6.6	104.0	5.1	2,943.8	271.8	21.5	17.7	10.7	0.0	0.0	0.0	2.2	0.0	0.0	1.1	26,892.6
Yearly Total		3,913.3	22,783.6	42.3	11.3	13,759.7	39.5	4,593.4	8,362.2	27.9	2,934.4	91.8	0.0	0.0	0.0	7.2	0.0	0.0	27.5	56,594.1
	4	125.4	927.9	180.9	0.0	3,469.5	0.0	322.9	11.4	0.0	0.0	0.0				0.0			1.8	5,039.8
	5	3.1	412.7	0.0	4.5	4,952.8	2.5	5.3	5.9	0.0	0.0	2.8				0.0			0.0	5,389.6
	6	0.8	2.5	0.0	0.0	2,758.0	1.7	36.3	0.0	0.0	0.0	0.0				0.0			0.0	2,799.3
Summer Total		129.3	1,343.1	180.9	4.5	11,180.3	4.2	364.5	17.3	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	1.8	13,228.7
	7	0.4	1.5	0.0	0.0	3,624.3	0.0	18.3	0.0	0.0	83.8	0.0				0.0			7.0	3,735.3
	8	50.4	9.1	0.0	0.0	268.2	65.1	57.6	567.9	0.0	804.4	1.4				0.0			49.3	1,873.4
	9	131.2	319.5	0.9	23.3	62.0	90.0	154.5	7,535.7	0.0	36.1	0.0				0.0			6.8	8,360.0
	10	772.8	2,663.6	16.4	13.6	14.7	77.2	839.1	529.5	0.0	24.6	0.0				0.0			0.0	4,951.5
Monsoon Total		954.8	2,993.7	17.3	36.9	3,969.2	232.3	1,069.5	8,633.1	0.0	948.9	1.4	0.0	0.0	0.0	0.0	0.0	0.0	63.1	18,920.2
	11	1,078.2	4,057.3	0.0	1.8	0.3	0.0	302.6	0.0	0.0	16.2	0.0				0.0			0.0	5,456.4
	12	561.8	3,867.2	0.0	0.1	0.0	0.0	351.3	38.0	7.6	0.0	0.0				0.0			0.0	4,826.0
2007	1																			0.0
	2																			0.0
	3																			0.0
Winter Total		1,640.0	7,924.5	0.0	1.9	0.3	0.0	653.9	38.0	7.6	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10,282.4
Yearly Total		2,724.1	12,261.3	198.2	43.3	15,149.8	236.5	2,087.9	8,688.4	7.6	965.1	4.2	0.0	0.0	0.0	0.0	0.0	0.0	64.9	42,431.3

Attachment F-14 Monthly Arrival Quantity of Green Peas at Azadpur Wholesale Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2004	4	8.9	63.2	0.0	6.6	1,457.6	5.7	71.2	0.0	0.0	0.0	0.0					0.0			1,613.2
	5	1.9	18.3	0.0	516.4	544.2	0.7	2.7	0.0	0.0	0.0	0.0					0.0			1,084.2
	6	12.7	14.8	18.3	10.7	732.5	0.0	7.3	0.0	0.0	0.0	0.0					0.0			796.3
Summer Total		23.5	96.3	18.3	533.7	2,734.3	6.4	81.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,493.7
	7	12.1	28.3	111.6	0.0	2,153.0	0.0	63.6	0.0	0.0	0.0	0.0					0.0			2,368.6
	8	0.0	4.6	26.7	0.0	1,567.1	0.0	14.0	5.8	3.8	8.0	0.0					0.0			1,630.0
	9	3.3	11.9	1.9	0.0	1,060.3	11.8	18.5	0.0	3.0	0.0	0.0					0.0			1,110.7
	10	7.5	6.6	0.6	0.0	1,348.8	200.7	375.3	2.5	0.0	0.0	0.0					0.0			1,942.0
Monsoon Total		22.9	51.4	140.8	0.0	6,129.2	212.5	471.4	8.3	6.8	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7,051.3
	11	38.1	97.1	2,997.7	0.0	1,187.9	747.5	1,069.2	120.1	0.0	0.0	0.0					14.3			6,271.9
	12	46.4	203.4	3,094.4	0.0	533.8	429.9	4,459.9	55.4	0.0	1,661.9	39.3					8.0			10,532.4
2005	1	267.8	634.5	32.9	0.0	4.9	396.4	11,319.2	1,723.2	0.0	402.8	24.8					5.4			14,811.9
	2	67.9	367.5	5.2	0.0	0.0	46.9	4,006.0	5,023.4	24.4	49.4	0.0					0.0			9,590.7
	3	117.1	508.5	15.1	0.0	286.1	13.0	2,946.3	1,313.9	0.0	0.0	0.0					0.0			5,200.0
Winter Total		537.3	1,811.0	6,145.3	0.0	2,012.7	1,633.7	23,800.6	8,236.0	24.4	2,114.1	64.1	0.0	0.0	0.0	0.0	27.7	0.0	0.0	46,406.9
Yearly Total		583.7	1,958.7	6,304.4	533.7	10,876.2	1,852.6	24,353.2	8,244.3	31.2	2,122.1	64.1	0.0	0.0	0.0	0.0	27.7	0.0	0.0	56,951.9
	4	1.0	16.3	2.3		2,150.6		242.7	1.1	0.0	0.0	0.0					240.0			2,654.0
	5	13.9	24.1	5.4		2,232.9		20.3	4.9	825.5	0.0	0.0					3.0			3,130.0
	6	2.0	10.4	14.6		1,334.5		10.5	1.2	656.9	0.0	0.0					0.0			2,030.1
Summer Total		16.9	50.8	22.3	0.0	5,718.0	0.0	273.5	7.2	1,482.4	0.0	0.0								7,571.1
	7	10.2	15.0	84.4		1,372.9		13.1	0.0	104.5	10.0	0.0					0.0			1,610.1
	8	11.9	26.7	72.6		2,454.0		25.5	0.0	0.0	0.0	0.0					0.0			2,590.7
	9	0.7	3.5	27.4		1,761.8		14.4	0.0	19.1	2.0	0.0					3.5			1,832.4
	10	0.8	13.9	2.4		1,002.9		80.6	0.0	0.0	0.0	0.0					335.9			1,436.5
Monsoon Total		23.6	59.1	186.8	0.0	6,591.6	0.0	133.6	0.0	123.6	12.0	0.0	0.0	0.0	0.0	0.0	339.4	0.0	0.0	7,469.7
	11	2.0	13.7	1,766.9		482.0		148.2	14.2	0.0	10.8	0.0					738.9			3,176.7
	12	51.3	35.5	4,764.8		38.1		2,108.2	6.1	0.0	280.3	0.0					275.5			7,559.8
2006	1	35.9	84.8	103.6		0.0		9,032.8	1,604.8	0.0	363.5	5.2					513.5			11,744.1
	2	35.2	308.7	34.1		0.0		5,638.1	2,999.7	0.0	13.8	0.0					144.9			9,174.5
	3	101.3	636.3	156.3		951.1		1,418.5	459.4	0.0	0.0	0.3					104.3			3,827.5
Winter Total		225.7	1,079.0	6,825.7	0.0	1,471.2	0.0	18,345.8	5,084.2	0.0	668.4	5.5	0.0	0.0	0.0	0.0	1,777.1	0.0	0.0	35,482.6
Yearly Total		266.2	1,188.9	7,034.8	0.0	13,780.8	0.0	18,752.9	5,091.4	1,606.0	680.4	5.5	0.0	0.0	0.0	0.0	2,116.5	0.0	0.0	50,523.4
	4	11.5	17.5	6.5		1,484.0		140.0	3.0	0.0	0.0	0.0					0.0			1,662.5
	5	1.9	27.5			2,657.8		2.5	0.0	0.0	0.0	26.0					0.0			2,715.7
	6	0.8	0.1	9.2		1,558.1		3.1	0.0	1.6	0.0	0.0					14.0			1,586.9
Summer Total		14.2	45.1	15.7	0.0	5,699.9	0.0	145.6	3.0	1.6	0.0	26.0								5,951.1
	7	9.3	27.2	37.8		1,702.1		10.0	0.0	0.0	0.0	0.0					0.0			1,786.4
	8	5.0	17.3	27.3		2,126.2		6.8	0.0	0.0	0.0	0.0					0.0			2,182.6
	9	1.0	3.8	7.6		1,183.2		3.5	0.0	0.0	0.0	0.0					0.0			1,199.1
	10	6.1	24.9	5.2		943.2		32.0	0.0	0.0	0.0	0.0					0.0			1,011.4
Monsoon Total		21.4	73.2	77.9	0.0	5,954.7	0.0	52.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6,179.5
	11	9.0	69.6	3,638.8		251.2		47.5	27.9	0.0	0.0	0.0					0.0			4,044.0
	12	62.3	140.3	1,797.0		0.0		6,699.9	15.8	0.0	133.7	0.0					0.0			8,849.0
2007	1																			0.0
	2																			0.0
	3																			0.0
Winter Total		71.3	209.9	5,435.8	0.0	251.2	0.0	6,747.4	43.7	0.0	133.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12,893.0
Yearly Total		106.9	328.2	5,529.4	0.0	11,905.8	0.0	6,945.3	46.7	1.6	133.7	26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25,023.6

Attachment F-15 Monthly Arrival Quantity of Cabbage at Azadpur Wholesale Vegetables and Fruits Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2006	4																			0.0
	5																			0.0
	6																			0.0
Summer Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7																			0.0
	8																			0.0
	9	4.9	31.3	1.1	0.0	4,351.5	160.7	31.2	48.0	0.0	2.0	0.0	23.7	0.0			0.0			4,654.5
	10	12.6	19.3	0.0	27.3	2,231.6	379.9	596.5	0.0	0.0	140.6	61.0	18.8	0.0			14.6			3,502.2
Monsoon Total		17.5	50.6	1.1	27.3	6,583.1	540.6	627.7	48.0	0.0	142.6	61.0	42.5	0.0	0.0	0.0	14.6	0.0	0.0	8,156.7
	11	14.4	90.2		0.0	85.6	9.3	5,819.7	2.9	0.0	82.7	17.7	0.0	0.0						6,122.4
	12	94.2	271.2	0.0	0.0	0.0	0.0	5,949.0	2.4	0.0	0.0	0.0	0.0	0.0			0.0			6,316.7
2007	1	108.4	209.4	6.5	0.0	0.0	0.0	3,976.9	0.0	0.0	0.0	0.0	0.0	0.0			0.0			4,301.1
	2	90.6	235.2	0.0	0.0	0.0	13.3	2,320.9	1.0	0.4	0.0	0.0	0.0	0.0			0.0			2,661.4
	3	57.1	584.5	67.7	0.0	0.0	18.8	2,174.7	0.0	0.0	0.0	1.2	0.0	0.0			0.0			2,904.0
Winter Total		364.6	1,390.5	74.2	0.0	85.6	41.4	20,241.2	6.3	0.4	82.7	18.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22,305.6
Yearly Total		382.0	1,441.0	75.3	27.3	6,668.8	582.1	20,868.9	54.3	0.4	225.2	79.9	42.5	0.0	0.0	0.0	14.6	0.0	0.0	30,462.3

Attachment F-16 Monthly Arrival Quantity of Beans at Azadpur Wholesale Vegetables and Fruits Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2006	4																			0.0
	5																			0.0
	6																			0.0
Summer Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7																			0.0
	8																			0.0
	9	7.6	1.1	11.2	0.0	742.8	2.6	5.6	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0			770.8
	10	1.0	15.4	3.4	0.0	568.6	0.1	5.6	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0			594.1
Monsoon Total		8.5	16.5	14.6	0.0	1,311.4	2.7	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,364.9
	11	1.5	4.7	84.4	5.0	269.0	69.5	27.6	1.7	8.2	0.0	18.1	0.0	0.0		0.0	2.7			492.3
	12	8.8	4.5	178.2	0.0	3.6	17.5	45.9	7.4	6.2	0.0	0.0	1.7	0.0		0.0	213.9			487.7
2007	1	48.3	1.2	17.4	0.0	0.0	0.0	0.7	74.8	81.3	0.3	23.6	4.1	0.0		22.9	544.0			818.6
	2	3.0	0.1	0.0	0.0	0.0	2.1	1.5	15.4	132.0	2.6	38.2	0.0	0.0		19.2	760.0			974.1
	3	39.5	118.0	1.0	0.0	0.0	0.0	252.0	4.7	29.2	3.8	0.4	5.2	0.0		2.8	275.6			732.1
Winter Total		101.1	128.6	280.9	5.0	272.6	89.0	327.7	104.0	257.0	6.7	80.3	11.0	0.0	0.0	44.9	1,796.2	0.0	0.0	3,504.9
Yearly Total		109.6	145.0	295.5	5.0	1,584.0	91.6	338.9	104.0	257.0	6.7	80.3	11.0	0.0	0.0	44.9	1,796.2	0.0	0.0	4,869.7

Attachment F-17 Monthly Arrival of Quantity of Chillies at Azadpur Wholesale Vegetable and Fruits Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ramchal	Uttar Predesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2006	4																			0.0
	5																			0.0
	6																			0.0
Summer Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7																			0.0
	8																			0.0
	9	3.0	7.7	0.1	0.0	1,267.5	0.0	28.6	2.4	0.0	0.8	0.0	0.0	0.0			0.0			1,310.1
	10	42.0	98.8	0.0	3.4	549.7	0.0	458.8	16.3	0.0	0.5	0.0	0.0	0.0			0.0			1,169.5
Monsoon Total		45.0	106.5	0.1	3.4	1,817.2	0.0	487.4	18.7	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,479.6
	11	61.6	136.3	0.8	0.1	27.9		2,160.6	9.0	0.6	10.2		0.0	0.0			0.0			2,407.1
	12	87.6	217.3	0.0	0.0	0.0	0.0	2,182.0	3.9	0.3	6.8	0.0	0.0	0.0			2.3			2,500.2
2007	1	91.3	145.3	0.0	0.0	0.0	0.0	1,911.2	15.3	1.5	0.0	7.3	0.0	0.0			0.6			2,172.6
	2	96.0	227.0	0.0	0.0	0.0	0.0	2,276.5	12.7	0.0	5.6	0.0	0.0	0.0			1.9			2,619.7
	3	94.4	203.5	0.3	0.0	0.0	0.0	1,575.0	11.3	0.0	0.0	12.3	1.2	0.0			0.0			1,897.9
Winter Total		431.0	929.4	1.1	0.1	27.9	0.0	10,105.3	52.2	2.4	22.6	19.5	1.2	0.0	0.0	0.0	4.9	0.0	0.0	11,597.5
Yearly Total		476.0	1,035.9	1.2	3.5	1,845.2	0.0	10,592.6	70.9	2.4	23.9	19.5	1.2	0.0	0.0	0.0	4.9	0.0	0.0	14,077.1

Attachment F-18 Monthly Arrival of Quantity of Garlic at Azadpur Wholesale Vegetable and Fruits Market

(Unit: ton)

Year	Mon	Delhi Metr. Area	Haryana	Punjab	Jammu. Kashmir	Himachal Pradesh	Utta ranchal	Uttar Pradesh	Rajastan	Gujarat	Madya Pradesh	Maha rastra	Karnataka	Kerala	Tamilnadu	Andra Pradesh	West Bengal	Assam	By Railways	Total
2006	4																			0.0
	5																			0.0
	6																			0.0
Summer Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7																			0.0
	8																			0.0
	9	6.2	204.2	48.9	0.0	2.7	0.0	732.5	172.7	34.6	80.5	0.0	0.0	0.0			0.0			1,282.2
	10	20.8	167.3	11.6	0.0	0.8	0.0	400.4	375.9	14.6	176.7	0.0	0.0	0.0			0.0			1,168.0
Monsoon Total		27.0	371.5	60.5	0.0	3.5	0.0	1,132.8	548.6	49.1	257.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,450.3
	11	9.2	299.4	20.4		2.6		734.4	264.8	2.7	134.2									1,467.6
	12	9.4	103.0	22.0	0.0	0.0	0.0	949.1	69.6	0.0	90.5	0.0	0.0	0.0			0.0			1,243.5
2007	1	13.6	33.1	6.1	0.0	0.0	0.0	409.9	181.6	89.5	1,015.6	10.3	0.0	0.0			9.0			1,768.7
	2	12.2	2.8	0.0	0.0	0.0	0.0	62.4	245.6	24.6	4,322.5	23.4	0.0	0.0			59.6			4,753.1
	3	0.8	55.4	0.0	0.0	0.0	0.0	403.2	1,774.5	37.2	1,707.0	9.3		0.0			0.0			3,987.4
Winter Total		45.2	493.7	48.5	0.0	2.6	0.0	2,559.0	2,536.0	154.0	7,269.7	43.0	0.0	0.0	0.0	0.0	68.6	0.0	0.0	13,220.3
Yearly Total		72.2	865.2	109.0	0.0	6.1	0.0	3,691.9	3,084.6	203.1	7,526.9	43.0	0.0	0.0	0.0	0.0	68.6	0.0	0.0	15,670.6

Attachment F-19 Projected Total Population

(Unit: 1,000 person)

Year	Punjab			Chandigarh			Uttaranchal		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
2001	24,359	12,985	11,374	901	507	394	8,489	4,326	4,163
2002	24,699	13,179	11,520	922	523	400	8,634	4,400	4,234
2003	25,041	13,374	11,667	957	544	412	8,780	4,474	4,306
2004	25,384	13,570	11,814	1,000	571	430	8,927	4,549	4,377
2005	25,724	13,764	11,960	1,050	600	450	9,073	4,624	4,449
2006	26,059	13,956	12,104	1,103	632	471	9,219	4,699	4,520
2007	26,391	14,146	12,245	1,161	667	495	9,365	4,774	4,591
2008	26,722	14,335	12,386	1,227	705	522	9,511	4,849	4,662
2009	27,048	14,523	12,525	1,297	747	550	9,656	4,924	4,732
2010	27,368	14,707	12,661	1,368	789	579	9,800	4,998	4,802
2011	27,678	14,886	12,792	1,438	832	606	9,943	5,072	4,871
2012	27,981	15,061	12,920	1,508	876	632	10,084	5,145	4,939
2013	28,279	15,233	13,046	1,580	921	659	10,224	5,217	5,006
2014	28,568	15,401	13,167	1,651	967	684	10,362	5,290	5,073
2015	28,845	15,563	13,283	1,719	1,013	707	10,499	5,361	5,138
2016	29,112	15,718	13,394	1,780	1,056	724	10,632	5,431	5,201
2017	29,372	15,871	13,502	1,859	1,111	749	10,761	5,498	5,263
2018	29,625	16,019	13,606	1,941	1,168	773	10,887	5,565	5,323
2019	29,868	16,162	13,706	2,028	1,230	798	11,010	5,629	5,381
2020	30,101	16,300	13,801	2,122	1,297	825	11,129	5,691	5,437
2021	30,323	16,432	13,891	2,226	1,372	854	11,241	5,750	5,491
2022	30,542	16,562	13,980		1,428	873	11,351	5,807	5,543
2023	30,753	16,687	14,066	2,374	1,483	890	11,457	5,863	5,594
2024	30,956	16,808	14,149	2,438	1,534	904	11,558	5,916	5,642
2025	31,154	16,925	14,229	2,488	1,576	913	11,655	5,967	5,688
2026	31,345	17,038	14,307	2,518	1,604	914	11,746	6,014	5,732

(Unit: 1,000 person)

Year	Haryana			Delhi			Rajasthan		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
2001	21,145	11,364	9,781	13,851	7,607	6,243	56,507	29,420	27,087
2002	21,579	11,605	9,975	14,273	7,846	6,428	57,664	30,031	27,633
2003	22,015	11,846	10,169	14,698	8,086	6,612	58,825	30,644	28,181
2004	22,450	12,088	10,362	15,129	8,330	6,799	59,984	31,256	28,728
2005	22,883	12,329	10,555	15,569	8,579	6,990	61,136	31,864	29,272
2006	23,314	12,568	10,746	16,021	8,835	7,186	62,276	32,466	29,811
2007	23,743	12,807	10,936	16,484	9,098	7,386	63,408	33,062	30,345
2008	24,171	13,046	11,125	16,955	9,365	7,590	64,534	33,656	30,877
2009	24,597	13,284	11,313	17,437	9,639	7,798	65,650	34,245	31,405
2010	25,020	13,520	11,500	17,935	9,922	8,013	66,750	34,825	31,925
2011	25,439	13,754	11,685	18,451	10,215	8,235	67,830	35,394	32,436
2012	25,854	13,985	11,869	18,983	10,518	8,465	68,892	35,954	32,938
2013	26,266	14,216	12,051	19,529	10,828	8,700	69,940	36,506	33,434
2014	26,675	14,444	12,231	20,092	11,149	8,943	70,969	37,048	33,921
2015	27,079	14,670	12,410	20,676	11,481	9,195	71,973	37,577	34,397
2016	27,477	14,892	12,586	21,285	11,827	9,458	72,948	38,090	34,858
2017	27,868	15,110	12,758	21,896	12,175	9,722	73,924	38,603	35,322
2018	28,253	15,325	12,928	22,523	12,532	9,991	74,884	39,107	35,777
2019	28,631	15,536	13,095	23,164	12,897	10,267	75,828	39,602	36,227
2020	29,002	15,743	13,259	23,818	13,270	10,549	76,759	40,089	36,670
2021	29,362	15,944	13,418	24,485	13,650	10,835	77,676	40,568	37,107
2022	29,720	16,143	13,576	25,162	14,036	11,126	78,521	41,009	37,512
2023	30,071	16,339	13,732	25,852	14,430	11,422	79,339	41,434	37,905
2024	30,416	16,531	13,885	26,553	14,830	11,723	80,116	41,838	38,279
2025	30,755	16,719	14,036	27,263	15,235	12,028	80,841	42,212	38,629
2026	31,087	16,903	14,184	27,982	15,645	12,337	81,501	42,551	38,950

Attachment F-20 Projection of Monthly per-Capita Consumption Expenditure (MPCE)

(Unit: Rs.)

YEAR	Delhi		Chandigarh		Haryana		Punjab	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
2005/06	465.39	674.48	920.35	1,333.85	740.49	1,073.17	706.52	1,023.94
2006/07	489.32	695.39	957.35	1,381.60	767.74	1,110.41	732.45	1,053.94
2007/08	514.47	716.95	995.84	1,431.06	795.99	1,148.94	759.33	1,084.82
2008/09	540.91	739.18	1,035.87	1,482.29	825.29	1,188.81	787.20	1,116.61
2009/10	568.71	762.09	1,077.51	1,535.36	855.66	1,230.07	816.09	1,149.32
2010/11	597.94	785.72	1,120.83	1,590.32	887.14	1,272.75	846.04	1,183.00
2011/12	628.68	810.07	1,165.89	1,647.26	919.79	1,316.91	877.09	1,217.66
2012/13	660.99	835.19	1,212.75	1,706.23	953.64	1,362.61	909.27	1,253.34
2013/14	694.97	861.08	1,261.51	1,767.31	988.73	1,409.89	942.64	1,290.06
2014/15	730.69	887.77	1,312.22	1,830.58	1,025.12	1,458.82	977.24	1,327.86
2015/16	768.25	915.29	1,364.97	1,896.12	1,062.84	1,509.44	1,013.10	1,366.77
2016/17	807.74	943.66	1,419.84	1,964.00	1,101.95	1,561.82	1,050.28	1,406.82
2017/18	849.26	972.92	1,476.92	2,034.31	1,142.50	1,616.01	1,088.83	1,448.04
2018/19	892.91	1,003.08	1,536.29	2,107.14	1,184.55	1,672.09	1,128.79	1,490.46
2019/20	938.80	1,034.17	1,598.05	2,182.58	1,228.14	1,730.11	1,170.21	1,534.13
2020/21	987.06	1,066.23	1,662.29	2,260.71	1,273.34	1,790.14	1,213.16	1,579.08
2021/22	1,037.79	1,099.29	1,729.12	2,341.65	1,320.19	1,852.26	1,257.68	1,625.35
2022/23	1,091.13	1,133.36	1,798.63	2,425.48	1,368.78	1,916.54	1,303.84	1,672.97
2023/24	1,147.22	1,168.50	1,870.93	2,512.31	1,419.15	1,983.04	1,351.69	1,721.99
2024/25	1,206.19	1,204.72	1,946.14	2,602.25	1,471.37	2,051.85	1,401.30	1,772.45

Remark) (At constant prices 1993-94)

Attachment F-21 Estimated Model Coefficients (1/2)

	Delhi			
Vegetable	a	b*100	Sig	R2
SUMMER				
Cauliflower	-0.057	0.0212	H	27.1
Cabbage	-0.0608	0.0201	H	17.16
Peas	-0.2073	0.041	H	36.6
Tomato	0.0719	0.0612	H	31.69
Capsicum	-0.0964	0.0375	H	33.02
Garlic	0.1478	-0.0018	N	0.59
Beans	0.1947	-0.0048	N	1.89
Potato	0.4446	0.1461	H	41.37
Broccoli	-0.0836	0.0134	H	21.18
Radish	0.0071	0.0139	N	1.34
Carrot	-0.0097	0.0172	N	1.43
Onion	0.122	0.0508	H	38.38
Pumpkin	0.2278	0.0543	H	24.69
Gourd	0.1537	0.0608	H	25.95
B.Gourd	0.1167	0.0227	H	17.54
Cucumber	0.0404	0.162	H	41.95
Brinjal	0.0925	0.0287	H	30.11
L. Finger	0.102	0.058	H	33.91
Palak	0.1063	0.0009	N	0.01
Ginger	0.2424	-0.0124	S	4.24
RAINY				
Cauliflower	-0.077	0.0203	H	26.28
Cabbage	-0.1049	0.021	H	16.32
Peas	-0.15	0.0374	N	3.1
Tomato	0.0019	0.0646	H	40.46
Capsicum	-0.1293	0.0367	H	36.81
Garlic	0.2437	-0.0063	N	1.84
Beans	0.2534	-0.0056	N	0.95
Potato	0.5196	0.1511	H	32.06
Broccoli	-0.0197	0.0045	S	5.07
Radish	-0.0286	0.0146	N	1.53
Carrot	-0.0526	0.0128	N	2.06
Onion	-0.0179	0.0641	H	33.09
Pumpkin	0.1135	0.0723	H	35.86
Gourd	0.0977	0.0675	H	27.11
B.Gourd	0.1045	0.021	H	10.29
Cucumber	-0.3243	0.1795	H	38.25
Brinjal	0.838	0.0283	H	19.71
L. Finger	-0.0198	0.0615	H	35.32
Palak	-0.0977	0.02	S	6.13
Ginger	0.1213	-0.0057	H	16.67
WINTER				
Cauliflower	0.2427	0.0328	H	38.47
Cabbage	0.2649	0.0289	H	37.33
Peas	0.2262	0.0261	H	20.51
Tomato	0.1283	0.0554	H	34.59
Capsicum	-0.0308	0.0051	S	4.02
Garlic	0.0523	0.0082	N	2.76
Beans	0.1958	-0.0004	N	0
Potato	1.1852	0.1148	H	34.77
Broccoli	-0.0128	0.0018	N	2.18
Radish	0.0979	0.0409	H	11.11
Carrot	0.2337	0.0357	H	12.57
Onion	0.0394	0.0563	H	47.44
Pumpkin	-0.0269	0.0108	N	1.65
B.Gourd	0.0228	-0.0012	N	2.15
Cucumber	0.0054	0.0009	N	0.12
Brinjal	0.2014	0.0105	H	7.26
L. Finger	0.2505	-0.012	H	22.19
Palak	0.0716	0.0596	H	33.68
Ginger	0.063	0.0094	N	2.65

	Chandigarh			
Vegetable	a	b*100	Sig	R2
SUMMER				
Cauliflower	0.648	-0.0008	N	0.02
Cabbage	0.5989	-0.0025	N	1.44
Peas	0.5617	-0.0011	N	0.41
Tomato	1.344	-0.0105	N	4.64
Capsicum	0.675	-0.007	H	9.05
Garlic	0.2611	-0.0032	S	8.11
Beans	0.7663	-0.0094	H	11.59
Potato	2.661	-0.0319	S	8.29
Radish	0.8578	0.002	N	0.31
Carrot	0.376	0.0059	N	1.42
Onion	1.3198	-0.0026	N	0.28
Pumpkin	0.4538	0.0057	S	8.54
Gourd	0.4088	0.0066	H	14.64
B.Gourd	0.381	0.0041	N	1.55
Cucumber	0.0043	0.0316	H	52.03
Brinjal	0.4839	-0.0011	N	0.31
L. Finger	0.2791	0.0078	H	20.08
Palak	0.4735	0.0025	N	1.49
Ginger	0.0722	0.003	H	22.75
RAINY				
Cauliflower	0.4754	0.0024	N	2.73
Cabbage	0.3797	0.0057	H	11.52
Peas	0.4967	0.0024	N	1.33
Tomato	1.4017	-0.009	N	3.55
Capsicum	0.5855	-0.0035	N	2.98
Garlic	0.1817	-0.0019	S	6.94
Beans	0.5154	-0.0026	N	1.69
Potato	3.1301	-0.0334	H	11.19
Broccoli	-0.0389	0.0021	N	4.78
Radish	1.4844	-0.0168	H	12.53
Carrot	0.475	0.0019	N	0.86
Onion	1.4242	-0.0104	N	4.54
Pumpkin	0.6597	-0.0045	N	4.7
B.Gourd	0.4046	-0.0003	N	0.03
Cucumber	0.2686	0.0104	H	24.61
Brinjal	0.4927	0.0012	N	0.47
L. Finger	0.3851	0.0026	N	2.74
Palak	0.393	0.0021	N	2.24
Ginger	0.1341	0.0004	N	0.58
WINTER				
Cauliflower	0.5996	-0.0018	N	0.92
Cabbage	0.4201	0.0051	S	6.92
Peas	0.4225	0.0025	N	2.55
Tomato	0.9802	-0.001	N	0.06
Capsicum	0.4564	-0.0086	H	19.92
Garlic	0.0657	0.0008	N	1.2
Beans	0.4961	-0.0097	H	22.49
Potato	3.2807	-0.041	H	12.28
Radish	1.1532	-0.0062	N	2.52
Carrot	0.3824	0.0039	N	4.53
Onion	0.0882	0.0121	H	22.1
Pumpkin	0.565	-0.0037	N	3.14
Gourd	0.6628	-0.0127	H	18.33
B.Gourd	0.4571	-0.0087	H	22.17
Cucumber	0.6141	0.0029	N	1.81
Brinjal	0.7587	-0.014	H	11.68
L. Finger	0.5772	-0.0105	H	18.68
Palak	0.7152	-0.116	S	7.58
Ginger	0.1965	-0.0016	H	9.03

Attachment F-21 Estimated Model Coefficients (2/2)

	Haryana			
Vegetable	a	b*100	Sig	R2
SUMMER				
Cauliflower	0.1699	0.0052	H	10.17
Cabbage	0.2179	0.006	H	7.05
Peas	0.0563	0.0136	H	27.61
Tomato	0.9471	0.0166	H	12.41
Capsicum	0.1055	0.0061	H	9.9
Garlic	0.0682	0.0009	N	3.14
Beans	0.0512	0.0063	H	18.47
Potato	1.1923	0.0071	N	1.38
Onion	0.4481	0.0157	H	14.87
Pumpkin	0.7365	-0.0064	N	1.98
Gourd	0.6523	-0.0041	N	1.19
B.Gourd	0.4769	0.0034	N	0.31
Cucumber	3.1518	0.086	H	15.51
Brinjal	0.4136	-0.0024	N	1.32
L. Finger	0.5089	-0.0041	N	2.04
Palak	0.0769	0.0034	N	2.24
Ginger	0.013	0.0001	N	0.09
RAINY				
Cauliflower	0.0558	0.0075	H	35.65
Cabbage	0.1334	0.0044	H	9.23
Peas	-0.022	0.0138	H	50.97
Tomato	0.5942	0.0384	H	33.24
Capsicum	-0.0105	0.0067	H	41.99
Garlic	0.0772	0.0008	N	3.52
Beans	0.0642	0.0062	H	25.73
Potato	1.0771	0.0417	H	15.44
Onion	0.6925	0.0247	H	23.33
Pumpkin	0.4259	-0.0026	N	1.02
Gourd	0.5838	-0.0064	N	3.46
B.Gourd	0.5694	-0.0087	H	12.18
Cucumber	2.466	0.0379	H	6.98
Brinjal	0.3348	0.0014	N	0.46
L. Finger	0.1519	0.0054	H	7.9
Palak	0.1715	-0.002	N	0.57
Ginger	0.1216	-0.0003	N	0.11
WINTER				
Cauliflower	0.4491	0.0005	N	0.04
Cabbage	0.3874	0.0043	N	2.97
Peas	0.238	0.0164	H	20.53
Tomato	0.1545	0.0262	H	27.45
Capsicum	-0.013	0.0043	N	3.28
Garlic	0.1885	-0.0022	N	1.1
Beans	0.1334	0.0026	N	1.08
Potato	0.9274	0.0726	H	42.24
Broccoli	-0.0014	0.0013	N	1.49
Radish	0.1265	0.0307	H	9.05
Carrot	0.061	0.0384	H	12.42
Onion	0.091	0.0286	H	32.34
Pumpkin	-0.0845	0.0182	S	4.75
Brinjal	0.1644	0.0071	H	8.64
L. Finger	0.2035	-0.0034	N	3.53
Palak	-0.0019	0.0345	H	30.24
Ginger	0.0791	0.0085	N	2.21
Mustard	-0.0156	0.0096	H	8.53
Methi	-0.0079	0.0074	H	8.98
Soya	0.1315	0.0008	N	0.13

Remarks:
H, S refers to Significance at 1 and 5 %.
N refers to Non - significance at 5 %.

	Punjab			
Vegetable	a	b*100	Sig	R2
SUMMER				
Cauliflower	0.3491	0.0028	N	1.68
Cabbage	0.384	0.0085	H	8.29
Peas	0.1076	0.014	H	27.18
Tomato	0.5757	0.0346	H	23.09
Capsicum	0.1169	0.0078	H	16.97
Garlic	0.0225	0.0024	H	19.77
Beans	-0.0025	0.0098	H	28.46
Potato	0.1861	0.0588	H	38.3
Radish	0.3747	-0.004	N	1.39
Carrot	0.0542	-0.0001	N	0.01
Onion	0.1486	0.0287	H	47.6
Pumpkin	0.1694	0.0166	H	11.36
Gourd	0.2422	0.0132	S	4.88
B.Gourd	0.0939	0.0161	H	8.2
Cucumber	-0.7574	0.2051	H	27.48
Brinjal	0.2137	0.0113	H	16.75
L. Finger	0.121	0.0095	H	12.91
Palak	0.0469	0.0042	S	5.52
Ginger	0.0571	-0.0001	N	0.04
RAINY				
Cauliflower	0.1853	0.0077	H	21.98
Cabbage	0.3663	0.0018	N	0.76
Peas	0.1457	0.0077	H	24.63
Tomato	0.407	0.0129	H	7.86
Capsicum	0.185	0.0026	N	0.96
Garlic	0.2848	-0.0055	S	6.13
Beans	0.0646	0.0064	H	15.03
Potato	0.6376	0.0159	H	13.6
Radish	0.328	0.0039	N	2.38
Carrot	0.2363	-0.0024	N	1.39
Onion	0.5054	0.0074	S	5.68
Pumpkin	0.1105	0.0072	H	8.35
Gourd	0.3098	0.011	H	15.69
B.Gourd	0.0635	0.0106	H	38.19
Cucumber	0.1436	0.0154	H	34.84
Brinjal	0.289	0.0006	N	0.05
L. Finger	0.1587	0.0003	N	0.04
Palak	0.1301	0.0014	N	0.61
Ginger	0.0193	0.0008	S	3.91
WINTER				
Cauliflower	0.4738	0.0024	N	0.81
Cabbage	0.2596	0.0123	H	16.93
Peas	0.1274	0.0141	H	26.87
Tomato	0.1239	0.0372	H	45.9
Capsicum	0.0872	0.0023	N	1.23
Garlic	-0.0648	0.0086	H	10.18
Beans	-0.0257	0.0045	H	7.64
Potato	-0.1883	0.0948	H	59.67
Broccoli	-0.0039	0.0007	N	1.46
Radish	-0.0395	0.0241	H	13.64
Carrot	0.0967	0.029	H	19.41
Onion	0.0574	0.0361	H	38.86
Pumpkin	0.1129	0.0041	N	0.69
B. Gourd	0.0162	0.0009	N	0.78
Cucumber	0.1074	-0.002	N	1.67
Brinjal	-0.2499	0.0193	H	44.24
L. Finger	-0.0122	0.002	S	3.94
Palak	-0.4542	0.0424	H	51.68
Ginger	-0.0812	0.0116	H	11.75
Mustard	0.0606	0.0069	N	2.68
Methi	-0.1358	0.0107	H	25.41
Soya	0.1589	0.0022	N	0.24

Attachment F-22 Demand Projections for Delhi (1/4)

(I) Total Demend Projection (1/2)

Season: Summer (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	15061	13832	22607	59327	26960	8271	8736	159870
2006-07	16098	14802	24430	62754	28802	8444	8834	168550
2007-08	17199	15833	26377	66384	30762	8619	8927	177730
2008-09	18372	16933	28455	70229	32846	8796	9013	187438
2009-10	19620	18103	30671	74302	35063	8974	9091	197706
2010-11	20946	19346	33036	78620	37420	9152	9162	208567
2011-12	22357	20670	35559	83192	39927	9332	9224	220056
2012-13	23858	22079	38250	88037	42592	9512	9275	232210
2013-14	25454	23577	41118	93171	45427	9692	9316	245071
2014-15	27150	25171	44176	98611	48441	9873	9345	258678
2015-16	28955	26866	47434	104377	51644	10053	9361	273078
2016-17	30887	28689	51046	110363	55076	10243	9420	287900
2017-18	32948	30637	54932	116690	58734	10439	9480	303526
2018-19	35148	32715	59116	123382	62636	10637	9540	320000
2019-20	37494	34935	63616	130458	66798	10839	9600	337368
2020-21	39996	37307	68461	137938	71236	11046	9661	355680
2021-22	42666	39838	73675	145848	75969	11256	9724	374984
2022-23	45513	42542	79284	154211	81016	11469	9784	395336
2023-24	48550	45430	85321	163053	86398	11688	9846	416794
2024-25	167942	48514	91819	172403	92137	11911	9910	439417

Season: Rainy (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	12869	11629	23260	57670	24054	10716	11969	169368
2006-07	13817	12563	24996	61151	25792	10826	12133	178457
2007-08	14826	13560	26848	64842	27644	10927	12292	188065
2008-09	15902	14624	28819	68757	29617	11020	12444	198223
2009-10	17048	15760	30922	72911	31717	11102	12589	208964
2010-11	18268	16970	33160	77315	33953	11174	12727	220320
2011-12	19569	18262	35546	81986	36333	11233	12856	232331
2012-13	20953	19640	38087	86940	38868	11278	12975	245033
2013-14	22426	21109	40791	92195	41564	11309	13083	258469
2014-15	23994	22673	43672	97769	44434	11324	13177	272683
2015-16	25664	24342	46739	103681	47488	11321	13261	287717
2016-17	27479	26189	50082	109870	50794	11377	13387	303156
2017-18	29423	28174	53666	116428	54330	11432	13516	319425
2018-19	31504	30311	57506	123379	58110	11489	13646	336566
2019-20	33732	32610	61620	130743	62155	11545	13779	354627
2020-21	36118	35083	66030	138548	66483	11603	13910	373657
2021-22	38672	37744	70754	146818	71109	11659	14044	393708
2022-23	41407	40607	75816	155582	76060	11716	14179	414836
2023-24	44337	43686	81240	164868	81354	11774	14316	437097
2024-25	47473	46998	87053	174709	87017	11832	14453	460552

Attachment F-22 Demand Projections for Delhi (2/4)

(I) Total Demend Projection (2/2)

Season: Winter (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	45480	43444	38361	57875	2480	10791	12725	181593
2006-07	47694	45486	40180	61091	2699	11329	13061	189953
2007-08	50027	47634	42097	64492	2932	11895	13407	198747
2008-09	52485	49896	44115	68091	3181	12490	13762	208000
2009-10	55077	52278	46240	71900	3447	13120	14124	217736
2010-11	57810	54787	48479	75933	3732	13785	14496	227985
2011-12	60692	57431	50838	80201	4035	14487	14878	238775
2012-13	63732	60216	53326	84719	4361	15227	15268	250136
2013-14	66939	63151	55948	89501	4707	16009	15670	262100
2014-15	70322	66244	58712	94564	5075	16833	16079	274703
2015-16	73893	69505	61626	99925	5470	17704	16500	287983
2016-17	77511	72802	64574	105460	5915	18589	16921	301376
2017-18	81306	76255	67663	111303	6397	19518	17353	315394
2018-19	85286	79871	70900	117469	6918	20495	17798	330062
2019-20	89462	83660	74290	123976	7483	21519	18252	345412
2020-21	93843	87627	77845	130845	8092	22594	18719	361478
2021-22	98438	91783	81569	138094	8750	23724	19196	378290
2022-23	103257	96136	85471	145744	9464	24910	19687	395883
2023-24	108312	100696	89559	153819	10235	26154	20190	414294
2024-25	113616	105472	93843	162340	11068	27462	20708	433563

Season: Overall (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	73410	68904	84227	174872	53494	29778	33430	510831
2006-07	77609	72850	89606	184995	57293	30598	34028	536960
2007-08	82052	77027	95322	195718	61337	31441	34626	564542
2008-09	86759	81454	101390	207077	65644	32306	35219	593661
2009-10	91745	86141	107833	219114	70227	33196	35805	624406
2010-11	97024	91103	114676	231868	75105	34112	36385	656872
2011-12	102617	96363	121943	245379	80296	35052	36958	691162
2012-13	108542	101934	129662	259696	85820	36016	37519	727380
2013-14	114819	107836	137857	274867	91699	37010	38069	765640
2014-15	121467	114089	146560	290944	97951	38031	38602	806064
2015-16	128511	120713	155798	307983	104602	39078	39121	848778
2016-17	135877	127680	165703	325693	111784	40209	39729	892432
2017-18	143677	135066	176261	344421	119460	41389	40350	938345
2018-19	151938	142897	187522	364229	127664	42621	40985	986628
2019-20	160689	151205	199526	385177	136436	43903	41631	1037408
2020-21	169958	160016	212336	407332	145811	45242	42290	1090815
2021-22	179776	169365	225997	430760	155828	46639	42964	1146982
2022-23	190177	179285	240570	455537	166540	48095	43650	1206055
2023-24	201199	189812	256120	481740	177987	49616	44353	1268186
2024-25	329031	200983	272715	509452	190221	51205	45071	1333531

Attachment F-22 Demand Projections for Delhi (3/4)

(II) Himachal Share in Total Demand Projection (1/2)

Season: Summer (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	1657	2075	7234	8306	0	6203	524	12790
2006-07	1771	2220	7818	8786	0	6333	530	13484
2007-08	1892	2375	8441	9294	0	6465	536	14218
2008-09	2021	2540	9106	9832	0	6597	541	14995
2009-10	2158	2715	9815	10402	0	6730	545	15816
2010-11	2304	2902	10572	11007	0	6864	550	16685
2011-12	2459	3101	11379	11647	0	6999	553	17604
2012-13	2624	3312	12240	12325	0	7134	557	18577
2013-14	2800	3536	13158	13044	0	7269	559	19606
2014-15	2987	3776	14136	13806	0	7405	561	20694
2015-16	3185	4030	15179	14613	0	7539	562	21846
2016-17	3398	4303	16335	15451	0	7683	565	23032
2017-18	3624	4596	17578	16337	0	7829	569	24282
2018-19	3866	4907	18917	17273	0	7978	572	25600
2019-20	4124	5240	20357	18264	0	8129	576	26989
2020-21	4400	5596	21907	19311	0	8284	580	28454
2021-22	4693	5976	23576	20419	0	8442	583	29999
2022-23	5006	6381	25371	21590	0	8602	587	31627
2023-24	5341	6814	27303	22827	0	8766	591	33344
2024-25	18474	7277	29382	24136	0	8933	595	35153

Season: Rainy (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	5019	5931	17445	32872	8419		5147	40648
2006-07	5389	6407	18747	34856	9027		5217	42830
2007-08	5782	6916	20136	36960	9675		5286	45136
2008-09	6202	7458	21615	39192	10366		5351	47574
2009-10	6649	8038	23191	41559	11101		5413	50151
2010-11	7124	8655	24870	44070	11884		5473	52877
2011-12	7632	9314	26659	46732	12717		5528	55759
2012-13	8172	10016	28565	49556	13604		5579	58808
2013-14	8746	10765	30593	52551	14548		5626	62033
2014-15	9358	11563	32754	55728	15552		5666	65444
2015-16	10009	12414	35054	59098	16621		5702	69052
2016-17	10717	13356	37562	62626	17778		5757	72757
2017-18	11475	14369	40249	66364	19015		5812	76662
2018-19	12287	15459	43130	70326	20339		5868	80776
2019-20	13155	16631	46215	74524	21754		5925	85110
2020-21	14086	17892	49522	78972	23269		5981	89678
2021-22	15082	19250	53065	83687	24888		6039	94490
2022-23	16149	20710	56862	88682	26621		6097	99561
2023-24	17291	22280	60930	93975	28474		6156	104903
2024-25	18514	23969	65290	99584	30456		6215	110533

Attachment F-22 Demand Projections for Delhi (4/4)

(II) Himachal Share in Total Demand Projection (2/2)

Season: Winter (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06		1738	1918				382	3632
2006-07		1819	2009				392	3799
2007-08		1905	2105				402	3975
2008-09		1996	2206				413	4160
2009-10		2091	2312				424	4355
2010-11		2191	2424				435	4560
2011-12		2297	2542				446	4775
2012-13		2409	2666				458	5003
2013-14		2526	2797				470	5242
2014-15		2650	2936				482	5494
2015-16		2780	3081				495	5760
2016-17		2912	3229				508	6028
2017-18		3050	3383				521	6308
2018-19		3195	3545				534	6601
2019-20		3346	3715				548	6908
2020-21		3505	3892				562	7230
2021-22		3671	4078				576	7566
2022-23		3845	4274				591	7918
2023-24		4028	4478				606	8286
2024-25		4219	4692				621	8671

Season: Overall (unit: ton)

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	6676	9743	26597	41178	8419	6203	6053	57070
2006-07	7159	10447	28574	43642	9027	6333	6139	60113
2007-08	7674	11196	30682	46254	9675	6465	6224	63329
2008-09	8223	11994	32926	49024	10366	6597	6304	66729
2009-10	8807	12844	35318	51962	11101	6730	6383	70323
2010-11	9429	13748	37866	55077	11884	6864	6457	74122
2011-12	10091	14711	40580	58379	12717	6999	6528	78139
2012-13	10796	15737	43471	61881	13604	7134	6594	82388
2013-14	11546	16828	46548	65595	14548	7269	6655	86880
2014-15	12344	17989	49826	69534	15552	7405	6709	91632
2015-16	13194	19225	53314	73711	16621	7539	6759	96658
2016-17	14114	20572	57125	78077	17778	7683	6829	101817
2017-18	15099	22014	61211	82701	19015	7829	6902	107252
2018-19	16153	23561	65592	87599	20339	7978	6974	112977
2019-20	17280	25218	70286	92788	21754	8129	7048	119008
2020-21	18486	26994	75322	98284	23269	8284	7123	125362
2021-22	19775	28897	80720	104105	24888	8442	7198	132054
2022-23	21155	30936	86506	110271	26621	8602	7275	139105
2023-24	22632	33122	92710	116802	28474	8766	7353	146533
2024-25	36988	35465	99364	123721	30456	8933	7431	154357

Attachment F-23 Demand Projections for Chandigarh (1/4)

(I) Total Demend Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	3003	2561	2549	5125	1808	856	2501	8768
2006-07	3124	2655	2650	5288	1790	876	2561	8982
2007-08	3249	2752	2754	5454	1772	896	2620	9194
2008-09	3380	2853	2862	5623	1752	915	2677	9401
2009-10	3515	2957	2975	5795	1731	934	2733	9603
2010-11	3656	3063	3090	5968	1709	954	2786	9799
2011-12	3802	3174	3211	6144	1686	972	2838	9986
2012-13	3955	3288	3337	6320	1662	988	2886	10164
2013-14	4112	3404	3466	6498	1636	1004	2931	10330
2014-15	4276	3523	3599	6677	1609	1018	2972	10486
2015-16	4444	3648	3738	6856	1580	1030	3007	10623
2016-17	4618	3777	3882	7055	1559	1048	3061	10824
2017-18	4800	3910	4032	7259	1538	1069	3117	11029
2018-19	4988	4048	4185	7470	1518	1087	3173	11236
2019-20	5186	4191	4346	7685	1498	1108	3232	11449
2020-21	5389	4342	4513	7908	1478	1128	3290	11666
2021-22	5602	4495	4687	8136	1458	1149	3351	11886
2022-23	5821	4654	4868	8374	1439	1169	3411	12111
2023-24	6051	4818	5052	8615	1420	1193	3472	12339
2024-25	6287	4988	5247	8865	1401	1213	3535	12572

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	2575	2529	2682	5587	2366	634	2146	10833
2006-07	2693	2661	2804	5776	2448	652	2222	11126
2007-08	2817	2800	2932	5971	2532	670	2302	11419
2008-09	2946	2948	3068	6169	2617	688	2384	11710
2009-10	3084	3104	3209	6370	2706	704	2467	12000
2010-11	3226	3269	3358	6578	2795	722	2552	12285
2011-12	3377	3444	3514	6790	2887	739	2640	12566
2012-13	3534	3629	3678	7004	2980	755	2730	12840
2013-14	3700	3825	3851	7222	3077	771	2824	13105
2014-15	3876	4032	4030	7444	3174	787	2920	13361
2015-16	4057	4253	4221	7669	3273	802	3016	13607
2016-17	4242	4477	4414	7911	3378	820	3120	13914
2017-18	4437	4713	4616	8161	3488	840	3225	14227
2018-19	4641	4961	4829	8418	3600	858	3335	14546
2019-20	4854	5223	5048	8683	3718	879	3448	14874
2020-21	5076	5499	5280	8957	3837	900	3566	15209
2021-22	5309	5789	5522	9241	3963	919	3686	15553
2022-23	5553	6093	5775	9531	4090	941	3812	15904
2023-24	5809	6414	6038	9833	4223	963	3943	16262
2024-25	6073	6753	6314	10143	4358	986	4076	16627

Attachment F-23 Demand Projections for Chandigarh (2/4)

(I) Total Demend Projection (2/2)

Season: Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	2653	2652	2334	4565	1113	415	1166	10613
2006-07	2756	2787	2442	4750	1118	436	1169	10862
2007-08	2860	2928	2556	4943	1121	458	1168	11105
2008-09	2969	3077	2677	5142	1120	481	1164	11343
2009-10	3082	3235	2801	5349	1116	505	1155	11572
2010-11	3200	3402	2933	5565	1107	532	1142	11792
2011-12	3320	3579	3073	5789	1095	560	1123	12001
2012-13	3445	3766	3218	6022	1077	588	1098	12195
2013-14	3574	3963	3373	6262	1053	620	1065	12375
2014-15	3707	4172	3534	6513	1022	653	1025	12536
2015-16	3844	4393	3704	6775	985	687	977	12675
2016-17	3986	4618	3876	7043	972	722	960	12897
2017-18	4135	4853	4058	7323	961	759	943	13122
2018-19	4288	5102	4246	7613	951	797	927	13350
2019-20	4449	5362	4444	7916	938	837	912	13583
2020-21	4613	5637	4651	8229	927	880	895	13821
2021-22	4783	5925	4868	8554	917	926	882	14062
2022-23	4962	6229	5094	8894	904	973	866	14306
2023-24	5146	6547	5332	9245	895	1024	850	14555
2024-25	5338	6882	5581	9613	883	1075	836	14810

Season: OVERALL

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	8231	7742	7564	15277	5287	1904	5812	30214
2006-07	8572	8103	7896	15814	5356	1964	5952	30971
2007-08	8927	8480	8242	16368	5424	2024	6090	31718
2008-09	9296	8878	8607	16933	5489	2084	6224	32453
2009-10	9681	9296	8986	17514	5553	2144	6355	33175
2010-11	10083	9734	9381	18112	5612	2207	6480	33876
2011-12	10499	10196	9797	18722	5668	2270	6601	34553
2012-13	10934	10682	10233	19346	5720	2330	6714	35199
2013-14	11387	11192	10689	19982	5766	2395	6821	35810
2014-15	11858	11727	11164	20635	5805	2458	6917	36383
2015-16	12345	12294	11664	21301	5837	2518	7000	36905
2016-17	12846	12871	12173	22009	5909	2590	7141	37634
2017-18	13373	13477	12706	22743	5988	2667	7285	38378
2018-19	13918	14111	13259	23501	6069	2742	7436	39133
2019-20	14488	14776	13839	24284	6154	2824	7591	39907
2020-21	15078	15478	14445	25093	6242	2908	7752	40695
2021-22	15693	16209	15077	25931	6337	2994	7918	41500
2022-23	16336	16976	15736	26799	6433	3083	8089	42320
2023-24	17005	17779	16423	27693	6538	3179	8264	43155
2024-25	17698	18623	17141	28621	6642	3273	8446	44009

Attachment F-23 Demand Projections for Chandigarh (3/4)

(II) Himachal Share in Total Demand Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	510	461	841	1076		685	300	877
2006-07	531	478	874	1110		701	307	898
2007-08	552	495	909	1145		717	314	919
2008-09	575	514	944	1181		732	321	940
2009-10	598	532	982	1217		747	328	960
2010-11	622	551	1020	1253		763	334	980
2011-12	646	571	1060	1290		777	341	999
2012-13	672	592	1101	1327		790	346	1016
2013-14	699	613	1144	1365		803	352	1033
2014-15	727	634	1188	1402		814	357	1049
2015-16	755	657	1234	1440		824	361	1062
2016-17	785	680	1281	1481		839	367	1082
2017-18	816	704	1331	1524		855	374	1103
2018-19	848	729	1381	1569		870	381	1124
2019-20	882	754	1434	1614		886	388	1145
2020-21	916	781	1489	1661		903	395	1167
2021-22	952	809	1547	1709		919	402	1189
2022-23	990	838	1606	1758		936	409	1211
2023-24	1029	867	1667	1809		954	417	1234
2024-25	1069	898	1731	1862		970	424	1257

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	1210	1568	2280	3575	946		1180	3467
2006-07	1266	1650	2384	3697	979		1222	3560
2007-08	1324	1736	2492	3821	1013		1266	3654
2008-09	1385	1827	2608	3948	1047		1311	3747
2009-10	1449	1924	2728	4077	1082		1357	3840
2010-11	1516	2027	2855	4210	1118		1404	3931
2011-12	1587	2135	2987	4345	1155		1452	4021
2012-13	1661	2250	3126	4483	1192		1502	4109
2013-14	1739	2371	3273	4622	1231		1553	4194
2014-15	1822	2500	3426	4764	1270		1606	4276
2015-16	1907	2637	3588	4908	1309		1659	4354
2016-17	1994	2776	3752	5063	1351		1716	4452
2017-18	2086	2922	3924	5223	1395		1774	4553
2018-19	2181	3076	4104	5388	1440		1834	4655
2019-20	2281	3238	4291	5557	1487		1896	4760
2020-21	2386	3410	4488	5732	1535		1961	4867
2021-22	2495	3589	4694	5914	1585		2027	4977
2022-23	2610	3778	4908	6100	1636		2097	5089
2023-24	2730	3977	5132	6293	1689		2169	5204
2024-25	2854	4187	5367	6492	1743		2242	5321

Attachment F-23 Demand Projections for Chandigarh (4/4)

(II) Himachal Share in Total Demand Projection (2/2)

Season: Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	0	106	117	183	22		35	
2006-07	0	111	122	190	22		35	
2007-08	0	117	128	198	22		35	
2008-09	0	123	134	206	22		35	
2009-10	0	129	140	214	22		35	
2010-11	0	136	147	223	22		34	
2011-12	0	143	154	232	22		34	
2012-13	0	151	161	241	22		33	
2013-14	0	159	169	250	21		32	
2014-15	0	167	177	261	20		31	
2015-16	0	176	185	271	20		29	
2016-17	0	185	194	282	19		29	
2017-18	0	194	203	293	19		28	
2018-19	0	204	212	305	19		28	
2019-20	0	214	222	317	19		27	
2020-21	0	225	233	329	19		27	
2021-22	0	237	243	342	18		26	
2022-23	0	249	255	356	18		26	
2023-24	0	262	267	370	18		25	
2024-25	0	275	279	385	18		25	

Season: Overall

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	1721	2135	3237	4834	969	685	1515	4343
2006-07	1797	2239	3380	4997	1002	701	1565	4459
2007-08	1876	2349	3529	5164	1035	717	1615	4574
2008-09	1959	2464	3686	5335	1069	732	1667	4687
2009-10	2047	2586	3850	5508	1105	747	1720	4800
2010-11	2138	2714	4021	5686	1140	763	1772	4911
2011-12	2233	2850	4200	5867	1177	777	1826	5020
2012-13	2333	2992	4388	6051	1214	790	1881	5125
2013-14	2438	3143	4586	6237	1252	803	1937	5227
2014-15	2548	3301	4790	6427	1290	814	1993	5324
2015-16	2662	3469	5007	6619	1329	824	2049	5417
2016-17	2779	3640	5227	6827	1371	839	2112	5535
2017-18	2902	3820	5457	7040	1415	855	2176	5656
2018-19	3029	4009	5698	7261	1459	870	2243	5779
2019-20	3163	4207	5947	7488	1506	886	2311	5905
2020-21	3302	4417	6210	7722	1553	903	2383	6033
2021-22	3447	4635	6484	7965	1603	919	2456	6165
2022-23	3600	4864	6769	8214	1654	936	2532	6300
2023-24	3759	5106	7066	8472	1707	954	2611	6438
2024-25	3923	5360	7377	8738	1761	970	2691	6578

Attachment F-24 Demand Projections for Haryana (1/4)

(I) Total Demend Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	24048	29824	26664	114620	19441	7772	14726	122690
2006-07	24671	30574	27782	117142	20048	7930	15278	124813
2007-08	25315	31348	28952	119745	20679	8093	15855	126984
2008-09	25984	32152	30176	122430	21337	8260	16458	129207
2009-10	26678	32984	31457	125203	22021	8433	17088	131481
2010-11	27396	33845	32799	128065	22734	8610	17745	133809
2011-12	28142	34739	34204	131020	23475	8793	18434	136193
2012-13	28916	35666	35673	134074	24249	8983	19153	138635
2013-14	29719	36627	37213	137230	25055	9176	19904	141136
2014-15	30554	37624	38824	140491	25895	9377	20689	143699
2015-16	31419	38658	40512	143863	26771	9583	21511	146326
2016-17	32255	39656	42221	147098	27628	9781	22717	148847
2017-18	33114	40680	44005	150406	28511	9984	23583	151411
2018-19	33997	41731	45862	153788	29423	10190	24484	154018
2019-20	34903	42809	47798	157245	30365	10400	25419	156672
2020-21	35832	43914	49815	160782	31336	10615	26388	159371
2021-22	36786	45048	51919	164397	32340	10835	27396	162115
2022-23	37766	46211	54110	168093	33373	11058	28442	164908
2023-24	38771	47405	56395	171873	34441	11287	29527	167749
2024-25	39805	48628	58774	175737	35543	11520	30654	170637

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	17013	19432	19659	116101	9521	8486	15821	166404
2006-07	17662	19947	20688	119838	10020	8650	16385	171031
2007-08	18340	20482	21770	123730	10543	8818	16973	175834
2008-09	19049	21037	22904	127786	11092	8991	17587	180821
2009-10	19790	21612	24095	132011	11668	9169	18229	186001
2010-11	20564	22210	25346	136413	12273	9352	18898	191384
2011-12	21373	22829	26658	141002	12909	9541	19596	196975
2012-13	22219	23474	28035	145786	13575	9733	20326	202788
2013-14	23103	24141	29482	150774	14275	9933	21088	208831
2014-15	24028	24836	30999	155975	15010	10137	21884	215114
2015-16	24996	25558	32593	161400	15781	10349	22717	221650
2016-17	25962	26254	34265	166728	16591	10551	23543	227979
2017-18	26966	26969	36023	172231	17442	10757	24397	234489
2018-19	28009	27704	37872	177916	18337	10969	25284	241185
2019-20	29092	28458	39816	183788	19278	11182	26204	248072
2020-21	30218	29234	41859	189854	20267	11401	27156	255156
2021-22	31386	30030	44008	196120	21307	11624	28143	262441
2022-23	32600	30848	46265	202594	22401	11851	29166	269935
2023-24	33860	31689	48640	209281	23550	12083	30226	277643
2024-25	35169	32552	51136	216188	24758	12319	31325	285571

Attachment F-24 Demand Projections for Haryana (2/4)

(I) Total Demend Projection (2/2)

Season: Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	42701	42953	48079	55672	5518	14168	16585	201104
2006-07	43329	43792	49653	57886	5829	14250	16962	207907
2007-08	43968	44656	51293	60201	6157	14326	17351	215000
2008-09	44616	45543	53001	62623	6500	14397	17753	222396
2009-10	45275	46456	54782	65155	6861	14462	18169	230109
2010-11	45945	47394	56639	67803	7240	14522	18598	238155
2011-12	46626	48360	58575	70574	7639	14576	19042	246548
2012-13	47318	49354	60594	73471	8057	14622	19501	255306
2013-14	48021	50376	62699	76503	8496	14662	19975	264446
2014-15	48736	51430	64896	79674	8958	14694	20467	273985
2015-16	49463	52514	67186	82994	9442	14718	20975	283942
2016-17	50169	53551	69438	86330	9959	14767	21463	293773
2017-18	50886	54609	71765	89799	10503	14817	21964	303945
2018-19	51614	55687	74170	93408	11077	14867	22476	314470
2019-20	52351	56788	76656	97162	11683	14917	22999	325358
2020-21	53099	57910	79224	101067	12320	14967	23534	336623
2021-22	53859	59054	81880	105128	12994	15018	24083	348279
2022-23	54627	60221	84623	109354	13704	15069	24644	360338
2023-24	55408	61409	87460	113749	14453	15119	25218	372814
2024-25	56201	62623	90391	118321	15243	15170	25804	385724

SAESON: OVERALL

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	83762	92209	94403	286393	34481	30426	47132	490197
2006-07	85662	94313	98124	294866	35897	30830	48625	503750
2007-08	87624	96487	102014	303676	37378	31236	50180	517817
2008-09	89649	98731	106081	312838	38928	31648	51798	532423
2009-10	91743	101052	110334	322368	40551	32065	53485	547591
2010-11	93906	103449	114784	332281	42247	32484	55241	563347
2011-12	96142	105929	119437	342596	44024	32910	57072	579717
2012-13	98453	108493	124302	353331	45881	33338	58980	596729
2013-14	100843	111144	129394	364506	47827	33772	60967	614413
2014-15	103318	113889	134719	376141	49864	34208	63040	632798
2015-16	105877	116729	140291	388258	51994	34651	65203	651918
2016-17	108387	119461	145924	400156	54177	35100	67722	670600
2017-18	110967	122258	151793	412436	56456	35558	69944	689845
2018-19	113619	125122	157904	425112	58837	36025	72244	709673
2019-20	116346	128055	164270	438195	61326	36500	74622	730102
2020-21	119149	131057	170898	451703	63923	36983	77078	751150
2021-22	122031	134132	177806	465645	66640	37478	79622	772836
2022-23	124993	137280	184998	480040	69478	37978	82252	795181
2023-24	128039	140503	192494	494902	72444	38488	84971	818206
2024-25	131175	143803	200301	510246	75544	39010	87783	841932

Attachment F-24 Demand Projections for Haryana (3/4)

(II) Himachal Share in Total Demand Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	4088	4474	5066	16047		5441	884	7361
2006-07	4194	4586	5279	16400		5551	917	7489
2007-08	4304	4702	5501	16764		5665	951	7619
2008-09	4417	4823	5733	17140		5782	987	7752
2009-10	4535	4948	5977	17528		5903	1025	7889
2010-11	4657	5077	6232	17929		6027	1065	8029
2011-12	4784	5211	6499	18343		6155	1106	8172
2012-13	4916	5350	6778	18770		6288	1149	8318
2013-14	5052	5494	7071	19212		6423	1194	8468
2014-15	5194	5644	7376	19669		6564	1241	8622
2015-16	5341	5799	7697	20141		6708	1291	8780
2016-17	5483	5948	8022	20594		6847	1363	8931
2017-18	5629	6102	8361	21057		6989	1415	9085
2018-19	5779	6260	8714	21530		7133	1469	9241
2019-20	5934	6421	9082	22014		7280	1525	9400
2020-21	6091	6587	9465	22509		7430	1583	9562
2021-22	6254	6757	9865	23016		7585	1644	9727
2022-23	6420	6932	10281	23533		7740	1707	9894
2023-24	6591	7111	10715	24062		7901	1772	10065
2024-25	6767	7294	11167	24603		8064	1839	10238

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	6976	9910	14744	66178	3142		7752	39937
2006-07	7242	10173	15516	68308	3306		8029	41047
2007-08	7520	10446	16327	70526	3479		8317	42200
2008-09	7810	10729	17178	72838	3660		8618	43397
2009-10	8114	11022	18071	75246	3851		8932	44640
2010-11	8431	11327	19010	77756	4050		9260	45932
2011-12	8763	11643	19994	80371	4260		9602	47274
2012-13	9110	11972	21026	83098	4480		9960	48669
2013-14	9472	12312	22111	85941	4711		10333	50120
2014-15	9852	12666	23249	88906	4953		10723	51627
2015-16	10248	13034	24444	91998	5208		11131	53196
2016-17	10644	13390	25699	95035	5475		11536	54715
2017-18	11056	13754	27018	98172	5756		11955	56277
2018-19	11484	14129	28404	101412	6051		12389	57884
2019-20	11928	14514	29862	104759	6362		12840	59537
2020-21	12389	14909	31394	108217	6688		13307	61237
2021-22	12868	15315	33006	111789	7031		13790	62986
2022-23	13366	15732	34699	115478	7392		14292	64784
2023-24	13883	16161	36480	119290	7771		14811	66634
2024-25	14419	16601	38352	123227	8170		15349	68537

Attachment F-24 Demand Projections for Haryana (4/4)

(II) Himachal Share in Total Demand Projection (2/2)

Season: Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06					110		498	
2006-07					117		509	
2007-08					123		521	
2008-09					130		533	
2009-10					137		545	
2010-11					145		558	
2011-12					153		571	
2012-13					161		585	
2013-14					170		599	
2014-15					179		614	
2015-16					189		629	
2016-17					199		644	
2017-18					210		659	
2018-19					222		674	
2019-20					234		690	
2020-21					246		706	
2021-22					260		722	
2022-23					274		739	
2023-24					289		757	
2024-25					305		774	

Season: Overall

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	11064	14384	19811	82224	3252	5441	9134	47298
2006-07	11436	14759	20795	84708	3423	5551	9454	48536
2007-08	11823	15148	21828	87291	3602	5665	9789	49819
2008-09	12227	15552	22911	89978	3790	5782	10138	51149
2009-10	12649	15970	24048	92775	3988	5903	10502	52529
2010-11	13089	16404	25241	95685	4195	6027	10883	53961
2011-12	13547	16854	26492	98714	4413	6155	11279	55446
2012-13	14026	17321	27804	101868	4641	6288	11694	56987
2013-14	14524	17806	29182	105153	4881	6423	12127	58588
2014-15	15046	18310	30626	108575	5133	6564	12578	60249
2015-16	15589	18833	32142	112139	5396	6708	13051	61975
2016-17	16128	19338	33721	115629	5674	6847	13543	63646
2017-18	16686	19856	35378	119228	5966	6989	14029	65362
2018-19	17263	20389	37118	122942	6273	7133	14533	67126
2019-20	17861	20935	38944	126774	6595	7280	15055	68938
2020-21	18481	21496	40859	130726	6935	7430	15596	70800
2021-22	19122	22073	42870	134804	7291	7585	16156	72713
2022-23	19786	22664	44980	139011	7666	7740	16737	74679
2023-24	20474	23272	47195	143352	8061	7901	17339	76699
2024-25	21186	23896	49519	147831	8475	8064	17962	78775

Attachment F-25 Demand Projections for Punjab (1/4)

(I) Total Demend Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	41228	54608	35207	119350	25534	6490	16494	120044
2006-07	41799	55643	36373	122550	26240	6695	17229	124661
2007-08	42383	56711	37586	125872	26974	6908	17996	129475
2008-09	42980	57812	38848	129319	27736	7130	18797	134493
2009-10	43592	58947	40163	132898	28528	7361	19633	139727
2010-11	44217	60120	41532	136613	29350	7602	20506	145185
2011-12	44856	61329	42956	140471	30205	7852	21417	150877
2012-13	45512	62577	44441	144477	31092	8113	22369	156812
2013-14	46182	63866	45986	177077	32014	8384	23363	163002
2014-15	46870	65197	47596	152963	32972	8665	24401	169459
2015-16	47575	66573	49271	157455	33969	8958	25485	176192
2016-17	48247	67883	50940	162598	34941	9249	26610	183031
2017-18	48930	69218	52666	167911	35943	9549	27785	190135
2018-19	49620	70580	54451	173396	36972	9860	29013	197516
2019-20	50322	71969	56295	179060	38031	10180	30294	205182
2020-21	51033	73384	58202	184910	39119	10510	31630	213146
2021-22	51754	74827	60174	190952	40240	10852	33027	221420
2022-23	52485	76300	62212	197190	41393	11204	34486	230014
2023-24	53227	77800	64320	203632	42578	11567	36009	238942
2024-25	53980	79331	66499	210285	43798	11943	37598	248216

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	32587	41249	28383	64627	23792	20362	17684	93777
2006-07	33361	41760	29113	66021	24180	20244	18232	95632
2007-08	34162	42280	29869	67462	24579	20111	18802	97548
2008-09	34993	42811	30654	68952	24989	19962	19395	99525
2009-10	35852	43351	31468	70494	25411	19797	20011	101565
2010-11	36743	43902	32313	72088	25844	19613	20651	103674
2011-12	37668	44464	33190	73738	26289	19412	21319	105850
2012-13	38625	45037	34100	75444	26747	19190	22013	108101
2013-14	39618	45623	35044	77211	27219	18948	22736	110425
2014-15	40647	46219	36025	79041	27704	18685	23487	112829
2015-16	41715	46828	37044	80935	28204	18398	24269	115314
2016-17	42745	47409	38030	82748	28679	18208	25042	117687
2017-18	43801	47998	39043	84601	29163	18020	25840	120109
2018-19	44884	48595	40082	86495	29654	17833	26664	122580
2019-20	45993	49198	41149	88432	30153	17648	27513	125104
2020-21	47130	49809	42245	90412	30662	17466	28390	127678
2021-22	48294	50427	43370	92437	31178	17285	29295	130305
2022-23	49487	51053	44524	94507	31703	17106	30228	132986
2023-24	50710	51687	45710	96623	32237	16929	31191	135724
2024-25	51964	52329	46927	98786	32781	16754	32184	138516

Attachment F-25 Demand Projections for Punjab (2/4)

(I) Total Demend Projection (2/2)

Season:Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	53622	48210	37439	76579	13056	7991	5015	142633
2006-07	54294	49406	38633	79506	13319	8573	5326	149575
2007-08	54980	50646	39874	82557	13591	9183	5652	156829
2008-09	55679	51932	41165	85738	13872	9821	5994	164411
2009-10	56392	53265	42509	89056	14163	10491	6351	172333
2010-11	57119	54647	43907	92515	14463	11192	6726	180611
2011-12	57860	56080	45363	96122	14773	11927	7118	189261
2012-13	58617	57569	46877	99884	15094	12697	7528	198299
2013-14	59389	59111	48454	103806	15425	13503	7957	207742
2014-15	60178	60712	50096	107897	15767	14347	8406	217610
2015-16	60982	62374	51804	112164	16122	15230	8876	227920
2016-17	61751	63979	53497	116495	16460	16239	9394	238787
2017-18	62531	65624	55244	120993	16805	17315	9942	250173
2018-19	63320	67312	57049	125665	17158	18460	10522	262101
2019-20	64119	69042	58913	130518	17518	19683	11137	274599
2020-21	64929	70819	60837	135557	17886	20986	11786	287691
2021-22	65748	72640	62825	140792	18261	22377	12474	301409
2022-23	66578	74508	64877	146228	18645	23858	13202	315780
2023-24	67418	76424	66997	151874	19036	25438	13973	330836
2024-25	68269	78390	69186	157739	19435	27122	14788	346611

SEASON: OVERALL

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	127438	144068	101029	260556	62382	34843	39193	356455
2006-07	129455	146809	104119	268077	63740	35512	40787	369868
2007-08	131526	149638	107330	275891	65144	36202	42450	383852
2008-09	133652	152555	110667	284009	66598	36914	44185	398429
2009-10	135836	155564	114140	292448	68102	37649	45995	413625
2010-11	138079	158669	117752	301216	69657	38407	47883	429470
2011-12	140384	161874	121509	310331	71267	39191	49854	445988
2012-13	142753	165183	125417	319805	72934	40000	51910	463211
2013-14	145189	168600	129484	358094	74659	40835	54056	481169
2014-15	147695	172127	133716	339901	76444	41697	56294	499898
2015-16	150272	175775	138120	350554	78295	42587	58630	519426
2016-17	152744	179270	142468	361841	80080	43697	61046	539505
2017-18	155262	182840	146954	373505	81910	44883	63567	560417
2018-19	157824	186486	151581	385557	83784	46153	66198	582197
2019-20	160435	190209	156357	398010	85702	47511	68943	604885
2020-21	163091	194011	161284	410879	87667	48962	71806	628516
2021-22	165795	197894	166370	424180	89679	50514	74796	653134
2022-23	168550	201861	171614	437926	91741	52168	77916	678780
2023-24	171355	205911	177027	452129	93852	53934	81173	705502
2024-25	174212	210049	182612	466810	96014	55820	84571	733343

Attachment F-25 Demand Projections for Punjab (3/4)

(II) Himachal Share in Total Demand Projection (1/2)

Season: Summer

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	7833	8191	8450	21483		4218	1979	4802
2006-07	7942	8346	8729	22059		4352	2068	4986
2007-08	8053	8507	9021	22657		4490	2160	5179
2008-09	8166	8672	9324	23277		4635	2256	5380
2009-10	8282	8842	9639	23922		4785	2356	5589
2010-11	8401	9018	9968	24590		4941	2461	5807
2011-12	8523	9199	10310	25285		5104	2570	6035
2012-13	8647	9387	10666	26006		5273	2684	6272
2013-14	8775	9580	11037	31874		5449	2804	6520
2014-15	8905	9779	11423	27533		5632	2928	6778
2015-16	9039	9986	11825	28342		5823	3058	7048
2016-17	9167	10182	12226	29268		6012	3193	7321
2017-18	9297	10383	12640	30224		6207	3334	7605
2018-19	9428	10587	13068	31211		6409	3482	7901
2019-20	9561	10795	13511	32231		6617	3635	8207
2020-21	9696	11008	13969	33284		6831	3796	8526
2021-22	9833	11224	14442	34371		7054	3963	8857
2022-23	9972	11445	14931	35494		7282	4138	9201
2023-24	10113	11670	15437	36654		7519	4321	9558
2024-25	10256	11900	15960	37851		7763	4512	9929

Season: Rainy

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	15316	22687	21287	38776	8327		8665	18755
2006-07	15680	22968	21835	39613	8463		8934	19126
2007-08	16056	23254	22402	40477	8603		9213	19510
2008-09	16447	23546	22991	41371	8746		9503	19905
2009-10	16851	23843	23601	42296	8894		9805	20313
2010-11	17269	24146	24235	43253	9045		10119	20735
2011-12	17704	24455	24893	44243	9201		10446	21170
2012-13	18154	24771	25575	45267	9362		10786	21620
2013-14	18620	25092	26283	46327	9527		11140	22085
2014-15	19104	25420	27019	47424	9697		11509	22566
2015-16	19606	25755	27783	48561	9871		11892	23063
2016-17	20090	26075	28523	49649	10038		12270	23537
2017-18	20587	26399	29282	50761	10207		12662	24022
2018-19	21095	26727	30061	51897	10379		13065	24516
2019-20	21617	27059	30862	53059	10554		13481	25021
2020-21	22151	27395	31684	54247	10732		13911	25536
2021-22	22698	27735	32527	55462	10912		14354	26061
2022-23	23259	28079	33393	56704	11096		14812	26597
2023-24	23834	28428	34282	57974	11283		15284	27145
2024-25	24423	28781	35195	59272	11473		15770	27703

Attachment F-25 Demand Projections for Punjab (4/4)

(II) Himachal Share in Total Demand Projection (2/2)

Season: Winter

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06					261		150	
2006-07					266		160	
2007-08					272		170	
2008-09					277		180	
2009-10					283		191	
2010-11					289		202	
2011-12					295		214	
2012-13					302		226	
2013-14					309		239	
2014-15					315		252	
2015-16					322		266	
2016-17					329		282	
2017-18					336		298	
2018-19					343		316	
2019-20					350		334	
2020-21					358		354	
2021-22					365		374	
2022-23					373		396	
2023-24					381		419	
2024-25					389		444	

Season: Overall

Year	Cauliflower	Cabbage	Peas	Tomato	Capsicum	Garlic	Beans	Potato
2005-06	23149	30878	29737	60259	8588	4218	10795	23557
2006-07	23622	31314	30564	61672	8729	4352	11161	24113
2007-08	24109	31761	31423	63134	8874	4490	11542	24689
2008-09	24613	32218	32314	64649	9024	4635	11939	25285
2009-10	25133	32685	33240	66218	9177	4785	12352	25902
2010-11	25670	33164	34203	67843	9335	4941	12782	26542
2011-12	26227	33655	35202	69527	9497	5104	13230	27205
2012-13	26801	34157	36241	71272	9663	5273	13697	27893
2013-14	27395	34672	37320	78201	9835	5449	14183	28605
2014-15	28009	35200	38442	74958	10012	5632	14689	29344
2015-16	28645	35741	39608	76903	10194	5823	15216	30110
2016-17	29257	36257	40748	78916	10367	6012	15745	30859
2017-18	29883	36781	41922	80985	10543	6207	16294	31627
2018-19	30523	37314	43130	83109	10722	6409	16862	32417
2019-20	31178	37854	44373	85290	10904	6617	17451	33228
2020-21	31847	38402	45652	87531	11089	6831	18060	34061
2021-22	32531	38959	46969	89833	11277	7054	18692	34918
2022-23	33231	39524	48324	92199	11469	7282	19346	35798
2023-24	33947	40098	49719	94628	11664	7519	20024	36702
2024-25	34679	40680	51155	97123	11862	7763	20726	37632

Attachment F-26 Total Demand Projection and Shared Demand for H.P. in Delhi and Chandigarh

Total Demand in Delhi

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	15,061	22,607	59,327	159,870	13,832	26,960	8,736	8,271
2017-18	32,948	54,932	116,690	303,526	30,637	58,734	9,480	10,439
2022-23	45,513	79,284	154,211	395,336	42,542	81,016	9,784	11,469

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	12,869	23,260	57,670	169,368	11,629	24,054	11,969	10,716
2017-18	29,423	53,666	116,428	319,425	28,174	54,330	13,516	11,432
2022-23	41,407	75,816	155,582	414,836	40,607	76,060	14,179	11,716

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	45,480	38,361	57,875	181,593	43,444	2,480	12,725	10,791
2017-18	81,306	67,663	111,303	315,394	76,255	6,397	17,353	19,518
2022-23	103,257	85,471	145,744	395,883	96,136	9,464	19,687	24,910

Total Demand in Chandigarh

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	3,003	2,549	5,125	8,768	2,561	1,808	2,501	856
2017-18	4,800	4,032	7,259	11,029	3,910	1,538	3,117	1,069
2022-23	5,821	4,868	8,374	12,111	4,654	1,439	3,411	1,169

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	2,575	2,682	5,587	10,833	2,529	2,366	2,146	634
2017-18	4,437	4,616	8,161	14,227	4,713	3,488	3,225	840
2022-23	5,553	5,775	9,531	15,904	6,093	4,090	3,812	941

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	2,653	2,334	4,565	10,613	2,652	1,113	1,166	415
2017-18	4,135	4,058	7,323	13,122	4,853	961	943	759
2022-23	4,962	5,094	8,894	14,306	6,229	904	866	973

HP sharing in Delhi

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	1,657	7,234	8,306	12,790	2,075		524	6,203
2017-18	3,624	17,578	16,337	24,282	4,596		569	7,829
2022-23	5,006	25,371	21,590	31,627	6,381		587	8,602

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	5,019	17,445	32,872	40,648	5,931	8,419	5,147	
2017-18	11,475	40,249	66,364	76,662	14,369	19,015	5,812	
2022-23	16,149	56,862	88,682	99,561	20,710	26,621	6,097	

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06		1,918		3,632	1,738		382	
2017-18		3,383		6,308	3,050		521	
2022-23		4,274		7,918	3,845		591	

HP Sharing in Chandigarh

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	510	841	1,076	877	461		300	685
2017-18	816	1,331	1,524	1,103	704		374	855
2022-23	990	1,606	1,758	1,211	838		409	936

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	1,210	2,280	3,575	3,467	1,568	946	1,180	
2017-18	2,086	3,924	5,223	4,553	2,922	1,395	1,774	
2022-23	2,610	4,908	6,100	5,089	3,778	1,636	2,097	

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06		117	183		106	22	35	
2017-18		203	293		194	19	28	
2022-23		255	356		249	18	26	

Attachment F-27 Total Demand Projection and Shared Demand for H.P. in Haryana and Punjab

Total Demand in Haryana

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	24,048	26,664	114,620	122,690	29,824	19,441	14,726	7,772
2017-18	33,114	44,005	150,406	151,411	40,680	28,511	23,583	9,984
2022-23	37,766	54,110	168,093	164,908	46,211	33,373	28,442	11,058

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	17,013	19,659	116,101	166,404	19,432	9,521	15,821	8,486
2017-18	26,966	36,023	172,231	234,489	26,969	17,442	24,397	10,757
2022-23	32,600	46,265	202,594	269,935	30,848	22,401	29,166	11,851

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	42,701	48,079	55,672	201,104	42,953	5,518	16,585	14,168
2017-18	50,886	71,765	89,799	303,945	54,609	10,503	21,964	14,817
2022-23	54,627	84,623	109,354	360,338	60,221	13,704	24,644	15,069

Total Demand in Punjab

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	41,228	35,207	119,350	120,044	54,608	25,534	16,494	6,490
2017-18	48,930	52,666	167,911	190,135	69,218	35,943	27,785	9,549
2022-23	52,485	62,212	197,190	230,014	76,300	41,393	34,486	11,204

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	32,587	28,383	64,627	93,777	41,249	23,792	17,684	20,362
2017-18	43,801	39,043	84,601	120,109	47,998	29,163	25,840	18,020
2022-23	49,487	44,524	94,507	132,986	51,053	31,703	30,228	17,106

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	53,622	37,439	76,579	142,633	48,210	13,056	5,015	7,991
2017-18	62,531	55,244	120,993	250,173	65,624	16,805	9,942	17,315
2022-23	66,578	64,877	146,228	315,780	74,508	18,645	13,202	23,858

HP Sharing in Haryana

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	4,088	5,066	16,047	7,361	4,474		884	5,441
2017-18	5,629	8,361	21,057	9,085	6,102		1,415	6,989
2022-23	6,420	10,281	23,533	9,894	6,932		1,707	7,740

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	6,976	14,744	66,178	39,937	9,910	3,142	7,752	
2017-18	11,056	27,018	98,172	56,277	13,754	5,756	11,955	
2022-23	13,366	34,699	115,478	64,784	15,732	7,392	14,292	

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06						110	498	
2017-18						210	659	
2022-23						274	739	

HP Sharing in Punjab

Season: Summer

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	7,833	8,450	21,483	4,802	8,191		1,979	4,218
2017-18	9,297	12,640	30,224	7,605	10,383		3,334	6,207
2022-23	9,972	14,931	35,494	9,201	11,445		4,138	7,282

Season: Rainy

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	15,316	21,287	38,776	18,755	22,687	8,327	8,665	
2017-18	20,587	29,282	50,761	24,022	26,399	10,207	12,662	
2022-23	23,259	33,393	56,704	26,597	28,079	11,096	14,812	

Season: Winter

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06						261	150	
2017-18						336	298	
2022-23						373	396	

Attachment F-28 Demand Projection for Major Vegetables

(1) Demand in Delhi and Surrounding States (Punjab, Haryana, and Chandigarh)

(see Attachments F-24 and 25)

(i) Season: Summer (March to June) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	83,340	87,027	298,422	411,372	100,825	73,743	42,457	23,389
2017-18	119,792	155,635	442,266	656,101	144,445	124,726	63,965	31,041
2022-23	141,585	200,474	527,868	802,369	169,707	157,221	76,123	34,900

(ii) Season: Rainy (July to September) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	65,044	73,984	243,985	440,382	74,839	59,733	47,620	40,198
2017-18	104,627	133,348	381,421	688,250	107,854	104,423	66,978	41,049
2022-23	129,047	172,380	462,214	833,661	128,601	134,254	77,385	41,614

(iii) Season: Winter (October to February) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	144,456	126,213	194,691	535,943	137,259	22,167	35,491	33,365
2017-18	198,858	198,730	329,418	882,634	201,341	34,666	50,202	52,409
2022-23	229,424	240,065	410,220	1,086,307	237,094	42,717	58,399	64,810

(2) Demand in Delhi and Surrounding States (Punjab, Haryana, and Chandigarh) in Himachal Sharing

(see Attachments F-24 and 25)

(i) Season: Summer (March to June) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	14,088	21,591	46,912	25,830	15,201	0	3,687	16,547
2017-18	19,366	39,910	69,142	42,075	21,785	0	5,692	21,880
2022-23	22,388	52,189	82,375	51,933	25,596	0	6,841	24,560

(ii) Season: Rainy (July to September) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	28,521	55,756	141,401	102,807	40,096	20,834	22,744	0
2017-18	45,204	100,473	220,520	161,514	57,444	36,373	32,203	0
2022-23	55,384	129,862	266,964	196,031	68,299	46,745	37,298	0

(iii) Season: Winter (October to February) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	0	2,035	183	3,632	1,844	393	1,065	0
2017-18	0	3,586	293	6,308	3,244	565	1,506	0
2022-23	0	4,529	356	7,918	4,094	665	1,752	0

(3) Production Projection to be Required by Cropping Seasons, based on Demand Projection of (2)

(i) Season: Kharif (June to October) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	35,651	139,390	176,751	128,509	50,120	26,043	28,430	0
2017-18	56,505	251,183	275,650	201,893	71,805	45,466	40,254	0
2022-23	69,230	324,655	333,705	245,039	85,374	58,431	46,623	0

(3) Production Projection to be Required by Cropping Seasons, based on Demand Projection of (2) (continue

(ii) Season: Rabi (November to May) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	17,610	59,065	58,869	36,828	21,306	491	5,940	20,684
2017-18	24,208	108,740	86,794	60,479	31,286	706	8,998	27,350
2022-23	27,985	141,795	103,414	74,814	37,113	831	10,741	30,700

(iii) Season: All seasons (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	53,261	198,455	235,620	165,337	71,426	26,534	34,370	20,684
2017-18	80,713	359,923	362,444	262,372	103,091	46,172	49,252	27,350
2022-23	97,215	466,450	437,119	319,853	122,487	59,262	57,364	30,700

Note) - Production projection = Demand projection for outside HP ÷ 0.8, 20% means consumed amount and loss in the State
- Peas: 50% out of production projection traded to Bangalore, Maharashtra, Kolkata, etc.

(4) Production in the Existing Vegetable Cultivated Area (see Table #.#.# for actual production in 2005/06)

(Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2005-06	51,332	202,734	248,907	172,871	73,818	26,080	34,628	35,378
2017-18	53,000	203,000	259,000	180,000	74,000	27,000	36,000	37,000
2022-23	54,000	203,000	261,000	182,000	74,000	27,000	36,000	37,000

Note) Estimated by JICA study team
- Data in 2005-06: Actual production from Block Office, Department of Agriculture, H.P.
- Increment from 2005/06 to 2022/23 : 5% (assumption)
- No increment for peas and cabbage, considering current unit yield level.

(5) Net Production Projection to be Required

(i) Season: Kharif (June to October) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2017-18	21,000	115,000	102,000	81,000	22,000	27,000	16,000	-25,000
2022-23	33,000	189,000	159,000	123,000	36,000	40,000	23,000	-25,000

(ii) Season: Rabi (November to May) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2017-18	7,000	42,000	1,000	1,000	7,000	-8,000	-3,000	15,000
2022-23	10,000	75,000	17,000	15,000	13,000	-8,000	-1,000	18,000

(iii) Season: All seasons (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Garlic
2017-18	28,000	157,000	103,000	82,000	29,000	19,000	13,000	-10,000
2022-23	43,000	264,000	176,000	138,000	49,000	32,000	22,000	-7,000

Attachment F-29 Production Plan for Major Vegetables (1/2)

(1) Production to be Required by Seasons

(i) Season: Kharif (June to October) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	21,000	115,000	102,000	81,000	22,000	27,000	16,000
2022-23	33,000	189,000	159,000	123,000	36,000	40,000	23,000

(ii) Season: Rabi (November to May) (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	7,000	42,000	1,000	1,000	7,000	-8,000	-3,000
2022-23	10,000	75,000	17,000	15,000	13,000	-8,000	-1,000

(iii) Season: All seasons (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	28,000	157,000	103,000	82,000	29,000	19,000	13,000
2022-23	43,000	264,000	176,000	138,000	49,000	32,000	22,000

(2) Production by Land Category (Full, Life saving, Rainfed) in Kharif (June to October / rainy season)

(i) Full time irrigation (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	17,000	93,000	83,000	66,000	17,000	22,000	13,000
2022-23	26,000	153,000	129,000	100,000	29,000	32,000	19,000

(ii) Life saving irrigation (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	2,000	12,000	10,000	8,000	2,000	3,000	2,000
2022-23	3,000	19,000	16,000	12,000	4,000	4,000	2,000

(iii) Rainfed (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	2,000	10,000	9,000	7,000	2,000	2,000	1,000
2022-23	3,000	17,000	14,000	11,000	3,000	4,000	2,000

(iv) Total (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	21,000	115,000	102,000	81,000	21,000	27,000	16,000
2022-23	32,000	189,000	159,000	123,000	36,000	40,000	23,000

(3) Production by Land Category (Full time irrigation, Life saving, Rainfed) in Rabi (November to May / winter and summer seasons)

(i) Full time irrigation (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	7,000	42,000	1,000	1,000	7,000	-8,000	-3,000
2022-23	10,000	75,000	17,000	15,000	13,000	-8,000	-1,000

(ii) Life saving irrigation (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	0	0	0	0	0	0	0
2022-23	0	0	0	0	0	0	0

(iii) Rainfed (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	0	0	0	0	0	0	0
2022-23	0	0	0	0	0	0	0

(iv) Total (Unit: ton)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
2017-18	7,000	42,000	1,000	1,000	7,000	-8,000	-3,000
2022-23	10,000	75,000	17,000	15,000	13,000	-8,000	-1,000

(4) Unit yield (estimated by the JICA study team)

2017-18 (Unit: ton/ha)

Category	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
Full	16.5	10.4	31.4	14.7	24.4	14.4	9.8
Life	13.2	9.4	28.3	13.2	22.0	13.0	8.8
Rainfed	9.9	8.3	25.1	11.8	19.5	11.5	7.8

2022-23 (Unit: ton/ha)

Category	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans
Full	16.8	10.4	32.0	16.0	24.4	15.0	10.0
Life	13.4	8.3	25.6	12.8	19.5	12.0	8.0
Rainfed	10.1	6.2	19.2	9.6	14.6	9.0	6.0

Attachment F-29 Production Plan for Major Vegetables (2/2)

(5) Cropped Area by Irrigation Condition (Full, Life saving, Rainfed) in Kharif (June to October / rainy season)

(i) Full time irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	1,000	8,900	2,600	4,500	700	1,500	1,300	20,500
2022-23	1,500	14,700	4,000	6,300	1,200	2,100	1,900	31,700

(ii) Life saving irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	200	1,300	400	600	100	200	200	3,000
2022-23	200	2,300	600	900	200	300	300	4,800

(iii) Rainfed (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	200	1,200	400	600	100	200	100	3,000
2022-23	300	2,700	700	1,100	200	400	300	6,000

(iv) Total (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	1,400	11,400	3,400	5,700	900	1,900	1,600	26,300
2022-23	2,000	19,700	5,300	8,300	1,600	2,800	2,500	42,200

(6) Cropped Area by Irrigation Condition (Full, Life saving, Rainfed) in Rabi (November to May / Winter and Summe

(i) Full time irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	400	4,000	0	100	300	-600	-300	3,900
2022-23	600	7,200	500	900	500	-500	-100	9,100

(ii) Life saving irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	0	0	0	0	0	0	0	0
2022-23	0	0	0	0	0	0	0	0

(iii) Rainfed (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	0	0	0	0	0	0	0	0
2022-23	0	0	0	0	0	0	0	0

(iv) Total (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	400	4,000	0	100	300	-600	-300	3,900
2022-23	600	7,200	500	900	500	-500	-100	9,100

(7) Total Cropped Area to be Required (5 + 6)

(i) Full time irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	1,400	12,900	2,600	4,600	1,000	900	1,000	24,400
2022-23	2,100	21,900	4,500	7,200	1,700	1,600	1,800	40,800

(ii) Life saving irrigation (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	200	1,300	400	600	100	200	200	3,000
2022-23	200	2,300	600	900	200	300	300	4,800

(iii) Rainfed (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	200	1,200	400	600	100	200	100	2,800
2022-23	300	2,700	700	1,100	200	400	300	5,700

(iv) Total (Unit: ha)

Year	Cauliflower	Peas	Tomato	Potato	Cabbage	Capsicum	Beans	Total
2017-18	1,800	15,400	3,400	5,800	1,200	1,300	1,300	30,200
2022-23	2,600	26,900	5,800	9,200	2,100	2,300	2,400	51,300

Attachment F-30 Cost Breakdown for Market System Improvement

(1) Preparation of quality standard

Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
1. Expert	150000	2 person x 6 months	1,800,000	

(2) Workshop on market promotion for APMC / Cas / Traders / Farmers at APMC

Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
a. Preparatory work	500	1 staff x 3 days	1,500	
b. Lodgings / Meals	200	30 persons x 1 days	6,000	
c. Transportation	200	30 persons x 2 days	12,000	
d. Materials	LS		3,000	
Total			22,500	
		per one APMC	(23,000)	
		for 10 PAMC a year	230,000	

(3) Staff Training for System Operation

Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
a. Preparatory work	500	1 staff x 3 days	1,500	
b. Lodgings / Meals	500	20 staff x 4 days	40,000	
c. Transportation	800	20 staff x 2 days	32,000	
d. Materials	LS		6,000	
Total			79,500	
			(80,000)	

(4) Establishment of New Market Information System

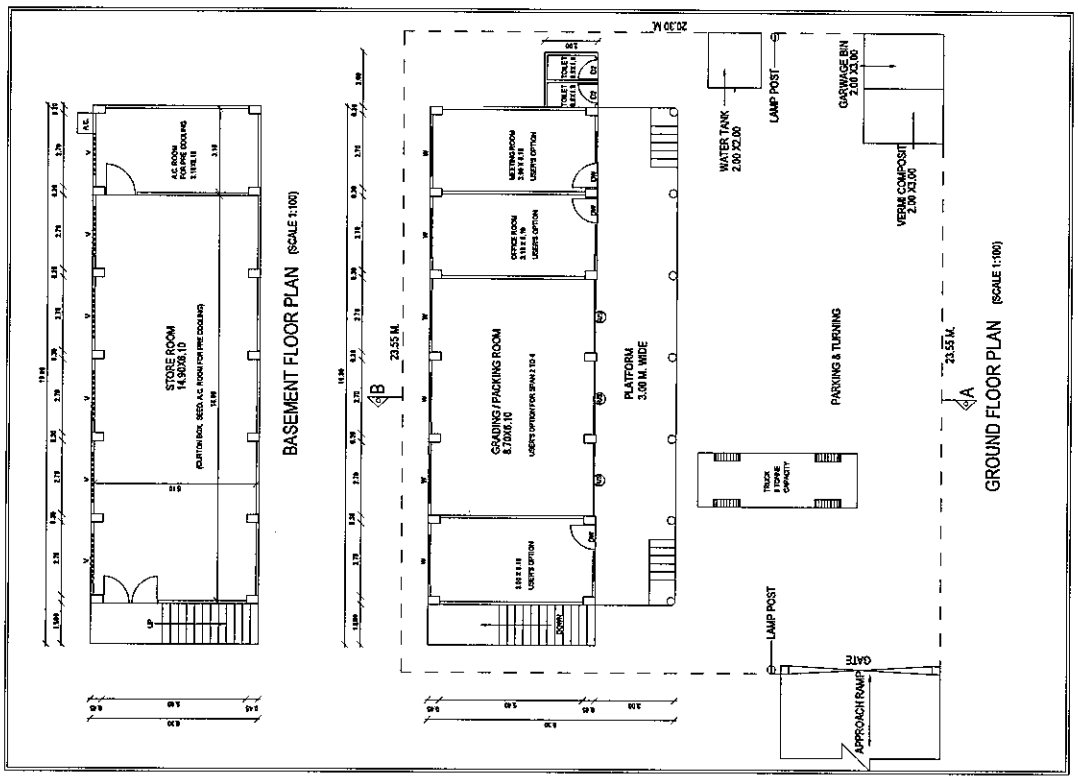
Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
1. Modification of current market information system (AGMARKNET)				- This modification should
a. Cost of staff	LS		1,400,000	be ordered to private
b. Technical charge	LS		400,000	indian sub-contractor.
c. Cost of software	LS		200,000	
Sub-total (1)			2,000,000	
2. Establishment of market information system for cellular phone holders				- This establishment should
a. Cost of staff	LS		1,000,000	be ordered to private
b. Technical charge	LS		500,000	indian sub-contractor.
c. Cost of software	LS		500,000	
Sub-total (2)			2,000,000	
Total			4,000,000	

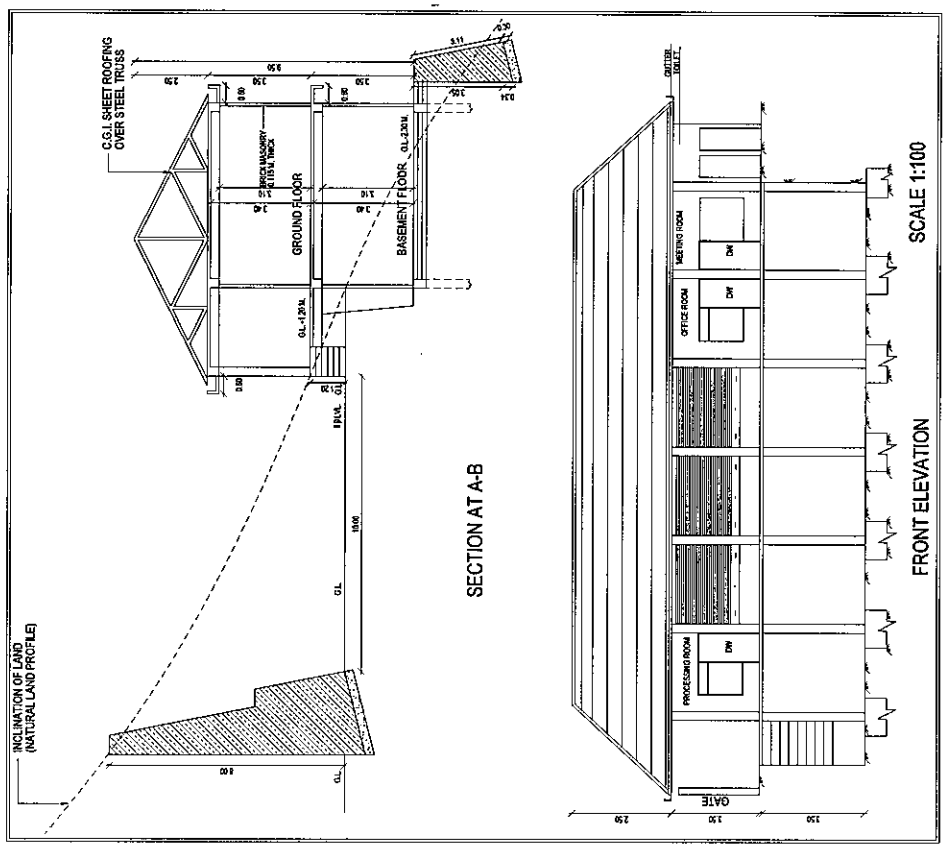
(5) Provision of computer sets

Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
a. Computer set	150000	22 sets	3,300,000	for market yard except seasonal market yards Total MY: 39
Total			3,300,000	Seasonal MY: 17 Ordinary MY: 22

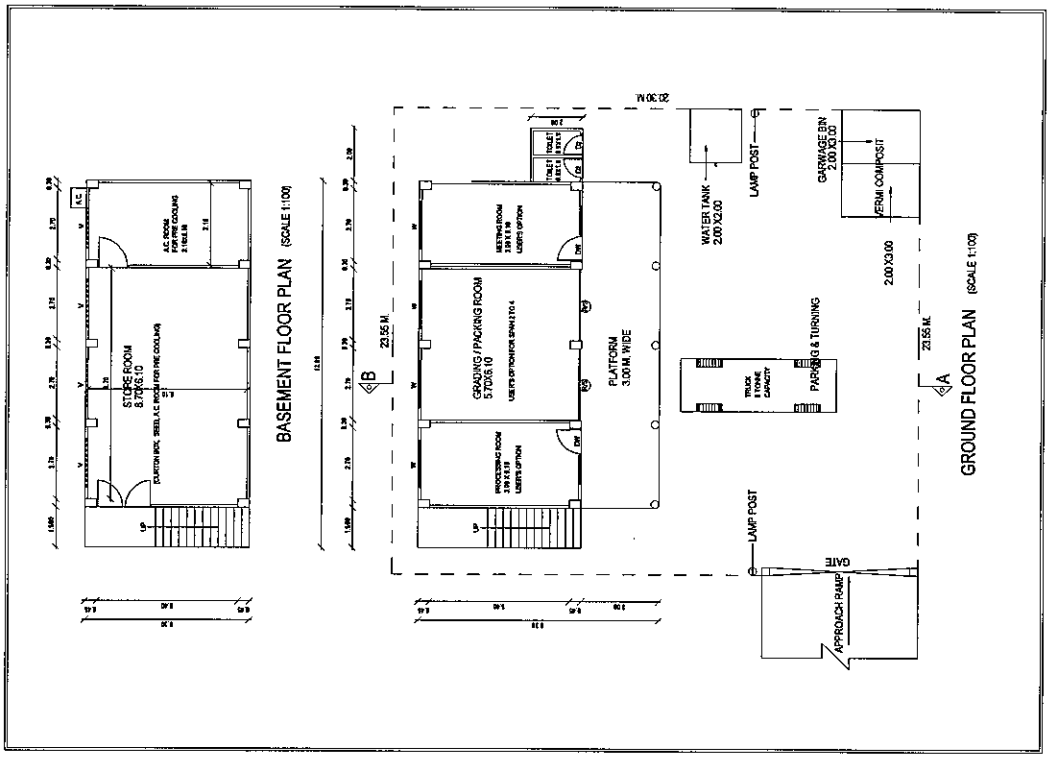
(6) Construction of market facilities

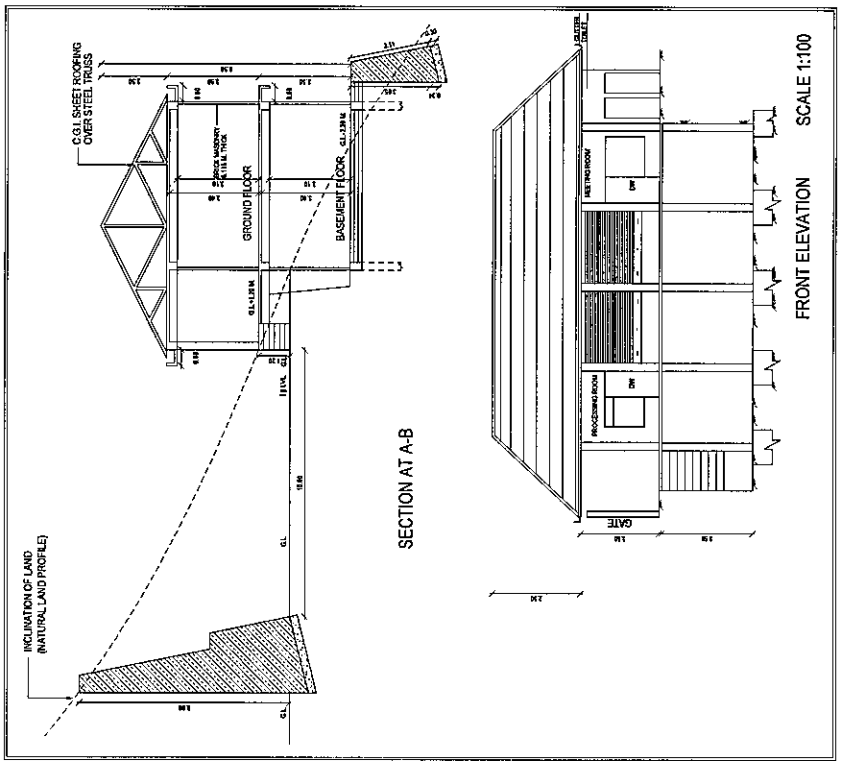
Items	Unit Cost (Rs.)	Q'ty	Amount (Rs.)	Remarks
1. Collection Centre	3,120,000	12 Collection Centres	37,440,000	- managed by DOA
2. Market Yard	12,000,000	10 Market Yards	120,000,000	- managed by MB/APMC - Regarding market yard, they are constructed in 10 districts except L&S and Kinnaur.



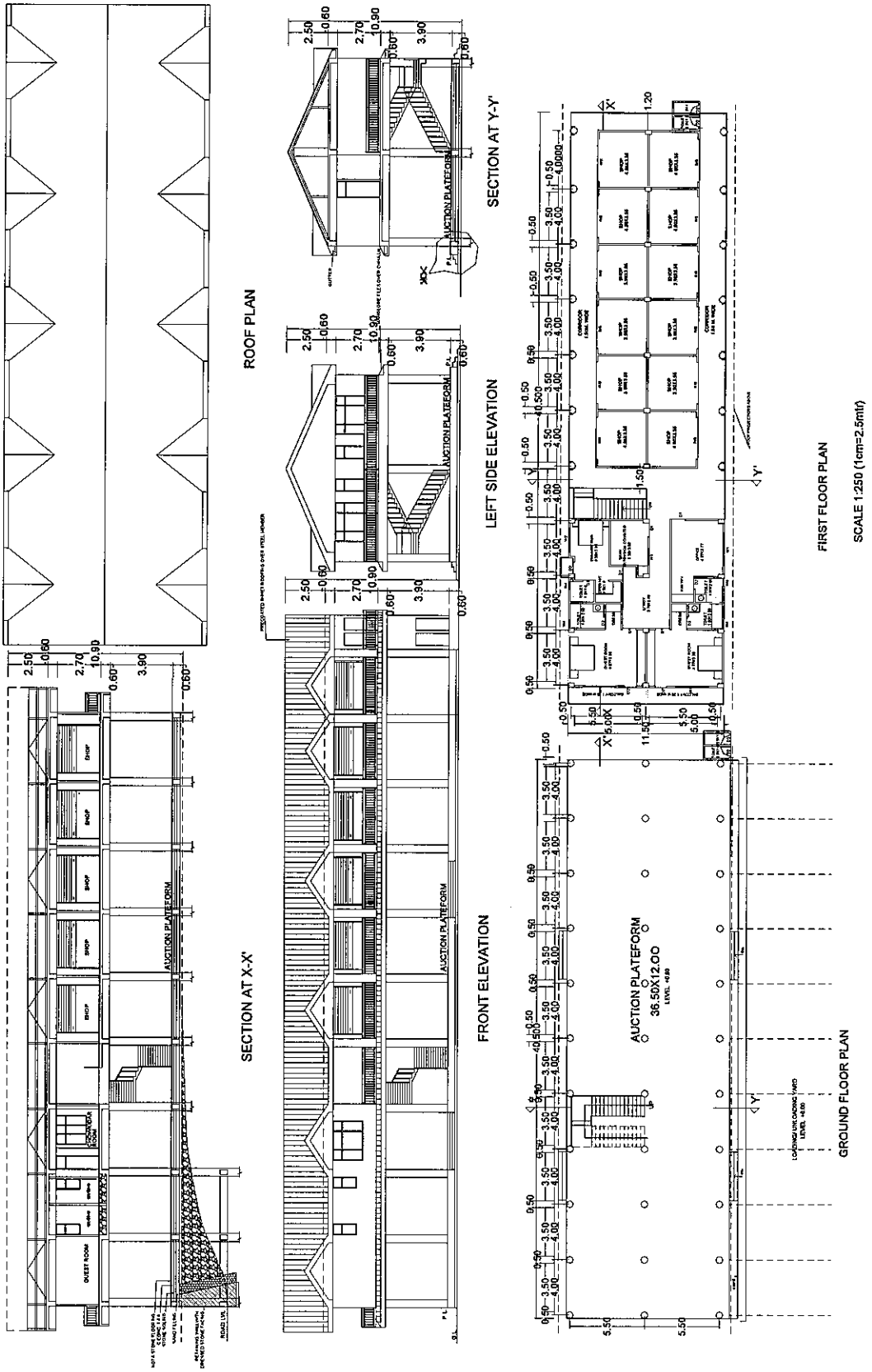


Attachment F-31 Proposed Collection Centre (6 spans)

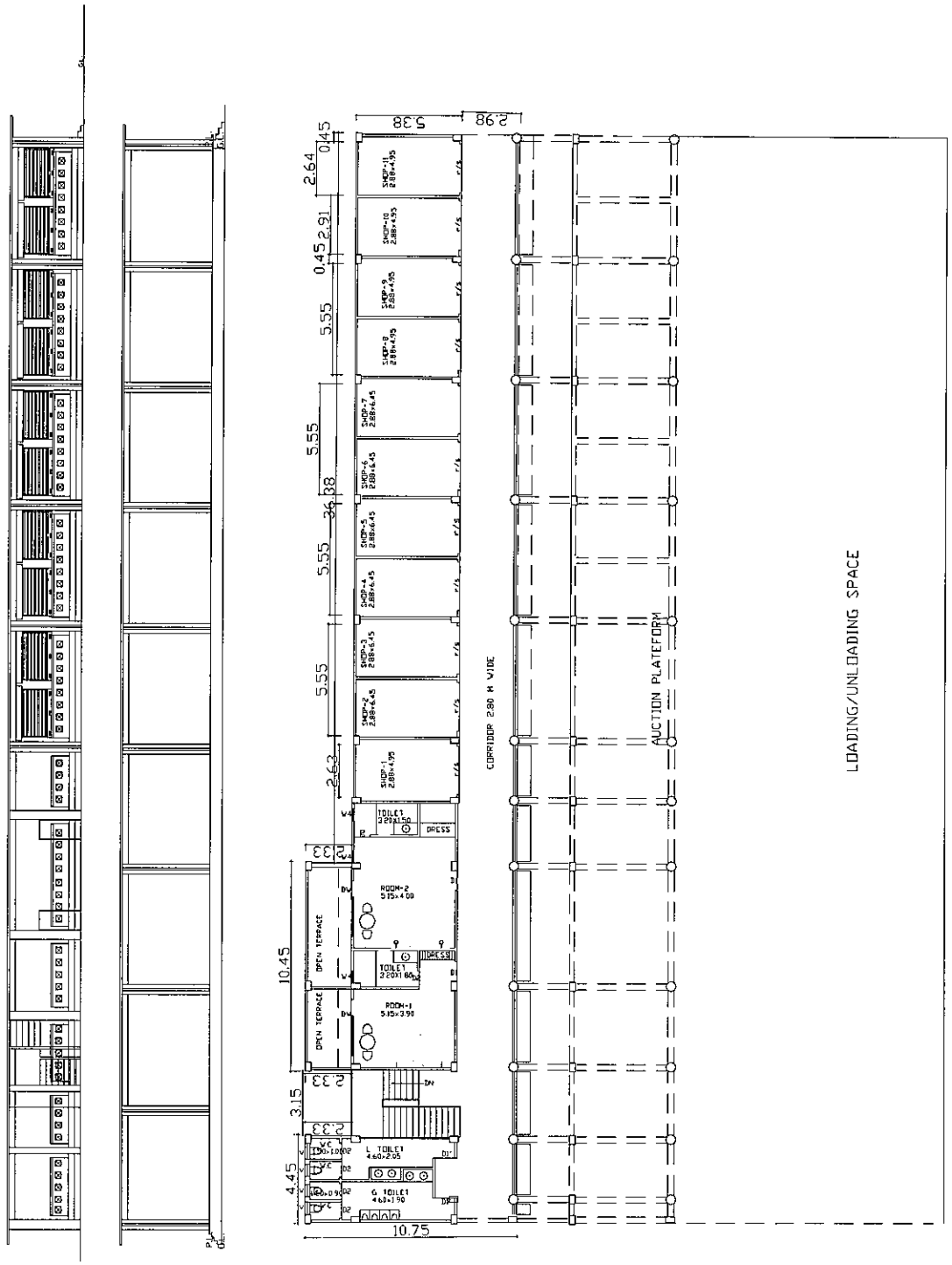




Attachment F-32 Proposed Collection Centre (4 spans)



Attachment F-33 Proposed Market Yard (2 Floors)



Attachment F-34 Proposed Market Yard (1 Floor)