Agricultural Perspective and Policy

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Ministry of Food, Agriculture and Livestock
Islamabad
AGRICULTURAL PERSPECTIVE
AND POLICY
NOTE:

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AGRICULTURAL PERSPECTIVE AND POLICY

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PREFACE

Agriculture sector is the lifeline of Pakistan's economy. It contributes 24% to the GDP, employs 48.4 percent of the labor force and contributes to 70% of the foreign exchange earnings through export of raw materials, semi processed and processed agricultural products.

2. The agricultural growth in Pakistan since 1960s has taken place at a magnificent rate of 4.3% per annum. It is imperative to increase availability of water at the farm through development of water resources and its conservation. Pakistan has built up huge water reservoir capacity of 18 MAF to store water for release during lean period. An on farm water management was initiated to minimize water losses during delivery at the farm. Over the quarter century since the inception of this program, the demand for water has increased substantially both at the farm and for human / industrial consumption. The resultant shortage in supply of water has been further compounded by the drought. The Ministry of Food, Agriculture & Livestock is undertaking a massive on farm water management program on war footing to address the issue.

3. It is seen that the productivity levels of crops in Pakistan are generally low. There are wide gaps in yields of crops at the farms of progressive and subsistent growers. The prospects for increase in area are limited. The Ministry of Food, Agriculture & Livestock is making strenuous efforts to raise productivity levels through increasing scientists - farmers contacts, improving out-reach capacity and focusing on electronic transfer of technology through manpower training and allocation of resources.

4. The world is transforming into a global village and Pakistan will be entering into international agreements as WTO, SAFTA and others in coming years. To meet this challenge Pakistan is strengthening its capacity through establishment of a network of quality testing accredited laboratories to certify quality of our products for exports and for indigenous consumption.

5. The developments in agriculture would not be sustainable without addressing the issue of poverty and enhancing investment capacity of the resource poor farmers. Government of Pakistan is undertaking the pro-poor programs through diversifying the pursuits of agriculture and through improving income generating skills. The horticulture & livestock are important segments of agriculture sector to provide a platform for poverty reduction program. The Government of Pakistan is further improving its out-reach for farm credit through removing distortions in credit disbursement and through cutting down on exorbitant interest rates for agricultural credit.

6. The South East Asia is in the grip of bird flue detrimental to human life. Pakistan also suffered from Avian Influenza that is specific to the poultry and is not transferable to human beings. We have taken steps to control the spread of this virus through invoking stringent quarantine measures and through the upgraded vaccination / hygiene campaign. We would also be building capacity in Pakistan to handle any likely case in future to diagnose / treat the poultry virus, lethal to human beings. Given our resolve and capacity to handle the issue, it is expected that Pakistan would soon be out of the travail of this virus.

7. The current manuscript depicts the technical viewpoint of the experts and I hope would provide the readers with the glimpses of developments in agricultural perspective and policy.

Sardar Yar Mohammad Rind
Minister for Food, Agriculture and Livestock
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INTRODUCTION

Agriculture is the single largest sector of the economy. It contributes 24 percent of the GDP, employs 48.4 percent of country’s workforce and is a major source of foreign exchange earnings. About 68% of the population lives in rural Pakistan and depends upon agriculture for sustenance.

The average annual growth rate of agriculture during 1990s was 4.5%. The highest growth rate of 11.7 percent was achieved in 1995-96 mainly due to increase in cotton, gram, milk and meat production. The sector touched the lowest negative growth rate of 5.3 percent in 1992-93 mainly due to decrease in cotton and sugarcane production.

The major crops as wheat, cotton, rice, sugarcane and maize account for 41% of value added and minor crops 10% in overall agriculture. Livestock has emerged as an important sub-sector of agriculture. It accounts for 37.5% of agriculture value added and about 9.4% of the GDP. Similarly, fisheries play an important role in national income through export earnings.

Government has identified agriculture as a priority area for addressing problems of unemployment, poverty alleviation and for fostering economic development. The agricultural policy focuses on sustainable food security, increasing productivity, commercial agriculture, imports substitution, income diversification and export orientation. The overall policy goal is to raise productivity and profitability of the farming community enabling the country to raise living standard of rural masses. The policy is directed to ensure that the natural resource base as land and water is conserved and the situations of short water supply or drought are mitigated. For farm inputs, attempt is being made to arrange adulteration free availability at reasonable rates. Steps have been taken to reduce cost of farm inputs. In procurement of agricultural commodities, the role of private sector is being emphasized leading to public-private sector partnership. The institutional services as agricultural research and extension are geared to raise productivity and profitability of the farmers and address issues faced by the farming community at field level. The services in agricultural marketing are being renovated. It is planned to establish new markets in areas where marketing structure is weak. Attempt is being made to remove market imperfections and provide an enabling environment for farmers to market their produce at reasonable prices. A special focus is being made to establish a network of quality testing laboratories in public sector for grains, livestock diseases and products, fertilizer and agro-chemicals, residue testing and strengthening of plant and animal quarantine services. Capacity building on World Trade Organization (WTO) issue is an area of high priority and for the purpose; the Agricultural Prices Commission is being restructured through building a capacity in the Commission for analysis and intelligence for promoting exports of agricultural commodities. The main areas for focus in agricultural policy include food security, enhancing productivity, profitable farming and improving marketing of agricultural produce.
1. GROWTH IN AGRICULTURE

Agriculture is a prime sector of national economy of Pakistan. The growth in agricultural sector and national economy moves hand in hand. The wide fluctuations in agricultural growth have greatly influenced national economy.

The sixties was a period of green revolution wherein dwarf cultivars of wheat and rice with high turnover of photosynthesis were introduced. This brought a quantum jump in productivity of these cereals. This resulted in an average growth rate of 5.1% during the decade.

The growth however retarded in seventies to 2.4%. The massive nationalization policy of the private enterprises had an overall negative impact on the economy. In addition there was a slow down in the process of varietal development and their release, platueing their potential. However, the seventies was a period of high public sector investments in agriculture sector. The important institutions commissioned during this decade are Tarbela Dam, Pakistan Agricultural Research Council, Training and Visit Program of Agricultural Extension, Seed Certification and Registration Departments/Seed Corporations, On Farm Water Management and Barani Area Development Programs. In addition Cotton Export Corporation and Rice Export Corporation were established during the decade to provide an export link to indigenous production.

The results of high investment in seventies were visible in eighties. The average growth rate during the decade was 5.4%. Eighties was period of Government interventions. The Agricultural Prices Commission was setup during this period to institutionalize support prices for major crops. Massive procurement operations were carried out by public sector during this decade. This intervention curtailed the role of private sector. The farmers’ problems of crashing prices during the period of glut were in general addressed to some extent. This brought security and protection to the farming community in generating farm incomes. Prior to eighties, the agricultural policy was lob sided. The emphasis had been mainly on new technologies, inputs and investments. The policy did not address the issue of distortions on output side. The country took corrective measures during eighties to address issues of stabilizing output prices.

The heavy losses to public sector exchequer for procurement of agricultural commodities made the Government realize to reconsider public sector intervention policies. In macroeconomics, Government launched policies of deregulation, privatization and restructuring the size of the Government and re-fixing priorities. The Government at the debut of the nineties started closing down public sector institutions that had played a major role in procurement of agricultural commodities. Cotton Export Corporation (CEC), Rice Export Corporation (REC) and Agricultural Marketing and Storage Limited (AMSL) were closed. The procurement operations were accordingly curtailed and confined to a number of restricted commodities. The frequency of intervention and size of procurement were both curtailed. This again brought up shadows of uncertainty and crashing prices, dwindling the farm economy. Other important factors during the decades
are devastating attack of cotton leaf curl virus in early nineties that at one time appeared to threaten the future of textile sector in Pakistan. Our scientists, through untiring efforts, discovered resistant genes that helped to resurrect agricultural economy. During middle of the decade, very heavy insect pressure was encountered in cotton especially the American Boll Worm and Army Worm inflicted heavy losses to the economy. In late years of the decade, severe drought started which inflicted a colossal loss to both crops and livestock sectors. There were wide fluctuations in growth of agriculture sector during the decade. Despite these adversaries, Pakistan transformed from a wheat importing country to a wheat exporting country. The average growth rate during the decade was 4.4%.

The basic philosophy has been to maintain a growth rate in agriculture sector higher than population growth rate. The average growth rate in this sector over last forty years was 4.3%, which reflects good performance. This cherished policy goal has been accomplished. The Ministry of Food, Agriculture and Livestock vows to carry out this policy further. At a time when growth rate in population is subsiding, it is planned to target at least a growth of 4.3% already achieved on an average through mounted endeavors. As the scope to increase the area under crops is limited, the major emphasis will be on increasing productivity. In livestock also the focus will be on increasing efficiency and productivity.

2. **INCREASING PRODUCTIVITY OF CROPS**

The scope for horizontal expansion in area brought about by quantum jump in water supplies through commissioning of Mangla and Tarbela dams in 1970s and later on has already touched a super saturation level. The major scope is now in vertical expansion through improving farm productivity levels. This can be accomplished through raising productivity of subsistent farming community to bridge the gap between the national yields and yields of the progressive growers. The gaps in productivity and the factors for improvement are as follows.

**2.1 Gaps in Productivity**

The productivity levels of crops in Pakistan are generally low. Even within Pakistan there are wide variations in productivity of crops at the farm of progressive growers and the subsistent growers. In wheat the progressive growers are harvesting yield of 5.5 tons/ha and the national level yield is 2.3 tons per ha. In cotton, the yield of progressive growers for phutti is 3.5 tons per ha and the national average yield is almost half of that. In sugarcane the yield of progressive growers is 110 tons per ha and national average yield is 48 tons per ha. Similarly, in basmati rice the progressive growers are harvesting 3.5 tons per ha while national average yield is 1.5 tons per ha. In irri rice, the yield of progressive growers is 8 tons per ha and the national yield is only 2.3 tons per ha. As the scope for horizontal expansion is limited, the agricultural policy is designed for vertical expansion through increase in the productivity of the important crops viz. wheat, cotton, sugarcane, and oilseeds. The focus is the subsistent farmers who lack behind in
harvesting good yields. To achieve this objective, the productivity will be increased through improvement in agronomic practices.

2.2 Important Factors for Increasing Productivity

The important factors for increasing productivity are identified as follows.

a  Quality Seeds

The quality seed has a major role to play in bridging the gaps of productivity in crops. The contribution of quality seeds has been estimated at bringing additionality in productivity of crops by 25 to 30%. This area will be focused as an important element of agricultural policy in improving Pakistan’s productivity of crops.

b  Fertilizers

Fertilizers are known to be the biggest factor in increasing productivity of crops. It is generally believed that grain nutrient ratio is 8:1. The application of fertilizers at appropriate time through placement and in proper balance is known to increase productivity of crops by 40-50%. Attempts will be made as a major policy issue through education and demonstration to increase fertilizer use efficiency and improve yield turn over per unit of fertilizer nutrients applied.

c  Pest / Weed Management

Pests and weeds take a heavy toll on productivity of crops. The crops with the largest pressure of insects and pests are cotton, fruits, vegetables, rice, sugarcane and other crops. Excessive and indiscriminate uses of chemicals have not only burdened farm economy eroding already fragile profit margins but have also disturbed the biological equilibrium through eliminating the farmer friendly predators. The pest-scouting program has been launched to educate the farmers on identification of insects and their control. Programs on Integrated Pest Management have been launched for an effective control of insects and for assuring the survival of predators. The Cotton Leaf Curl Virus (CLCV) has done colossal damage to cotton crop, which has been controlled through breeding of resistant varieties. The Burewala Strain of cotton virus is mutant of the Multan Virus and breeding/agronomic programs have been started to contain the disease. Similarly, weeds are detrimental to increased crop productivity. These compete for nutrition, soil moisture and solar radiation. The Punjab Province has focused on this issue and through proper weed management and increased herbicides application has achieved higher per acre yield in case of wheat. It is desired that the other provinces should focus on weed management and popularize use of herbicides.

d  Transfer of Technology

There have been heavy investments in agriculture sector in the areas of research, extension, development, water management and promotion of the use of quality seeds.
The synergy from all these production factors bears fruit when these technologies are transferred to the farming community at gross root levels. It is planned as a policy to place major emphasis on transmission of technologies through electronic media.

3. SUSTAINABLE FOOD SECURITY

Pakistan is located at the mouth of Persian Gulf in the Arabian Sea that extends into the Indian Ocean. This position is of strategic geo-political importance and the region has already undergone turmoil over last 20 years.

Pakistan being in the nexus of nuclear club of nations, we have to assure and safeguard the continuity of the chain of our food supplies. The sustainable domestic food security through our own indigenous production is therefore an issue of prime importance in Pakistan’s Agricultural Policy. The commodities that make an integral component of food security are food grains, edible oils and sugar. Pakistan can ill afford a fragile or marginalized situation in production of these commodities. The details are as follows:

3.1 Food Grains

Pakistan’s production of cereal crops is around 25 million tons. The important food grains are wheat, rice and the coarse grains. Wheat is Pakistan’s major and staple food crop. Pakistan generally remained a food deficit country and the requirements were met through imports. Pakistan has built up a huge network of agricultural research institutions to strengthen research on crops to improve productivity. The major focus among cereals was on wheat and rice crops although to lesser degree some attention was also given to maize crop. Simultaneously mega water resources development projects as Mangla, Tarbela, Chashma and others were built up to provide live storage capacity of 18 Million Acre Feet (MAF) to supplement river water supplies during period of shortages. This composite effort has enabled Pakistan to achieve self-sufficiency in wheat production over last three years in a row. As a policy it is planned to continue assuring national food security in staple food of wheat. For this purpose, the agricultural research, manpower training and institutional support for provision of quality seeds for wheat production system would remain an area of high priority in agricultural policy.

Rice is another important food crop of the country. However, Pakistan is already surplus by 2.5 million tons of rice and the export of rice especially Basmati is an important source of foreign exchange earnings. Pakistan would continue to make endeavors to maintain its supremacy and monopoly in long grain, aromatic basmati rice production. As basmati rice is a better earner of foreign exchange, there is massive planned shift from coarse irri rice to fine basmati rice. Simultaneously, Pakistan as a policy, plans to improve productivity for both basmati and irri rice to improve profitability of the farming community. Cooperation in rice genomics, breeding, sharing of germ plasm and transfer of technologies with rice stalwarts as China and International Rice Research Institute (IRRI) in Philippines would continue as an active element of our policy.
Coarse grains as maize, millets and barley are our important crops especially in the harsh areas of arid climate. Pakistan has made a major break through in raising productivity of spring maize crop in central Punjab. The productivity levels have been improved from 1.5 tons per ha to 7.0 tons per ha. The benefits of the experiment of five fold increase in productivity of maize crop need to be transformed to NWFP, which is the major grower of maize crop at a subdued level of productivity. As a policy, this would occupy an important position in agricultural policy. Similarly focus is being made on improving productivity of other coarse grains and a network of research institutions have already been established to work on these crops in the potential areas.

3.2 Sugar

The sugarcane is our conventional crop, although some sugar is also produced from sugar beet mainly in Mardan and Swabi areas. The crop has high water requirement, of the level of 15 MAF, which is equivalent to two Tarbela Dams. Despite high water requirement, Pakistan is at a disadvantage in terms of cost of production for producing sugar from both sugarcane and sugar beet. The price of sugar made from sugarcane is almost Rs. 6-7 per kg (50%) higher than international sources. This is due to the reasons that most of the sugarcane growing countries are (a) have higher productivity levels (b) heavily subsidizing sugar production (c) produce high value products from molasses. The sugar beet has merits of (a) short duration of five months against ten to fourteen months in case of sugarcane (b) lesser water requirement of 25 acre-inches against 68 acre-inches in case of sugarcane and better recovery of 10% compared to 9% in case of sugarcane. However, the sugar beet lacks capability to sustain energy demand for sugar manufacture from its residue, as is the case in sugarcane. This calls for additional investment in energy for manufacture of sugar from sugar beet. This further raises the cost of sugar by another Rs. 4-5 per kg., making us further uncompetitive in an area where we are already inefficient.

As policy MINFAL has already proposed that Pakistan should enter into the area of production of industrial alcohol and should legislate to mix it with gasoline to make gasohol. Brazil and India have already started producing gasohol from molasses. As WTO is around the corner, we cannot afford the luxury to continue to be an inefficient producer of sugar. Converting molasses into industrial alcohol is suggested to be an important element of our future industrial policy.

4. FOCUS ON COTTON

Cotton is the lifeline of Pakistan’s economy. Enhancing its volume and value has thus invariably remained the focal point in the national agricultural research and development strategies. As a matter of fact, the economic significance of the cotton crop and the necessity to boost its production was realized soon after the independence, which led to the establishment of the Pakistan Central Cotton Committee (PCCC) in 1948 for the improvement and development of growing, marketing and manufacturing of cotton.
Over the years, there has been significant improvement in cotton production in the country. The quantum of cotton production has moved up sizably to over 10 million bales. The country is also producing long staple cotton of 1-1/8″ and even longer. The area under cotton has also increased considerably to about 3 million has. The expansion in cotton production has been instrumental in proliferation of the textile industry. Currently Pakistan is the third largest cotton consuming country in the world.

Pakistan’s cotton vision program targets cotton production to 15 million bales by the year 2010. The Government is, therefore, determined to accelerate the cotton research and development process necessarily required for a quantum jump in cotton production and for the qualitative improvement matching the industrial requirements. At the same time, it also intends to facilitate all the stakeholders, particularly the farming community, through both the price and non-price measures to safeguard their interests.

4.1 World Cotton Situation

The International Cotton Advisory Committee has projected the world cotton production, consumption and the price patterns in 2003-04 as under:

<table>
<thead>
<tr>
<th></th>
<th>2002-03</th>
<th>2003-04</th>
<th>% Change in 2003-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>88.18</td>
<td>96.30</td>
<td>(+) 9.21</td>
</tr>
<tr>
<td>Consumption</td>
<td>96.46</td>
<td>97.10</td>
<td>(+) 0.66</td>
</tr>
<tr>
<td>Import/Export</td>
<td>29.85</td>
<td>30.20</td>
<td>(+) 1.20</td>
</tr>
<tr>
<td>Cot look A Index</td>
<td>56.00</td>
<td>61.00</td>
<td>(+) 8.93</td>
</tr>
</tbody>
</table>

(Million bales of 480 lbs. each)


The available data on world cotton projects the following cotton situation in 2003-04:

i) The beginning stock to decline by over 17% from 48.62 million bales in 2002-03 to 40.3 million bales in 2003-04.

ii) Production to move up by over 9.2% mainly due to 11% increase in area sown in 2003-04.

iii) Consumption to grow further by about 1%.

iv) Average market prices to improve by 5 Cents per lb. (Cot look A Index)

4.2 Domestic Cotton Situation
The likely domestic cotton situation in 2003-04 vis-à-vis the estimates for 2001-02 and 2002-03 are shown below:

<table>
<thead>
<tr>
<th></th>
<th>2001-02</th>
<th>2002-03</th>
<th>% Change in 2002-03</th>
<th>2003-04 (Target)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (Ml. ha)</td>
<td>3.115</td>
<td>2.724</td>
<td>(-) 12.5</td>
<td>2.860</td>
</tr>
<tr>
<td>Production (Ml. bales)</td>
<td>10.612</td>
<td>10.200</td>
<td>(+) 3.9</td>
<td>10.550</td>
</tr>
<tr>
<td>Consumption (Ml. bales)</td>
<td>10.529</td>
<td>11.500</td>
<td>(+) 9.2</td>
<td>11.500</td>
</tr>
<tr>
<td>Yield (kg/ha)</td>
<td>579</td>
<td>636</td>
<td>(+) 9.8</td>
<td>627</td>
</tr>
</tbody>
</table>

Bale = 170 kgs.

The cotton production in 2002-03 declined by 3.9% mainly due to 12.5% less area sown on account of short water supply. The projected cotton situation in 2003-04 may, however, be epitomized as under:

- 4.5% increase in production due to 5% expected increase in area.
- Cotton quality to further improves due to efforts made by the provincial Governments.
- Cotton prices to maintain a reasonable level.
- More consumption of MMF (Man Made Fiber) by the mills due to expected drop in crude oil prices.

Based on the world wide shortage of cotton especially in China, farmers got an all time record prices.

The cotton policy 2003 is devised to offer a package of fiscal, technological, administrative and legislative measures to boost cotton production, ensure qualitative improvement, and facilitate the growers and to safeguard the interest of all the stakeholders. The policy covers the following areas along with the measures to ameliorate the cotton situation in the country.

a. **Enhancing Productivity**

For enhancing the cotton production, principally through increase in the yield, the following arrangements / measures would be focused:

**Genetic Base of Commercial Cotton Varieties:** Broad genetic base is very important from the point of view of resistance against virus and disease and adaptability in various agro-environments. In respect of the cotton varieties in vogue the parent in majority of cases is NIAB-78 or its derivatives and /or S-12 (highly susceptible variety to Cotton Leaf Curl Virus (CLCV)). It is required to diversify the genetic base and wide crosses may be attempted for stabilizing the cotton varieties to resist disease and commercial
adaptability. For this purpose, germplasm would be collected from all cotton growing countries.

**Strengthening of Foundation Seed Cell in Sindh:** Seed production may also be streamlined in accordance with the pedigreed system comprising maintenance of seed stocks true to type and generation system. The performance of Foundation Seed Cells of Punjab Seed Corporation (PSC) at Khanewal is excellent whereas the Foundation Seed Cells of Sindh Seed Corporation (SSC) needs further strengthening. It must be upgraded to produce early generation seed of all cotton and other crop varieties for meeting the targeted needs in Sindh.

**Seed Availability for Balochistan:** Regarding quality seed availability for Balochistan, it is proposed to allow Agriculture Department to arrange seed production in collaboration with SSC and PSC or reputed private agencies. For the purpose the private sector seed agencies may be given some incentives like land on long lease or credit line to produce required quantities of cottonseed for this area.

**Quality Control of Pesticides:** Cotton crop is exposed to a large insect pests complex throughout its growth and development. Therefore, growers are using the insecticides as a common practice to protect the crop. But, there have been a large number of complaints regarding the inefficacy of the pesticides applied to the crop resulting in economic losses. The federal and the provincial agencies concerned have been taking necessary measures to overcome the problem of selling the adulterated and ineffective pesticides through collection and inspection of the pesticides samples. The Pesticides Companies would be encouraged to develop their own network of outlets. However, in order to ensure the availability of quality pesticides to the growers, following actions would also be undertaken.

- To cater the needs of the large number of small landholders, the sale of chemicals in small packing would be encouraged.
- In order to eliminate the chances of adulteration, drum packing would be prohibited
- For enabling the local dealers to sell the pesticides in accordance with the target insect pests, their training in pest management would be undertaken.

**b. Cotton in New Areas**

In view of cotton production potential in Balochistan province and D.I. Khan district in NWFP, the Government has been providing support to the provincial Governments by supplementing their seed requirements and providing technical support. For 2003-04 season the Government has also provided Rs. 3.7 million worth farm implements for demonstration purposes. The Government would however, continue to focus upon the following areas:

- Technical and financial support to the Provincial Governments.
- Training of trainers and growers.
• Procurement center to be opened in Jafferabad (Balochistan) in case a need for implementation of support price arises.
• Negotiating with the private sector to set up a ginnery at D.I. Khan.

c. Development Programs on Cotton

Agriculture has grown at an average rate of 3.5% per annum since 1991-92 with wide fluctuations. The fluctuations in agricultural growth has largely stemmed from fluctuations in major crops. This was primarily because of the behavior of mother nature, pest attack on crop, adulterated pesticides and relatively less attention on pragmatic research and extension approaches. Judicious investment to overcome the new emerging problems and constraints in cotton production, however, cannot be undermind. The Government has, therefore, allocated adequate funds for the following projects with a view to economize the cost of production and save the crop losses.

Managing Burewala Strain of Cotton Virus (Cost: Rs. 199 million): Recently, cotton leaf curl virus has again emerged as a key disease in the province of the Punjab in general and Burewala area in particular. The re-emergence of virus commonly called as Burewala Strain of Cotton Virus (BSCV) is dangerous version and could develop into a serious problem. It is suspected that previous virus strain has mutated and resistant varieties are also showing symptoms of CLCV in the whole cotton belt of the Punjab. Even the parent material used to develop cotton leaf curl virus resistant varieties has also been found susceptible in Burewala territory. The infestation of CLCV disease has crossed the boundaries of the Punjab and entered into the neighboring provinces. Therefore, there is an urgent need that integrated and interdisciplinary research is undertaken for development of BSCV resistant varieties and cultural management strategies on war footing before the problem gets dangerous dimension hurting the national economy.

Managing Reddening Malaise of Cotton Leaves (Cost: Rs: 24.2 million): The new emerging problems like stunting of cotton growth; wilting of the plants and reddening of cotton leaves are endangering the cotton production in Sindh. The situation is getting worse and it could devastate the crop like that of cotton leaf curl virus. Under these complex phenomena i) the plants entirely die-off, and ii) reddening of leaves forcibly opens up the immature bolls, affects yield with bad seed and fiber quality. In order to identify the factors exactly responsible for the problems in-depth studies are required for developing remedial measures before these problems reach an epidemic level.

Integrated Pest Management in Sindh (cost: Rs: 75.54 million): The cotton plant with its green leaves, many large open flowers, nectaries on every leaf and flower and large number of fruits seems to especially attract the insect pests under natural condition. Different types of insects with chewing and sucking habits attack the crop causing serious damage, which can result in partial or total failure of the crop. They do not only lower the yield but also impair the quality of the fiber. It is estimated that about 20-40% loss is occurring annually due to different pests of cotton. This has resulted in the increased use of pesticides, which has created many secondary problems. These include environmental pollution and development of resistance to pesticides by major insect pests, flare-up of
secondary pests, destruction of natural enemies of cotton pests and increased pesticides residue in the food. The above project being executed by the Central Cotton Research Institute of PCCC focuses upon the setting up of insect rearing lab for the release of parasites and predators to suppress the activity of various insect pests as well as large scale training of extension workers and growers in non-chemical control measures.

d. Quality of Cotton

Pakistan’s cotton is well known for its good quality. However, improper handling, poor ginning practices, absence of quality control measures and high degree of contamination as well as non existence of a marketing mechanism based on premia and discounts leads to depreciation of the value of raw cotton and the textile products. Being cognizant of these problems, the Government had launched a project in mid-eighties for improvement in cotton quality through standardization of cotton to bring it at par with the international standards. The purpose of the project was to improve the competitiveness of Pakistan’s raw cotton and to ensure better returns to cotton growers, ginners, spinners, and exporters and for increasing foreign exchange earnings for the country. After completion of the project in December 1994, an institution namely Pakistan Cotton Standards Institute (PCSI) has been established to perform the following functions to promote quality control of cotton:

- To introduce standardization of cotton.
- To establish cotton standards and recommend measures to Provincial Governments for producing contamination-free cotton.
- To devise quality control measures for export and domestic use of cotton and the handling procedures for contamination-free cotton in ginning factories.
- To conduct grading of seed cotton and classification of lint cotton through its Classers or the approved private inspection companies.
- To pre-qualify the private inspection companies for certifying the quality of cotton.
- To conduct training in cotton grading and cotton classing for growers, ginners, spinners, exporters and other persons of public and private sectors.

e. Clean Cotton

A campaign has been launched for the last two years to encourage cotton growers and ginners for production of contamination free clean cotton. There has been visible improvement in bringing down the contamination level to 5 grams per bale from 19 grams per bale. The ginning factories in the districts of Rahim Yar Khan where PCSI prescribed procedures for the production of high quality contamination free cotton had been fully adopted the contamination level ranged between 0.74 to 1.97 grams per bale. The program of clean cotton in the districts of Ghotki and Sanghar in Sindh and Bahawalpur and Rahim Yar Khan in the Punjab as well as Dera Allah Yar in Balochistan would continue during the 2003-04 season. As a matter of fact, the production of clean cotton needs to be expanded throughout the country for an overall improvement in the cotton quality through implementation of the cotton standardization and grading system.
at the ginneries’ level as provided under the Pakistan Cotton Standardization Ordinance. The success of the program would, however, solely depend upon the response of the raw cotton exporters and the textile mills in making payments to the growers on the basis of grade and staple rather than the varieties and stations.

For promotion of contamination free / clean cotton production and implementation of the Cotton Standardization and Grading System at the grass root levels, the following measures would be pursued:

- Campaign for clean cotton production would continue and cover larger areas.
- The textile mills through All Pakistan Textile Mills Association (APTMA) would be pursued to ensure the payment of premium for clean cotton.
- Marking of grade and staple on each bale would be ensured through amendments in the Provincial Cotton Control Act.
- Facilities for instrumental testing of cotton would be strengthened through provision of more HVIs (High Volume Instrument).
- A nominal cotton standardization fee would be levied to facilitate PCSI for implementing the cotton standardization and grading system at the grass root levels.

**Pakistan Cotton Standards System:** International competition has placed a premium on doing things properly not only in the cotton sector but also in the high technology Textile Sector. Today, the textile industry is advancing at a very rapid speed and its management is calling upon manufacturing processes to control costs, reduce wastages and improving productivity levels. To achieve these, the spinners require clean and standardized lint, which fulfills their specifications and where standards are the essential ingredients for earning the quality of all raw materials, products system, and services. Cotton Standardization system is devised on scientific basis with a view to up-grade Pakistan cotton and the resulting yarn thereby raising its status and value in the high competitive world market. Such an arrangement is of vital importance in the context of cotton's contribution to the national economy and future gains in cotton production, which would be possible more through qualitative improvement.

Pakistan cotton is inherently of good quality but the country loses 10 to 15 % of its intrinsic value (raw cotton and its made-up) due to absence of quality control measures in handling and ginning practices. The other weakness is non-implementation of cotton grading and classing system that results in contamination of cotton. To address this issue/problem the Government has introduced the cotton standards.

**Cotton Standards:** Pakistan has the potential to become a key force in the worldwide cotton and textile market place. However, in order to attain this laudable goal, the areas that must be included are the cotton marketing and quality control. Being cognizant of the cotton quality and marketing problems the Government has promulgated Cotton standardization Ordinance 2002 for the improvement of cotton quality through the cotton standardization system to bring it at par with the international standards. The purpose of
the Ordinance is to improve the competitiveness of Pakistan's raw cotton and to ensure better returns to cotton growers, ginners, spinners, exporters and the national economy on the whole. For the purpose Pakistan Cotton Standards Institute has been established and the measures under taken so far by the Institute are epitomized here under;

- Cotton standards /grades have been developed.
- Technical capabilities to implement the cotton standardization and grading system for producing contamination free cotton have been organized under the Pakistan Cotton Standards Institute.
- The private sector stakeholders have been convinced to switch over to an internationally recognized cotton pricing and marketing system. As a result, the Karachi Cotton Association (KCA) has now been issuing the daily spot rate of raw cotton on grade and staple basis instead of varieties with effect from July 1, 2000.
- The domestic textile industry, which consumes bulk of the locally produced cotton also fully, recognizes the growing demand of the world market for high quality and contamination free cotton and its products.

Presently PCSI is functioning with its Head Office at Karachi and two Regional offices one each at Sukkur (Sindh) and Multan (Punjab). The offices at Karachi, Sukkur and Multan have the services of cotton classers and are equipped with modern day sophisticated machines. They provide the facilities of cotton classing and grading at the specially designed classing rooms with the provision of daylight facility. There are also well equipped fiber testing labs to provide latest facilities of instrumental classification of cotton fiber by using latest machines like HVIs.

f. Legislative Cover

In order to overcome the economic and health hazards on account of supply, distribution and use of toxic pesticides, the following legislative measures would be undertaken:

- Implementation of Pesticide Ordinance.
- Committees to be formed under District Coordination Officers (DCOs) to monitor quality of pesticides.
- Appointment of Magistrates in Agriculture Departments for trial of spurious pesticide dealers/companies.

g. Cotton Trade

There are no quantitative restrictions on the export or import of raw cotton. The textile industry would continue to meet their extra long staple cotton requirements through free imports. In order to ensure smooth cotton trading and providing a level playing field to all the stakeholders, the Government has been pursuing a free trade policy in cotton.
4.3 Future Strategy

Assessing the success of the system for the production of high quality contamination free/clean cotton, it has been decided to extend the same model to more districts in the year 2003-2004 and the same shall be gradually extended allover the cotton belt. To improve the system for the production of high quality contamination free cotton:

- PCSI has arranged trainings in the skills of cotton classing and grading for the production of high quality contamination free cotton at Karachi, Sukkur and Multan for persons from the private sector. PCSI this year has trained 120 Cotton Selectors 80 at Multan, 15 at Sukkur and 25 at Karachi. Till to date PCSI has trained 1320 Cotton Selectors from the private sector.
- To meet the future requirements of cotton PCSI has prepared 100 sets of seed cotton grade and lint cotton standards boxes.
- PCSI shall launch education awareness campaigns for the production of high quality clean cotton.
- PCSI shall arrange on farm/ factory demonstration for the proper picking, handling and ginning procedures for the production of high quality clean cotton.

5. FARM INPUTS

The use of quality inputs in appropriate proportion and quantity has a great bearing on productivity of crops. Important inputs include quality seeds, fertilizers and pesticides. An easy and timely access to agricultural credit facilitates are required to expand the capacity of the farmers to purchase these inputs. The description of each input is as follows.

5.1 Quality Seeds

The Seed Industry Project was launched in the country through promulgation of Seed Act, 1976. This enactment provides requisite infrastructure like National Seed Council, Provincial Seed Councils and Federal Seed Certification and Registration Department. The National Seed Council addresses all pursuits of seed both of public or private seed sector organizations. The Federal Government entrusts the Provincial Seed Councils function within the provincial territories for the purpose of this act. The department regulates and controls the quality seed through crop inspection and seed testing. Seed production/multiplication and distribution is carried out by public and private seed sector organizations like Punjab Seed Corporation, Sindh Seed Corporation (now as Foundation Seed Cell), Agricultural Development Authority, NWFP (now as Department of Agriculture Extension and Research), Department of Agriculture Extension, Balochistan and private seed companies.

Certified seed availability in the country is about 14% in wheat, 60% in cotton, 15.5% in paddy and 15% in maize. The MINFAL has fixed the seed renewable target at 20% for wheat and paddy, 100% for cotton and 30% for maize. To meet the targets broad based
A seed policy is required enabling public and private sectors access to the basic seed and equal opportunities of production and marketing crop seeds. In this respect the strategy of the Government is as follows:

**Induction of Private Sector**: The use of good quality seed at a farm is a symbol of progressive farming. It holds a tremendous potential for further growth in agriculture production. The policy initiatives of the Government like free seed certification services, least possible restriction for the choice of crop species for seed multiplication and an easy access to public sector crop varieties have encouraged the induction of private seed sector. Consequently a number of seed companies, including 4 public, 6 multinationals and 425 national seed companies have been granted permission to do seed business in the country. It has been ensured that both public and private sectors have a level playing field. The subsidies have been withdrawn and market forces determine the seed prices.

**Access to Pre-basic Seed**: The pre-basic seed at present is multiplied under the supervision of the concerned breeders at the Agricultural Research Institutes/Seed Corporations. The private sector is only supplied basic seed and does not have access to pre-basic seed. Plans are underway to allow accessibility to private sector to pre-basic and basic seeds. Necessary enactment for the same is in progress.

**Introduction of Plant Breeder Rights**: Breeding new varieties of crops require a substantial investment in terms of scientific knowledge, trained manpower and ingenuity. At present, there is no provision of any incentive for the breeders that bring promising varieties with different traits of excellence. This problem has been felt worldwide. It is now planned to introduce plant breeders rights to encourage the talented scientists/Institutes some rewards and paybacks for their outstanding work and investment. This will also help to comply with WTO obligations under Trade Related Intellectual Property Rights (TRIPS) Agreement and simultaneously provide ownership rights to the concerned research institutes both in public and private sector, for their varieties. It would also help to generate revenues for furthering research activities.

**Quality Control**: The Federal Seed Certification and Registration Department (FSC&RD) has established 17 seed testing laboratories in various agro-ecological regions. The seed testing manuals have been published and quality criteria has been established and legislated. The Department carries out regulatory and advisory service on quality of crop seeds through its laboratory network. The facility is equally available to the public sector, private sector and the farming community. The department does not charge any fee in lieu of its testing services. There is growing feeling to start charging some fee for the services rendered for seed testing to off load budgetary pressures on the public sector exchequer.

**Training and Development Activities**: The Government attaches high priority to the training of private sector investors in new technologies of seed production and multiplication. The FSC&RD has arranged workshops, seminars and training programs for the entities working in seed sector to improve their working skill and efficiency.
addition, the agricultural universities and colleges have been approached to develop curricula in seed sciences for their graduating students.

**Registration of Nurseries and Certification of Fruit Plants:** The Seed Act 1976 does provide coverage in registration of nurseries and certification of fruit plants. However, this activity generally remained dormant. Currently, pro-active program have been launched particularly in NWFP for registration of fruits nurseries and certification of fruit plants. It is aimed to provide disease free, healthy and genuine fruit planting material. Initially, pome and stone fruits are covered. The FSC&RD has active plans to cover all other temperate and tropical fruits of Pakistan. It is also ventured to expand the coverage of this program throughout the country.

**Incentives to Seed Industry:** The Government as a general restructuring of economy is in the process of withdrawing all subsidies. However, to attract investment in seed industry, the Government has allowed incentives such as exemption of sales tax on certified seed and zero duty on the import of seed processing machinery not manufactured in Pakistan.

**Establishment of Variety Data Bank:** A Variety Data Bank is being established in FSC&RD. This Bank will describe all the traits of a variety released in Pakistan including its parentage. This will help breeders in Pakistan and in the outside world to know about the characteristics of our varieties and help further in the breeding process.

**Assistance to the Neighboring Nations:** Pakistan as a responsible member of the community of nations has played a pro-active role in fighting hunger and mal nutrition through expanding food production in a number of countries around the globe. In addition to providing scientific knowledge and trained manpower, Pakistan is proud of providing high quality seeds of number of crops to drought stricken and war-ravaged Afghanistan. In addition, Pakistan has provided quality seed to Bangladesh, Myanmar, Gulf States and African nations. Pakistan vows to continue this policy in future also.

5.2 Fertilizers

The success story in proliferation of crop production since mid 1960s can be attributed at least partly to the prudent expansion in manufacturing capacity of fertilizers and its consumption. Both fertilizers and high yielding varieties go hand in hand and are the major players in increasing productivity of crops.

**a. Fertilizer Supply**

**Domestic Production:** The present fertilizer production capacity in the country is about 5.65 million product tons comprising mainly urea (4.17 million tons). In product terms, current urea capacity is about 4.2 million tons, Single Super Phosphate (SSP) 0.18 million tons, Di-ammonium Phosphate (DAP) 0.45 million tons, Calcium Ammonium Nitrate (CAN) 0.45 million tons, nitrophos 0.31 million tons and NPK 0.10 million tons. For manufacturing DAP, Pakistan is dependent on import of rock phosphate. A plant
under Fauji Fertilizer Company (FFC) has been established at Port Qasim. This plant has been shutdown due to high cost of production. The urea is the most important fertilizer product and accounts for 74 percent of the total domestic fertilizer production capacity. Actual production, however, varies according to over/under capacity utilization primarily because of gas availability. Annual imports of fertilizer products mainly DAP is around one million tons. Fertilizer is imported by private sector.

**Fertilizer Consumption:** Fertilizer consumption has experienced an exponential growth during the last three decades. Urea consumption is about 4.0 million tons and DAP one million tons. In nutrient terms nitrogen consumption is 2.33 million tons and phosphate only 0.63 million tons, with N:P ratio of 3.7:1. It shows consumption skewed in favor of nitrogen, resulting in imbalance use of nutrients at national level.

**Fertilizer Demand:** Fertilizer demand by the year 2010 is estimated using three different approaches i.e., on food production requirements, agronomic needs and taking into account economic and non-economic variables such as exchange rate, crop and fertilizer prices and the development of irrigation and other infrastructure. It is projected that the country would need additional capacity of one million tons of urea and 1.5 million tons of DAP by the year 2010.

**Deregulating Fertilizer Controls:** Until the recent past, fertilizer production and marketing was subject to state regulations particularly with respect to their import and retailing at Government fixed prices. Government was providing heavy subsidy to farmers. Since 1986, all price controls on nitrogen fertilizers including subsidy have been abolished while phosphate prices were deregulated in August 1993. Subsidy on sulphate of potash was eliminated in October 1995. The free market forces now determine fertilizer prices.

**b. Pricing Policy**

**Urea:** Since deregulation urea prices have followed an upward trend. Several factors have contributed to the price hike. Some of the important factors are the general inflationary trend, increase in the price of gas particularly used as fuel and upward adjustment in the cost of production due to increase in salary and wages. Government imposed 15 per cent general sales tax (GST) on urea in February 2001, which resulted in an increase of about Rs. 50/bag. Country has achieved self-sufficiency in urea, but will go soon in imports by year 2004-05. Prices in international market are volatile and any imports in coming years will result in further price hike.

Government is providing indirect subsidy on gas to fertilizer producers around $0.2 billion/year. There has been contention that this subsidy is not being passed on to farmers, whereas industry’s view point is that while comparing with international prices subsidy is passed on to farmers. A new fertilizer plant of urea is required by year 2005-06.
DAP: In case of DAP, the prices have registered large increase during the past deregulated period. The main reasons for the increase in the DAP price are withdrawal of subsidy, increase in international prices and depreciation of Pak. rupee against foreign currency. Since DAP price is charged from the farmers on the basis of the international prices, any downward adjustment would necessitate reduction in cost of marketing, handling and profit margins, particularly of the private distributors. However, prices in the country are no more uniform and farmers in the north of Punjab, remote areas of Balochistan and NWFP have to pay more. Imposition of 15 per cent GST in September 2001 has further aggravated the situation adding the cost of Rs. 100/bag. DAP prices are twice of urea. There is no possibility of domestic expansion in DAP production. Thus the only option left with Government is to give relief through withdrawal of GST on fertilizers.

c. Marketing of Fertilizer

Efficient marketing and distribution arrangements are essential for improving the efficiency of both fertilizer use and supply. It is through marketing channels that fertilizer reaches the farmers on time, in the right quantity and quality, and at the right price. The complaints of under-weight bags and poor quality of the products of the new importers are frequent.

d. Fertilizer Adulteration and Quality Control

The mal-practices in fertilizer marketing and distribution such as fake, adulterated and under weight are frequently reported by farmers. Provinces of Punjab and Sindh have implemented ‘Fertilizer Control Acts’ to ensure quality at retail level. However, ‘Fertilizer Legislation’ is pending for approval and implementation under Federal Government to regulate quality of imported fertilizers.

e. Fertilizer Research and Extension

The fertilizer research particularly in the provinces should address the issues of efficiency, proper rates and minimize losses to protect environment. Extension activities in the provinces are not up to mark due to variety of factors. Provincial agricultural extension should be properly trained to disseminate information on fertilizer use to the farmers.

5.3 Pesticides

Plant Protection measures currently depend largely on the use of pesticides. The pesticide use has grown from 5000 tons in 1982 to 47,592 tons in 2001. The most intensely covered crop is cotton followed by paddy, sugarcane, fruits and vegetables. Cotton alone accounts for about 60% of the total consumption of pesticides. The pesticide and herbicide have helped to manage insect pressure and weeds. The practice has helped to make phenomenal increase in production of cotton, rice, wheat, sugarcane, fruits, vegetables and number of other crops.
Until 1971, pesticides to be imported were standardized by the Federal Government through Department of Plant Protection. Agricultural Pesticides Ordinance (APO) was promulgated in 1971. Agricultural Pesticides Rules were made thereunder in 1973. Pesticides were offered to farmers at subsidized prices until 1980 when the pesticide trade was transferred to the private sector. Initially, the private sector performed well, but later on cartels were formed for selling pesticides at exorbitant prices. A registration policy was introduced in 1992. The policy resulted in import of pesticides from diversified sources. There was also an induction of more than 350 new entrepreneurs as against about 30 until 1992. The policy made quality pesticides available at much cheaper rates to the farmers. Pesticide is the only agricultural input where the prices of frequently used product have declined despite the devaluation of Pak Rupee.

Pakistan being a signatory to the WTO is obliged to implement various agreements. After 2004, the nation will have to adopt the standards of IPPC (International Plant Protection Convention), CAC (Codex Alimentarius Commission) and OIE (Office International des Epizooties). These agreements include: absence of undesirable pesticide residues in crop produce and food made thereof, pest freedom and disinfestations. These requirements necessitate an absolutely disciplined environment with respect to the use of pesticide for plant protection.

Liberalization of pesticide trade had been welcomed because it has provided relief to the farmers. However, some unscrupulous elements found this opportunity to indulge in illegal activities as formulating pesticides using active ingredients in substandard quantities, adulteration at supply chain, packing, distribution and marketing level, preparation and sale of spurious pesticides and clandestine and unauthorized import of pesticides. It has been noted with great concern that many pesticide companies allure buyers with fabulous lotteries and prizes. A recent trend is to offer prizes ranging from motorcycles to Rs. 10 millions in cash to the dealers, tempting them supposedly to compromise on quality.

The farmers have inadequate knowledge for identification of pests, selection of pesticides, spray timings, application techniques and safety measures. Lack of awareness results in a number of problems including ineffective pest control, development of resistance in pest species, environmental pollution and public health problems.

The following steps are proposed for a paradigm shift regarding use of pesticides:

- Fully equipped analytical laboratories need to be established at Karachi, Lahore, Multan, Peshawar and Quetta to ensure that export agricultural produces are free from undesirable pesticide residue as required under WTO. These laboratories also need to be entrusted with the responsibility of analyzing pesticide sample taken from consignments at ports, manufacturing and formulation plants, re-packing units and warehouses to monitor quality.
- The Agricultural Pesticides Rules need to be amended to incorporate provisions making it mandatory for the registrants to distribute pesticides
themselves only. This would eliminate the role of third party as distributors. The amendment will be instrumental in fixing responsibility in case of selling adulterated or sub-standard pesticides. The Rules need to be amended to make it mandatory for the dealers/vendors to get themselves registered with the District Governments. Special magistrates need to be designated for expeditious disposal of cases registered under the Agricultural Pesticides Ordinance for selling adulterated or sub-standard pesticides.

- An exhaustive campaign should be launched by the Provincial Agriculture (Extension) Departments with the collaboration of the private sector for awareness building in the farmers on rational and safe use of pesticides. The campaign should include training on identification of pests, selection of pesticides, spray timings, application techniques and safety measures.
- To provide a conducive environment for the investors to enter into basic manufacturing of pesticides as well as local formulation of some of pesticides:
  - No duty and tax be levied on import of intermediate chemicals for synthesis of active ingredients.
  - The duty on the import of pesticides active ingredients may be reduced to zero.
  - The duty on the import of emulsifiers, stabilizers, wetting agents and other materials for local formulation may be reduced to zero.
  - The duty on the import of pesticides in finished form may be enhanced from 5 % to 10 %.
  - To minimize the use of pesticides, Integrated Pest Management (IPM) be given the highest priority. Since 1960, Food and Agriculture Organization (FAO) has advocated Integrated Pest Management as the preferred pest control strategy, but in Pakistan there is negligible promotion of IPM by the agriculture extension service. An exhaustive campaign may be launched by the Provincial Agriculture (Extension) Departments with the collaboration of the District Governments for introducing IPM at the grass root level. The target of the campaign would be reduction in pesticides use by one third within next 5 years

5.4 Agricultural Credit

The Government of Pakistan in early 1960s started agricultural credit scheme through Agricultural Development Bank of Pakistan (ADBP), renamed as Zarai Taraqiati Bank Limited (ZTBL). Recently, the Commercial Banks and Domestic Private Banks have also started disbursing agriculture credit to the farming community. Credit is provided to farmers for purchase of seeds, fertilizers, and pesticides as well as for purchase of agricultural machinery.

Government policy with regard to agricultural credit is to safeguard the interest of small/medium farmers by extending credit to them on easy term and to recover the same in time as well as to protect them in case of any natural hazards and calamity. Ministry of Food, Agriculture and Livestock is playing an active role to monitor agricultural credit disbursement and conducts meetings to remove the bottleneck/hurdles in disbursement.
Present regime gives special emphasis to resolve the credit problems of farming community.

Agriculture credit is provided for production and development purposes. Production loan is being provided for agriculture input comprising of seeds, fertilizer, pesticides/insecticides, poultry/animal feeds, chicks medicines, water charges, electric charges for tubewells, labor, fuel and ice of marine fisheries. The development loan is provided for agriculture machinery i.e. purchase of tractors, installation of tube wells, pumping set, reapers, cutter binders, threshers, trolley, spray machinery and cane crusher.

a. Current Facilities Available to Farmers

- Running financing from the banks on the basis of multiple/revolving limits for a period of three years in addition to demand finance in single disbursement.
- Revolving limits can be availed not only against 100% adjustment/repayment of previous loan but also in case of partial adjustment/repayment without any fresh documentation.
- Lease financing facility against pledging of tube-wells and tractors with the banks if these are free from all encumbrances.
- Finance for Agricultural produce by farmers/marketing companies against raw cotton, cotton yarn, mutton and beef, wool and animal hair, food stuff for animals.
- Non-fund based facilities (LCs and Guarantees) can be opened/availed by the Corporate Farming.
- In addition to commercial banks, agricultural credit facility can also be availed by the micro credit institution, recognized NGOs and Rural Support Organization for onward lending to farmers/growers/borrowers.
- For meeting the liquidity shortfall, the farmers/growers/borrowers can discount their deferred payment vouchers issued by the tobacco, sugarcane and other processing units from the commercial banks.
- Agriculture finance against mortgage of Defence Saving Certificate (DSCs), Special Saving Certificates (SSCs), gold and silver ornaments.
- In order to redress the problems of farmers at their doorstep, State Bank of Pakistan (SBP) has established Credit Advisory Committees and Sub-Committee at its 15 SBP Offices (Karachi, Lahore, Quetta, Peshawar, Islamabad, Rawalpindi, Multan, Faisalabad, Sialkot, Bahawalpur, Gujranwala, D.I.Khan, Muzaffarabad, Hyderabad and Sukkur).
- A farm loan help Desk is functioning in the Agriculture Credit Department, State Bank of Pakistan, Karachi to facilitate the farmers/borrowers.

b. Security/Surety

Pass Books: Agriculture credit can be availed against security of land through the Pass Book System on the basis of realizable value/forced sale value. (Value of land should be
calculated at Rs. 400/- per produce index unit-PIU as fixed by the Government of Pakistan).

**Personal Sureties:** Agricultural credit can also be availed against personal surety of Rs. 100,000/- per farmer per year. However, total guarantee of one guarantor/person cannot, in any case, exceed Rs. 500,000/- except processing unit.

c. **Documentation**

**Agricultural Production/Development Finance Against Pass Book**

- Agreement-cum-guarantee Form.
- Charge Creation Certificate.
- Photocopy of registration booklet of tractor/trailer registered in joint names of bank and borrower (wherever applicable).
- Comprehensive Insurance Policy with Bank clause (wherever applicable).
- National Identity Card.

**Agricultural Production/Development Finance against two personal Sureties**

- Agreement-cum-guarantee Form.
- Fard Jamabandi for landowners in the Provinces of Punjab, NWFP and Balochistan.
- Deh Form-VII for landowners in the Province of Sindh.
- Khasra Girdwari for Tenant cultivators.
- National Identity Card.

d. **Mark-up Rates**

State Bank of Pakistan (SBP) has not fixed any maximum or minimum cap on mark-up for agricultural finance extended by the commercial banks. The Government has reduced make-up rate on agriculture credit from 14% to 11% on both production and development loans. Commercial banks have also lowered the markup rates.

e. **Role of State Bank of Pakistan**

State Bank of Pakistan takes keen interest in providing credit facilities for agriculture, both through the development of credit institutions as well as through providing credit lines to the development banks and incentives to commercial banks. State Bank has created an Agricultural Credit Department with the following functions:-

- To maintain an expert staff to study all questions of agricultural credit and be available for consultation by the Federal Government, Provincial
Governments, Provincial Cooperative Banks and other banking organizations.

- To co-ordinate the operations of the Bank in connection with agricultural credit and its relations with the Provincial Cooperative Banks and any other organizations engaged in the business of agricultural credit.

Prior to 1972, commercial banks’ lending to agriculture was nominal. The Agricultural Development Bank of Pakistan was providing bulk of credit to this sector. With the introduction of Banking Reforms in 1972, several institutions and policy changes were made with the objective of more equitable distribution of credit among various sectors and groups.

Agricultural Credit Advisory Committee (ACAC): The targets of agricultural loans were set by the National Credit Consultative Council (NCCC) and were based on the recommendations of the ACAC. ACAC was set up in 1972 to assess credit requirements of the agriculture sector in order to assist the NCCC in the preparation of the annual credit plan and to consider the ways and means for improving the disbursement and recovery of agricultural credit together with suggesting measures for the strengthening of institutional framework of agricultural credit.

The ACAC, with the assistance of Committee of Experts appointed by it, evolved a methodology for the preparation of estimates of agricultural credit requirements. First devised in 1973-74, the methodology was subsequently revised in 1978-79, 1983-84, 1989 and lately in 2001. Cash requirements for production loans were estimated on the basis of total acreage of land under various crops and the cost of inputs for each crop in each province, and the estimated personal savings of various categories of farmers in terms of size of holdings.

f. Revolving Limit of Agricultural Loans

Banks can provide running financing for agricultural purposes on the basis of multiple/revolving limits for period of three years in addition to demand finance (single disbursement) under the Supervised Agricultural Credit Scheme. Banks are now allowed to renew the limits automatically not only on 100% adjustment of the previous loans but also in case of partial adjustments if these are regular advances. Banks will not ask for any fresh document at the time of each renewal.

Mandatory Credit Targets: State Bank of Pakistan is authorized to determine the policy in relation to advances to be followed by the banks in general or by any bank in particular. In accordance with the above powers, the SBP has been prescribing mandatory credit targets for commercial banks on yearly/half yearly basis since 1972. The targets allocated to commercial banks are advised on six monthly basis with the ratio of 40:60 i.e. 40% for the first half and 60% for the second half. Banks are now free to extend development loans to farmers other than small farmers upto 50% of their targets (main agriculture) subject to the condition that they shall ensure to make financing of the
remaining 50% of their mandatory credit targets to small farmers for production/crop loan.

**Agricultural Credit Facilities Covered under Mandatory Credit Targets**

- Lease financing facilities to the farmers under the scheme for tube wells, tractors and harvesters, with the banks, for availing agricultural credit if these are free from all encumbrances.
- Equity participation by banks in corporate agricultural farm units.
- Financing by the banks for export of agricultural products by farmers/marketing companies to be a part of agricultural financing on items like raw cotton, cotton yarn, mutton and beef, wool and animal hair, fish other than frozen and preserved, foodstuff for animals, all grains, fertilizer crude, oil seeds, nuts and kernels, live animals, without refinance from SBP on subsidized basis.
- Non-fund based facilities extended by banks for corporate farming.
- The credit that is disbursed by banks for processing of crops other than major crops and polishing and grading of fruits.
- The commercial banks’ lending to micro credit institutions, recognized NGOs and rural support organizations.
- The commercial banks’ financing to ZTBL for onward lending to farmers. This also includes inter bank lending (participating banks) for onward financing for agricultural purposes as defined in the scheme.
- Agricultural loans by banks for export of fruits, vegetables, poultry, livestock, dairy farming and tobacco marketing.
- The commercial banks’ lending to farmers through discounting of deferred payment vouchers of tobacco, sugarcane, and processing units.
- The financing made by banks against mortgage of any property rural or urban, earmarking of deposit in lieu of Defense Saving Certificate (DCS), Special Saving Certificate, gold and silver ornaments, if such credit is obtained by the farmers for agricultural production only.
- There is no restriction on the banks to provide agricultural loans to the farmers, having/below subsistence holding i.e. Punjab and NWFP (upto 12.5 acres), Sindh (upto 16 acres) and Balochistan (upto 32 acres) for purchase of new/old tractors subject to completion of required formalities.
- The credit provided by banks to farmers/growers/other private sectors for construction of cold storages/godowns/silos and other structures for storage of agricultural produce at a debt equity ratio of 60:40 at normal lending rate.
- The financing made by banks to leasing companies for providing agricultural equipments/machines on leasing/rental/hiring basis to the growers/farmers.
- The credit provided by banks to seed processing units for processing of high quality seeds.
- The financing provided by banks for preparation and installation of steel/metal capsules for storage of all agricultural produce.
g. **Zarai Taraqiati Bank Limited (ZTBL)**

The Zarai Taraqiati Bank Limited was established under the Agricultural Development Bank Ordinance, 1961 (iv of 1961) to make better provision for offering credit facilities to agriculturists and persons engaged in cottage industries in the rural areas. The operations of the ZTBL are extended to whole of Pakistan including Azad Jammu and Kashmir (AJK). In recent years, it has emerged as a single largest lender in agriculture, which is providing more than 50% agriculture credit to the farmers.

h. **Commercial Banks**

Banks have started different schemes of disbursement of agricultural credit to farmers. These include agricultural credit revolving scheme, supervised agricultural credit scheme and one window operation. Supervised agricultural credit scheme is a system of providing agricultural credit to the farmers at their doorsteps. Under this scheme credit is provided in the form of an integrated package of finance, supplies of essential inputs and technical guidance on farm management. This scheme has been designed to cover entire Pakistan, with no restriction of territorial jurisdiction.

**5.5 Reducing Costs of Farm Inputs**

It is seen that the cost of farm inputs are constantly increasing. The Government is aware of the situation. In order to provide relief to the farming community, the following steps have been/are being undertaken.

a. **Fertilizers**

Studies have been undertaken by Inter Ministerial Committee under Minister of Industries with Ministers of Food, Agriculture and Livestock, Commerce and Finance in the committee to lower cost of fertilizers. As a result a relief of Rs. 30 to Rs. 40 has been given on one bag of DAP. This is also applicable on other phosphates, the relief depending upon the level of phosphate ingredients.

b. **Electric Tariff.**

Pakistan has faced severe shortage of water. This has increased pressure on exploitation of sub-surface water through the tubewells adding up to the costs in raising of crops. Government is conscious of the situation and has provided a relief of 33% for the Kharif crops.

c. **Reduction in interest rate on agricultural credit.**

Government of Pakistan, as a measure of restructuring macroeconomics is lowering down interest rates on all transactions in the banking sector. For agriculture credit the interest
rates have also been lowered to 9% for production loan and 11% for development loans. Similarly, incentive package has been offered for payment of non-performing loans.

6. PROMOTION OF HORTICULTURE (EXPORT LED GROWTH)

Horticultural crops include fruits, vegetables, medicinal herbs, spices, flowers and ornamental and aromatic plants. These crops provide a valuable enterprise for local and international markets.

In Pakistan, fruits grown in cool temperate climate are apples, plums, pears and cherries, whereas in warm temperate climate are apricots, grapes, pomegranates and melon. In the subtropical climate citrus, mango, banana, dates and guava are produced on a large scale. Pakistan produces unrivaled quality mangoes, kinno and dates that have a large global market.

The major fruits grown in Pakistan are citrus, mango, dates and apple. Pakistan also produces a wide range of vegetable as potatoes, onions, tomatoes, peas, beans, okra, turnip, brinjal and a large number of root and leafy vegetables.

Pakistan has been exporting fruits over long periods of time. The export earnings from fruits are valued at $80 million and vegetable exports are $39 million. Pakistan’s share in exports of cut flowers and spices is almost negligible.

6.1 Constraints

a. Production

- Low yields
- Lack of hybrid seed technology
- Pest and diseases particularly the fruit fly
- Highly perishable nature of horticultural commodities
- Lean - agro processing industry

b. Infrastructure

- Lack of facilities for removal of field heat
- Inadequate specialized facilities for marketing of horticultural commodities
- Inadequate cold storage facilities
- Absence of cold chains
- Air cargo flight facilities:
  - Development of airports for landing of wide bodied cargo planes
  - One window handling facilities
  - Limited space and cold storage facilities at airports
- High transit time through sea
- Inadequate linkages with a number of potential importing countries
- Inadequate availability of reefer containers
c. Exports

- Sub standard quality.
- Lack of accredited laboratories for quality testing of produce.
- Threat of fruit fly and inadequate facilities to assure treatment against this pest.
- Grading and packing industry especially lack of card board containers
- Lack of quality processing and packing
- Weak marketing and facilities such as cold storage and agro-processing.
- Limited and expensive refrigerated transport facilities
- Limited availability of working capital

6.2 Policies and Strategies

The strategy for horticultural development is as follows:

a. Export Led Production

Pakistan has been producing a large number of fruits, vegetables and flowers almost around the year. The production system in Pakistan has not bothered to start a demand based horticultural production system. Most of the commodities are being grown because they have been there over long period of time. There is a need to link up a production system with consumers demand overseas. Pakistan’s citrus has high number of seeds. This serves as a barrier in promotion of overseas trade of our citrus. The Research Institutes especially in Punjab are working to bring varieties of citrus that are seedless and have demand in the export markets. In addition, Pakistan has not focused on non-conventional commodities as cut flowers, mushrooms and spices. These commodities need to be integrated in our policy and production programs.

b. Post Harvest Handling and Management

Pakistan loses a large size of horticultural crops in post harvest handling and in transit. Horticultural research institutes and extension organizations are running educational programs to provide the information to the growers on plucking technologies of fruits, removal of field heat, grading of the produce and appropriate packaging.

c. Infrastructure Development

Government is committed to develop infrastructure for efficient and safe disposal of the horticultural produce. The focus is on developing airport facilities for wide bodied cargo planes to land at airports in the main production areas, improving handling facilities at ports including one window operation and establishing of cold storages. It is also planned to establish cold chains in the country once adequate funds are available for the purpose. Efforts will also be made to attract investment on built-own-operate basis.
d. **Marketing System and Wherewithals**

The marketing of horticultural products is supply based and once a farmer brings his produce to the market, he has to accept the prevailing prices. Many times he has to dispose off his commodity at throwaway prices. The following facilities are being established to improve the marketing of horticultural produce:

- A marketing improvement project is being launched to improve market information system, establish price-clearing houses of agricultural commodities in provincial/federal capital. In addition, it is also planned to construct new fruits and vegetables markets in all the four provinces.
- The post harvest losses are planned to be minimize through linking production to agro industrial transformation and through encouraging private sector to build cold storages.
- Flowers are being introduced as field crops through back up technological support to the farming community. To provide a marketing outlet, the floral shops have been opened in metropolitan cities where these are doing successful floral business. This activity is planning to be extended further.
- Pakistan badly lacks in quality packaging industry. Currently, the wooden crates are widely used to pack fruits and vegetables. Since the wooden packing material is a source of insect/disease infestation, it is getting extremely difficult to market commodities in wooden crates and resistance in this respect is already being experienced. It is planned to promote cardboard packaging industry to replace wooden crates. Private sector investment is being attracted.

e. **Accrediting Export Quality**

Pakistan is in process of enforcing quality standards for all agricultural commodities including horticultural products. Accredited quality test laboratories are being established to certify quality of the produce for exports and in the domestic market.

f. **Research**

Pakistan is moving toward the demand based horticultural production system, with high productivity, minimizing post harvest losses and improving quality of the product. The research system is planned to be geared to move in line with the policy objective given above and focus on finding solutions in terms of increasing productivity, broaden harvesting times of crops and increase farmers’ profitability. In addition, it is planned to introduce seedless varieties of fruits. Some of the new horticultural crops as persimmon, cherries, strawberry, lychee and others have already been introduced and have been established as commercial crops. It is planned to further look around the globe and introduce new high value horticultural crops suiting to our climatic conditions. Asparagus was introduced some time back and the effort was abandoned due to inadequate cold storage facilities at port of embarkation.
Biotechnology as a tool for rapid multiplication of quality planting material, virus cleaning, genetic transformation, is of great importance in case of horticultural crops. Therefore, priority needs to be given on:

- Development of micro propagation protocols in selected crops
- Genetic engineering for integration of desirable traits
- Molecular characterization of germplasm and development of molecular linkage maps
- Value addition to products
- Preservation of post harvest losses through control of metabolic process

Production technologies can bring swift improvement in production and productivity of horticultural crops in various agro-ecological zones of Pakistan. Pragmatic work on horticulture based cropping systems; water management including micro irrigation and fertigation, greenhouse cultivation of vegetables and flowers, integrated nutrient and pest managements, environment pollution and pesticide residue problems need attention. Further refinement of the technologies and their transfer will bring perceptible improvement in production. Hybrid seed production for vegetables and commercialization of micro propagation in floriculture are also important tools to enhance production.

Bulk handling system including, pre-cooling, storage and post harvest protocols for sea transport of major fruits and vegetables needs R & D for promotion of exports. Organic farming for horticultural crops and residue free IPM technology are important areas as a future strategy for quality production of these crops.

Advanced training in research methodologies and instrumentation, biotechnology, micro-irrigation, fertigation, IPM, bio-fertilizer, bio-pesticide, pesticide residue and product development need priority attention for increasing research capabilities of the scientists. Skill development for development functionaries through in-service training at different R&D institutions will enhance capabilities of extension staff. Postgraduate programs in fruits, vegetables, floriculture, medicinal and spices crops and post harvest management of horticultural crops will help in providing trained manpower in these specialized areas.

g. Transfer of Technology

It is planned to further build up and strengthen the agricultural extension services in the country also covering horticultural field focusing on demand based production systems, improving productivity, Integrated Pest Management and harvest/post harvest management practices and other disciplines of economic importance.
7. IMPORT SUBSTITUTION

Pakistan has become a member of the club of food exporting nations. However, still there are grey areas where Pakistan is deficient and has to spend huge foreign exchange reserves to meet the deficits. Oilseeds, tea, pulses and milk are some of these commodities. The description is as follows.

7.1 Oil Seeds

Pakistan’s annual consumption of edible oil is 1.9 million tons. About 70% of this is met through imports at a cost of Rs. 25 billion. The remaining 30% of the requirement is met through indigenous production. Most of this oil comes from cotton seed and the availability of edible oil from conventional and non-conventional oil seed crops is limited.

The country cannot afford continuous drain of precious foreign exchange. The promotion of oilseeds is therefore an integral component of the agricultural policy since 1970s. A number of efforts have been made to promote local production of oilseeds in the country. A massive debate and exercise was carried out in 1970s for choice of suitable combination of oilseed crops that can fit in cropping pattern. The choice of soybean crop was abandoned as commodity has extremely low oil contents. The crops wherein Pakistan is working for promotion of edible oil are canola and sunflower. In addition, Pakistan has also ventured to establish plantation crops as oil palm and olive.

The Pakistan Oilseed Development Board as an autonomous body has been set up in the Ministry of Food, Agriculture and Livestock. The funds for the Board are generated through levy of cess fund on import of edible oils. This Board is responsible for policy formulation and execution of research and development program in the country.

There have been wide fluctuations in area under oilseed crops as sunflower and canola. The oilseed crops have biological problems of insect attack, shattering of grains and high initial investment in hybrid seeds. Further, the oilseeds cannot compete with existing crops for production and profitability. In addition, the marketing of the produce, volatile international prices and the erratic import policies have also served as a major barrier in promotion of oilseed crops. Currently the area under sunflower is 0.16 million ha and canola is 0.10 million ha. With international prices rising over last year the area under oilseed has picked up by 162%.

Cultivation of oil palm in the coastal areas of Sindh and Balochistan has been a success. One thousand acres have been brought under cultivation. We need to increase it to 12,000 acres in the next 4-5 years. Similarly two olive projects are under implementation covering NWFP, Potohar and Balochistan. After the completion of these projects 34,800 tons of olive oil will become available in the country.
The implementation of 65:35 ratio of hard and soft oil in manufacturing of ghee may be ensured to create demand for locally produced oil and to maintain quality of ghee for safeguarding the health of consumers.

Solvent extraction industry needs to be supported by livestock sector. For this purpose the use of meal in cattle feed need to be popularized instead of cotton cake. The solvent industry will start processing cottonseed that will result in higher oil recovery from cottonseed. It is estimated that through this change additional 200,000 tons of oil per year will become available.

7.2 Tea

Pakistan imports all of its tea from abroad to meet its requirements. During 2000-01, 111.9 metric tons were imported for Rs 12.0 billion in foreign exchange. Government initiated efforts to promote tea cultivation in the country over last two decades. Chinese tea experts under the technical assistance program of China carried out a soil survey of the prospective tea growing areas of northern hilly tracts of Hazara Division and Central Swat in NWFP in 1982 and then in 1989. A National Tea Research Station (NTRS) was set up in 1986 on 50 acres at Shinkiari. Since then, tea promotion efforts are in progress on small scale which would take several years for making significant break through in tea production.

Currently, 700 acres has been brought under tea plantation. In addition, two tea processing plants, one in public sector and the other in private sector have been established to provide industrial link. A crash tea program has been launched to accelerate the progress in tea plantation. This program will include establishment of additional tea processing units for catering production from new plantation. Pakistan Agricultural Research Council (PARC) will provide necessary technical services and tea seedlings to the farmers. Large private sector tea companies will be encouraged to join hands and participate in the crash tea promotion program. Necessary incentives will be provided to them for this purpose. Credit institutions including Bank of Khyber and ZTBL will extend credit to the farmers on long-term recovery basis.

A National Tea Development Board comprising of all stakeholders is being established in MINFAL. This Board will formulate policies with respect to research, development, agricultural credit and processing issues for promotion of tea cultivation in the country.

7.3 Pulses

Pulses constitute an essential element of food for majority of the people in the country. In addition, it serves as protein supplement for poor segment of population. The consumption is one million tons per annum. The imports are of the order of 460 thousand tons worth Rs. 8.3 billion.

Gram is the main pulse crop of the country constituting 70% of our requirements. It is mainly grown in barani areas on marginal lands with limited management. The
production trends are generally erratic and it depends largely on rainfall pattern, intensity and timeliness. The gram blight, which had played a major catastrophe in production of gram, has been put to control through breeding programs. Another important crop where Pakistan has made quantum jump is mung crop. Its production has been more than doubled over the last one decade. The dwarf varieties with profused fruiting characteristics have played a major role in this endeavor. The efforts are made to promote production of other pulses as lentil, mash, cowpeas, urd, beans and large numbers of exotic materials are under screening in research institutes for introduction. It is planned to carry out major productivity enhancement programs for import substitution to minimize Pakistan’s dependence on imports of the commodity.

8. CROP DIVERSIFICATION

Pakistan is facing severe water shortages and drought over last few years and this phenomenon may continue many years. We are in a process to conserve the limited water resources. It is planned to introduce high value crops to diversify and maximize farm incomes. The following steps are being taken:

8.1 Promotion of Low Water Requiring Crops

Rice is a heavy water using crop. Aromatic, long grain basmati rice is a high value commodity that fetches premium prices in the export market. The basmati is an indispensable commodity and cannot be replaced. However, Pakistan has tough competition in IRRI rice. The following are the priority areas in this regard:

- Basmati rice is being promoted in the Punjab to replace IRRI rice.
- IRRI rice cultivation in Southern Punjab, left bank of Indus in Sindh and Pat feeder canal command area in Balochistan is being discouraged. Rice in this area is being replaced by cotton, which is a lesser consumer of water.

Sugarcane is another high delta crop. Initial experiments for introduction of sugarbeet were laid in Sindh and Punjab. Biologically sugar beet has shown promise and adaptability to high temperature, which were previously considered prohibitive for growth of sugar beet in these areas. If sugar beet is to replace, at least partly, the sugarcane crop, it would save almost half of the water. A mission of Pakistan Sugar Millers under Food, Agriculture and Livestock Minister visited Germany, Poland, Romania and France to see the prospects for purchasing sugar beet crushing machinery for installation in Pakistan. The only problem with sugar beet is high cost of production that would further raise prices of sugar in Pakistan by another Rs. 3-4 per kg over and above the sugar prices from cane. Currently, Pakistan sugar prices are already higher from the international market by Rs. 6-7 per kg on account of (a) low productivity of sugarcane in Pakistan (b) low recovery of sugar from the cane and (c) lack of industry for conversion of by products of sugarcane into high value commodities. If Pakistan has to enter into introduction of sugar beet, it would have to raise productivity of sugar beet
substantially and also install crushing capacity in Punjab and Sindh, failing which the scope to introduce sugar beet would be bleak.

8.2 Introduction of High Value Crops

The Ministry of Food, Agriculture and Livestock is in the process of introducing cultivation of medicinal herbs and spices on commercial scale. Initially 31 plants have been selected for introduction. The Pakistan Forest Institute Peshawar, National Agricultural Research Center Islamabad and Hamdard University Karachi have been involved by MINFAL in introduction of medicinal herbs and spices. The experiments are being undertaken at research farms and farmers’ fields to develop package of technology.

The tunnel farming is also being introduced for cultivation of off-season vegetables to increase farmer’s profitability and diversify availability of vegetables, during off-season for the consumers. The floriculture industry is at inception stage in Pakistan. Innovative farmers have started growing floral crops on commercial scale in various areas. However, Pakistan still badly lacks infrastructural arrangements for post harvest handling, preservation and quick transport of flowers to the consumers/niche markets around the globe. Pakistan has already taken measures to encourage import of necessary machinery for the purpose of high value crops including fruits, vegetables and flowers at zero-rated GST.

9. WATER MANAGEMENT AND CONSERVATION

The annual flow in the Indus Basin System on an average is 142 MAF below rim stations. However, there are wide variations in surface water flows during wet and dry years. The highest availability of surface water in the Indus basin has been recorded of 186 MAF and the lowest of 91 MAF.

Summer is a time of high water availability because of snowmelt and monsoon. As a result, the rivers in Pakistan rise up and expand rapidly, resulting about 82% of the water flows during summer months. The winter is a time of low rainfall, mainly brought by Mediterranean / western disturbances. The snowmelt is nominal or non-existent during this period. As a result, the size of rivers squeezes to mere creeks and many of them even dry up. The surface water flows during winter months are only 18% of the annual flows. With this type of flow system, the agriculture in this part of the world was largely confined to times of high rainfall/river flows. In order to smoothen the water supply in winter, it was appropriate to tame the river flow system.

An Irrigation Commission was set up in 1903 to introduce a new irrigation regime. Based on the recommendations of this commission, a gigantic irrigation network was setup to divert and distribute water supplies from the Indus Basin System. This effort was further substantiated through establishment of a network of link canals, and water reservoirs of a capacity of 18 MAF. This helped to regulate water supplies during peak scarcity period, especially of winter.
9.1 Water Diversions from the River System

The irrigation network in Pakistan diverts 106 MAF of surface water. This system results in huge delivery losses both in canals and in watercourses. The net water supply at farmgate on an average is 62 MAF. The total irrigated area in Pakistan is about 18 million hectares. Most of this area is in the Indus basin. The major expansion in irrigated area, after the setting-up of Indus Irrigation Machine was brought by commissioning of Mangla and Tarbela dams in late 1960s onwards.

9.2 Current Supply Situation

The current situation is that Pakistan has suffered from a prolonged drought over past 4-5 years. The rainfall is erratic and scanty. The rivers flow at a subsided level. The water in Tarbela dam reaches the dead level almost in late February or early March each year. The March and April are most crucial months. This is the time when water is badly needed for maturing wheat crop in Punjab and for sowing of cotton crop in Sindh. The irony of the fact is that the availability during this period from the reservoirs have generally exhausted and is mainly dependent on surface water flows which are one of the lowest during this period. The major dependence generally is on exploitation of subsurface irrigation water to meet shortages, mainly in Punjab. Pakistan exploits about 48 MAF from the sweet subsurface water aquifer. This is at a huge cost in the shape of investments in energy (electricity/diesel bills), adding up to the cost of production. This increase in cost of production of crops is not generally compensated properly through increase in output returns. This makes the growing of crops under such irrigation scheme, a fragile and marginalized farming practice.

There is a severe pinch being felt of the shortage of water supply. To distribute water supplies and to share the shortages, an Indus River System Authority (IRSA) has been setup and is functional. The current reservoir capacity is rapidly silting up and live capacity has been reduced to 16 MAF. There are largely feuds among provinces, in IRSA on the issue of distribution of water supplies and the situation worsens during period of short supplies. The down stream provinces generally blame the up stream provinces for theft of water. To build a confidence, a telemetry system has been installed on major water bodies to gauge up down stream / diverted water supplies.

In coming decades, it is felt that the water available from the existing reservoirs would be cut down appreciably. The demand of water for households and industry would also expand, generating further squeeze of irrigation water supplies. This calls for a need for expansion in water supplies through building up fresh water reservoir capacity. There has been rumpus on the sites of the new dams and the issue is still unresolved.

9.3 Investment in Water Mobilization

Little investment in mobilization of additional water supplies for irrigation and expansion of irrigated areas has been made for over twenty years. The recent drought exposed the vulnerability of the vast Indus Basin Irrigation System and environmental issues in lower
river and the delta areas. Need for additional storage to improve and increase supply and provide greater operating flexibility has been felt. However, supply options are increasingly costly and approaching their physical limits and demand management (efficiency, productivity, pricing) has received little attention. Among the supply options, ground water development is already nearing its practical limits, water conservation may be able to add about 10-15% to total supply through improving efficiency of existing irrigation system which is reported to be 40%. WAPDA vision 2025 may improve situation slightly but with diminishing reliability. Till to-date efforts have been on solving water problems by focusing mainly on the supply side of the equation. The demand side – water delivery and use efficiency, governance, water pricing, rehabilitation and modernization of infrastructure and improved operation and maintenance (O&M), incentives for wise and productive use of water is being focused currently.

In order to ensure food scarcity and produce surplus for export and in consideration of looming constraints on water resources and irrigation development, water resources development and management in future need to be focused. This would require balanced approach to supply and demand management coupled with management of investment in water infrastructure and water management.

Expansion in infrastructure and water supply is felt necessary for poverty alleviation in rural areas. In the first instance, scant rainfall need to be harvested and conserved in the barani areas. The limited summer rains offer few opportunities for a good harvest of crops. Small dams construction through provision of incentive need to be encouraged for water storage and ground water recharge to be utilized during period of water shortages. The persistent low cropping intensity in both rabi and kharif seasons, the high proportion of landless and very small farmers in rural areas who might benefit from irrigation expansion or intensification and the high rate of population growth support that water supplies, irrigated areas and the productivity of scarce water supplies should be increased.

Currently about 0.7 million ha of land is being irrigated through rod kohi / hill torrent. The water flows from hills have high velocity, damaging standing crops, farm households / property and eroding fertile surface soils. Pakistan has neglected to tame the creeks generating hill torrents. There is a potential to irrigate 2 million ha of agricultural land and this would need an investment of Rs. 5 billion.

9.4 Water Requirements by 2025

The major driving forces creating additional needs for water in Pakistan are –

- Demographic pressure
- Rapid urbanization
- Socio-economic improvement
- Industrialization
- Better recreational facilities
- Improved environment
- Expanded irrigated agriculture
Irrigated agriculture consumes by far the major quantity of freshwater in Pakistan. Existing uses of available water include agriculture 93% (99 MAF), industry 3% (3.5 MAF) and households 4% (5.8 MAF). The existing water uses for crops is wheat 30 MAF, rice 19 MAF, sugarcane 15 MAF, cotton 18 MAF, fruits and vegetables 8 MAF and other crops 9 MAF.

Future water requirements (by year 2025) would be influenced by many factors. The anticipated population by year 2010 would be 168 million with annual increase of 2% and 221 million by year 2025 with an average annual increase of 1.81%. Accordingly water requirement to meet increased demand are to be met.

The actual consumption of various items of agriculture products for the year 2000 and anticipated requirements for the projected population by the year 2025 has been analyzed and estimated that approximately 20 MAF of additional water assuming a reasonable target of 50% increase in crop yield due to non-water inputs would be required.

9.5 Water Conservation

Water conservation and increase in the productivity or value of water are not an alternative as much as an imperative, since no amount of infrastructure investment is likely to make Pakistan or Indus Basin system water abundant. Water conservation is strongly linked to efforts to solve the chronic problem of the low productivity of water. There is considerable experience already in Pakistan with core element of water conservation – watercourse lining and land leveling – progress and experience on raising the productivity of water use, improving water course maintenance. However, organizing sustainable Water User’s Associations, or introducing water saving irrigation technology and crops is seriously deficient.

- Current canal water distribution is wasteful as 60-65 % of the water available at the canal head is lost through seepage, evapo-transpiration, before it reaches root-zone in the intended farmers’ field.
- Current irrigation methods and practices are wasteful and there has been little progress in introducing modern technology (low pressure pipe, drip/trickle, and sprinkler systems). Only casual progress has been made in land leveling an important approach to improve efficiency though it has been found to be most desired measure by farmers approached. Various estimates put the potential savings from current supply at about 10-15 MAF – primarily by lining of water course and land leveling under On Farm Water Management (OFWM) projects of province (s).

The challenges are daunting. Only about 32% of all watercourses have received some form of investment in renovation. Many of renovated watercourses have since deteriorated because of lack of maintenance attention.
9.6 Water Vision 2025

Water vision 2025 envisages mega program including development of 64 MAF of storage capacity with an investment of 50 billion over next 25 years in three phases. Phase-1 comprises fast track projects to be completed in first 5-7 years (2002-2006). This includes construction of Gomal Zam Dam, Mirani Dam, Greater Thal Canal, Kachhi Canal, Rainee Canal, Raising of Mangla Dam and Satpara Dam. These dams would add about 5 MAF and bring more than 0.8 million hectare of land under cultivation besides generating 332 m.w. of power. Feasibility studies for Basha Dam, Kurram Tangi Dam are underway. Detailed design of Sehwan Barrage and Chashma 1st lift project would also be started.

Phase-II include Basha Dam on Indus with 5.70 MAF storage capacity and power generation 3360 M.W, Sehwan Barrage on Indus with 0.65 MAF storage capacity Phase-II of Thar Rainee Canal in Sindh, Phase II of the Greater Thal Canal and a high Dhoke Pathan and combined storage from Sanjwal and Akhori Dams in Punjab.

Phase-III would include Kalabagh Dam with Storage capacity of 6.10 MAF, Yugo Dam on Syhok River in Northern Areas with 9.82 MAF capacity Skardu Dam with 15-52 MAF capacity and Kalan Dam on Swat River.

9.7 Water Management Program

For enhancement of water productivity, On-Farm Water Management Program in early 1970 under which various activities including lining of watercourses, precision land leveling, installation of high efficiency irrigation system and harvesting of rainfall in barani areas was started. The performance of this program was reported highly satisfactory. Beneficiaries’ participation through Water User Association has been one of the features of On-Farm Water Management Program for its onset. However, with time Water Users’ Association normally become inactive. After analyzing the reasons for incentivity two models i.e. transfer of management model and participatory irrigation management products have been planned in order to ensure farmers’ participation in O&M of the system and collection of abiana as well.

Various water-related issues have been identified for which strategy and interventions have also been suggested as under: -

9.8 Water Issues

- Dismally low efficiency –40% efficiency of IBIS.
- In-equitable water distribution within the canal commands.
- Poor Macro Water Management.
- Lack of coordination between suppliers and end-users.
- Delivery not compatible with cropping patterns.
- Un-used floodwater and runoff from hill torrents.
- Water logging and salinity.
• Rod Kohi system/barani areas.

9.9 Water Management Strategy

• Improving water productivity.
• Institutional Reforms.
• Minimizing water conveyance losses/field application losses (water logging and salinity).
• High Efficiency Irrigation System.
• Operational Management of Canal.
• Adjusting cropping pattern with water availability.
• Water efficient crop cultivars.
• Harvesting Hill torrent in Rood Kohi and saliba area.
• Farm drainage – 33 M.T (24 retained 13.06 M.T. Punjab and 10.4 M.T. Sindh)
• Farmers’ awareness.

9.10 Intervention for Improvement of Water Productivity

The following proposals need to be made for improvement of water productivity.

• Farmer’s training.
• Precision land leveling/laser land leveling.
• Reduce tillage/resource conservation cultivation.
• Raised bed cultivation.
• Rain water harvesting (Barani areas/Rod Kohi).
• Drip and Trickle Irrigation System.
• Sprinkler Irrigation System.
• Watercourse lining and improvement.
• Water storage reservoir.
• Demonstration centers.
• On-Farm Drainage.

The conclusion is that Pakistan has so far undertaken a few small-scale irrigation projects. The need for large-scale reservoirs is imperative. It takes a decade to build up a dam once the earth breaking ceremony has taken place. It appears that next decade in view of the changes in climate and lack of undertaking major water projects both for capacity building and conservation of resources in delivery and at the farm could be a period of difficulties. This situation will not only for agricultural water but the drinkable water for human settlements and for the growing industry can also pose a serious problem. The solution to this difficult situation is that Pakistan should immediately go for large-scale capacity building for reservoirs, conserve water resources through modern agronomic practices and encourage the adoption of pressurized irrigation system as sprinkler/drip at least for high value horticultural/ medicinal crops.
The Government is aware of the need for on-farm water management program. The Prime Minister has already directed MINF AL to put up a development program for concrete lining / earthen improvement of 82000 watercourses of the country in 4 years. The Ministry of Food, Agriculture and Livestock is already working on this program and it would require an investment of Rs. 54 billion.

10. FARM MECHANIZATION

Animal draft has conventionally remained a source of traction powers at farm over centuries. All operations at farm from tilling of the land to sowing, cultural management practices, lifting of water from shallow wells, harvesting, threshing, winnowing and transport were carried through animal provided draft. The use of fuel run machinery is a matter of about half a century. The major focus in the area came since the times of green revolution in late 1960s when the high yielding varieties (HYVs) inspired farming community for paradigm shift in adoption of other new technologies including farm mechanization. The major emphasis has been on farm traction, exploitation of sub surface water resources from sweet water aquifer, harvesting/threshing of crops, spraying of crops against insects, pests/diseases and pressurized irrigation operations. The description is as follows: -

10.1 Tractors / Bulldozers

Tractor is a symbol of progressive farming that brings along with it adoption of improved technologies as quality seeds, integrated pest management and improved cultural/harvesting technologies. The traction power available in Pakistan is 0.6 Hp/ha against FAO scale of 1.42 Hp/ha.

Local tractor industry manufactures five types of tractors including Massey Ferguson, Ford, Fiat, Belarus and M.T; with a capacity of 30,000 tractors per annum. The traction range is 47-86 Hp. At present Pakistan tractor’s manufacturing industry is operating under a vertically integrated monopoly market structure with little competition in either price or quality. WTO trade restrictions are likely to be waived off within next two years, making the work an open market, therefore, manufacturers have to improve and become expert. There is a need to change production strategy to meet the coming challenges. A future vision and management plan is to be put in place in order to facilitate the transfer of technology. Natural transformation in deletion program and transparency in this program is to be brought in for new entrants. The new fuel-efficient and pollution free tractor’s models are yet to be introduced in the market. In addition to tractors, MINFAL is in the process of building capacity of the provinces through inducting new 600 bulldozers. This will help in earthen embankments for water bodies in water deficit areas particularly in Balochistan and also help in land development from the current culturable waste areas.

10.2 Tube-wells

Out of 531,296 tube wells 413,228 numbers (77%) are reported to be diesel tube wells needing 10-25 Hp prime movers for operations. Whereas majority of tube wells are being
operated with local 50 Hp tractors considered as inefficient use of the prime movers leading to high cost of production. The wider choice for machinery selection could allow improving socio-economic conditions of small farmers through increase in ownership of tractors, which stand 10% as per agriculture machinery census.

In-efficient use of scare irrigation sources is another area where intervention is required. The existing tariff structure on import of high efficiency irrigation equipment i.e. 10% custom duties and 15% sales tax is not encouraging its promotion. Agriculture sector being a backbone of our economy should have been treated at par with other sectors of the economy. The situation is required to be corrected for achievement of 5% growth rate besides producing surplus for export earnings.

10.3 Other Farm Machinery

At farm a large number of farm machines are used for various operations for sowing, cultural management practices, application of agro chemicals, harvesting and for post harvest operations. In addition, pressurize irrigation system as drip and sprinkler are being introduced for efficient use of scarce water resource for high value crops.

10.4 Constraints

The process of mechanization of agriculture faces the following issues:

- Tractor sales depend on institutional credit.
- Limited use of farm implements.
- Poor quality of locally produced farm equipment.
- High initial and maintenance cost of the pressurize irrigation system and inadequate knowledge/skills at farm to operate the system.
- Tilling machinery is mainly limited to cultivators, the continuous use of which creates hard pans.
- Inadequate renting services for the agricultural machinery.
- Insufficient/non-availability of rice transplanting and cotton picking machinery.

10.5 Policy Proposals

Import of agriculture machinery is heavily taxed ranging 15-35%, thus discouraging the adoption of latest technology in agriculture sector. Considering future challenges of globalization and role of agriculture machinery in the agriculture production system transfer of technology through following steps is to be facilitated:

- The tractor deletion policy (ISDPO) that prescribe new entrants must start at a minimum level of 60% (50-60 Hp tractor) and catch up to industry level (85%) within 2 years be reviewed. New investors due to non-competitive environment are reluctant to make new investments in tractor’s new plants. To create competitive healthy environment for the
industry in the wake of WTO membership, the current policy that prohibits or taxes excessively on importation of farm machinery would need to be changed. This would need tax holiday for companies that achieve 70% to 100% local values added production of tractors and manufactured parts components and assemblies. These arrangements would help to develop a dynamic private sector driven by competitive market forces. In order to encourage investment in tractor industry, minimum 30% deletion as benchmark for new entrants is suggested.

- New contract in tractor manufacturing industry would either face large hurdles with domestic vendors of sub-assemblies or would have to vertically integrate. In addition, a new entrant besides official sanction would be required to negotiate with Engineering Development Board for a domestic contents schedule, which poses a serious barrier to new entrants. Waiving off this condition may facilitate manufacturing of 30 HP tractors in the country. To allow small farmers wider choice for machinery, selection of small tractors below 30 HA with implements in CBU/CKD may be considered for import at zero duties/taxes for at least three years. Import of high efficiency irrigation equipment such as sprinkler, drip and trickle system both in CBU/CKD at zero duties/taxes need to be allowed in order to utilize scare water resources efficiently. It would supplement Government efforts to control water logging and salinity besides improving quality of both cereal and horticulture crops for increased export.

- The incentive of allowing free of duties/taxes import of new/re-conditioned agricultural machinery and equipment by overseas Pakistanis from their earnings is worth for consideration on the same conditions permissible for import of cars.

- Diesel engine manufacturing industries is at infant stage. The use of diesel engines for irrigation needs not to be over emphasized. The cost of POL is on increase therefore, agriculture sector demands qualitative machinery i.e. fuel-efficient. There is urgent need that diesel engine of good quality for running of tubewells are allowed to be introduce and subsequently their local manufacturing need to be encouraged.

- Pre and post harvesting losses of cereal crops needs to be checked through promotion of combine harvesters along with auxiliary equipment. Due to their initial high cost these look beyond the reach of average farmer. This is plausible through establishment of agro-service centers wherein small farmers’ needs can be addressed more appropriately. Incentives/support through provision of credit facilities need to be encouraged for establishment of agro service centers in the country.

- Implement manufacturing industry has been provided incentive of zero duties/taxes. However, quality of equipment manufactured locally need to be further improved through transfer of heat treatment technology. Concerned Departments, therefore, need to establish extension service for capacity building of local entrepreneurs. Due to continuous use of tractorization and soil puddling in rice growing areas hardpan formation
leave started restricting movement of plants roots thus affecting good crops yield. Use of productivity enhancing implements thus, needs to be promoted through mass media Program.

- The prospect for enhancement of export of horticultural crops are promising. However, facilities available on farm for preserving quality as well as increasing shelf life of horticulture produce are inadequate. As a result high levels of post harvest losses in horticulture crops are reported. In order to maintain freshness and quality of horticulture crops for export as well as local marketing, cold-chain and grading facilities are to be created and strengthen. Participation of private sector needs to be ensured through liberal credit facilities.

- It has been reported that continuous pumpage has lowered the level of ground water to the extent that quality of water has shown sign of deterioration. Efforts are therefore to be made to conserve land resources likely to be affected with the use of poor quality of water. In this regard, possibilities of installation of skimming wells in these areas in coordination with provincial departments need to be encouraged.

- Taking into consideration economic conditions of small farmer and cost of new agricultural machinery import of second hand machinery along with extending loan facility by credit institutions for purchase of second hand agricultural machinery need to be examined for accelerated agricultural mechanization in the country.

- A Committee of Parliamentarian that met under chairmanship of Food and Agriculture Minister has already recommended to the Government to allow duty free import of tractor not manufactured in Pakistan of traction power lesser than 35 hp and larger than 100 hp.

### 11. LAND USE PLANNING

The geographic area of Pakistan is 79.61 million ha. The cultivated area is 22.27 million ha. Out of this, 15.67 million is irrigated and the rest is dependent upon rains. The area under forest is 3.8 million ha, and under rangeland is about 52 million ha.

#### 11.1 Land Capability Classification

Land capability classification is a method of appraisal and grouping of soils to show their relative suitability for sustained production of agricultural crops or for grazing or forestry. It takes into account general agricultural uses including range /forest land, but no special agricultural or non-agricultural uses, which may be made of certain land.

Pakistan’s soils have been categorized into 8 classes. Soils placed in the highest class (I) have the least limitations for agricultural use and can be used for obtaining high productivity of crops with proper management. The classes II and III have relatively more limitations for agricultural use and need much better management for producing crops. These problems are severer still in soils of class IV which, though capable of producing a few marginal crops, have little possibility for improvement. Soils in the
lowest four classes (V to VIII) are not suited to arable farming. The soils placed in classes V to VII can however, be used for rangeland or forestry. Their suitability for these uses gradually diminishes from well suited in the case of class V to poorly suited in the case of class VIII land. Soils placed in class VIII are agriculturally unproductive.

The major limitations determining agricultural potential are: wind and water erosion, salinity and sodicity, water logging, flooding and ponding, difficult tillage due to surface/subsurface clays, sands, subsoil compaction or pan formation, surface crusting, nutrient depletion and structure deterioration. The severity of these limitations and their ill effect on agricultural production varies from no limitation, slight, moderate and severe in different parts of the country determining agricultural potential as very good, good, fair and poor respectively when compared with the requirement of major agricultural land use of the area.

Waste land are the potentially suitable tract of land lying uncultivated within cultivated areas due to some major limitation and needs major input technology from Government or public sector for becoming productive lands. Culturable wastelands includes waterlogged soils, flood watered areas, salt affected soils within canal commands and land lying barren due to shortage of irrigation water.

11.2 Management of Degraded Lands

Common forms of land degradation of arable or non-arable agricultural land uses are:

a. **Soil Salinity and Sodicity**

Soil salinity refers to excessive accumulation of salts in soil where as soil sodicity is excessive absorption of sodium on soil exchange complex (clay particles) so as to impair seed germination or plant growth.

Soil Survey of Pakistan has recognized several types of saline and saline sodic soils during course of reconnaissance soil survey. The strategy for control of these problem soils is as follows:

**Strategies for the Control of Salinity and Sodicity**

**Canal-Irrigated Areas**

- Adequately, meeting the water requirements of crops and soils, by limiting the cropped area, to match available water supplies fully satisfying their leaching requirements.
- Reclaiming saline and saline-sodic soils through the use of gypsum. Heavy irrigation should be used only when a drainage system exists or when natural drainage, a permeable substratum, is available, if these conditions cannot be met, biological measures i.e., growing salt tolerant plants, should be used.
- Temporarily embanking and slightly lowering the level of small saline patches within cultivated fields would effectively leach their excess salts; for the reclamation of slick spots, gypsum would have to be used (1-1.5 kilograms per square meter of the affected area) alongside the above practice.

**Tubewell (or Canal plus Tubewell) Irrigated Areas**

- Active guidance and supervision of farmers using tubewell water, by providing timely information on the quality of their tubewell water, as well as by explaining or demonstrating the consequences of using low-quality water for irrigation. The maximum permissible Electrical Conductivity (EC)/salt concentration, Sodium Absorption Ratio (SAR) and Residual Sodium Carbonate (RSC) values of irrigation water for different kinds of soils may be standardized.
- Disposal of poor quality groundwater pumped by tubewells through drainage ditches or canals and distributaries, instead of use for irrigation, locally. This water may be used for the irrigation of sandy soils and for growing a few salt tolerant crops.
- Amelioration of soils affected by poor quality water through the application of gypsum (2-3 tones per ha) since most of these soils are afflicted only by sodicity.
- Popularizing the continuous use of gypsum on soils already affected by poor quality water or where irrigation with poor quality water is unavoidable.

**Uncultivated Areas**

- Proper embankment of uncultivated saline soils to check salt contamination, through run-off of adjoining low-lying cultivated areas.
- Planting vegetation, which could provide surface cover against salts blown by winds or which could improve soil fertility. Local plants, adapted to saline and drought conditions with some economic/social value in terms of forage, wood and shade, would be preferable.

**b. Water Logging**

Water logging is a condition of rise of water table in soils. This creates saturated condition in the root zone of common crops. This affects crop growth in one-way or other. The concept of water logging is not generally clearly understood by the common people. Many of them regard soils as waterlogged if the groundwater table occurs within 3 m (10 ft) depth from the surface. It has, however, been found out during soil survey in different parts of the country that the major farm crops seldom suffer from excessive wetness so long as the water saturation zone remains below 1.5m depths in all types of soils. If the soils are somewhat sandy, the required upper depth limit would be about 1m. In fact, the cropping on sandy soils is much benefited rather than suffering from rise of
water table to this depth for the inherent droughty conditions of these soils, which are offset by sub-irrigation from the groundwater, especially when it is fresh from the canal seepage as is mostly the case in canal-commanded areas. The strategy for control of water logging is as follows:

**Strategy for the Control of Water Logging**

- Control of excessive water seepage by lining canals and distributaries in sandy soil areas.
- Encouraging the installation of small, shallow tubewells to pump groundwater accumulated from canal seepage for irrigation.
- Effective control of irrigation in the more permeable soil areas, by not allowing the cultivation of rice on loamy soils and sugarcane on sandy or somewhat sandy soils.
- Provisions must be made for an effective drainage system (preferably with open ditches) in the waterlogged areas. The drains could be designed to keep the water-table below a 1.5 meter depth in areas growing cotton or fruit trees, and below 1 meter in other areas; improvement, realignment (where necessary) and proper maintenance of existing systems.
- Opening old natural drainage channels in urban areas by constructing bridges for roads, railways and other structures blocking these channels; planned diversion of sub-surface water through artificial drainage systems where the opening of natural channels are not feasible.
- Guiding farmers to adjust field size and irrigation timings according to the physical properties of the soil: a smaller field size for relatively sandy or more permeable soils and larger fields for clayey or less permeable soils; short watering periods to check flooding in the more permeable soils.

c. **Erosion**

**Soil Erosion:** Soil erosion refers to loss or removal of surface soil material through the action of moving water, winds or ice. By mode there are two types of soil erosions i.e. water erosion and wind erosion.

**Water Erosion:** It is most evident in the areas of high relief, humid and sub humid climate and very gently to gently sloping level plains without vegetation cover.

**Strategies for the Control of Water Erosion**

**Mountain Areas**

- Protection of existing natural vegetation from excessive browsing, illegal cutting and uprooting / burning through active supervision by concerned organizations like the Forest Department.
- Re-greening bare slopes, where feasible, through reseeding and replanting with suitable plant species; proper care of growing plants until they are
fully established and effective control, thereafter, on grazing particularly by nomadic livestock (rotational gazing).

- Restricting cultivation on steep slopes, if land has already been cleared for cultivation, such slopes should either be replanted or reseeded with suitable tree/bush species, or proper bench terraces should be constructed and maintained,
- Provision of alternate source of fuel, food, fodder and other requirements for the local people.
- Generally improving accessibility and the infrastructure necessary for administrative control and social welfare in areas affected by soil erosion.

**Potohar Plateau**

- Protection of existing natural vegetation from excessive browsing, illegal cutting and uprooting/burning by the local inhabitants and nomads, through active supervision by concerned organizations like the Forest Department.
- Protecting loose terrace remnants from being leveled for cultivation; the remnants along with their side slopes should be replanted where feasible, to stabilize them.
- Making mechanical power available to the common farmer for deep ploughing, chiseling and subsoiling where required. This would help to improve existing cultivated terraces to enhance water absorption and minimize run-off from sloping land.
- Construction and improvement of bench terraces and water-drop structures, strengthening of field and terrace embankments and adoption of contour-ploughing and strip-cropping techniques on gently sloping un-terraced cultivated land.
- Growing strong-rooted plant species along the banks of gullies and active streams.
- Plugging animal burrows with stone or earth.
- Providing proper vegetation cover or leaving stubble on the fields during the rainy season.
- Formulating soil-specific cropping patterns that include crops, such as groundnut, that provide effective soil cover during the rainy season.
- Growing and ploughing-in leguminous or green manure crops at regular intervals, to improve the organic content of soils and to reduce its erodibility.

**River Plains**

- Afforestation of stream banks, especially those subjected to deep flooding, sedimentation or erosion by the rivers.
- Local leveling/terracing of non-gullied escarpments and planting with suitable salt tolerant and drought-resistant species.
- Proper leveling of fields, to minimize run-off.
Wind Erosion: It is most evident in sandy areas of Thal, Thar, cholistan and Kharan deserts of arid climate where speedy wind blowing is common. Its main forms are drifting through creep, shifting through suspension and saltation, formation of dune, sandy ridges and burial of good land with sandy soil cover.

Strategies for the Control of Wind Erosion

Thal, Thar, Cholistan and Kharan Desert Areas

- Effective control of grazing, and a check on the uprooting, cutting and burning of natural vegetation growing on sandy ridges
- Restriction on the cultivation of sandy ridges, a check on their leveling and the use of their sandy material as cover for adjoining valley soils under arable use; scraping back sand from already affected soils onto adjoining ridges, and re-stabilization of ridges through vegetative cover.
- Stabilization of sand dunes and activated parts of sandy ridges in areas adjoining irrigated land through reseeding with adopted plant species, followed up with proper plant care and control of grazing.
- Growing shelter hedges around cultivated fields located near active sandy ridges and exposed to the wind.
- In some countries, the special lubricants are sprayed on the sandy desert and cultivation is carried out through drip irrigation. Possibilities may be explored for use of such techniques under local conditions.

The River Plains

- Persuading farmers to avoid dry tillage of their fields, especially during dry and windy periods such as early summer.
- Discouraging the removal of vegetative cover from sandy ridges, especially those located in arid and semi-arid areas, by providing alternative sources of fuel and other basic requirements.

d. Soil Contamination

It refers to addition of toxic or otherwise detrimental substances to the soils in significant quantities so as to affect their chemical composition. It is generally brought by application of chemical industrial wastes, sewerage water, biocides or excessive or inappropriate fertilizations.

Strategy for Management

- Education and awareness
- Implementation of national environmental regulations
- Installation of waste water treatment plants
- Water quality management of agriculture sector
11.3 Rapid Urbanization

The large chunks of productive and fertile land around cities have fallen victims to rapid urbanization/colonization. It needs to be realized that land is a non-renewable resource and nature takes thousand of years to convert a pile of raw parent material into living natural soils. A case study of Peshawar has revealed that over the past 20 years, the city has lost over 2,700 ha of good agricultural land to urban users.

There are no data available on the level of urbanization over past many decades. There is a need to collect such data. Rather than expanding the existing cities it would be advisable to build up new cities/townships on marginal lands to save the valuable and productive land resources.

11.4 Land Use Policy

The non-agricultural uses of land like urbanization; industrialization and construction of roads are blemishing the whole landscape. These threats of national disaster demand a national policy for conservation and rational use of land resource. Such a policy could ensure the use of marginal land for non-farm uses instead of grabbing prime agriculture land.

Currently Soil Survey of Pakistan has selected five districts viz Lahore, Rawalpindi, Peshawar, Quetta and Hyderabad. It is designed to update land resource inventory in these districts. The digital topographical maps will be prepared for these districts according to land capability for field use. In addition, it is planned to group the soils on the basis of land capability into about 80 major types, i.e. 30 in Punjab, 20 in Sindh, 20 in NWFP (incl. Federally Administered Tribal Area (FATA) and Northern Areas (NA) and Azad Jammu and Kashmir (AJK) and 10 in Balochistan. Each the farmland type will then be studied through economic analysis under the promising crops or land use types/systems at medium and high levels of management and inputs. It is estimated that there will be a total of 200 to 250 land suitability mapping units to be recognized throughout the country. As a result of this exercise, the following two types of district maps will be produced at 1:250,000 scale, which will be accompanied with description of each mapping unit delimited on them.

- Land Suitability
- Land Use Planning Units.

Legislation and Regulatory Authority: It is advisable that Pakistan should legislate on appropriate land use. In additional, a Land Use Regulatory Authority needs to be established.
12. PROMOTION OF AGRICULTURAL EXPORTS

12.1 Concept of Export

Conceptually the exports of agricultural commodities in Pakistan over decades have been confined to surpluses. Any time there is a bumper crop; Pakistan starts pushing for export of that commodity. All commitments for export generally suffer from a summersault in the shape of Government bans, restrictions and mounting duties in case of marginal or short crops. This is a faulty concept of export and the international community cannot wait for our surpluses. There is a need for a regular and consistent export of commodities, maintaining our presence and business in the World market.

12.2 Liberal and Consistent Trade Policy

Pakistan’s export policies in the past have been marred by regulations, restrictions, bans and infrequent changes leading to inconsistencies in trade of agricultural commodities. In addition, the market distortions through infrequent public sector interventions both in domestic and the export markets in 1980s and 1990s ridiculed the role and growth of private sector. The country has undergone a massive restructuring of macro economic policies wherein a large number of public sector corporations/entities have been closed down. The private sector has been given a lead role primarily based on market economy. The role of public sector has been confined to minimal only for wheat crop, which is the basis of Pakistan’s food security or to address some of the distressing situation. Other trade deregulatory measures have been taken allowing free export and import of all commodities in agriculture sector. The only exception to this rule is the import of cotton seed, which is the prohibited area mainly because of quarantine measures/sensitivity of cotton to seed borne diseases. Pakistan has already suffered a loss of $ 1.1 billion through cotton virus and we do not intend to increase our vulnerability by exposing our system to any potential threats. Hopefully, these trade policies would remain consistent and help Pakistan when the World trade is globalized under WTO regime.

12.3 Transforming from Imports to Exports

Pakistan over years was importing about two million tons of wheat every year. This was an area of our main focus. As a result of concerted efforts in the field of agriculture production, Pakistan has become an exporter of wheat. Last year, 1.2 million tons of wheat was exported. In addition Pakistan is venturing to promote export of horticultural, livestock, fisheries and other products.

12.4 Export Led Production

Pakistan’s export policy based on export of surpluses has proven erratic and faulty and has minimized the Pakistan’s revenues through infrequent absconding from the export market. There is growing realization in Pakistan that we should now come up with an export led production system and should initiate to grow for export program, meeting requirements and consumer tastes overseas. A classical example is of Kinno which
inspite of excellent quality has plenty of seeds that hinder its acceptability in the international market. Pakistan has already launched a program to produce and introduce seedless fruits including Kinno. In addition, many countries do not allow entry of Pakistan’s fruits mainly because of the threat/risk of fruit fly. The high use of agro chemicals in our crops is another area of concern, which can in future hinder Pakistan’s trade of agricultural commodities. An Integrated Pest Management Program has been initiated to guard against indiscriminate use of pesticides. To further supplement the effort a pesticide residue-testing laboratory has been established in Karachi to test and certify the residual levels of agro chemicals in our agricultural commodities/products.

12.5 Quality Assurance for Exports

Pakistan exports had badly suffered being substandard and of heterogeneous quality of its products. This has generally remained a neglected area in the past. In recent years, Government has made heavy investments for improvement of the quality of its agricultural products through:

- Two, grain-testing labs are being established at Islamabad, and Karachi to assure quality of cereal exports. Incentives were also offered to private sector for upgrading quality of wheat for export purpose.
- Quality standard have been fixed through legislation and a program of clean cotton is being launched and incentive prices to the ginners/growers are being offered for carrying out this scheme.
- In fruits and vegetables Pakistan’s prime focus is in the area of improving quality of these commodities through grading. Pakistan has excessively used wooden crates as packing material. In view of increasing competition and the threat of transfer of insects and diseases, the international market is showing reservation to accept such packing material. A process has been started for upgrading packaging industry for fruits and vegetables using card boards.
- Plans are underway to link up recovery of sugar to the sugarcane prices.
- A pesticide residue-testing laboratory has been established at the premises of Plant Protection Department, Karachi.
- The animal and plant quarantine facilities and services are being upgraded. The quarantine services are being strengthened at a number of dry ports through establishment of new laboratories.
- The handling facility at fishing vessels and at auction hall has been overhauled. A massive improvement has been made in fish processing facilities. The fish processing units have been registered in Europe, meeting their quality standards.
- Modern abattoirs have been established at a number of places meeting the quality standard of the exporting nations mainly Saudi Arabia and Gulf States.

12.6 Agricultural Export Promotion Cell

In order to address the issues of prompt actions for export of agricultural commodities and to keep vigilance around the globe for potential export of Pakistani agricultural
commodities, a proposal is under consideration in MINFAL with the blessing of the Ministry of Finance to create an Agricultural Export Promotion Cell. This Cell will be manned by marketing experts and analysts of international repute and will be based in Agricultural Prices Commission, MINFAL.

13. AGRICULTURAL MARKETING

Pakistan’s agriculture sector is undergoing fundamental structural changes. These changes form a part of the overall economic policy reforms being pursued by the Government in the move to a market based system with an expanded role for the private sector.

About two third of the total production is consumed on the farm or traded within the local area, with the remaining as marketable surplus. It is generally seen that the prices crash during the post harvest seasons to the dis-advantage of farmers. Many times, the farmers have to off load their produce at throw away prices. These distortions deprive the resource poor farmers of the meager capital and serve as barriers for adoption of improved technologies.

13.1 Current Marketing System

Most of our agricultural produce/commodities pass through a number of players. Among these the most important are wholesalers and commission agents who constitute important intermediaries for several products specially food grain that is not subject to Government support price. In case of cash crops the downstream processing industries, ginning factories, sugar mills and tobacco companies are mainly agencies to which growers sell their produce. For vegetables, village / local sales are important only for less perishable commodities such as onions and potatoes. These are taken to wholesale markets and are sold to whole sellers or commission agents. Commission agents purchase the agricultural produce/ commodity on behalf of producers and charge a fix percentage as per market rate for the produce as commission charges. The wholesalers make purchase through open auction and sell to sub-wholesalers (pheria) in small lots who then sell to the retailers after grading. Such an imperfect market system leads to several unfair trade practices e.g. coalition among traders to suppress prices, excessive rates of various intermediary services, unreasonable quality and weight deductions, hoarding and price exploitation. Exporters mostly meet their demands through contractors in case of fruits and vegetables but at times make purchases from whole sale markets.

Based on these realities it has been observed that markets in Pakistan are not well co-ordinated. Resultantly there is monopoly of cartels in the form of commission agents and whole sellers, who exploit and deprive farmer of his/her share by manipulating demand and supply situations. Large number of farms with a size below subsistence holding level is another irritant. Major proportion of our food grain is sold to village shop-keepers, itinerant markets and others who purchase the produce during harvest to sell subsequently at higher prices. Such sale at village level is disadvantageous to small farmers. The main reasons include inferior trade practices and inadequate information at local level.
13.2 Constraints

One of the most important constraints in the marketing system of the country is the glut supply condition at the peak harvesting season. It has been observed that at the peak harvesting season of the agricultural commodities particularly in the case of perishable produce, most of the time the growers losses even their cost of production. During surveys and marketing studies, it has been pointed out by the farmers that when the supply of fruit and vegetable reach at peak, some time they can’t get even the cost of transporting their produce to the market. Thus in many cases they prefer to throw away instead of taking it to the wholesale markets. Secondly, grows suffer due to lack of their knowledge about the market where they can get better return for their produce. The non-existence of domestic grading and held in abeyance of grading for export is also causing less return to the farmers. Post harvesting losses which are recorded 30% to 35% is another problem faced by the growers.

13.3 Legislations

In the province of Punjab the legislative cover is available in the shape of Agricultural Produce Markets Ordinance (XXIII of 1978) Amended-2001. There are 132 regulated markets in the province operating under this act. Presently the market committees in the province are categorized as; (i) 23 category “A”, (ii) 44 category “B” and (iii) 65 category “C”. Similarly, the Government of Sindh has an amended and updated “Agricultural Produces Marketing Act, 1939 and Rules, 1940” to regulate agricultural produce marketing in the province. Balochistan Government has also adopted the Act from Punjab namely “The Balochistan Agricultural Produce Market General Rules, 1995”. The Government of NWFP has prepared their draft Rules and is under submission for approval.

13.4 Future Plans

In order to overcome the problems of the marketing system in the country a project namely “Improvement of Agricultural Marketing” is in the process of approval. The project aims to restructure and strengthen agriculture marketing system and marketing information mechanisms in all provinces. The Project “Improvement of Agricultural Marketing” is a step in the direction of providing agriculture sector a boost. Keeping in view project's mandate and resources that can be made available a short listing of problem areas has been carried out for focussing project interventions in some areas whereas for others endeavours will be made to devise responses and other complimentary and supplementary interventions. Overall objective of the project is to restructure and strengthen agriculture marketing information mechanisms in a manner which would make agriculture more remunerative for the producers while at the same time assure fair returns for the traders and more stability in supply of commodities and their prices for the consumers. The project is expected to have a positive impact on national incomes, export earnings, opportunities and an improved environment for private sector investment in agriculture and down stream agribusiness.
The project will have multi components that will build upon the strengths of the existing institutions of public sector at the federal and provincial level. Activities of the project are also expected to supplement and compliment activities of other development projects in the sector.

13.5 Dissemination of Market Information

Collection, compilation, analysis and dissemination of market information is one of the functions of the Federal Agricultural and Livestock Products Marketing and Grading Department. Daily prices of 200 items are presently being collected, from important markets, through its market intelligence services. Prices of 24 essential items from 11 markets of the country are collected and disseminated to the stakeholders, press and radio. A monthly summary is prepared for Economic Coordination Committee of the Cabinet (E.C.C). In order to further improve the market information system, the "Improvement of Marketing" Project provides for in depth service provision through the Provincial marketing agencies. The details are as under.

<table>
<thead>
<tr>
<th>Province</th>
<th>No. of Markets at District Level To Be Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab.</td>
<td>34 markets to be linked with Provincial Clearing House based at Lahore.</td>
</tr>
<tr>
<td>Sindh</td>
<td>14 markets at district level shall be linked with Provincial Clearing House at Hyderabad.</td>
</tr>
<tr>
<td>N. W.F.P.</td>
<td>9 markets to be linked with provincial Clearing House to be based at Peshawar.</td>
</tr>
<tr>
<td>Balochistan</td>
<td>15 markets at district level to be linked to Provincial Clearing House at Quetta.</td>
</tr>
</tbody>
</table>

The Provincial Clearing House will in turn be linked with Federal Clearing House within Department of Agricultural and Livestock Products Marketing and Grading at Islamabad. The prices prevailing in important markets of the country will be displayed through electronic digital display boards to be installed in the market premises. Agriculture Database is also proposed to be established under the project.

13.6 Grading, Waxing and Packing

Quality conscious markets demand the commodity to be mechanically graded, chemically treated, waxed and packed in attractive and strong packages. Government may create atmosphere conducive for development of grading, waxing and packing/packaging
sector. The facilities may be provided in the producing areas and at the export point for benefit of export trade.

Proposals have been prepared for provision of mechanical graders of potato, onion, mango and apples. Citrus grading plants have already been installed in Sargodha region.

13.7 Improvement of Quality of Agricultural Products

In order to improve the quality of agricultural products, emphasis may be laid on pre and post-harvest technology. Various reports have shown that post-harvest losses of perishable items range between 25 - 35 %. Focus should be to reduce such losses by adoption of better harvesting, handling, storage, packing and packaging and transportation of the produce. The greater emphasis would be placed for adoption of cold chain transportation and modern ware-house storage systems. A system of grading and quality certification is implemented by the government under the Agricultural Produce (Grading and Marking) Act. Grades and standards of quality of agricultural and livestock products have been laid down for export purposes. The system of grading has improved quality of export consignments as well as increase per unit price of the produce. The grade standards are in line with international standards and have general acceptability in international markets. The future focus would be on the followings:

- In order to save the growers from the exploitation of the market intermediaries, Agricultural Markets would be strictly regulated and the Agricultural Markets Act would be amended to suit the new developments in global agricultural marketing.
- A number of malpractices exist in marketing of agricultural commodities. These include, under weighment, undue deductions, delayed payments, over charges of market fees. Such malpractices would be controlled and eliminated through supervisory committees consisting of Provincial Agriculture Departments, local market committees and growers.
- Quality standards and grades for all food items need to be reviewed in line with WTO requirements and laboratories for certifying these grades would need to be improved/upgraded.
- Agricultural Prices Commission is being entrusted with the responsibility to watch the implementation of WTO rules in the country as well as to point out their non-implementation and misuse in the rest of the world and recommend proper action at the part of the Government.
- Sugarcane cess will be used extensively to construct new farm-to-market roads or improve the old ones so that growers have better market access and can get better prices for their produce.
- To improve the processing of agricultural produce in the country, import of modern machinery for processing, grading and packing would be made duty free.
- Institutional credit for balancing and modernization of agro-based industries would be encouraged.
Sugar Factories Control Act is being amended to suit the new development in sugarcane crushing.
- In order to improve the marketing of sugarcane, payment of sugarcane prices on the basis of its sucrose contents would be ensured.
- Quality standards in cotton marketing will be strictly implemented.

14. SUPPORT PRICES AND PROCUREMENT POLICY

The Agricultural Prices Commission (APCom) was established in 1981 under resolution of the Federal Government. The objective was to conduct scientific studies for providing basis for fixing support prices of agricultural commodities for shielding the farmers against abnormally low prices. The basic idea was to ensure certain minimal level of farm profitability to continue attracting investment in improved technologies.

14.1 Support Price System

The rationale of support prices is as follows:

- During the post harvest season, most of the farmers dispose off their commodities because of liquidity crunch. As a result the prices sharply crash causing a loss to the farming community. This vulnerable community is therefore required to be protected during the post harvest season.
- The agro-based mills/factories as well as village/town commission agents usually form cartels, hurting interests of growers in various ways. In times of glut they reduce demand and create price instability.
- Because of huge agricultural subsidies provided by the industrial nations to their farmers, Pakistani farmers are generally at a disadvantage to compete based on free market economy. Some protection needs to be given for a level playing field.
- Demand for most agricultural commodities is inelastic; therefore, slight changes in supplies affect the prices considerably.

14.2 Support Price across the World

System of guaranteed minimum price also called support price has been adopted by a number of countries as a price stabilization measure for agricultural commodities. In this system, farmers are ensured a minimum price of their produce as safeguard against fall in prices. Notwithstanding the current trend towards liberalization of economic activities, programs providing for guaranteed producer prices aimed at correcting the deficiencies of the market system of farm commodities are still in vogue in many countries including USA, EC countries, Turkey, Egypt, Brazil, Argentina, CIS States, Russia, Japan, Saudi Arabia, Australia, Canada, Indonesia and even our neighboring country India. USA, EC countries, Japan and various other European countries are protecting their growers since 1940’s. Under Common Agricultural Policy, the EC countries have progressed a lot by...
ensuring a minimum price to the growers for their produce. Their annual subsidy goes into billions of dollars. In order to protect growers, India established Agricultural Costs and Prices Commission in 1968, since then, Indian growers are being ensured a minimum guaranteed price for their produce.

14.3 Support Price in Pakistan

In Pakistan, Agricultural Prices Commission recommends support prices of some specified crops on scientific lines. Initially eight crops were included in the support price net. These crops were wheat, cotton, rice, sugarcane, non-traditional oilseeds (sunflower, soybean, safflower and canola), gram, onions and potatoes. There is no provision of prohibiting the support price programs under WTO if total support does not exceed 10 per cent of the agricultural GDP. In Pakistan’s case what to speak of 10% of GDP, it is even less than zero per cent i.e. negative. However, under the pressure of some donor agencies like International Monetary Fund (IMF) and World Bank, the Government of Pakistan had to cut its support price program to four main crops namely wheat, cotton, rice and sugarcane in 2001. The support prices for the year 2003-04 have been fixed at wheat Rs. 350/- per 40 kg, cotton Rs. 850/- per 40 kg of phutti, basmati rice Rs. 485 per 40 kg. of paddy and irri rice Rs. 215.

The implementing agencies i.e. Cotton Export Corporation (CEC) for cotton and Rice Export Corporation of Pakistan (RECP) for rice were closed down on the pretext that these organizations were running into losses. However, the CEC never ran into losses and the loss of RECP did not exceed the tax paid by this organization to the Government of Pakistan. Under the pressure of international donor agencies these organizations were closed and the task of implementing the support price of seed cotton was entrusted to Trading Corporation of Pakistan (TCP), whereas the task of implementing the paddy prices was given to Pakistan Agricultural Services and Storage Corporation (PASSCO).

After winding up the Agricultural Marketing and Services Limited (AM&SL), there has been no regular agency to procure potatoes and onions. The same has happened in case of oilseed crops when the Ghee Corporation of Pakistan (GCP) was wound up.

For considerations of equity, productivity and agricultural development and regular consumer supplies, support prices for farm commodities are in the overall interest of the sector and economy. There have been instances when the market prices of rice (paddy), gram, onion and potatoes were trending downward to un-remunerative levels. However, under such conditions with limited and small scale interventions by the designated agencies, the market prices were stabilized at or above the support prices. This greatly helped the growers to achieve a fair return for the crop. This kind of intervention and insurance to the growers was resultantly helpful in maintaining the regular supplies to the consumers in the subsequent period.

In certain crops, like sugarcane, physical storage of the commodity is practically ruled out though theoretically farmers may delay harvesting at the cost of following crops or process sugarcane into gur/brown sugar. This kind of farm processing of sugarcane can
only be possible for a small quantity. Therefore, in the absence of minimum guaranteed support price, farmers are bound to suffer in years of good crop due to price fall.

In the absence of price support, farmers may be reluctant to adopt new technology package aimed at raising crop yield as the fall in prices during the harvest/post harvest season resulting from abundant produce may lower their incomes/returns in good crop years. This has happened recently (1999-2000 crop) in case of cotton, potatoes, onions and sugarcane (1997-98 and 1998-99 crops) due to entire absence or inadequate arrangements for implementing the price program. Accordingly, support price program is justified for considerations of equity, productivity and stability.

14.4 Future Policy and Action Plan

The support prices for four major crops i.e. wheat, cotton, rice and sugarcane will continue to be ensured to the growers. However, the support prices will be re-named as rescue prices so that misconception about the support prices is removed. These rescue prices will be implemented through PASSCO (for wheat and rice), TCP (for cotton) and sugar mills (for sugarcane).

Agricultural Prices Commission will continue to be the recommendatory body for the rescue prices. While recommending the support prices, APCom would keep in view the cost of production, domestic and world prices, parity prices, domestic and international demand and supply situation, comparative economics of competing crops, real prices, profitability of input use, impact of rescue price on other sections of the economy.

The concept of rescue prices will be promoted in the farming community. The provincial agricultural departments will educate the farmers that support price is not a commercial price but it is a rescue price. Moreover, the implementing agencies will have to ensure the effective implementation of these prices in case of need. There will be, however, no compulsory procurement of any agricultural commodity.

15. PARTICIPATORY APPROACH

The Ministry of Food, Agriculture and Livestock consults all the stakeholders in the policy formulation process including economic ministries, provincial Governments, farming communities/associations, trade, industry and all others concerned agencies in public and private sectors. For the purpose Ministry has held workshops, farmer’s conferences, field surveys and also holds in-house discussions at various forums of the Ministry. Some of these are as follows:-

- Wheat and Rice Advisory Boards.
- Standing Committees of Agricultural Prices Commission on various crops.
- Governing Board of Pakistan Agricultural Research Council.
- Governing Body/Standing Committees of Pakistan Central Cotton Committee.
- Board of Directors of Pakistan Cotton Standard Institute.
16. **FOCUS ON SMALL AND MEDIUM FARMERS**

The number of small farms (less than 5 ha) is continuously increasing over the time. In 1962, the small farms were 45 percent of total farms whereas in 1972 this number increased to 68 percent. According to Agriculture Census 1980, the small farms increased to 74 percent and in 1990 the number further increased to 81 percent. The leading factor causing this trend is the burgeoning population, which was growing at 3 percent per annum.

According to Agriculture Census 1990, there are 5.07 million farms in the country and 81 percent of them are small farms but account for 39 percent of total cultivated area. The middle size farms (5-10 ha) are 12 percent and account for 22 percent of cultivated area. The large farms (10 ha and above) are 7 percent of total farms but account for 40 percent of total cultivated area. The average size of small, medium and large farms is 1.8, 6.6 and 21.6 ha respectively.

All Government run programs in the shape of interventions are designed to primarily focus on the drudgeries of small farmers. Some of these programs are provision of agricultural credit, procurement of agricultural commodities, distribution of cotton seeds in NWFP and Balochistan, distribution of agricultural machinery under cotton promotion program and farmers visits abroad. The small farmers are given high priority in state run development program in agriculture sector both in federal Government and provincial Governments. Some of these are on farm water management program and crop, livestock and fisheries development programs. The programs for tubewells subsidies and subsidized tractor programs in the past were basically designed for small and medium scale farmers. Small and Medium Enterprises (SME) Bank and Small and Medium Enterprises Development Authority (SMEDA) are also active in providing financial and technical support to small and medium scale farmers for setting up enterprises in agriculture and ancillary sectors.

17. **STORAGE AND FREE MOVEMENT OF AGRICULTURAL COMMODITIES**

Government during the process of liberalization of economy and deregulation of trade laid great emphasis in involving private sector in a number of areas where public sector generally dominated to the disadvantage of private sector. While formulating storage policy, it was considered appropriate to attract investment from the private sector as public sector alone is not in a position to cater for growing needs of the country. In this regard, the Government has made a number of decisions to allow the participation of private sector in the following areas:
• Procurement of wheat.
• Provision of cash credit limit to the private sector on the same concessional terms and conditions as to the public sector.
• The construction of Silos at ports and up country was allowed to the private sector.

In addition to above, Government decided to remove all restrictions on movement of agricultural commodities particularly wheat which had hitherto remained restricted to provincial borders. All restrictions of wheat at provincial and national frontiers were removed. This had a saluting effect on procurement prices of agricultural commodities. For instance, the farmers in the Punjab got incentive prices for their wheat crop over and above the support price as private sector from within Punjab and other provinces invested heavy funds for procurement of wheat. The State Bank of Pakistan through commercial Banks provided cash credit limit of Rs. 6 billion which is sufficient to procure 0.65 million tons of wheat. This paradigm shift in policy facilitated to raise procurement prices above the support prices. This is a classical example of correcting marketing mechanism through removal of distortions.

18. LIVESTOCK

Livestock plays a vital role in the country economy. It accounts for 38.4% of the agricultural value added and 9.3% of national GDP. Its net foreign exchange earnings were to the tune of Rs. 51.5 billion for the year 2001-02, which accounted 11.4% of the overall export earnings of the country. Its role in the rural economy may well be realized from the fact that 5-7 million rural families are involved in raising livestock. These rural household have 2-3 cattle/buffalo and 4-6 sheep/goat and 6-8 birds per family deriving 25-30% of their income from it. Livestock sector had achieved 4 -5 % growth during the last decade.

The population growth, urbanization and increase in per capita income are the key stimulus for increased demand of livestock and livestock products. The strategy for future development of the livestock sector revolves around increasing the productivity of the sector rather than livestock numbers, improving animal health coverage; marketing facilities; and improving the quality of livestock products. The strategy depends on the private sector for its implementation and on free market prices to determine the allocation of resources. The main elements of policy are delineated as follows.

18.1 Animal Health

The development of livestock sector is constrained by the presence of contagious and non-contagious diseases in our livestock. These include Foot and mouth, Pest des petits ruminants, Haemorrhagic septicemia, Black Quarter in cattle / buffalos, Enterotoxaemia, Sheep/Goat pox, Caprine pleuropneumonia in sheep /goats, Newcastle, Gumboro, Hydro pericardium syndrome, Pullorum and Chronic respiratory disease. in poultry causing economic losses to livestock sector worth of million of rupees annually. The mortality rate in small ruminants range from 30-35%, large ruminants 20-25% and commercial
poultry 10-15% annually. The veterinary services cover only 12% of livestock population.

There are four Veterinary Research Institutes operating at Lahore, Tandojam, Quetta and Peshawar. They are providing diagnostic services as well as engaged in the production of veterinary biologicals to protect livestock population from various contagious and non-contagious diseases. Vaccination schedules have been practiced against various diseases on the basis of their prevalence in an area to control the livestock diseases.

A National Veterinary Laboratory (NVL) has been established at Islamabad to provide testing services for improvement of quality of livestock products. The laboratory provides facilities to improve, expand and modernize the disease diagnostics. It is serving as a “Reference Laboratory” for all the provincial veterinary labs for the diagnosis / research of livestock diseases prevalent in the country as well as quality assurance laboratory for the export of livestock and livestock products.

### 18.2 Improvement of Productivity

Pakistan possess some of the finest dairy breeds like Nili, Ravi and Kundi breeds of buffalo and Red Sindhi, Sahiwal, Tharparker breeds of cattle. These are efficient converters of poor quality roughages into milk and meat. The average milk production in minimal management conditions ranges from 2000 liters to 2700 liters of milk per lactation of 305 days. However, sizeable proportion of stock also exists, which produce approximately 5000 liters of milk per lactation under good management conditions. There is a need to improve the productivity per unit animals.

There are seven semen production units operating in the country. They are producing good quality semen for Artificial Insemination. Farmers are encouraged to use artificial insemination services for breeding to improve the genetic potential of offspring. As a policy measure high producing animals like Holstein Friesians/Jersey and their semen are allowed to import for cross breeding to improve the genetic potential of non-descript animals. Selective breeding is being encouraged for propagation of elite cattle and buffalo locally. Embryo transfer technology has been introduced in the country for production and propagation of high breed animals.

### 18.3 Improvement of Animal Nutrition

The livestock population is supported by feed resources derived from the crop sector, range-lands, grassland / grazing pastures, animal meals and agro-industrial by-products. The sources like fodder crop provide 53.6% nutrition followed by grass land 27%, range-land 11% and other feeds 8.4%. About 60% of dry matter is derived from the crop sector, which gives less than 50% of digestible nutrients. Grazing areas are therefore a very important feed source. It is estimated that existing feed resources barely meet 75% to 80% of the nutrition requirement of livestock population, which is still deficient in protein and energy.
Efforts have been made to develop rangeland and grazing pastures, in collaboration with Forest Department using better varieties of grass seeds. High yielding varieties of fodder seeds have been introduced for increased per acre yield. Feed concentrates, commercial livestock ration and molasses for balanced livestock feeding have been encouraged to improve their performance. The feed, fodder and silage preservation techniques are being introduced to ensure supply of feed during off seasons.

18.4 Control of Cross Border Infectious Diseases

In order to control the transboundary animal diseases and address the diseases of trade and economic importance, following development projects have been launched:

- Support for emergency prevention and control of main transboundary animal diseases in Pakistan (Foot and Mouth Disease (FMD), Rinderpest and Peste des Petits Ruminants (PPR) diseases) with a total cost of Euro 1.8 million. The project has been launched during November 2001. It is aimed to eradicate Rinderpest disease from the country and develop eradication strategy for other diseases of trade importance such as FMD and PPR. On account of samples collected under the project and based on their tests/analysis and results, Pakistan has been declared provisionally free from Rinderpest disease from January 2003.

- Strengthening of Livestock Services in Pakistan - Rinderpest Eradication Program with total cost of 25.924 million Euros. The Project is of six years duration supported by EU and has been launched by the Federal Government in collaboration with Provincial Livestock Departments. The project aims at enhancing efficiency and effectiveness of livestock services to achieve full prophylactic coverage, consolidate and strengthen the epidemiological units for realizing systematic disease investigation and reporting system, strengthen disease diagnostic services especially for identification of viral strains and strengthen and expand veterinary vaccine production in the country.

18.5 Post harvest Management (Collection of Milk, Meat and Dairy Products)

Private sector is encouraged to establish cold chain facilities for collection, storage and transportation of perishable livestock products.

18.6 Export of Live Animals and Livestock Products

The strategic location of the country and potential of livestock sector creates a good export avenue for our livestock and livestock products. The major exports include animal casings, bone and its products, animal wastes, live animals, meat, dry milk, wool, hair, feeding stuff for animals and poultry. The export of livestock and its products constrained because of the presence of contagious diseases, and poor sanitary/hygiene conditions of our slaughterhouses and slaughtering practices and processing units for value addition.
Livestock production and processing systems need to be transformed and harmonized to internationally acceptable standards for consumers' safety.

In order to exploit export potential of livestock sector, export of livestock and meat has been allowed. The establishment of abattoirs is encouraged in the private sector. Five slaughterhouses of international standards have been set up in the private sector for export of meat and three more are at various stages of completion.

18.7 Improving Livestock Marketing

- Organizing livestock farmers associations for improving production and marketing of their products. These associations will be encouraged to establish milk collection centers.
- Establishment of milk chilling units.
- Improving and equipping the existing livestock markets with minimum facilities like weight-bridges, sheds, water supply, electricity and provisions of feed.
- Promotion of setting up of milk powder plants for converting surplus milk during flush season into powder for use during lean production season to reduce dependency on import of milk powder.
- Encouraging establishment of poultry processing units to store surplus production in the periods of low demand for poultry products.
- Improvement of existing slaughter house facilities and construction of new ones for production and marketing of quality of meat.
- Establishment of commercial fattening farms/feed lot units with their own feed mills and slaughter house facilities.
- Use of manufactured feed will be encouraged.

18.8 Strengthening Extension Services

- Strengthening of aggressive and effective livestock production extension service to ensure technologies transfer to farmers on better feeding, breeding, management and disease control through demonstration, training programs, audio-visual materials and TV coverage.
- Outreach program for livestock production research institute / livestock experiment stations for effective dissemination of modern technology to the farmers; and
- Encouraging poultry sector to provide advisory /extension services to the poultry farmers as part of their sales programs.

18.9 Exports

- Control of disease of economic and trade importance such as Foot and Mouth Disease, Rinderpest, PPR, Newcastle, Fowl Plague in the country.
- Establishment of Disease Free Zones for export certification.
• Strengthening of diseases diagnostic and drug residue testing facilities in the country for quality production of livestock products and consumer’s safety.
• Strengthening of Animal Quarantine Department in terms of man power and diseases diagnostic facilities.
• Establishment of chilling units and cold storage facilities for collection, storage and transportation of perishable livestock products.
• Introduction of quality and grading system for livestock products in the market e.g. grading of eggs (on the basis of weight) and meat (on the basis of fat percentage and rigor mortis and body parts).

19. FISHERIES

Pakistan reviewed its deep sea fishing policy in 2000 and placed a complete moratorium on this activity. Later on this policy decision was reverted in 2001 and the deep sea fishing was allowed.

19.1 Main Features

The main feature of this policy is the socio-economic uplift of the small-scale fishermen. The fishermen will be provided with:

• Boats with modern gadgets
• Up-grading their skill through training in modern fishing techniques. This would enable them to harvest the fishery resources of the area between 12 to 35 nautical miles and better prices for their harvest.

19.2 Action Plan

The following action plan for development of fisheries is envisaged.

• Resource surveys and research on migratory patterns, biological studies of demersal/small pelagic/large pelagic and mesopelagic fisheries will be carried out to develop strategies for sustained exploitation.
• A shrimp conservation program will be followed by limiting the number of trawlers to 600, observing closed season for two months (June and July) to reduce juvenile mortality and banning trawling inside the Indus delta creeks.
• Studies on the effects of reduced Indus River water flow in the sea on the fauna; flora and fish stock will be initiated.
• The traditional fishing fleet will be modernized by providing high power engines, navigational and communication equipment and improvement of storage facilities, in order to enhance their capability to fish in relatively deep waters.
• Export outlet from Gawadar and Pasni will be provided to facilitate the fishermen of the area to export their catch directly to Gulf countries.
• Improved technologies will be adopted through research on fundamentals of fish biology, reproductive physiology, ecology, fish nutrition, health, management, population dynamics and control of aquatic vegetation especially in natural lakes.
• Improved aquaculture techniques like pen culture and cage culture will be introduced through demonstration.
• The Punjab Fisheries Research and Training Institute and the Trout Culture Training/Research Center established at Mardan in NWFP will be upgraded.
• The technology for harvesting of cuttlefish, squids and octopii will be introduced.
• Revitalization of coastal aquaculture for shrimp and introduction of culture for crabs catfishes (magur, clipping perch and panguis).
• Strengthening of extension services for fishermen and fish farmers.
• Strengthening of infrastructure facilities through construction of small landing jetties and important fishermen settlements such as Jiwani, Ormara, Sonmaini (Damb), Sur, Gaddani and Keti Bandar.
• Establishment of an information system for fish exporters.

20. PLANT AND ANIMAL QUARANTINE SERVICES

The Quarantine system makes an integral system of curbing movement of insects and disease inside and outside the country.

20.1 Plant Quarantine

The Plant Protection Department operates in accordance with the Pakistan Plant Quarantine Act, 1976 and Rules framed thereunder. The fees charged for plant quarantine services and fines imposed for violation of the regulations are according to SRO 27(I)/97 dated 12-01-1997.

The plant quarantine services annually provides quarantine coverage for import and export of 6 to 7 millions tons of plants, plant products and other material. Botanists, entomologists, pathologists and the other related staff do the job. The procedure is given as under:

a. Documentary Check

The papers such as import permit, certificate of origin, phytosanitary certificate, treatment certificate, bill of lading, invoice, letter of credit, anchorage permit and the other documents, in respect of the consignments are checked for genuineness and proper entries. Violations and infringements are adequately dealt with.
**Identity Check:** The material is checked for identity. It is seen that it is the same as stated in invoice, import permit, phytosanitary certificate, bill of lading and the other accompanying documents. However, there is no liability on the department or its staff for that matter. It is ensured that the material is tradable according to local as well as foreign / international trade law. A positive and negative list published by the Commerce Ministry is consulted invariably.

**Phytosanitary Check:** Freedom from quarantine pests and application of suitable treatment if necessary is ascertained. The assessment of compliance by the local exporter is also made.

**Inspection:** It is carried out in godowns, warehouses, dry ports, and entry and exit points. Ship holds, containers, baggage, and packets in mail are also inspected. The plant and plant products in imports, export or transit are inspected. Propagating material and perishables are given high priority. There are standard sampling and examination methods, which are followed according to the nature and quantity of commodity. Disaster relief goods are prioritized. Items of consumption, and those, which are semi-processed, are considered low risk objects. The quarantine inspectors have the necessary kit for the job. The presence of insects, fungi and nematodes is determined and where necessary, species are got confirmed. It is seen that no quarantine pests are transmitted through agricultural trade. The national pest list, regional pest lists and quarantine pest lists of the trading partners are constantly kept in view.

**b. Inspection Based Actions**

On the export side, a phytosanitary certificate is issued if the consignment is free of quarantine pest at the time of inspection and or suitably treated. For the import consignments a release order is issued if the material is free of quarantine pests and or suitably treated. The import consignments refused entry may be sent back or destroyed. Some material may be released after segregation. The treatment of plant products include dry dressing, spraying and fumigation with due care to the operators and the environment.

**c. Fees and Fines**

User fees and fines are realized through challans paid into designated banks. The payment of fees and fines by the importers and exporters precedes issuance of a release order or phytosanitary certificate as the case may be.

**d. Customs Clearance**

This follows inspection and issuance of a release order or Phytosanitary Certificate (PC) from the plant quarantine service. The staff of Pakistan Customs under the Finance Ministry does it.
e. Records and Communications

Records of trade, permits, certificates, interceptions, treatments, fees and fines are maintained on files and registers. Interceptions, refused entries and non-compliance are duly notified. The activities of plant quarantine service are given in the periodical reports of the department and sent to several quarters including FAO.

f. Pest Surveillance and Risk Analysis

A small unit for pest surveillance and risk analysis has been set up in the quarantine service at Karachi. The guidelines as contained in ISPM No.2 and 6 of the FAO are followed. The forms for information for pest risk analysis in respect of dates, apples and citrus have been circulated among the prospective foreign exporters. Likewise information has been provided on rice / paddy, wheat, citrus, mango, apple, onion, potato, and other crops to Kenya, South Africa, Thailand, Sri Lanka, Philippines and other countries. A pest database and pest distribution maps are maintained. The additional conditions in the import permit and additional declaration on the P. C. issued are according to the information available.

g. Capacity Enhancement Measures

The quarantine service has two development projects at hand. Expansion of plant quarantine section project is composed of construction of laboratory, provision of equipment and machinery and training of staff. Another project is aimed at boosting the export of fruits and vegetables with vapor heat treatment. With the completion of these projects the capability of quarantine service will be enhanced.

h. Quarantine Protocol Establishment

For increasing market access establishment of quarantine protocols have been proposed with several countries including Philippines, Thailand and Sri Lanka.

20.2 Animal Quarantine

The Animal Quarantine Department was created to implement the “Pakistan Animal Quarantine (import and export of animal and animal product) (Amendment) Act, 1985” according to “Pakistan Animal Quarantine (import and export of animals and animal Products) Rules, 1980”. The department is responsible to regulate the import, export and quarantine of animals and animal products in order to prevent the introduction or spread of diseases.

a. Procedure and Practices

The department provides certification service to the importers and exporters of animals and animal products of uniform standard through examination and tests to meet the international trade requirements. The department is also responsible to prevent the
unauthorized import and export of animals and animal products. It provides round-the-clock services to the importers, exporters and general public with regard to import and export of animals and animal products. Every “point of entry” and “point of exit” has to be guarded to prevent the introduction or spread of diseases. Therefore, the department has office-cum-microbiology laboratories of international standards located at Karachi, Lahore, Peshawar, Islamabad, Quetta, Multan and Sialkot as per Clause-J of Section-2 of “Pakistan Animal Quarantine (Import and Export of Animals and Animal Products) (Amendment) Act, 1985”.

The department handles all kinds of “Animal” which includes birds, cold blooded creatures: by means of which any diseases may be carried or transmitted: four footed beasts which are not mammals; mammals except man and “Animal Products”. It means anything originating or made, whether in whole or in part from an animal or from a carcass and other substance of animal origin as specified by the Federal Government by Notification in the official Gazette.

b. Export of Animals and Animal Products

As far as export of live animals is concerned all the animals are kept under quarantine for the required period and after necessary vaccination and tests are allowed for export. There is a great demand for the export of live animals from Pakistan to Middle East countries and Afghanistan also. During the last five years the department handled 63250 cases of import and export of birds, animals and animal products. The export of animal casings is allowed only from the registered and approved processing units. The approved processing units are 40 and 15 are provisionally approved and are under process of upgradation. There are 12 approved and registered bone crushing factories and 3 are provisionally approved. The factories are up-grading their facilities to fulfill the E.U. member countries’ requirements. However, all these factories are fulfilling the international hygienic requirements and W.T.O. standards.

c. Rules and Regulations

Pakistan being the member of OIE (Office of International Des Epizootics) and WTO is obliged to maintain quarantine services of high standards. To safeguards the livestock industry of Pakistan and foreign countries and human health from communicable diseases. The Animal Quarantine Department is in a position to fulfil the requirements of WTO and E.U. member countries. However, to overcome the discrepancies for the import and export of animals and animal products and to fulfill the requirements of WTO and E.U. member countries, an ordinance to amend “Pakistan Animal Quarantine Act, 1979 has been prepared and is in final stage. This improvement in the act will boost-up the export of animals and animal products according to zoo sanitary conditions all over the world. This will also help for the registration of processing plant for foodstuff of animal origin and laying down a community procedure for the establishment of maximum residue limits of veterinary medicinal products of foodstuff of animal origin and the impact of residue on the industrial processing of foodstuff.
d. Management and Other Services

The Animal Quarantine Department apart from its usual functions have the following additional responsibilities.

- Tenders advice to MINFAL on any or all matters falling within its purview:
- Converts Government’s policy decisions into executive orders and communicate them to the lower formations for implementation.
- Supervise the work of lower formations to ensure that the units at operational levels implement Government’s decisions properly.
- Co-ordinates and ensure as uniformity of action to the working of the lower formation.
- Collects information from the lower formations and maintains important data having a bearing on the policies of the Ministry and supplies them to the Ministry.
- Has a country-wise jurisdiction in it’s filed of activity.

The existing animal quarantine facilities in the country need an up gradation and necessity capacity building in order to fulfill the international requirements for quality control and SPS measures. This would enable to accommodate the requirements of WTO and E.U. member countries and help increase the exports. Some of the suggestions in this regard are as follows:

- For provision of quarantine coverage to animal and animal products, the Animal Quarantine Department facilities may be established at Lahore, Islamabad, Peshawar, Quetta, and Multan.
- All the office-cum-laboratories of Animal Quarantine Department in Pakistan has been established in hired residential buildings, which cannot fulfill the requirements of international standard. The laboratories usually have different sections, which can be provided only by construction of specific buildings. This is the pre-requisite for up-gradation of laboratories.
- The establishment of laboratories for testing of drug residues in animal products at Karachi and Lahore are immediately required. This would enable the department to meet the requirement of E.U. member countries and WTO also. As the Animal Quarantine Department has to conduct 485 residue tests for the Year 2002-2003, for monitoring purposes. This has been intimated to the E.U. member countries headquarter at Brussels.
- Existing testing laboratories of Animal Quarantine Department need most sophisticated equipments in order to fulfill the future requirements. This would need that the animal quarantine laboratories may be equipped for testing / quality control. This up gradation also facilitates ISO Certification and accreditation with the PNAC.
21. CORPORATE AGRICULTURAL FARMING

The agriculture sector in Pakistan contributes 24 percent to the GDP, employs 48 percent of the labor force, provides major exports of rice, cotton and fish and supplies raw material to agro-industry. In order to sustain this role the agriculture sector must follow a multi dimensional approach in its future development.

Traditional agriculture is, presently, beset with following major challenges:

- Productivity per unit of crops is comparatively low. In the case of wheat, the average yield for 1999-00 is 2.5 ton per hectare whereas the world average yield is 2.7 tons, China 4.0 ton, India 2.6 ton and Egypt 6.4 ton.
- Water shortage is threatening agricultural productivity. This necessitates adopting water saving technology and water use efficiency.
- Investment by public and private sector in agriculture decreased from 10.6 percent of total investment in 1990-91 to 6.1 percent in 1996-97. However, thereafter the ratio lifted back to 8.3 percent in 2000-01. These are unacceptable levels considering its GDP share of 25 percent.
- Public Sector expenditure on agriculture from the Public Sector Development Program decreased from 3.4 percent in 1990-91 to 0.5 percent in 2000-01.
- Agricultural exports lack international standards and quality. This is going to be a big issue in future as the World Trade Organization rules and regulations require the export commodities to meet the international standards.

Pakistan is endowed with an immense agricultural resource base and agro-ecological diversity, which makes crop production possible throughout the year. High quality fresh water is abundantly available in our rivers and extensive canal network for irrigation. Alluvial soils stretch over thousands of kilometers of the Indus Basin plain. We have a rural population, which is seeped in the culture of farming since centuries. All these factors combine to make Pakistan as an agricultural producer with one of the lowest costs of production. It is due to this inherent comparative advantage that large investment in Corporate Agriculture Farming (CAF) will be forthcoming once we have in place the law and policies, which provide safeguards and incentives to potential investors.

21.1 Objectives of CAF

Keeping in view the above facts of agriculture sector, the Government decided to embark on the policy of CAF with the following objectives:

i) To seek efficiency of production and increased incomes/revenues by bringing together the agricultural production, processing and marketing activities at one place under management of a corporate entity.

ii) To improve agricultural productivity and profitability through the use of latest production technology, adequate inputs use such as balanced doses of fertilizer, quality seed, heavy machinery, efficient use of water by using
latest technology in the form of sprinkler/drip irrigation, integrated pest management and marketing expertise particularly for exports.

iii) Producing high quality agricultural products due to favorable resource base.

iv) Internationally competitive unit cost of production for all major crops, fruits and vegetables.

21.2 Policy Package

a. Investment Areas under CAF

The following areas shall be available for investment under CAF:

i. Land development/reclamation of barren land, desert and hilly areas for agriculture purpose and crops farming.

ii. Reclamation of Water Front Areas/Creeks.


iv. Processing of agricultural products.

v. Modernization and Development of Irrigation Facilities and Water Management.

vi. Plantation/Forestry.

vii. Dairy, small ruminants (sheep, goat) and all other livestock farming and breeding.

viii. On farm construction of wheat/grains storage and construction of cold storage for captive use (not on commercial basis).

ix. Marketing of agricultural produce.

b. Financial and other Incentives under CAF

The following incentives/measures form part of the policy package for CAF:

i) CAF declared as industry

- 100 % foreign equity will be ultimately allowed
- Local or foreign, private or public limited companies to invest in corporate farming
- No Government sanction required undertaking CAF except registration with the Board of Investment (BOI).
- Liberal credit

ii) The size of the proposed corporate farm will left to be determined by the prospective investor.
iii) State Land can be purchased, or leased for 50 years, and extendable for another 49 years.

iv) Taxation as per following rule:

- The Agriculture Income Tax regime presently applicable on Incomes from agriculture would be applicable to Corporate Agriculture Farming, thereby maintaining the preferential treatment available to agriculture.
- Exemption of dividends from tax.
- Existing definitions of farming activity, as distinct from processing/industrial activity, continued to be maintained.

v) Labor Laws: Labor laws will not be presently applicable to corporate agriculture companies due to special circumstances of the agriculture sector. However, appropriate labor laws would be developed for this sector within five years.

vi) Import duties: (a) Zero-rated custom duty will be charged on import of agriculture machinery and equipment and also exempted from Sales Tax (b) Machinery items for wheat/grain storage and cool chain will be included in SRO 437(I)/2001 dated 18th June 2001.

vii) Duty on Transfer of land to CAF will be exempted
### 21.3 Action Plan

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Policy Package Elements</th>
<th>Implementation Responsibility</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Corporate Agriculture Farming (CAF) as an industry:</strong> Government may declare CAF as an industry along with the exemption that it would not be subject to those levies and industrial establishment laws which are applicable to an industry, after 3-5 years.</td>
<td>Ministry of Industries and Production/BOI/ MINFAL</td>
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<tr>
<td>2.</td>
<td><strong>Legal Entity:</strong> Only such local and foreign companies will be entitled to Corporate Agriculture Farming that are locally incorporated under the Companies Ordinance, 1984.</td>
<td>Security and Exchange Commission of Pakistan and Provincial Governments</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Land ceiling:</strong> There may not be any upper ceiling on land holding for CAF by amending relevant laws. The size of the proposed corporate farm may be left to be determined by the prospective investor.</td>
<td>Federal Land Commission</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Taxation:</strong> Agriculture Income Tax (AIT) regime applicable in provinces on incomes from agriculture would be applicable to Corporate Agriculture Farming. Tax relief in shape of First Year Allowance of 75% of machinery cost be allowed to set-off provincial AIT.</td>
<td>Provincial Revenue Departments</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Labor Laws:</strong> Labor laws may not be presently applicable to corporate agriculture companies due to special circumstances of the agriculture sector. However, appropriate labor laws be developed for this sector within five years.</td>
<td>Ministries of Labor and Law, MINFAL</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Import duties:</strong> (a) Zero-rated duty to be charged on import of agriculture machinery and equipment and also exempted from Sales Tax; (b) Machinery items for wheat/grain storage and cool chain may be included in SRO 437(I)/2001.</td>
<td>CBR</td>
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<tr>
<td>7.</td>
<td><strong>State land:</strong> Wherever possible, state land may either be sold or leased to the investors for 50 years extendible for another 49 years. Preference in this respect will be given to culturable wasteland, which is otherwise fit for cultivation.</td>
<td>Board of Revenue, Provincial Governments/ BOI</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Duty on Transfer of land:</strong> Government of the Punjab has exempted from stamp duty and registration fee all transfers of land in favor of agricultural companies registered under Companies Ordinance 1984 vide Notification No. 2369-2001/921-ST(I) dated 30 July 2001. Government of NWFP has also provided one time exemption of stamp duty for initial purchase/lease of land to CAF. Other provinces may follow the suit.</td>
<td>Provincial Revenue Departments</td>
</tr>
</tbody>
</table>
22. INSTITUTIONAL SERVICES

A Famine Commission was set up by the British Government in 1891 to mitigate recurring famine conditions in the subcontinent. This was simultaneously coupled with the setup of an Irrigation Commission in 1903. In the aftermath of the recommendations of these Commissions, a College of Agriculture was set up in addition to four places of India (Pusa, Nagpur, Kanpur, and Coimbitoor) at Layallpur (Faisalabad). Later on Agricultural Universities / Colleges were set up at Faisalabad, Peshawar, Tandojam, Rawalpindi, D.I. Khan, Multan, D.G. Khan, Quetta, Larkana and Rawalakot. Initially Agricultural Research, Extension and Education were the responsibility of the Agricultural Colleges. Later on separate institutions for Agricultural Research, Extension and Education were established in Punjab, Sindh and Balochistan. In NWFP, the University of Agriculture is responsible for Agricultural Education and Research. The Agricultural Extension in NWFP like elsewhere is a separate entity. The detailed description is as follows:

22.1 Agricultural Research

The Green Revolution, beginning with the wheat and rice revolutions in the late 1960s, and extending to several other crops including cotton in recent years, ushered an era of food and fiber self-sufficiency and ultimately export led quality production of crops. The National Agricultural Research System (NARS) was at the forefront in guiding these technological breakthroughs.

Notwithstanding remarkable achievements on the food and agriculture front, several weaknesses persist, and future challenges are complex and daunting.

a. Challenges to Agricultural Sector

The agriculture sector is constrained for a favorable environment for growth in area and yields. This is due to many factors, including inadequate use of quality seeds particularly hybrids, flare up of insect pest and diseases, slow down in breeding programs, failure to cope up with increasing demand of water for crops, deteriorating soil quality and above all, withdrawal of domestic support. The intensive agriculture practiced by many farmers demand that problems of water scarcity and water and wind erosion, salinity and sodicity, water logging, flooding and loss of organic matter from the soil be addressed. Water is a limiting factor and is used inefficiently as only 30% of the water diverted from the river system actually reaches the crops.

Cost effective production and the quality of agricultural goods are emerging challenges due to globalization. Currently the country has been confronting problems related to surplus production of some food commodities, and the increased supplies are difficult to procure and sell in national and international markets. The support price policies formulated to safeguard the interest of the producers and to stabilize the prices are not functioning well. These have fallen short of grower expectations mainly due to lack of financial resources and non-existence of needed procurement and storage infrastructure.
The processing and value addition of agricultural produce for higher economic returns is still at an early stage. On the other hand, import of commodities like tea, edible oil, and milk powder is a significant burden on foreign exchange reserves.

The arid and semi-arid rangelands that cover much of the country are degraded, with chronic overgrazing and poor maintenance practices responsible for productivity losses of up to 40%. Marine resources of the coastal areas are also under threat. Untreated urban sewage, mangrove cutting, and unplanned urban development affect particularly the coastal areas. Fresh water resources are also becoming increasingly polluted.

With virtually all available cultivable land and water resources now being used, pressure on the country's natural resource base is growing and environmental problems have already reached critical level. Soil erosion has caused crop yields to dwindle. Forests are being depleted at alarming rates as land is cleared for fuel wood, for agriculture use, and as fodder/orage for livestock. Rangelands are becoming increasingly and irreversibly degraded, as a result of uncontrolled grazing, industrial pollution and increasing level of salinity from upstream irrigation stresses the marine environment.

Pesticide consumption is increasing alarmingly in Pakistan. Consumption of pesticides has increased from 665 tons in 1980 to 47,592 tons in 2001-02. Such a tremendous use of pesticides not only drains the exchequer (US$129million), but also presents a growing threat to the people and environment of the country.

b. Opportunities for Agriculture Sector

The economy of Pakistan is still largely based on agriculture. A major part of the economy depends on farming and the collection, storage, processing and distribution of agricultural commodities, as well as wages paid by farming and agribusiness to the household. The well being of the economy depends largely on major products such as cotton, wheat, edible oil, sugar, milk and meat. In the long run an agricultural economy that produces increases in marketable surplus to sustain economic growth and the transition to a more market oriented economy is necessary.

The present global economic scenario and the speed with which Pakistan is opening its product market, there is a widespread concern about the effects of trade liberalization on agriculture. Considering the present structure of the agriculture sector, natural resource base, policy environment, trade related infrastructure, political economy, the country is gradually moving towards liberalizing trade in agriculture and is taking steps to support the domestic agricultural sector to compete in the international markets. To fully implement the requirements of the Uruguay Round (UR) Agreement on Agriculture, there is a long way to go, especially in terms of improving trade infrastructure, quality of the products, and addressing environmental issues as well as issues related to sanitary and phytosanitary requirements of the agreement. To smoothly proceed towards a more liberalized economic environment, the expected effects of trade liberalization related to various agricultural products need to be identified. The research focus of the National Agricultural Research System requires substantial adjustments to withstand a highly competitive WTO regime. The conventional mandate of the research institutions requires major changes for quality and competitive production of all tradable goods.
c. Agricultural Research Accomplishments

A higher and sustained growth in agricultural production is imperative for achieving equitable income distribution, welfare and development of the economy of Pakistan. Agricultural research through its influence on productivity has proved to be an important source of growth in agricultural production. In the past, studies have shown handsome returns on investment in national agricultural research system (NARS) of Pakistan. The returns are attractive enough to cover all the previous investments in research and development. High rates of return from investment in wheat and maize research in Pakistan are an example. Internal Rate of Return (IRR) are estimated over 81% and 19-23% in case of wheat and maize research respectively. Cotton research in Punjab has yielded 95-102% and return on cotton research in Sindh is reported at 49-51%.

The primary objective of agricultural research is to generate new knowledge and technologies for the enhancement of agricultural productivity, quality, competitiveness for export and conservation of the resource base. The research system will be made responsive to new challenges facing the agriculture sector, and will be developed in accordance with the farmers’ needs. Better linkages will be developed between systems of research, education, extension and production. Conventional plant breeding and modern biotechnology will be utilized for the development of new varieties of crops.

Pakistan Agricultural Research Council (PARC) is responsible for coordination of research throughout the country in order to avoid duplication of research activities and strengthen the research infrastructure and human resources. The modest human and financial resources available for research need to be judiciously used by prioritization of research needs and consolidation of scattered research efforts. To transform agriculture sector from self-sufficiency to high value products, following measures are being taken:

- Basic and strategic research is conducted by the PARC while provinces undertake applied/adaptive research. Research programs need to be reorganized and resources allocation to high priority research areas. A proper mix of adaptive and basic research is undertaken to solve the emerging problems in crops, livestock, fisheries and forestry;
- Germplasm of important crops is being collected, evaluated, and conserved with a view to utilizing it for the development of new varieties;
- High priority is accorded to the development of disease resistant-varieties of cotton by the relevant federal and provincial research institutions;
- Emphasis is laid on accelerating the development of high yielding, disease-resistant varieties of crops, especially cotton, sugarcane, wheat, rice, oilseeds, pulses, fruits and vegetables;
- Research is undertaken to develop agronomic packages necessary for realizing the full yield potential of each crop, including appropriate tillage and planting equipment. Appropriate management practices for problem soils are developed;
- Integrated disease and pest management program for different crops are being developed;
• Programs on Genetic Engineering and Biotechnology have been established and strengthened in selected institutions which have the capability for undertaking such activities;
• Research is undertaken on efficient harvest and post-harvest handling techniques of different crops/commodities;
• Special attention is given to optimize the use of irrigation water for different crops;
• Research and development activities are undertaken for cultivation of tea in the NWFP;
• Livestock research is strengthened in order to increase the production of milk, meat and other livestock products; and
• Coordination and linkages within the research and extension system are being strengthened.

Following research priority areas are identified for focused research:

i. Land and Water Resources

• Integrated Plant Nutrition Systems (PNS) for efficiency in field crops and orchards
• Bio-saline agriculture and safer use of brackish water.
• Technologies for increasing organic matter contents of soils.
• Use of Geographical Information System (GIS) and remote sensing for assessment and mapping of soil fertility, soil ailments and general soil survey.
• Bio-fertilizers in sustainable crop production.
• Soil and water conservation techniques for rainfed agriculture.
• Control of land degradation, desertification, salinity, water-logging and nutrient depletion.
• Water conservation technologies for crop production.
• Technologies for improvement of physical soil properties.

ii. Field Crops

• Development of hybrids.
• Breeding: high yield, resistance to biotic and a biotic stresses, short duration and quality improvement.
• Production technologies for various crops: planting techniques for good crop stand and better efficacy of inputs-fertilizers, irrigation, easier working and control of insects and weeds.
• Use of GIS and remote sensing for forecasting of bio-mass and crop yield.
• Post harvest handling of cereals.
iii. Horticultural Crops

- Production system for flowers, nurseries and other high value low acreage and specialty crops.
- Citrus, mango and guava die-back, nutritional problems of orchards, new irrigation technologies and biological control of insect pests and diseases.
- Breeding for High Yielding Varieties (HYVs) of fruit and vegetables (especially hybrid).
- Production technologies and processing of non-conventional crops (mint, medicinal plants, tea, olive/palm oil).
- Green house/tunnel farming: Design, materials, irrigation, development of liquid fertilizers, disease management.
- Organic farming for exportable commodities.
- Development of dwarf rootstocks for high density planting.
- Selection of rootstocks for biotic and a biotic stresses.
- Post harvest management of fruits, vegetables and flowers to meet ISO standards and WTO requirements.

iv. Plant Protection

- Development of safe, efficient and environmentally compatible means to control and manage insects, weeds, vertebrate pests and pathogens.
- Epidemiological studies of plant viral and other diseases. Use of GIS and remote sensing in disease forecasting and surveys.
- Management of storage pests and diseases.
- Establishment of National Pest Risks analysis network.
- Establishment of network of laboratories for analyses of chemical and toxic residues/ISO accredited.
- Establishment of network of grain quality laboratories/ISO accredited.

v. Post Harvest Technologies and Quality Assurance

- Research on methods to extend shelf life and desired quality in exportable horticultural products and field crops to meet ISO standards (grading, packaging material).
- Research on reducing post harvest losses of major field crops, fruits and vegetables (storage and transportation techniques).
- Development of indigenous grading equipment/facilities for exportable agricultural commodities.
- Establishment of a network of labs for analysis of chemical and toxic residues and quality of agricultural produce with ISO accredited certificate.
vi. Farm Mechanization

- Develop equipment associated with crop production, harvesting and threshing for improved efficiency and product quality (crop harvesters, planters, laser land levelers, tillage implements, threshers, and grading equipments.).
- Development of drip and sprinkler irrigation systems.

vii. Global Climate Changes

- Development of agricultural meteorology laboratories network for database for forecasting, modeling and simulation of the effects of changing climate on crop yields/cropping patterns for development of early warning systems.
- Effect of global climate change on crop yields.
- Effect of global climate change on forests and rangelands.
- Green house gases emission from agricultural lands and animal farms: quantification and control technologies.

viii. Livestock and Fisheries

- Health care and vaccine production for diseases of high economic importance.
- Development of high nutritional value feed and supplement for livestock and poultry.
- Genetic improvement of ruminant and non-ruminants.
- Embryo transfer technology.
- Production of livestock for export quality products.
- Exportable products from livestock.
- Fertility improvement in cows and buffaloes.
- Development of parent stocks for broiler/layers.
- Strengthening semen production and artificial insemination sources.
- Conservation of indigenous livestock breeds.
- Research to improve production efficiency of fish farming/inland fisheries using brackish water.

ix. Food and Food Ingredients

- Develop technologies that lead to production of value added food and food products for fruits, vegetables and agricultural commodities.
- Identify and develop ways to prevent, control or eliminate toxic factors from food and other agricultural commodities.

x. Social Sciences

- Implications and strategies to be adopted to meet the challenges of WTO and other international agreements.
- Export oriented marketing research and development.
- Farming systems and research on economies of alternate cropping systems.
d. R&D Needs of Agricultural Research System

Increased demands for food and other agricultural commodities from shrinking/limited land and water resources can only be met through aggressive research programs. This would need strengthening National Agricultural Research System in the country and promoting farmer friendly policies. Following suggestions are made for improving the output of agricultural research system:

- Greater autonomy in financial management and other policy issues (especially in provincial organizations).
- Effective planning, programming, monitoring and evaluation system to undertake efficient research activities.
- A uniform service structure (4 tier system) for the scientists in all agricultural research institutions of the country.
- Adequate operational funding.
- Strengthening of departmental and institutional libraries.
- Adequate mobility for outreach programs.
- Better coordination of agriculture research at the national level.
- Opportunities for short and long-term training (Ph.Ds.) especially for provincial institutions.
- A performance allowance for the scientists for their excellent achievement.
- Opportunities for participation in international seminars/conferences.

The low and stagnating intensity of research investment in Pakistan is worrisome. This level of R&D investment in the country when compared to other developing and industrialized countries indicates that our investment is quite low in this area. Further the increasing globalization of agriculture in which technological advances will be critical for competitiveness and would need more focused research. Recent perspectives on the world food situation also highlight the critical role of investment in agricultural R&D to meet future needs for food, feed and fiber.

22.2 Agricultural Extension

National yields in Pakistan are appreciably lower from those at the farms of progressive growers. The gaps of national yields from those of research farms are even larger. The reasons leading to this situation could be capital constraints at the farm, slow rate of diffusion of modern technologies, marketing constraints and physical barriers arising from lack of availability of hardware as seeds, soil amendments and others. This calls for more efficient extension system and correcting availability of the hardwares. As agriculture is primarily a provincial subject, major over hauling of the system will have to be carried out in provinces.
a. Weaknesses in the Extension System

The current extension service does not suit to the present requirements of a more progressive and integrated approach to agriculture. It is neither operationally attended to the identification of farmers problems nor to the prompt response to their needs. The weaknesses both in structure as well as methodology for transfer of technology for the farmers must be addressed on priority if the entire system of extension service to be strengthened and revitalized. This will entail substantial increase in resources for the sector. The weaknesses of the present extension system in each province of Pakistan include:-

- Poor access to electronic media for transfer of technologies.
- Knowledge and skills of front line extension workers.
- High number of farming families per extension worker.
- Inadequate training programs.
- Poor mobility
- Extension is a scapegoat for the failures of other disciplines as agriculture research, marketing and education.
- Funding and resource constraints.
- Avenues for national and international exposure are scanty for agricultural extension.
- Linkages with research and education are inadequate.

b. New Trends/Policy Shifts

The trend lines requirements of the extension system are as follows.

i. Federal Cell on Agricultural Extension: For an effective interprovincial coordination and integration of the Extension System, the role of Federal Government is imperative. There is a strong need for establishing a Federal Coordination Agricultural Extension Cell in the Ministry of Food, Agriculture and Livestock (MINFAL).

ii. Devolution: The current devolution has resulted in severing the frequent flow of information and technologies from top to grass root level. This has further isolated the extension worker from an access to research based modern system in agriculture. This issue needs to be addressed.

iii Emphasis on Public – Private Partnership: It is not feasible to replace the work of public extension services with private companies and NGOs. As with several other services provided by public sector, such as roads and telecommunications, this would be neither cost-effective nor a good use of the private companies and NGOs’ scarce resources. What is required and indeed, being experimented with is a form of partnership between the public extension services and the work of participatory NGOs to bring about the most effective method for agricultural development at all levels of society and to maximize coverage to the beneficiaries.

iv. Role of Electronic Media. The electronic media has emerged as a very strong instrument in transfer of new technologies. There is a need to increase the number of
telecast hours per week. Later on an Agricultural T.V. Channel can be opened to substantiate the efforts of the Research and Extension System in transfer of technologies to the farming community.

v. **Focusing Resource Poor Farmers:** Traditionally, resource poor farmers have lacked the power and organizational ability to exert pressure on the research and extension systems to meet their needs. Their access to research information is restricted; their ability to articulate their needs is poor; their capacity to tolerate risk is limited; and the pressing concerns of their daily existence make it difficult for them to focus on long term technological change.

vi. **Participatory Approach:** Community participatory approaches involve people in the planning, implementation, monitoring and evaluation of various activities that affect their lives directly. The approach generally works better at micro level. Hence, there is a need to establish Farmers Organizations (FOs) at village level for effective community participation.

vii. **Institutional Linkages:** Links between agricultural research institutes and their clients – farmers and extension agencies – are vital for successful technology development and delivery. Direct links with farmers, developed through on farm research, ensure relevance and rapid feedback. Links with extension agencies ensure impact through a wider dissemination of technologies. The two sets of links are complementary, and both are necessary: one cannot substitute for the other. Research managers have found these links difficult to organize and sustain, particularly when addressing the needs of resource poor farmers. Linkage problems not only reduce efficiency, they also impair performance and diminish the impact of agricultural research. There is no single recipe for strengthening links. The policy and institutional context determines the types of strategies and mechanisms a manager can use to develop effective links. Key contextual factors influencing links are: agricultural development and research policies; the resource situation and organizational structure of the institute involved; and technical issues such as the existing knowledge base, the inventory of available technologies, and the diversity of agro-ecological conditions and production systems. Effective linkage mechanisms need to be adopted to improve performance, build stronger links and address the needs of resource poor farmers.

viii. **Multi-Commodity Focused Extension:** It is not practical or desirable to establish parallel extension services for all sub-sectors of agriculture namely livestock, forestry, fisheries and irrigation, since it will be very costly and highly confusing for the farmers to have numerous narrow specialists visit them frequently. All these departments have their technical officers at the district, or in some cases sub-district level that provide specialist advice to farmers on request.

23. **TAXATION IN AGRICULTURE**

Pakistan has a long history of taxing agriculture under different heads. The tax structure of the country is comprised of three-tier system i.e. federal, provincial and local level.
Short of GST, all taxes in agriculture are provincial taxes and are collected through the provincial system. The description of various taxes in agriculture is as follows.

23.1 Land Revenue

Land revenue is one of the oldest taxes on agricultural lands. Since 1980s the rate of land revenue varied by farm size and its location, irrigation status, land productivity and type of crops grown on the land.

23.2 Water Rate (Aabiana)

The water rates in provinces vary from crop to crop and are collected on six monthly basis.

23.3 Ushr

Ushr was levied as a part of islamization process in the 1980s. It is only chargeable from the muslim farmers irrespective of their tenancy status. Owners and leaseholders pay the ushr at uniform rates with a basic exemption of 948 kgs of wheat or an equivalent value of other crops. The rates vary with irrigation (irrigated and non-irrigated) status. However, non-muslims, muslims of certain sects, non-citizens of Pakistan and share tenants were also exempted from this tax.

23.4 Agricultural Income Tax

Agricultural income tax has a history of variant rates in different time periods across the provinces. In near past under the pressures of international donor agencies viz, the World Bank and the IMF, the Government of Pakistan introduced agricultural income tax in its full application to the sector by 1996.

The agricultural income tax collection system is very much organized in the Punjab province and the recovery percentage (i.e. 92%) was outstanding in the year 1999-2000. During the subsequent years the percentage has gone down to the level of 61%.

23.5 General Sales Tax (GST)

The GST was imposed on all farm inputs and also on machinery for agro-processing and farm operations. However the exemptions have been made for the agro-processing machinery for following items in the budget of 2003-04:

- Fruits, Vegetables and flowers
- Dairy and dairy products
- Rice (milling machinery)
- Sulfur oxidizing machinery for de-salinization
24. AGRICULTURAL SUBSIDIES

Agricultural subsidies have a long history of its evolution in Pakistan. As a standard practice Government initiated giving two kinds of subsidies; (i) budgetary or explicit subsidies and (ii) concealed or implicit subsidies. Government started to subsidize the key agricultural inputs beginning from chemical fertilizer around mid 1950s. Finally, the end of 1960s subsidized all the agricultural inputs such as fertilizers, insecticides, seeds, irrigation water, tubewell installations, and agricultural machinery. These input subsidies continued up to the end of 1970s. But since mid 1980s Pakistan has started phasing out all sorts of input subsidies. In case of non-product specific support, budgetary and hidden subsidies on fertilizer and credit have been phased out. A small amount of economic subsidy in lieu of tariff reduction on electricity used by agricultural tubewells has been phased out with effect from July 2000. The subsidy on sinking tubewells in Punjab has been withdrawn. Under the Structural Adjustment Program (SAP) supported by international donor agencies such as the World Bank, International Monetary Fund (IMF) and Asian Development Bank (ADB), the Government of Pakistan has withdrawn subsidies on agricultural inputs such as seeds, pesticides, tubewells and mechanization in one step in early 1980s. The only input subsidy continuing in agricultural sector is the subsidy on canal water. However, it had been controversial whether it is subsidy or not because the capital cost of this canal system has since long been recovered.

Until recently agricultural producers in Pakistan were provided a notional type of Minimum Support Price for few commodities. But recently Pakistan’s domestic support price program has been restricted to wheat and cotton only. Our Aggregate Measure Support (AMS) is negative since the emergence of WTO in 1995. Pakistan can provide Green box subsidies, which include Government storage, pest and disease control, training service, extension and advisory services; infrastructure services and facilities for food security. However, our capacity to provide these subsidies is quite limited due to financial resource constraints.

Pakistan cannot provide export subsidy on any item because in the base year period i.e. 1986-90 we were not giving any export subsidy and this was notified in 1995. Since July 2002, a subsidy of Rs 3250 per ton on the export of wheat was started which was permissible under the Article 9.4 of Agreement on Agriculture (AOA). However, due to stoppage of export from public sector this has also been withdrawn. Some details of implicit and explicit subsidies granted in the past in Pakistan are given below:

24.1 Fertilizers

Subsidies on fertilizers were withdrawn gradually – nitrogenous fertilizers in 1984-85 and Phosphate and potash in 1989-90. All fertilizer subsidies are explicit in nature.
24.2 Tube wells, Plant Protection and Seeds

Agricultural subsidies given on inputs like tubewells, plant protection and seeds were the budgetary or explicit subsidies and eliminated totally by 1994-95.

24.3 Irrigation Water

Irrigation water witnessed almost all implicit subsidies by the Government and shared about 60 per cent of the total implicit subsidy in various years.

24.4 Agricultural Credit

Institutional credit is mainly disbursed by the Zarai Taraqiati Bank Limited (ZTBL) and stood second by its volume in the total amount of implicit subsidies extended by the Government over time. According to State Bank of Pakistan, banks provide funds from their own resources to the Federal/Provincial Governments and their agencies to carry out commodity operations. The mark up rate for Commodity Operation Financing (COF) is 11% per annum. The mark up rates under credit lines granted by State Bank of Pakistan (SBP) to Zarai Taraqiati Bank Limited (ZTBL) and other banks have also been related to treasury bills rate.

24.5 Electricity

Electricity occupies an important place in the implicit subsidies and ranked almost third in the total volume of subsidies comes under the category. At national level subsidy on electricity was provided up to 1994-95 and in subsequent years it was withdrawn at country level. However, it was continued in Balochistan for agricultural tubewells at flat rate.

24.6 Revenue Forgone in Lieu of Support Price

It was observed that no revenue was forgone by PASSCO on procurement of wheat in lieu of support price. However, the provinces forwent some revenue but the amount was not large.

24.7 Subsidy on Natural Gas Consumed for Fertilizers

The subsidy on natural gas consumed for fertilizers is Rs. 13 billion. Revenue foregone as subsidy on natural gas consumed for fertilizer preparation is not available. There is strong feeling in MINFAL that the advantage of gas subsidy provided to the fertilizer industry is not passed on to the farming community and is just gobbled up by the industry.

24.8 Subsidy on Export of Wheat

Government of Pakistan earmarked Rs 500 million as export subsidy in favor of PASSCO during 2002-03 and the amount was subsequently released. Another amount of
Rs 1000 million was earmarked for the Punjab Food Department but the amount has not been released.

24.9 Subsidy on Freight

According to Export Promotion Bureau of Pakistan (EPB) public notice No.2 (1)/2002-PPI dated 1st January 2003, the Government has allowed 25% freight subsidy on export of fruits and vegetables. To enjoy this freight subsidy, exporters are required to apply to EPB.

24.10 Subsidies Provided by Developed Countries

According to WTO Agreement on Agriculture (AOA) developed countries were required to reduce 20 per cent domestic support subsidy from the base 1986-88 during the transition period of six years starting from 1995-96 to 2000-01. On all agricultural products during 1986-88 on an average they were providing $ 239 billion domestic support, which they had to reduce to $ 191 billion by 2000-01. But they did not fulfill their side of obligations and they have reduced only 3.1 percent instead of 20 per cent. They have reduced domestic support subsidy on wheat 23.35%, maize 10.29%, rice 9.54%, sugar 9.77%, and on milk 17.14% which shows that they fulfilled requirement of AOA only for wheat. Contrary to this developed countries have increased domestic support on beef 15.06%, meat 3.04% and poultry 37.14%.

Due to heavy subsidies given by the developed countries to their farmers Pakistan’s agricultural exports are facing tough competition in international markets because developed countries are exporting agricultural products through subsidies not only at marketing stage but also at production stage whereas Pakistan due to financial constraint cannot afford it. It creates artificial competitive edge to developed countries, which also hurts the export prospects for Pakistan. Moreover, in major agricultural commodities such as wheat, rice, cotton, sugarcane, Pakistan has enjoyed comparative advantage. However, because of subsidization by the developed countries, the country has not always been in a position to translate its comparative advantage into production and export surpluses.

25. WORLD TRADE ORGANIZATION (WTO)

The following WTO Agreements affect Agriculture Sector: -

- Agreement on Agriculture (AOA).
- Agreement on Sanitary and Phyto-Sanitary (SPS) Measures.
- Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPRS).
25.1 Agreement on Agriculture (AOA)

The WTO Agreement on Agriculture (AOA) asks for major reductions in export subsidies, trade distorting domestic support and tariff barriers on agricultural products. The AOA, interalia, sets up specific quantitative targets for cuts in each of the three areas of import tariffs/barriers, domestic support and export subsidies as stated below:

<table>
<thead>
<tr>
<th>IMPORT TARIFF</th>
<th>Developed Countries (%)</th>
<th>Developing Countries (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average cut for all agricultural products</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>Minimum cut per product</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Domestic Support total Cuts for the sector</td>
<td>20</td>
<td>13</td>
</tr>
</tbody>
</table>

**EXPORTS SUBSIDIES:**

<table>
<thead>
<tr>
<th></th>
<th>Developed Countries (%)</th>
<th>Developing Countries (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut on value of subsidies</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>Cut on subsidized quantities</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Time allowed for Implementation</td>
<td>1995-00 (6years)</td>
<td>1995-04 (10 years)</td>
</tr>
</tbody>
</table>

The Government support/subsidization up to 5% of agricultural GDP in case of developed countries and up to 10% of agricultural GDP in case of developing countries plus green subsidies such as R&D expenditure, infrastructure development, marketing advisory services, income loss/disaster relief are exempted from calculation of domestic support.

We are not under any reduction commitments. Pakistan is providing only minimal amount of subsidies much below our permissible limits in the agriculture sector. So there is good scope of increasing subsidies in the agriculture sector if one can afford and find them feasible. Our agricultural tariff bounded in WTO is also quite high i.e. 102% on the average.

MINFAL has set up a WTO cell, National Committee on AOA and National Consultative Group to deliberate on issues. It is planned to create a wing under Chairman Agricultural Prices Commission to work as secretariat on analytical work on all WTO assignments. It will cooperate with all other existing organizations working on the subject.

Pakistan is in full conformity with WTO Agreement on Agriculture [AOA] and fulfilled all the required reduction commitments. Nothing is pending on Pakistan’s side. The impact of the AOA has not been fully calculated as yet. But it seems that there may not be any direct negative impact of AOA on Pakistan’s agriculture. The AOA has three basic areas in which reduction commitments are required.

**a. Market Access**

Market Access means elimination of non-tariff measures, and the reduction and binding of tariff rates. The market access contains three elements: tariffication, tariff reduction
and access opportunities. Tariffication implies replacement of non-tariff trade barriers, like quotas, licensing, debarring imports and exports, by equivalent tariff imposition. The existing tariff rates are to be reduced by an average of 36 percent in the developed countries and by 24 percent in the developing countries. Access opportunities involve imposition of duties when there are either import surges or particularly low prices.

As regard market access there is no serious implication in implementing provisions of the Agreement on Agriculture. Pakistan has no problem of tariffication as all non-tariff measures have already been converted into tariff equivalents. We have reduced tariff more than 36% on average from the tariff structure of base year (1986-88) and 15% on each tariff line. Custom duty has been reduced from maximum 65% in 1995 to 25% in 2002-03 on agricultural items. Regulatory duty has been converted into fixed specific duty on import of selected agricultural products. Some items, which are harmful to animal, human and plant life, are prohibited under import policy order. Similarly, the items pertaining to religion belief are also protected. Our bound tariff on an average is 102%, which shows that we have protected our agricultural items from import surge if the full trade liberalization takes place in year 2005. Our applied rates on the import of agricultural items are quite low.

Pakistan cannot enjoy tariff concessions under tariff quota provision, as we have no agreement with any developed country for such concession. Pakistan is against to use any tariff quotas and wants complete elimination of all type of quota tariffs as it is against the principle of free market economy. According to AOA provisions, Pakistan would not be able to use Special Safeguard Measures (SSM), because these measures can be involved against a product whose tariff rate has been associated with a Tariffication of non-tariff measures. In 1995 Pakistan did not notify any tariffication in its schedule, which can show that we have converted non-tariff measures in to tariffs. Out of 144 WTO members only 38 have the right to use this products specific SSM. During negotiations under reform program in WTO committee on agriculture Pakistan has pressurised developed countries to provide market access to developing counties including Pakistan by reducing their tariff on items of our agricultural exports.

Pakistan could not get any benefit due to non-implementation of market access provisions by the developed countries. Still Organization for Economic Cooperation and Development (OECD) countries continue to have very high tariff peaks and escalations. Few countries in particular have set some very high tariffs, reaching 350% or more. In the OECD countries, the post WTO tariff profile is typically characterized by relatively high rates on products of our export interests. Products with the highest frequencies of tariff peaks and escalations are major agricultural staple foods like cereals, meat, sugar, milk, butter and cheese as well as those of export interest to Pakistan, such as sugar, tobacco and fruits and vegetables. Indeed, these high OECD tariff peaks on these items exceed 100 percent. Tariff escalation (the situation where tariffs rise as the processing chain advances) still prevails. The difference between the tariffs on processed products and primary commodities in developed countries remains at an average tariff escalation of 17 percent. Tariff escalation in developed countries prohibits diversification of exports.
b. Domestic Support

Domestic support means financial grants provided by the Government to domestic producers, which may result in encouragement for production and exports, and discouragement to imports. Under the agreement, domestic support policies for agriculture must ensure a reduction of 20 per cent in the developed and 13.3 per cent in the developing countries in the total Aggregate Measure of Support (AMS). Policies that entail less than 5 per cent of value added by agriculture in developed countries and 10 per cent in developing countries or those having no effect on production or trade are exempt. Untargeted subsidies on food distribution among the poor, and investment and input subsidies available to poor farmers in the developing countries are also exempted from the purview of the agreement.

Pakistan has completely phased out all sort of domestic support programs. Until recently agricultural producers in Pakistan were provided a notional type of minimum support price for few commodities. Now this program has been restricted to wheat and cotton only. As far as component of Aggregate Measure Support is concerned, it is negative since the emergence of WTO in 1995. Pakistan current total AMS is negative which is $ -218 million. It means Pakistan has a big cushion to provide domestic support of $ 218 million first to reach a positive sign then it can go up to 2.6% of total GDP and a similar amount of non specific support can also be provided. In case of non-product specific support budgetary and hidden subsidies on fertilizer and credit have been phased out. A small amount of economic subsidy in lieu of tariff reduction on electricity used by agricultural tubewells has been phased out with effect from July 2000.

Pakistan has some reservations regarding the benefits from the WTO trade regime due to the fact that developed countries are still providing agricultural support amounting to about $ 360 billion a year against $ 302 billion that provided during 1986-88. This makes total agricultural support three times the Official Development Assistance (ODA) flows and more than twice the foreign direct investment (FDI) flows to developing countries. It also makes up almost 60 percent of total world agricultural trade. Highly subsidized OECD export product to developing countries like Pakistan destabilizes and depresses prices, destroys producers, and hence reduces our production capacity and export potential.

Although Green box policies including Government storage, pest and disease control, training services, extension and advisory services; infrastructure services facilities for food security are exempted from any reduction commitments. However, our capacity to provide green box support is quite limited due to financial resource constraints to increase much needed support under this category. It may be pointed out that no reduction commitment is required. It is evident from the fact that Pakistan’s federal and provincial Governments provided Rs 681.4 million green box support in 1997-98 which decreased to Rs 465.7 million in 2000-01. On the other hand developed countries are capable to increase support on these policies, for example, they were providing $ 41 billion in 1986-
87 85.1% of all Green Box expenditure for all members in 1995 which increased to $ 54 billion which is 87.9% in 2002

c. Export Subsidies

This means support by Government on export, which may put exporters of other countries to disadvantage. As per agreement, the export subsidies on individual commodities should be reduced by 21 per cent and expenditure on them by 36 per cent in the developed countries and correspondingly 14 and 24 per cent in the developing countries. In view of the anticipated increase in world food prices, the agreement also provides for food aid in grant form, technical assistance to raise agricultural productivity, export credit and credit guarantees for the least developed and food importing countries including Pakistan.

In case of export subsidies we have limited choice to provide subsidies because in the base year 1986-90, Pakistan neither provided nor notified any export subsidy (in WTO agreement) to boost agricultural exports. Pakistan cannot provide export subsidy on any item because in the base year period i.e. 1986-90 we were not giving any export subsidy and this was notified in 1995. Due to this disadvantage we may loose competitiveness of agricultural products in the international markets. This could be a negative impact on our agricultural exports. However, by using a provision of export subsidy in the AOA, present Government has announced Rs. 3250/ton export subsidy on the export of wheat. Government is also giving 25% freight subsidy on the export of agriculture commodities.

In major agricultural commodities such as wheat, rice cotton, sugarcane, Pakistan, has enjoyed comparative advantage. However, because of inadequate infrastructure and inefficient processing/manufacturing sector, the country not always been in a position to translate its comparative advantage into production and export surplus. Contrary to this domestic scenario Pakistan agricultural exports are facing very tough competition in international markets as developed countries are subsidizing their agricultural products. These subsidies are provided at marketing as well as production stages. This creates disparities for countries like Pakistan where currently farming sector is not provided any subsidy.

25.2 Other Non Trade Related Issues

An important concern for Pakistan is the increasing use of non-trade related issues to influence trade by the developed countries. As a result of these issues farmers in Pakistan have to incur higher costs of production resulting in unfair competition in the international market place. Issues concerning the environment, labor and the human rights have been linked to agricultural trade liberalization. The rationale of Pakistan’s producers is that developed countries imposed stricter regulations pertaining to these issues to their agricultural producers. Developed countries may take unilateral actions against our exports to impose import ban and other trade restriction if we would not follow their standards of practice in production. Other new issue, such as the multifunctionality is also emerging that tends to justify the existence of protectionist
policies. If such issues are freely allow to be brought in the liberalization agenda, a free flow of other trade unrelated issues may pursue and this can jeopardize the original objective of the WTO Agreement towards freer trade.

To counter the expected negative affects, Government can take/is taking several steps. Some of them are as under: -

- Provide domestic support and export subsidies where provisions are available in Agreement on Agriculture.
- Pressurize developed countries to eliminate all sorts of domestic and export subsidies and to provide market access to Pakistan’s agricultural exports.
- Improve quality and standards of agricultural commodities according to WTO Agreements of Sanitary and Phyto-sanitary (SPS) and Technical Barriers to Trade (TBT).
- Provide Green box subsidies which include Government storage, pest and disease control, training services, extension and advisory services; infrastructure services facilities for food security. Government has taken a number of steps in this area in spite of the fact that our capacity to provide these subsidies is quite limited due to financial resource constraints.
- Export subsidy of Rs. 3250/ton on the export of wheat has been started which is permissible under the Article 9.4 of AOA.
- The 25% Freight subsidy on the export of fruits and vegetables has been announced.

25.3 Action Plan

- Pakistan’s stance on the modalities in the Agreement on Agriculture would continuously be reviewed however; special work would be continued before the commencement of future meetings/dialogues.
- Negotiating stance and policies of other countries particularly of developed countries are closely monitored and Pakistan’s stance has been modified keeping in view the changing situation of world trade negotiations.
- Comprehensive arrangements for the calculations of Aggregate Measures of Support (AMS) would be made. Notification of AMS to WTO would be issued regularly.
- Regular analysis of Applied and Bound Tariff would be done and Revenue Division would be advised regularly on further cut/improvement in the tariff structure in the light of WTO obligations.
- Comprehensive plan would be prepared to provide product specific domestic supports to different crops in the light of Agreement on Agriculture (AOA) provisions keeping in view farmers demand, country’s requirements, import substitution policy and export potential.
- According to WTO Amber Box provisions of de minis level economically feasible plan to provide Non Product Domestic Support would be prepared. Existing policy of providing input subsidies would be reviewed.
• Regular meetings of federal and provincial Government representatives would be conducted to review the progress of existing green box subsidies. Projects would be prepared in consultation with Ministry of Food, Agriculture and Livestock and Provincial Agriculture Departments to make best use of Green Box subsidies of AOA. Federal and Provincial Finance Ministry/departments would be advised on the provision of Green Box subsidies.
• Analysis of other countries competitiveness in the light of AOA provision would be done.
• Area of support under article 6.2 needs to be identified; Geneva mission would clear the ambiguity of this provision. However, for a time being a plan would be prepared after a detailed survey with the help of Narcotics Division to make best use of this provision.
• Pakistan cannot provide export subsidies under AOA except given in article 9.4 (d & e). At present subsidy on wheat export and freight subsidy on fruits and vegetable is being provided, however, this would be streamlined to notify in WTO and other area would be identified and policies would be prepared.
• A comprehensive study would be conducted on market access conditions in developed countries for Pakistan’s export potential of agricultural products.
• Another study would be conducted to monitor and evaluate effects of export subsidies and domestic support provided by developed countries on Pakistan’s agriculture exports.

25.4 Agreement on Sanitary and Phyto-Sanitary (SPS)

The international food safety standards for the protection of human, animal and plant life/health have gained unprecedented prominence and importance with respect to consumer's protection and international food trade/exports especially after the conclusion of WTO agreement on Sanitary and Phyto-Sanitary (SPS) measures. The agreement sets rules to ensure that the national SPS measures are consistent with the obligations/prohibiting arbitrary and unjustifiable requirements/standards on the trade between the countries. The agreement requires that the members base their national SPS measures on standards adopted by FAO/WHO Codex Alimentations Commission (CAS), International Office of Epizootics and International Plant Protection Convention. The Agreement requires for harmonization of the national standards/laws and quality testing procedures. The SPS measures cover all food-hygiene measures and food safety measures, such as content of veterinary residues, pesticides residues and other chemical residues/additives.

The MINFAL has set up a SPS Committee. The Committee has so far held 12 meetings to review relevant laws, standards and testing procedures enforced in the country and suggest measures required to implement the SPS/TBT agreements. A project amounting to Rs. 34 million has been approved for capacity building, training and education/research studies. A South Asian Association for Regional Cooperation (SAARC) Workshop was held in March 2003 at Islamabad to set up a Regional Network on SPS/TBT.
The Government has enforced following laws to regulate the quality of the agriculture items:-

- Pakistan Plant Quarantine Act, 1976.
- Pakistan Fish Inspection and Quality Control Act, 1988.
- Seed Act, 1976.
- Pakistan Standards and Quality Control Authority Act 1994.
- Agricultural Produce (grading and marking) Act, 1937.
- Pakistan Pure Food Laws 1960. (Provincial)

The above laws and various other laws enforced by the departments/agencies are being reviewed to match with WTO requirements. The certification agencies have also been asked to upgrade the laboratories/ testing facilities and get them accredited with PNAC/International Bodies to enhance the acceptance in the international markets and to ensure the quality of agricultural items imported in the country. The Government has tentatively allocated an amount of Rs. 13.0 million in the financial year (FY 2003-04) for strengthening of laboratories in compliance with the WTO requirements. The donor agencies like FAO, UNIDO and bilateral donors like Australia have been requested to provide financial/technical assistance for upgradation of our capacity.

25.5 Agreement On Trade Related Aspects Of Intellectual Property Rights (TRIPS)

Under Article 27.3 (b) of TRIPS Agreement, Pakistan was required to provide protection to the breeders of the new plant varieties by 31st December 1999. The MINFAL prepared a Draft Law on Plant Breeders Rights. However, the Law and Justice Division pointed out that, under the Constitution, this is a provincial subject and the Federal Government requires authorization through resolutions passed by the provincial assemblies authorizing the Federal Legislature to enact a uniform law on the subject. Since the Federal and Provincial Legislatures are now in place, the Minister for Food Agriculture and Livestock has requested the provincial chief ministers to get resolutions passed by the provincial assemblies authorizing the federal legislature to enact a uniform law. After the authorization is received MINFAL will place the draft legislation before the National Assembly after the approval of the Cabinet.

The existing Draft Law will be finalized keeping in view the protection of traditional rights of farmers for saving / reusing the farm saved seed of the protected varieties and protection of biodiversity. It is expected that protection of new plant varieties will enhance research and development in public and private sectors.
26. PUBLIC SECTOR INVESTMENT IN AGRICULTURE

26.1 Five Year Plans

The public sector investment in agriculture sector for the first plan during 1955-60 was of the order of 9.5% of the total plan cost. It has tapered off during subsequent plans and was 1.3% in the eighth plan and 1.7% in the ninth plan. The data in this regard are as follows:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Period</th>
<th>Agriculture (Rs. Billion)</th>
<th>Percent of the Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>1955-60</td>
<td>0.46</td>
<td>9.5</td>
</tr>
<tr>
<td>Second</td>
<td>1960-65</td>
<td>0.70</td>
<td>6.6</td>
</tr>
<tr>
<td>Third</td>
<td>1965-70</td>
<td>0.82</td>
<td>6.1</td>
</tr>
<tr>
<td>Non-Plan</td>
<td>1970-78</td>
<td>4.14</td>
<td>5.5</td>
</tr>
<tr>
<td>Fifth</td>
<td>1978-83</td>
<td>6.06</td>
<td>4.0</td>
</tr>
<tr>
<td>Sixth</td>
<td>1983-88</td>
<td>8.12</td>
<td>3.3</td>
</tr>
<tr>
<td>Seventh</td>
<td>1988-93</td>
<td>12.31</td>
<td>3.5</td>
</tr>
<tr>
<td>Eighth</td>
<td>1993-98</td>
<td>10.01</td>
<td>1.3</td>
</tr>
<tr>
<td>Ninth</td>
<td>1998-03</td>
<td>14.90</td>
<td>1.7</td>
</tr>
</tbody>
</table>

26.2 Ten Years Investment plan

A ten years investment plan of Rs. 36 billion has been prepared for developing agriculture sector. These include:

- Initiation of Crop Maximization Project for developing centers of excellence in 109 villages across Pakistan for community extension to raise productivity of crops and diversify farm income.
- Integration of Research and Extension Project to narrow the productivity gaps between subsistence growers and progressive growers.
- Improvement in agriculture marketing through improving market information system and removing distortions.
- Sugar beet production and promotion through intercrop culture. The objectives is to raise farmers’ profitability and elongate crushing /slicing season of sugar mills.
- Production of medicinal herbs.
- Building Livestock National Veterinary Laboratories to assure meat quality for export.
- Establishing Global Positioning System for monitoring movement of fishing ships.
26.3 Attracting Investment in Agriculture Sector

In addition to public sector investment, private sector has been encouraged through fiscal policies to invest in agro-based industries, marketing of agricultural commodities and building silos as well as export-oriented businesses. It is hoped that Government focus on private sector would help boost up production in agriculture sector and bring additional revenues. Government is also in the process of introducing Corporate Agricultural Farming where Fiscal incentives have been offered to investors to raise productivity at farm through mechanized high investment, farming along with processing of commodities both for the domestic and export purposes.
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