



YEAR BOOK

2005 - 2006

**GOVERNMENT OF PAKISTAN
MINISTRY OF FOOD, AGRICULTURE AND LIVESTOCK
ISLAMABAD**

Government of Pakistan
Ministry of Food, Agriculture and Livestock
(Economic Wing)

EDITORIAL BOARD

Raja Abdul Hameed	Economic Consultant
Mr. Shoaib Bashir Khan	Director
Mr. Habib Ahmad	Deputy Director
Mr. Abdur Rashid	Research Officer
Mr. Muhammad Ramzan	Research Officer
Mr. Marghoob Mehdi	Research Officer
Mr. Abdul Sattar	Stenotypist

FOREWORD

The year book 2005-06 is an official Hand Book of the Ministry of Food, Agriculture and Livestock (MINFAL) published in pursuance of sub-rule (2) of Rule 25 of the Rules of Business. This year book outlines vision, objectives, activities, achievements of the ministry and its affiliated organizations, especially focusing on the progress made by them during 2005-06.

The main responsibility of the ministry is the formulation of agricultural policies at the national level to facilitate equitable and sustainable development of agriculture sector. It provides policy guidelines to the provincial governments and also takes initiatives in areas, where private sector and provincial governments are reluctant to invest. Trade liberalization and globalization have particularly created new challenges for the sector and MINFAL coordinates, guides and formulates policies, strategies and programs to enable agriculture sector meet these challenges. The overall objective is to make agriculture competitive and achieve maximum food security of the people on a sustainable basis.

Overall, agriculture sector registered a modest growth of 2.5% during 2005-06 reflecting largely a natural adjustment after a record growth of 7.5% during the previous year. The relatively lower growth rate of 2005-06 is primarily due to return of cotton production to its long-run growth trend after an extra-ordinary level of output in 2004-05 and a minimal increase of only 0.4% growth of wheat production. However, rice production increased by 10.4% and livestock had an impressive growth of 8% reflecting response of the sector to market demand.

As noted in the year book, major reforms of policies and institutions are continuing to make the sector productive, profitable and competitive in the global market. I hope that this book shall be found useful by all users including researchers and policy makers. I appreciate the efforts of the officers and staff of the Economic Wing for timely preparing this book. The ministry welcomes any suggestions and views/comments for improvement of this book

(Muhammad Ismail Qureshi)
Secretary

LIST OF CONTENTS

NAME OF WINGS/ORGANIZATIONS	Page No.
Foreword	
Executive Summary	1
1.0 Agriculture and the Economy	
• Agriculture policies and institutions	12
• Structural adjustments and on-going reforms in agriculture	14
• Key challenges and development strategies for agriculture	15
2.0 Policy Planning and Development Assistance for Agriculture	
• Plan Wing	17
• Agricultural Prices Commission	24
• Federal Seed Certification and Registration Department	27
• National Livestock Policy	30
• Agricultural Sector Programme Loan-II	35
• Agribusiness Development Project	38
• International Cooperation Wing	41
• World Trade Unit	48
3.0 Agriculture Sector Performance during 2005-06	
• Agricultural Crops Development Wing	50
• Livestock Wing	59
• Pakistan Oilseed Development Board	71
• Agriculture and Livestock Products Marketing and Grading Department	77

NAME OF WINGS/ORGANIZATIONS	Page No.
4.0 Food Policy and Management <ul style="list-style-type: none"> • Food Wing • PASSCO • Food Policy Reforms 	 80 82 85
5.0 Agricultural Support Services and Knowledge System <ul style="list-style-type: none"> • Pakistan Agricultural Research Council • Department of Plant Protection • Federal Water Management Cell • Soil Survey Department • Economic Wing 	 86 119 123 127 130

EXECUTIVE SUMMARY

1. Agricultural Economy of Pakistan

Agriculture is the mainstay of Pakistan's economy. Nearly 22 percent of total output (GDP) and 44.8 percent of total employment are generated in agriculture, and 65.9 percent of country's population living in rural areas is directly or indirectly linked with agriculture for their livelihood. It contributes substantially to the country's export. Agriculture also contributes to growth as a supplier of raw materials to industry as well as market for industrial products.

Agriculture is playing a key role in stability and growth of country's economy. Main policy focus in agriculture has been ensuring food security for a growing population, expanding foreign exchange flow through agricultural exports and reduction of poverty through agriculture growth. To achieve these objectives, main policy initiatives adopted by government include increasing productivity and profitability of major crops, providing rural infrastructure and access to agriculture inputs, ensuring water availability and efficiency, and liberalizing commodity markets and trade regimes on sustainable basis. Improving support services, especially for small farmers, enhancing efficiency and delivery capability of agriculture institutions, and providing an enabling environment for public-private partnership are other policy concerns of MINFAL.

2. New Directions in Policy Planning for Agriculture

Government recognizes the role of agricultural growth in boosting overall growth of the economy and reducing poverty. For achieving higher growth in agriculture, priority objectives set by MINFAL include enhanced productivity to ensure food security, efficient import substitution and export orientation. Within these broad objectives, the main element is to accelerate growth by narrowing existing yield gaps, promotion of agriculture related business enterprises, provision of quality support services to farmers, and market reforms to increase profitability of agriculture for small farmers. Moreover, attention is being focused on increasing the production of major crops like wheat, cotton, sugarcane, rice and maize through remunerative market-based prices, evolving new high-yielding varieties requiring low

inputs through adaptive research, help improving market and storage facilities with public-private nexus, and providing greater access to farmers for optimal technologies and seasonal credit. Such far-reaching objectives require efficient agriculture institutions to effectively respond to growing and diversifying needs of farmers to accelerate productivity and growth at the grassroots.

MINFAL has initiated careful reforms of the agriculture sector institutions to allow decentralization and liberalization of agriculture services. For reforming the research system, Pakistan Agricultural Research Council (PARC) is being restructured with more autonomy to the Board of Governors both in formulation of research policy and financial empowerment. Similarly, in agriculture extension, reforms actions are being conceived to improve research extension linkages in the backdrop of further decentralizing extension services at the union council level. To face the future challenges of policy analysis, APCoM's mandate has been redefined to play a meaningful role in the Ministry, priority focusing on agriculture policy issues, monitoring and analysis of international trade agreements for suggesting measures to improve Pakistan agriculture's competitiveness in the global market. To support agribusiness development in the livestock sector, the Prime Minister, in principle, has approved a National Livestock Development Policy. A new market-friendly wheat policy is in place, key elements of which include free wheat marketing, voluntarily selling by farmers at the guaranteed minimum price, and maintaining a clear distinction between operational reserve and strategic reserve by the government. A comprehensive fisheries policy has been prepared and presented to the Prime Minister. In addition to above policy reforms, MINFAL has also undertaken a project for the strengthening of capacity for improvement of agriculture statistics in Pakistan. The objectives of the project are to strengthen the capacity of Provincial Crop Reporting Service (CRS) by providing them motorcycles, vehicles, computers, office equipment, technical equipment and O & M cost for field operations. It will help the CRS in provision of timely agricultural statistics for policy formulation and early warning system.

To support policy objectives set at the national level, efforts are underway to augment development component of agriculture through continued supply of financial resources for agriculture sector development. Public Sector Development Programme 2005-06 included

56 schemes under the Agriculture Sector with an allocation of Rs.9135.799 million including a foreign aid component of Rs.1073.67 million and a local cost component of Rs.8035.69 million. There were 50 ongoing and 6 new un-approved schemes with an allocation of Rs.8885.799 million and Rs.250.00 million respectively. The overall utilization was Rs.7839.300 million which is 86% of the total allocation and 96% of the releases. The allocation for the year 2006-2007 has been increased to Rs.11800.054 million including Rs.907 million in foreign exchange. It shows an increase of Rs.2664.201 million or 29% increase over 2005-2006. The number of schemes has also been increased from 56 to 61. The increase in the final allocation indicates the commitment of the Government to develop the agriculture sector. In the development budget more emphasis has been given to the livestock sector which is supposed to be growth engine of national economy.

One of the key achievements of government, during the reporting year, has been signing of agriculture specific MOUs/Agreements/Protocols with friendly countries like China, Iran, Sri Lanka, Uzbekistan, Australia, Bangladesh, Jordan, Norway, Vietnam, Yemen, Mauritius, Turkey and Malaysia, and negotiation of MFN status for agricultural exports with various other countries. A number of Joint Ministerial Commissions (JMC) were set-up relating to agricultural development, and policy-level negotiations were undertaken under the WTO regime as well as SAFTA.

3. Accelerating Growth and Productivity in Agriculture Sector

In Pakistan, the agriculture framework is supported to a great extent by the crop sector with its percentage contribution to agricultural GDP exceeding that of other sectors. In 2005-06, the crop sector contributed 47.5% to agricultural GDP as opposed to a 49.6% contribution from livestock, and 2.9% from the fisheries and forestry sectors. Directly or indirectly agriculture contributes 67% of Pakistan's total foreign exchange earnings.

The agriculture sector could not perform well during the current year mainly due to setback to major crops. The major crops have registered a decline of 3.6% against the target of 6.6%. High base growth of 7.8% during 2004-2005, unfavourable weather conditions and lesser availability of water (137.78 MAF) against the target of 138.58

MAF during 2005-2006 explain the relatively lower growth in agriculture. Minor crops have registered a marginal growth of 1.6% against the target of 4.0%. However, livestock have registered an impressive growth of 8.0% over the last year growth of 2.3%. All this taken together resulted in growth rate of 2.5% in overall agriculture sector, changing its share in GDP from 22.5% in 2004-2005 to 21.6% in the current year.

Four major crops i.e. cotton, sugarcane, rice and wheat account for 90% of the value added of the major crops. The wheat production was targeted at 22.14 million tonnes whereas presently it has been assessed at 21.7 million tonnes, depicting a nominal increase of 0.4% over the last year production. Based on the last year's extraordinary cotton crop of 14.6 million bales, the target for cotton production for the current year had been fixed at 15.0 million bales. Reversal of cotton crop to normacy ensured 13.0 million bales, bringing about a decline of 11.0 % over the output of last year and 13.3% from the target. The rice production is estimated at 5.5 million tonnes depicting an increase of 10.4% over the production of the last year and 11.0% against the target. The production of sugarcane is estimated at 44.3 million tonnes against the target of 50.1 million tonnes which shows a shortfall of 11.5% from the target and 6.2% from the output of the last year. The minor crops contributing 12.3% of the agriculture value added in 2005-2006, recorded a growth rate of 1.6% against the targeted growth rate of 4.0%. One of the main reasons for the lower growth in minor crops is the low value addition of pulses, vegetables and oilseeds, which witnessed negative growth of 13.2%, 6.4% and 12.1% respectively.

Government has provided Rs.50 million for launching "Grow More Wheat Campaign 2005-2006". Under the campaign wheat production technologies are being disseminated to the farming community through agriculture extension services in the provinces. For greater coverage and promotion of wheat production technology, messages on electronic media are also flashed to encourage and educate the farmers for timely sowing of wheat, use of recommended varieties and quality seed, balanced use of fertilizer, and application of weedicides. The farmers are also advised for judicious use of water.

Agricultural credit is one of the most important instruments for increasing the productivity. The credit facilitates the farmers for timely

purchase of inputs. In Pakistan, agriculture sector is not getting proper share of credit in respect of other sectors of economy. Now, there is an increase in the allocation of loans which has increased from Rs.45 billion in 2001-2002 to Rs.130 billion in 2005-2006, but it is still low than the requirements of the sector. There is a strong need to fill the gap between supply and demand. Although there is an increase in allocation and disbursement of credit during the last five years but outreach of credit has not increased and share of Sindh and Balochistan has decreased. Moreover, the allocation for non-farm sector is nominal. Ministry of Food, Agriculture and Livestock is pursuing with the State Bank of Pakistan for increase in allocation, enhancement of outreach in all provinces and provision of loans for non-farm sectors. A trend of increase in allocation has been observed during the last two years. The loan disbursement for the year 2004-2005 was Rs.109 billion against the allocation of Rs.85 billion, which indicates the higher demand for the credit. For the current year, the credit allocation is Rs.130 billion whereas, the disbursement during the year 2005-2006 is Rs.137.5 billion. So the trend of increasing use of credit in the agriculture sector is maintained during 2005-06.

Livestock plays an important role in the economy. Greater emphasis is being placed for the development of livestock and fisheries components. Within these sectors, key focus areas identified for investment are propagation of large animals, poultry and fisheries, expansion of breeding facilities, aquaculture of fish and shrimp, accelerating supply of veterinary services, and systematic up-gradation of animal quarantine facilities. Strategy for livestock development in Pakistan will be private sector-led development with public sector providing enabling environment and capacity building role. The Prime Minister has approved a new “Livestock Development Policy” in principle. It addresses legal framework and development strategies and action plan for farmers using livestock as supplementary source of income and development of small and medium enterprises (SME) and large businesses. The policy will bring radical changes in the current livestock production system and help in exploitation of potentials of livestock sector. Two private sector led companies namely “Livestock and Dairy Development Board” and “Pakistan Dairy Development Company” have been established to increase the pace of development in livestock sector. The import of dairy and livestock machinery/equipment, not manufactured locally is allowed at Zero tariff.

4. Food Policy Reforms

The present government is committed to ensure availability of sensitive food items, particularly the wheat and wheat flour and sugar for the general public. A phased reform of government food policy is underway. The overriding objective is to promote efficient markets for wheat in order to ensure market-based incentives for farmers. The reform program would also include measures for increasing private sector involvement in the wheat market. The wheat policy until recently distorted market operations, created disincentives for farmers and traders, and cost the government huge expenditure for supplementing subsidies. The government has removed all restrictions and allowed inter district and inter provincial free movement of wheat.

As a result of the elaborate internal discussion and dialogue with the provinces and other stakeholders, the government adopted the following wheat policy, endorsed by the ECC and Provincial Governments: (a) a clear distinction is now been made during stock build-up between guaranteed minimum price and procurement price, (b) a strategic reserve is being maintained (initially one million ton) separated from the operational stock needed for public distribution system, (c) government in the future would determine a price band for wheat procurement and marketing, of which the lower end is dictated by the objective of providing incentive to the growers and the upper ceiling is pre-determined to serve the interest of the consumers, and (d) targeted subsidy programs would be extended to the food insecure groups (e) provide comfortable cash credit margin to private sector to increase wheat procurement.

Meanwhile, government has also initiated restructuring of provincial Food Departments and Directorates to make them lean and more efficient state-owned enterprises. PASSCO role is also being reviewed to encourage private sector involvement in wheat marketing and storage. The challenge for the future is to devise a market friendly approach to address the issue of food insecurity in Pakistan.

5. Other Major Programs

To reduce poverty in Pakistan since 2003, Government has adopted a Poverty Reduction Strategy Paper (PRSP), which defined a

key role for agriculture in attaining an accelerated and broad-based economic growth. As poverty in Pakistan is mainly situated in rural areas, agricultural growth is key to curtailing poverty since poor heavily rely on agricultural goods and services for their livelihood. In line with the objectives set under PRSP, MINFAL has approved a number of projects for crop maximization under PSDP 2005-06 to reduce poverty and food insecurity in Pakistan. A number of other projects for crop maximization, food security and poverty alleviation are also assisted by ADB, FAO and UN/WFP.

Government has given top priority to the development of water resources in order to uplift the agro-economic on the national level which will be achieved by maximizing crop production, through progressively increasing surface water supplies and conserving them using the latest technologies available and protecting land and infrastructure from water logging, salinity, floods and soil erosion. The main objectives are overcoming the scarcity of water through augmentation and conservation means i.e. by construction of medium and large dams and by efficient utilization of irrigation water, restoring the productivity of agricultural land through control of water logging, salinity and floods.

An integrated programme approach is being adopted and On-Farm Water Management (OFWM), projects have been implemented on community participation basis in the provinces, AJ&K and Federal Agencies. Water conservation is being ensured under the monitoring of President's programme for the improvement and lining of watercourses. This programme envisaged lining/improvement of 87,000 watercourses at a cost of Rs.66 billion within 3-4 years, which will significantly improve water supply at the farm-gate through the reduction in seepage losses. During the year 2005-06, about 15,050 watercourses have been lined and renovated.

The government has fulfilled most of the commitments related to different WTO specific agreements. Pakistan has already started improving quality and standards of agricultural export commodity markets. Imposition of strict Sanitary and Phyto-Sanitary (SPS) measures are other significant regulatory steps undertaken through the Department of Plant Protection. Different development projects for the strengthening of laboratories for quality control have been initiated. For

export grading of agriculture and livestock commodities, grade standards of about 50 commodities, under Grading and Marketing Act, were developed. Most of our exports of fruit and vegetables have been graded to meet international quality standards, and enjoy comparative advantage in the world market.

MINFAL is also in the process of negotiations of early harvest agreements with other countries so that export of agriculture and livestock related products would be improved. The agreements will increase the demand for the agriculture products, resulting the better return to the farmers and subsequent increase in the agriculture production. MINFAL plans to launch a program for promotion of high efficiency irrigation system including drip and sprinkler systems. High value crop production especially horticulture sector will be the main beneficiary of this intervention. The estimated cost of the project is Rs.15 billion.

MINFAL has also prepared an up-scaled “Crop Maximization Programme” covering 1,000 villages in four provinces, AJK and FATA/NA. This programme is aimed to enhance crop productivity of small farmers at the village level and supporting them to start income generation activities in the areas of livestock, fisheries and high value crops on sustainable basis. The project will also create required systems for value addition of crops and livestock produce coupled with improved market linkages.

The “National Integrated Pest Management” (IMP) Project will continue to be implemented for large scale and sustainable implementation of IMP techniques, rationalizing the use of pesticides, maintaining production level and increasing farmer’s income.

The project “Establishment of Seed Testing Laboratories and Rehabilitation of Existing Laboratories” will be continued. The project aims to extend seed certification cover according to the demand of the seed sector to promote certified seed production. Plant genomics is regarded as backbone of all activities related to genetic engineering. A project on functional genomics is also underway at PARC and NIBGE focusing on wheat and cotton genomes.

6. International Development Assistance for Agriculture

Agriculture sector in Pakistan is primarily supported by three main donors i.e. ADB, FAO and UN through WFP window. ADB is providing development assistance via two main project portfolios i.e. Agriculture Sector Program Loan-II and Agribusiness Development Project.

ASPL-II program, which is worth US\$ 350 million, started operating in early 2004. The program is designed to assist government in addressing key constraints in agriculture sector regarding productivity and profitability with a deliberate emphasis on the development of small agriculture. The five-year umbrella program would accelerate agricultural growth and rural employment, and reduce poverty level. Specific reform measures incorporated in the program include (a) to promote efficient markets for the major agricultural commodities including wheat, cotton, rice, sugarcane, fertilizer and seed, and (b) to strengthen support services of research and extension especially for small farmers and regulation to improve quality control.

Agribusiness Development Project is another project of ADB with a financial size of US \$ 31 million, which started operating in 2004-05 covering all provinces and federal agencies. The project envisages a comprehensive and systemic approach to remove developmental constraints for agribusiness development in Pakistan e.g. poor infrastructure, limited access to appropriate technology packages, lack of financial and capacity services required for agriculture enterprises and absence of proper processing and quality control mechanisms for value added exports of agricultural products. Through project interventions, Pakistan would be able to tap growth opportunities provided by regional and international markets with the implementation of trade regimes of WTO and SAFTA. An Agribusiness Support Fund (ASF) a non-profit company has been established under which about 2,000 agro-enterprises are expected to benefit over the five years of the project's life.

Pakistan is a contributing member of FAO. Since the launching of Technical Cooperation Programme (TCP) in 1976, FAO has implemented 80 different projects in Pakistan at a cost of approximately US \$ 10 million. In addition, FAO has also provided assistance of US \$ 108.4 million covering various thematic areas of agriculture like

agriculture policy, planning, research and livestock and fisheries development.

Pakistan is a member of the WFP/UN Executive Board elected by ECOSOC for the three-year term (2004-2006). The current Country Program (2005-2009) of WFP in Pakistan is a continuation of the last Country Program with a commitment of US \$ 68.7 million in addition to the earthquake relief and rehabilitation efforts. WFP/UN development contributions towards Pakistan are in line with the commitments made during the World Summit on Sustainable Development (WSSD), convened in Johannesburg (South Africa) during September, 2002. The Summit approved eight Millennium Development Goals (MDGs), one of them calls upon all UN member states to eradicate hunger and substantially reduce poverty by the year 2015. Pakistan held the Vice Chairmanship of WFP Executive Board for the year 2005.

7. Key Future Challenges in Agriculture

Agriculture sector in Pakistan is still facing many serious challenges and constraints for future growth. These challenges are embedded in (i) the rising demand for agricultural products with the growth of population and incomes, and (ii) the expanding role of free and competitive markets in agriculture trade at the national and international levels. Increased farm productivity, achieved by sustainable use of natural resources and other inputs, and diversification of production from the low value to high value products in response to market demand have to be the key ingredients of future agriculture strategy to make agriculture both productive and profitable.

Few other technical issues in agriculture, which require effective resolution, include wide yield gaps in major and minor crops, inefficient use of water at farms, poor quality and availability of agricultural inputs, frequent insect and pest attacks and high incidence of crop and livestock diseases.

At the policy level, now there is a growing concern that strengthening of agriculture research system is needed to focus more on emerging areas such as bio-technology, genetic engineering, hybrid seeds etc. Improving agricultural knowledge system for effective crop forecasting, and undertaking market reforms in preparation of expanding

trade regimes of WTO and SAFTA are other areas in which MINFAL is currently focusing on.

8. Conclusion

Agriculture is the backbone of Pakistan's economy. In order to improve the economy, incremental investments would have to be made in the basic infrastructure of agriculture. During 2005-06, the agriculture sector as a whole could not perform well mainly due to set back to major crops. Steps are being taken to enhance the growth and further reducing poverty in rural areas is a major challenge for the government.

For effective management of the agriculture sector, Pakistan needs better institutions with enhanced delivery capability, which can creatively respond to the diversifying needs of farmers. MINFAL has initiated a number of structural reforms, which are aimed at repositioning key agriculture institutions in research, extension and food. With such institutional reforms combined with greater reliance on market forces, agriculture sector would be able to effectively move into a new direction which promises higher economic growth coupled with enhanced food security and reduction in poverty level.

The agriculture sector of the economy is still facing persistent challenges. These include narrowing yield gaps, strengthening research agenda on priority issues, improving knowledge systems and undertaking effective market reforms. An integrated response from government as well as from the private sector would be most appropriate.

1.0 AGRICULTURE AND THE ECONOMY

Agricultural Policies and Institutions

The government has adopted a comprehensive strategy and policy framework to deal with the constraints facing the agricultural sector. The different elements of the policy package for agriculture include strengthening extension services, development of high yielding varieties, balanced use of fertilizer and micro-nutrients, integrated pest management, plant protection, crop maximization programmes as well as efficient water management. The Ministry also aims at improvement of the livestock sub-sector by provision of nutritious feeds, control of diseases, establishing chilling and milk powder plants, and improving marketing of dairy farm products. A special emphasis is being laid on promotion of high value products like livestock, fisheries, vegetables and fruits. To save foreign exchange, special projects for tea cultivation and edible oil seeds production have also been launched.

Although the country depends on major cereal crops i.e. wheat and rice, the status of self-sufficiency in wheat is at best fragile. There is a large gap in domestic production and consumption in both pulses and oilseeds. The import bill of these two products is rapidly increasing. The achievement of self-sufficiency in pulses and oilseeds is a top priority of the government.

High economic growth, rapid urbanization and shifting preferences imply rapidly rising domestic demand for high value agriculture products i.e. livestock, fruits and vegetables. Export market for these products is also large and expanding at a fast pace in view of high-income elasticities for high value products. As a consequence, Pakistan needs to shift from cereals to non-cereal foods to meet the challenge of changing dietary patterns at home and abroad.

The slow pace of diversification to high value products is due to weak incentives as well as absence of institutional support. It is imperative to strengthen incentives and institutional support for livestock holders to increase their productivity and incomes and provide an improved policy framework for ensuring access of livestock holders to credit. The strategic location of the country provides a good export avenue for the livestock and livestock products. Such exports are presently constrained because of the presence of contagious diseases and

poor sanitary/hygienic conditions of the slaughterhouses and inadequate laboratory facilities to assure quality products to consumers. The Prime Minister in principle has approved a new “Livestock Development Policy”. It addresses legal framework and development strategies and action plan for farmers using livestock as supplementary source of income groups and development of small and medium enterprises (SME) and large businesses. The policy will bring radical changes in the current livestock production system and help in exploitation of potentials of livestock sector.

Similarly, egg production offers good prospects for rapid increases in output relative to other livestock sub-sectors (milk, mutton, beef, etc). it possesses an edge over other sources of protein as it makes the least demand on land and is the most efficient converter of inedible protein into edible animal protein of high biological value.

The per capita availability of protein in Pakistan is well below the minimum daily requirements. An alternative source of protein and the one that has been underutilized in Pakistan is fisheries, both marine and inland. The consumption of fish and fish products is very low in Pakistan as compared to other countries with a similar level of per capita income. This is partly due to dietary habits and partly to the high prices of fish. An improved policy and institutional support for the fisheries sub-sector would lead to rapid growth in this sector. Increased production would lower the prices and increase the domestic absorption of fish in Pakistan.

The Ministry of Food, Agriculture and Livestock (MINFAL) has a number of administrative wings into which the work of the Ministry has been distributed such as Administration Wing, Economic Wing, Livestock Wing and Plan Wing. The Ministry has a number of Departments such as Soil Survey of Pakistan, Department of Plant Protection and ALMA. In addition, the Ministry of Food, Agriculture and Livestock has a number of organizations namely Pakistan Agricultural Research Council (PARC) which includes National Agricultural Research Centre (NARC), Agricultural Prices Commission (APCom) etc. There are some organizations whose status as Autonomous Body or Attached Department has not been determined as yet like Pakistan Oilseeds Development Board (PODB). For these organizations, the administrative control rests directly with the Ministry. An organizational chart of MINFAL is also enclosed.

Structural Adjustments and On-going Reforms in Agriculture

The MINFAL has taken a number of measures to increase the availability such as seed, fertilizer, pesticides etc. import substitutions for edible oil crop diversification, livestock & fisheries development, implementation of WTO's programmes and policies and strengthening of our trade relation with friendly countries such as China, Sri Lanka and Australia as well SAARC countries. The MINFAL has fixed support prices as well as procurement prices of our staple crops to ensure fair return to the farmers. Besides great emphasis have been made on development of livestock and fisheries with a view to increase our export earnings. Due to the efforts of MINFAL prices of pesticides have been reduced by 20-30 percent.

Agriculture has been identified as a priority area by the present government to harness growth in economy and to help reduce poverty. An attempt was also made to improve input/output relationship in agricultural production to ensure better returns to the farmers. This was made possible on account of significant support measures taken by the Government in the interest of the agriculturists, particularly, the small farmers. The off-take of nitrogenous and phosphoric fertilizers increased significantly with the government ensuring timely imports and distribution during the critical period. During the year, 0.7 million tons of Urea fertilizer and 1.4 million tons of phosphoric fertilizers were imported. An amount of 10 billion rupees support was given for imported urea to equalize prices while an amount of 5.23 billion rupees was given in tax relief for phosphoric fertilizers. A policy of importing pesticides under generic names cut down prices of pesticides and ensured its abundant availability. These efforts were back stopped with major investments in grow more wheat and cotton media campaigns so as to increase farmers' awareness on best agriculture practices and help them in achieving better productivity.

Public Sector Development Programme 2005-06 included 56 schemes under the Agriculture Sector with an allocation of Rs.9135.799 million including a foreign aid component of Rs.1073.67 million and a local cost component of Rs.8035.69 million. There were 50 ongoing and 6 new un-approved schemes with an allocation of Rs.8885.799 million and Rs.250.00 million respectively. The overall utilization was Rs.7839.300 million which is 86% of the total allocation and 96% of the releases. A number of these projects are in advanced stage of

completion. The government funds for the development of the agricultural sector had a direct beneficial impact on agricultural growth. The indirect impact on the growth prospects in agriculture is also expected to be positive and large. In view of the increased profitability, as a result to public investment, farmers also are expected to invest more in agriculture. The government is trying to divert its resources towards introduction of high yielding varieties, strengthening of agricultural research system and preservation of genetic resources as well as bio-diversity.

The policy challenges in this process of structural transformation are manifold. There is a need to increase yields of crops, livestock and fisheries products. In view of growing water shortage, area expansion would not be an important source of growth in coming years. The case for diversification in favour of high value products is based not only on the changing pattern of domestic and foreign demand but also for rapid generation of rural employment opportunities.

Key Challenges and Development Strategies

The key challenges pertinent to the agriculture sector include: (i) stagnating yields, (ii) wide yield gaps between progressive farmers and average farmers, (iii) inadequate supply of water and inefficient use of available water, (iv) poor quality and inadequate availability of inputs, (v) inefficient research and extension services, (vi) poor rural infrastructure, (vii) frequent insect and pest attacks, (viii) high incidence of crop and livestock diseases, (ix) lack of capital and financial resources, and (x) lack of international competitiveness of some agricultural commodities grown by farmers. The Government has prepared a poverty reduction strategy paper for achieving pro-poor growth with a special emphasis on rapid agricultural growth. Government is also committed to improve rural and agricultural infrastructure and implement various agricultural programmes to generate high and sustainable growth in the sector. The government's development strategy is to increase farm income by enhancing agricultural production and maximum availability of food in accordance with the growing needs of population. The government is also trying its best to improve rural infrastructure and expending agricultural support services and facilities.

2.0 POLICY PLANNING AND DEVELOPMENT ASSISTANCE FOR AGRICULTURE

Plan Wing

The Plan Wing is an integral part of the MINFAL, which deals with formulation of Public Sector Development Programme of the MINFAL. It monitors the releases of the projects as well as reports progress of the implementation of the projects to the Planning and Development Division.

PSDP 2005-06

Public Sector Development Programme 2005-06 included 56 schemes under the Agriculture Sector with an allocation of Rs.9135.799 million including a foreign aid component of Rs.1073.67 million and a local cost component of Rs.8035.69 million. There were 50 ongoing and 6 new un-approved schemes with an allocation of Rs.8885.799 million and Rs. 250.00 million respectively. The allocation of PSDP for the year 2005-06 was revised to Rs.9109.36 million. The overall utilization was Rs. 7839.300 million which is 86% of the total allocation and 96% of the releases.

The projects under MINFAL are designed to achieve the following objectives:

- a) To provide the better water availability to the farmers for irrigation.
- b) To enhance the agricultural productivity in the country.
- c) To provide quality seed to the farmers.
- d) To introduce new and profitable varieties in agriculture and livestock sector.
- e) To establish modern labs to facilitate agriculture and livestock sector to ensure standard and quality to compete in the international market.
- f) Food Security and income generation.
- g) To increase productivity of cultivated land through leveling and improvement of fields for better utilization of limited water resources and better drainage.

- h) To expand available land resource through development of culture-able waste land.
- i) Harvesting of rainwater for agriculture development in barani areas.

Goals & Targets

The total targets/goals of MINFAL for the year 2005-06 were 40 including 5 targets shifted from 2004-05. Against these, 22 targets/goals were achieved and 18 goals/targets were shifted to year 2006-07. The goals which could not be achieved were mainly related to various policy matters and structural reforms for which the consultation with the provinces is in progress.

Important Goals

- Facilitate production of 21.5 million tons of wheat.
- Facilitate production of 5 million tons of rice.
- Facilitate production of 15 million bales of cotton.
- Lining of 15,000 watercourses.
- Formulation of Livestock Policy and Action Plan for approval of Prime Minister.
- Incorporation of Agribusiness Support Fund (ASF) to promote/support Agribusiness Support Services.

Achievements

- Wheat production 21.6 million tons.
- Rice production 5.5 million tons.
- Lining of 17,222 watercourses.
- Enhanced the productivity and profitability of farmers.
- Livestock policy and action plan approved.
- MoU signed with China and Iran to promote horticultural products (Mangoes, Oranges).

DEVELOPMENT PROJECTS

Cultivation of Medicinal Herbs and Spices as Crops

In Pakistan attention is given to food security especially with a large population dependent on the agricultural sector not only for its

livelihood, but are also surviving just around the ‘poverty line’. The agricultural sector maintains the livelihood of the rural community and ensures that sufficient food is available for domestic needs. Food security issues cover availability and stability of food supplies. Agriculture is the mainstay of our economy. The majority of farmers are small-scale farmers producing for own subsistence. Keeping in view, the Government of Pakistan through Ministry of Food, Agriculture and Livestock (MINFAL) has launched a project “Introduction of medicinal herbs and spices as crops”. The achievements of the project are as follows;

1. Developed coordination with various institutes, pharmaceutical companies, universities, eminent ‘hakims’ and scientists to achieve the objectives of the project.
2. Coordination with National Institute of Health (NIH) and World Health Organization (WHO) to develop Good Agricultural and Field Collection Practices Guidelines for medicinal herbs and spices.
3. Helped to organize more than 250 farms under Basic Salvation of Resources (BSR) organic farms to promote cultivation of medicinal herbs and spices following guidelines developed in collaboration with WHO.
4. Promoted Contract growing farming between farmers and traders and as a result a contract of Hashmi Isboghhol and BSR farms for production of 5-10 tons of Isbghol has been concluded.
5. In private sector (Aloe Pak Pvt. Ltd Lahore) provided technical assistance for the cultivation of Aloe Vera on about 50 acres which is providing raw materials for preparation of various products of aloe vera.
6. On various aspects regarding research, development, marketing, trading, diseases, conservation, propagation and policy papers of medicinal herbs and spices have been reviewed and collected from different sources.

7. Providing farmers a source of pragmatic knowledge about the cultivation of medicinal herbs and spices. About 50 documents have been published in Urdu and distributed amongst farmers and others concerned organizations.
8. More than 1535 accessions of medicinal plants belonging to more than 50 plant species have been collected from various parts of the country which has been properly documented, conserved in the gene bank.
9. Experiments were conducted to characterize and evaluate on fifty five accessions of Ajwain (*Trachyspermum ammi*).
10. Screen *Foeniculum vulgare* (Sonf) germplasm against Anthracnose and data on 52 accessions was recorded as susceptible, tolerant and resistant. The data indicated that five accessions are a precious source of resistance identified in the germplasm which will be further multiplied.
11. The Sowa (*Anethum graveolens*) germplasm was also characterized for variation in total seed proteins using SDS-PAGE. A total of 33 accessions of *Anethum graveolens* were studied.
12. Methray germplasm consisted of 34 diverse accessions were evaluated under field conditions for different qualitative and quantitative traits.
13. *Plantago ovata* germplasm consisted of twenty accessions obtained from USA were evaluated and characterized under green house conditions for different morphological and quantitative traits.
14. The experiments were conducted to develop the production technology of various medicinal herbs.
15. The demonstration plots of Kalongi (*Nigella sativa*), Sonf (*Foeniculum vulgare*), Ajwain (*Carum copticum*) and

Ispbaghol (*Plantago ovata*) were planted at different localities on farmers' field.

16. Established Herbal Gardens in four provinces for the purpose of conservation, multiplication, education and distribution.
17. Fourteen germplasm of medicinal herbs were evaluated for productivity potential in Balochistan.
18. Studies were conducted to evaluate different available seed sources/varieties of *Nigella sativa*, *Anethum sowa*, *Linum usitatissimum*, *Carum copticum*, and *Foeniculum vulgare* for yield potential in different agro-ecological zones of Balochistan.
19. Seed multiplication and demonstration plots of medicinal herbs were planted on farmer's fields at Quetta, Pishin, Kalat and Sibi.
20. Twelve species (Sage, Hyssop, Yarrow, English Lavender, French Lavender, Rosemary, Marjoram, Feverfew, Celery, Parsley, German Camomilla, and evening Primrose) were also established at Cantonment Dairy Farm, Quetta.
21. Established demonstration plots for seed production in various agro-ecological zones of the NWFP.
22. Seed production demand of different medicinal plant species were grown on farmers' fields at various locations of the NWFP.
23. *Established plantation of Liquorice (Glycyrrhiza glabra) plantation on marginal land in NWFP.*
24. Seeds of "buckwheat" (*Fagopyrum esculantum*) were sown and multiplied.
25. Introduced *Zingiber officinale* in different agro-climatic areas of NWFP

26. A survey of various pansara (herbal drug) markets i.e., Batal and Chatter-plain, Dir, Mingora, Madayn, Bahrain and Alpuri were carried out to find out the production status, marketing system, sources of supply and storage facilities as well as related problems faced by the drug dealers and cultivators.
27. Production technology was developed for *Psoralea corylifolia* L. (babchi) and *Lavatera kashmiriana* L. (raisha khatmi) for farmers in NWFP.
28. Ethno-botanical survey was carried out in Babusar valley of Hindukush- Himalayans
29. Collected and planted about 35 exotic germplasm of medicinal herbs and spices in Sindh province. In addition the exotic medicinal herbs seeds were imported from USA (9 species), Japanese (21 species), Germany (19 species).
30. Fourteen medicinal herbs were cultivated as crops for standardization of production technology, post harvest management and seed multiplication in Sindh.
31. Conducted agronomic trials to evaluate performance of different varieties of *Withania somnifera*, *Matricaria chamomilla*, *Carthamus tinctorius* in Sindh
32. Survey was conducted in which the current market prices of medicinal herbs in Karachi market were obtained and analyzed.

Crop Maximization Project

The main objectives of the project are to: (a) supplement the country's on-going efforts to increase food production through enhancing crop productivity (b) ensure food security and alleviate poverty through improving income of small farmers and (c) build a sustainable mechanism to ensure continuity for the productivity enhancement and food security programme even after termination of the project.

Strategy and Approach

- Complete participatory approach under farmers leadership.
- Enhancing food crop productivity through input management.
- Additional support for provision of input credit to farmers at village level.
- Additional support for technology extension to farmers.
- Improving water use efficiency through On-Farm Water Management technologies.
- Improving income of small farmers through income diversification interventions.
- Sustainability through establishing revolving fund for each village.

Principals

- Technology based and enhanced extension services
- Main focus on target group of resource poor small farmers
- Cost sharing by farmers

Components

- Establishment of village organization
- On-farm water management
- Crop management
- Income diversification
- Human resource development

The Crop Maximization Project had been implemented since 2002-03 in 109 villages of 15 districts of all the provinces & AJK and now has been completed as on 30-06-2006. This project has resulted in 30-40% enhancement in crop productivity. Its follow up “Crop Maximization Project-II” will be launched in other 1,012 villages of 27 districts of all the provinces, AJK and NAs during 2006-07. The project envisages to benefit from the experience of phase-I project in increasing the agricultural productivity of rural areas on sustainable basis, enhance food security and reduce poverty. It will establish collective institutions, i.e. Village Organizations one each in 1012 villages which will be owned and managed by the farmers themselves for procurement/management of critical inputs/services, marketing of outputs and diversification of income generation activities, especially by the small land holders.

Agricultural Prices Commission (APCom)

The Agricultural Prices Commission (APCom) was established in 1981 through a Resolution of the Ministry of Food, Agriculture and Livestock, Islamabad. It has been declared as an “Attached Department” of MINFAL in May, 2006. The main responsibility assigned to the APCom is to advise the Government on the price policy of important crops. The Agriculture commodity markets are not only imperfect but also fragmented. During the post-harvest period, commodity prices in the open market tend to crash to the disadvantage of growers. Small farmers who dominate farm production system in the country neither have adequate storage nor sufficient staying power to hold on to their marketable surplus in hope of getting better prices later on, are forced to part with their marketable surplus immediately after harvesting of the produce. In such a situation the farmers, particularly small farmers, are at the mercy of middlemen who tend to exploit the situation to their advantage.

In order to safeguard the interest of growers, the government announces the support minimum price of important crops. The support price acts as minimum guaranteed price and is designed to provide a floor to the market, especially during the post harvest period when the market prices tend to crash to un-remunerative levels, particularly in years of good crop.

Crops Covered Under the Programme

In past the Support Price Programme covered Wheat, Sugarcane, Cotton, Rice, Gram, Onion, Potatoes and Non-traditional Oilseeds viz. Sunflower, soybean, safflower and Canola. In a presentation on the recommendations of the Support Price Committee by the Adviser to the Chief Executive on Food, Agriculture and Livestock in May 2001, it was decided by the Chief Executive to continue Support Price Programme for Wheat, Sugarcane, Rice and Cotton Crops. Later on, it was decided in the meeting of ECC held on 23-9-2002 that the Support Price of Wheat, Rice and Cotton will be determined by the Federal Government and Provincial Governments will consider fixing the Support Price of Sugarcane.

Price Policy Recommendations

The APCom submits detailed commodity specific reports providing background analysis and recommendations on the support prices. In addition to provide recommendations on the level of support prices, these reports also include proposals to increase the efficiency of the production and marketing systems of the respective crops.

The policy reports prepared by the Commission provide detailed analysis on the following aspects of the respective commodities.

1. Short term and long-term changes in area, yield and production of respective crops;
2. Domestic demand, supply, stocks and price situation;
3. World supply, demand, stocks and trade situation;
4. International prices behaviour;
5. Production targets fixed by the government;
6. Export or import parity prices;
7. Domestic parity prices;
8. Cost of production;
9. Comparative economics of competing crops;
10. Nominal and real support prices;
11. Profitability in the use of fertilizer;
12. Parity between input and output prices;
13. Impact of proposed prices on other sectors of economy; and
14. Economic efficiency of resources used in crop production.

Activities of APCom 2005-06

The major activities performed by APCom during 2005-06 are summarized below:

Support Price Policy and Other Reports

1. Support Price Policy for Wheat 2005-06 crop
2. Support Price Policy for Seed Cotton, Rice (paddy), Sugarcane, Mung, Mash crops for the year 2006-07.
3. Gur Production in the NWFP, its Consumption and Export
4. Wheat Situation 2005-06 crop

5. Country Paper “Comparative Study of Basic Agriculture Policy in Member Countries of APO (Pakistan)”

Comments and Recommendations

1. On Comprehensive Policy Paper regarding Modalities of New Framework of Agreement on Agriculture
2. Paper on Establishment of Agriculture Accreditation by Higher Education Commission
3. Prepared Draft Proposals for Amendments in Sugar Factories Control Act 1950
4. Prepared comments on the study of Pakistan India Trade conducted by LUMS, Lahore
5. Prepared comments on the queries raised by Establishment Division regarding finalization of the Status of APCom

Changing and Repositioning APCom

Agricultural Prices Commission (APCom) was established in 1981 to advise government on price policy of major commodities assuming that markets were not properly functioning for those commodities and the growers’ interest must be protected by guaranteeing a minimum price to the growers of major agricultural products. This thinking has changed over time with more acceptance of the market role in determining commodity prices. APCom’s role in ensuring a minimum price for the farmers is still being pursued only for wheat and cotton. The significance of this role has also changed calling for a fresh mandate of APCom.

The needs for analysis of agricultural Policy issues such as emanating from globalization have become more pressing in recent times. With evolving WTO regime and regional trade agreements in place, Pakistan would have to actively monitor market patterns, both regionally and internationally, for effective exports of its tradable commodities. APCom, with its professional expertise and experience, can take-up these roles which no other organization is currently performing within MINFAL.

Federal Seed Certification & Registration Department (FSC&RD)

Federal Seed Certification & Registration Department is an attached department of Ministry of Food, Agriculture & Livestock (MINFAL) and acts as an executive arm of the National Seed Council. It provides quality control services in the shape of certification cover to four multinational seed business companies and about 550 national - public and private sector seed corporations/ companies engaged in the production and marketing of various crops and vegetables seeds in the country. Public sector research stations/ institutes and public seed corporations like Punjab and Sindh Seed Corporations are actively involved in the production of early generation seeds of various crops and vegetables. These pre-basic and basic seeds are then provided to private registered seed companies for further multiplication purposes. The department carries out all its functions in accordance to the Seed Act, 1976.

1. Registration/Approval of New Seed Corporations:

During the year 2005-06, the working group of the MINFAL granted approval/ registration to about 68 new private seed corporations for carrying out seed business in Pakistan. Besides four multinational seed companies, number of registered national seed companies has been raised to more than 550 that indicate the emerging role of private sector in this business/ industry.

2. Registration of Newly Developed Cultivars:

Development, registration and release of new improved and high yielding varieties of field and horticultural crops is a constant feature of agricultural research and development activities in the country. During the year 2005-06, 108 varieties of different agricultural crops developed by public and private sector research institutes were tested by the department for registration under DUS (Distinctness, Uniformity & Stability) system. For Registration process about 129 varieties were evaluated under DUS trials. Similarly for Agronomic Value or Yield Performance trials were carried out for candidate crop varieties initially by public research institutes and then at national level by Pakistan Agricultural Research Council (PARC) for all crops except cotton and

by Pakistan Central Cotton Committee (PCCC) for cotton only through National Uniform Yield Trials (NUYT).

3. Establishment of New Seed Testing Stations/ Laboratories:

FSC&RD through its 27 Field Seed Testing Stations/ Laboratories monitors/ regulates the quality of seed from production fields to the business markets through its well trained staff and well equipped laboratories and testing facilities. To extend seed certification cover effectively to the fast growing seed sector, a project with the capital cost of Rs. 81.28 million has been successfully initiated by the department and 11 new seed testing laboratories have been established at Bahawalpur, Bahawalnagar, Bhakkar, D.G.Khan, Gujranwala, T.T.Singh, Vehari, Larkana, Mirpur Khas, Abbotabad and Usta Muhammad. Efforts are also being made for the establishment of accredited seed testing facilities.

4. Certification of Vegetables and Fruit Plants:

In order to make possible the supply of certified fruit plants to the growers through registered fruit plant nurseries, four (4) Fruit & Vegetables Certification Laboratories are being set up in the country. Four fruit crops germplasm units have already been established in NWFP while 30 fruit plant nurseries were registered by the department in NWFP. With the coordination of other provincial governments more temperate, tropical and subtropical germplasm units are being established in Punjab. Similar action would also be initiated by other provincial agricultural research system.

5. Seed Act Enforcement:

Quality control activities in the seed markets are carried out by the notified Seed Inspector of the department in each district under the provisions of Seed Act, 1976 and Seed (Truth in Labeling) Rules, 1991. During the year 2005-06, seed inspectors of 27 field stations collected more than 352 seed samples from 14012 bags (249317 Kgs. approx.) from the seed markets, submitted chalans against more than 257 dealers/ sellers violating seed act through sale of substandard seeds. The enforcement campaign is still in progress in various cotton and paddy growing tracts of the country.

6. Functions of Central Seed testing Laboratory (CSTL):

Central Seed testing Laboratory (CSTL) performs the most critical functions of counter testing of the seed lots accepted from all the field stations while Central Seed Health testing laboratory is actively engaged in the testing of seedling and seed born diseases of various crops, vegetables and fruit.

7. Amendment in Seed Act, 1976:

The Provincial Assemblies of Balochistan and NWFP have authorized the Federal Government to promulgate the proposed amendments in the Seed Act as required under Article 144 of the Constitution of Islamic Republic of Pakistan. Authorization from the Province of Punjab and Sindh is still awaited for which efforts are being made. The monitoring and quality control system of the department will be strengthened to a great extent with the promulgation of new Seed Act.

8. Launching of Introductory Website of the Department:

An introductory website of the department has been launched to make available the information, about the goals, targets, achievements etc. of the department and seed industry of Pakistan to the general peoples, farmers, students, researcher and those involved in seed business. Address of the site is www.pakistanseeds.gov.pk while regular monthly updated information about the department activities are also uploaded on the website of the ministry, www.minfalgov.pk.

Procurement & Distribution of Certified Seeds

During the year 2005-06, the following quantities (MT) of seeds of different major crops were procured and distributed to the growers.

Sr #	Crop/ Seed	Total seed requirement	Procurement	% Age	Distribution	% Age
1	Wheat	1010520.00	222718.44	22.04	166064.14	16.43
2	Gram	41520.00	144.00	0.35	144.00	0.35
3	Cotton	62000.00	39649.76	63.95	Under process	--
4	Paddy	39645.00	14892.49	37.56	"	--
5	Maize*	41183.60	7057.38	17.14	"	--
6	Mungbean*	3637.90	91.00	2.50	"	--
7	Vegetables*	5270.00	258.70	4.91	"	--
8	Oilseeds*	4688.92	80.02	1.71	"	--
9	Fodders*	58962.50	29.60	0.05	"	--

* Figures are provisional and still in progress and don't include imported seeds.

NATIONAL LIVESTOCK POLICY

The Prime Minister has approved a new “Livestock Development Policy” in principle prepared by MINFAL in consultation with provincial governments and other stakeholders. The livestock policy is aimed at improving legal frame work, credit availability, capacity building and restructuring of institutions for sustainable development of livestock sector to meet the challenges ahead. An independent professionally run corporate body namely “Livestock and Dairy Development Board” with sufficient financial autonomy has also been proposed which would facilitate and promote producers owned and controlled organizations for milk and meat production, provide technical and managerial services to improve capacity building of stake holders.

The policy outlines immediate (1-year) short term (2-3 years) and medium term (3-5 years) action plans for increased milk and meat production. It involves all stakeholders and also defines the responsibilities of state organs such as Livestock Board, Provincial Governments, District Governments and Federal Govt. and Private Sector. It also indicates areas for working of small and medium term enterprises, spells out strategy to mitigate drought situations and has programs for absolute poor segments to improve their socio-economic conditions. The policy will bring radical changes in the current livestock production system in the country and encourage all stakeholders to play their role for the development and exploitation of potentials of livestock sector.

National Veterinary Laboratory, Islamabad

Keeping in view the current and future challenges under European Union Legislations and WTO conditionalities regarding quality assurance of livestock and livestock products for export and to implement the Chief Executive’s directives for promotion of export of livestock and livestock products, Ministry of Food, Agriculture and Livestock established National Veterinary Laboratory at Islamabad having sufficient capability to produce prompt and accurate results from the samples. The Laboratory has been fully operational since July 2004 with main objectives as follows:-

- a) Serve as National Reference Laboratory.

- b) Develop active animal disease surveillance and virus typing.
- c) Provide vaccine quality control services to Federal and Provincial livestock departments.
- d) Test residues of livestock and livestock products to meet EU and WTO sanitary and phyto-sanitary conditionalities.
- e) Evaluate veterinary drugs for safety, potency and efficacy.
- f) Investigate specific emerging disease problems as they arise.
- g) Train Laboratory staff from the provinces in advance diagnostic techniques.
- h) Develop coordination between national (provincials livestock departments) and international (World Animal Health Organization (OIE), Food and Agriculture Organization, EU and veterinary health related agencies).
- i) Develop human resource on national and regional levels.
- j) Perform such other functions, which the Federal Government approved from time to time.

The activities are fully in line with the aims and objectives of the livestock sector towards export promotion, poverty alleviation and raising socio-economic condition of animal growers. The laboratory is helping to meet WTO and EU conditionalities of exports of livestock and livestock products and is imparting services and knowledge on most modern laboratory practices to curb highly infectious and economically important diseases, besides providing residues analysis/drug testing and quality control of biological for the Federal and Provincial Governments. Moreover, the laboratory is serving as the Reference laboratory especially for transboundary animal disease of economic and regional importance. The services thus made available by the NVL are expected to eventually translate into enhanced and disease free exports and reduction in losses due to disease.

**Performance of National Veterinary Laboratory, Islamabad
during the year 2005-06**

Sr. No.	Activity	No. of samples analysed
1.	Monoclonal based ELISA diagnostics	1219
2.	Monoclonal based ELISA surveillance	8250
3.	Virus typing /antibodies	1973
4.	Bacterial examination including antibiotic sensitivity	777
5.	Histopathological analysis	203
6.	Parasitology of blood and others	591
7.	Postmortem an outbreak attendance	85
8.	Vaccine quality tests	21
9.	Residue/drug/heavy metal analysis	946
10.	Training imparted/No. of participants	3/37

The present government realizing importance of livestock sector attaches high priority to its development. The Govt. has evolved livestock supportive policies to achieve sustainable growth in the livestock sector. In order to accelerate the pace of development of livestock sector various projects have been launched during the last four years which strengthened the disease diagnostic laboratories and departments in terms of equipment, capacity building, human resource development, enhanced efficiency and effectiveness of veterinary health services to achieve full prophylactic coverage, strengthened disease diagnostic services and strengthened/expanded veterinary vaccine production and promoted improved animal husbandry practices in the country.

In order to improve the production of livestock and livestock products, to achieve sustainable growth, to meet WTO/ trading partner's conditionalities and to control disease of trade and economic importance following projects have been initiated / in pipeline: -

1. Strengthening of Livestock Services Project

It is European Union-Government of Pakistan funded project. The project started in September 2003 in the four provinces, AJK and Northern Areas and is for 6 years. It is aimed to eradicate Rinderpest disease from the country, enhance efficiency and effectiveness of

veterinary health 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.

2. Prime Minister's Special Initiative for Livestock

Prime Minister's Special Initiative for Livestock has started in December 2005. The project's duration is 05 years. The project will be executed by National Project Management Unit (PMU) of Ministry of Food, Agriculture and Livestock in collaboration with Provincial Livestock Departments and Eight Rural Support Programs (RSP). It is aimed at enhancing the livestock productivity through the provision of livestock production and extension services at farmer's doorsteps, targeting 13 million rural poor in 1963 union councils in 80 districts of the country. It will employ and train 290 veterinarians and 29 District Livestock Officers and would create/make 7,250 self-employed Community Livestock Extension Workers (CLEWs). Its activities will assist in the production of additional milk and meat to the tune of 12 million liters and 0.2 million tons per annum respectively, after the completion of the project.

3. Livestock & Dairy Development Board

Livestock & Dairy Development Board has been established under Agribusiness Development Project and registered by the Securities and Exchange Commission of Pakistan (SECP) as a *not-for-profit* company under Section-42 of the Companies Ordinance 1984. It has members from public and private sectors. It will play key role in the development of livestock sector.

4. Pakistan Dairy Development Company- Dairy Pakistan

Dairy Pakistan has been established as a Not – for – Profit Led Company. MINFAL and M/O Industries, Production and Special Initiatives will work together for creating an enabling environment for dairy industry by developing policy and regulatory measures.

PIPE LINE PROJECTS

Livestock Production and Development for Meat Production

The project entitled, “Livestock Production and Development for Meat Production” is of five years duration (2005-2010) with a proposed cost of Rs.1.520 billion. The project will be implemented in the four provinces including Northern Areas, AJK and NARC under the supervision of Livestock and Dairy Development Board. The salient objectives of the project include organizing farming community for a feed lot fattening to maximize bio-economics and sustainable meat production / its value addition through meat processing and quality control, research and development to generate and develop appropriate cost effective technologies for meat production, processing and quality control, create linkages among meat producers and processors, capacity building of stake holders for meat production. The project will provide full technical and partial financial assistance for the infrastructure development at farm level, slaughterhouses and butchereries.

Milk Collection Processing & Dairy Production and Development Program

The proposed cost of the project entitled, “Milk Collection Processing and Dairy Production and Development Program” is Rs.1.590 billion with a duration of five years (2005–2010). The project will be executed in the four provinces alongwith AJK and Northern Areas under the supervision of Livestock and Dairy Development Board.

The proposed project have four major components that included Milk Collection & Marketing from Small & Landless Farmers; Support to Market-oriented Rural Dairy Farmers; Production of Quality Breeding Animals and Production of progeny tested bulls.

The activities initiated under the above referred projects would consolidate and strengthen the disease diagnostic laboratories and departments in terms of equipment, capacity building, human resource development, enhance efficiency and effectiveness of veterinary health services, strengthen disease diagnostic services, expand veterinary vaccine production and promote improved animal husbandry practices in the country and will lead to an overall improvement of the livestock infrastructure in the country. It will also help in organizing small-scale producers. The project will assist in speeding up the pace of development in livestock sector.

Agriculture Sector Program Loan-II (ASPL-II)

Government of Pakistan has signed the above loan with the Asian Development Bank on 1st April 2002. Its salient features are noted below:-

I. Objectives and Scope: The primary objective of the program is to improve agricultural productivity and profitability. It includes specific reform measures to (i) promote efficient markets for major commodities, including wheat, cotton, rice and sugarcane in order to promote market-based incentives for farm, especially smallholders; (ii) liberalize markets for fertilizer and seed; and (iii) strengthen support services in small farmer extension and training, research and regulation to improve quality control.

II. Loan Amount: Loan amount is US\$350 million on following terms and condition:

- a) \$123 million for 24 years; @ 1% during the grace period of 8 years and 1.5% per annum during the amortization period.
- b) \$225 million for 15 years; grace period 3 years; interest to be determined in accordance with the ADB's LIBOR-based loan facility.
- c) A TA loan of US\$ 2 million for 32 years; grace period 8 years; interest rate of 1% during grace period and 1.5% during the amortization period.

III. Program Period and Tranching: The program period is five years from December 2001. The loan is releasable in three tranches; first US\$ 125 million; second US\$ 100 million; and third US\$ 123 million. The first tranche has been released. Policy measures for release of second tranche have been completed and the second tranche is expected to be release in August 2006.

IV. Technical Assistance: The program includes \$2 million Technical assistance as additional support to effectively implement sequence and monitor policy reform action. TA is meant for, (i) programme coordination, (ii) improving efficiency of commodity

markets, (iii) small farmer extension and research services and safety nets, and (iv) reorganization and restructuring of state-owned-enterprises.

V. Implementation Arrangements: Ministry of Finance is the Execution Agency and responsible to (i) coordinate with MINFAL, MOC, MOF, and the provincial governments on the policy reforms, (ii) oversee compliance of tranche conditions, (iii) administer the use of loan proceeds; and (iv) request ADB for tranche release.

MINFAL is responsible for day to day implementation, including monitoring the implementation of the program, use the counterpart funds and evaluate the impact of the reforms on stakeholders. To facilitate implementation, MINFAL has (i) established a Steering Committee composed of senior staff from MINFAL, MOC, MOF and the provincial Planning and Development Departments, Agriculture Departments and Food Departments, (ii) established a Program Implementation Unit (PIU) in MINFAL under the direction of Secretary MINFAL for implementation of ASPL-II, TA component and using the counterpart funds under an umbrella project titled Agriculture Sector Development Loan.

VI. Disbursement: The loan proceeds are to be used to finance the foreign exchange cost of items produced and procured in ADB member countries, excluding ineligible items. The Government will open a deposit account with the SBP in which all withdrawals will be deposited. The use of local proceeds of the loan (counterpart funds) is to be used by the Government to support the reforms to be initiated or implemented under the Program. The Government has agreed to provide part of the counterpart funds to provinces.

VII. Policy Matrix: The Policy matrix (conditionalities) attached with the Finance Minister's Development Policy letter dated 16th November 2002 with the ASPL-II documents requires reforms for:

- Improving efficiency of commodity markets including major crops of wheat, cotton and sugarcane.
- Improving public management of strategic reserves of wheat.
- Phasing out commodity price supports and subsidies.
- Accelerating divestiture and restructuring of state-owned-enterprises.

- Accelerate the provision of agricultural support services.
- Accelerate the strengthening and coordination of agricultural support services.
- Improve quality control and regulation measures regarding pesticides and fertilizer.

VIII. Implementation Status of ASPL-II as of 30 June 2006: All the conditions of the release of first tranche have been met and the first tranche of US\$125 million loan was released in September, 2002. Release of second tranche of US\$100 million was due by April 2004. This is delayed because it involved implementation of complicated conditionalities relating to restructuring of food departments and restructuring of national agriculture research and extension systems. Necessary steps have been taken to comply with all the conditionalities. MINFAL has complied with 13 out of 14 conditions and seeking waiver for one remaining condition. It is expected that the second tranche of loan will be released in August 2006.

TA component is being implemented. Eleven consultants have been hired. They have submitted reports to support implementation of ASPL-II. From the counterpart funds of ASPL-II (Rs.10,266 million for five years 2003-08), one hundred development projects of Federal and Provincial Governments are being implemented. All the projects generally aim at (i) increasing agricultural productivity, (ii) improving agricultural research system, (iii) meeting the cost of reforms undertaken under ASPL-II.

Agribusiness Development and Diversification Project

The aims and objectives of the project are as under:

- Creating an agribusiness support fund to provide farmers, farmer groups, and entrepreneurs with demand-driven technical and managerial services on a matching grant basis to improve their productivity, competitiveness and creditworthiness to access financing for their enterprises;
- Providing capacity building for horticulture, hortibusiness and agribusiness;
- Streamlining the collection and dissemination of market information;
- Strengthening agribusiness technical training capacity, upgrading, testing and certification facilities for seeds nurseries, and crops, and building awareness of the need to comply with international agricultural products standard and practices;
- Revising and updating the agribusiness regularity frame work and formulate a national agribusiness policy and provincial horticultural policies;
- Project management support.

The Agribusiness Development Project perceives to create an enabling environment for agribusiness development in all four provinces and special areas of Pakistan with a view to enhance farm profitability, farmers' income and reduce rural poverty. The Project consist of a combination of policy measures, supporting infrastructure development, improve marketing services and facilities both local and export an agribusiness related capacity development in the provinces and special areas. The Project is essentially private sector led and demand driven with the minimal role in terms of coordination, facilitation and necessary support of creation an enabling environment for the Government. The Project objective is development and promotion of the wider agribusiness activities but the principal focus of its activities shall be on promotion and development of horticulture (fruit, vegetables, flowers,

spices and horticulture business and improvement of livestock and dairy related institutional framework. Through the agribusiness support fund and business development services components selected enterprises will be helped in identification and development of viable agribusiness investment proposals. The capacity development foreseen for selected participatory financial institutions through the SBP will open the window for commercial finance for agribusiness enterprises. The Government of Pakistan component part from supporting development of natural agribusiness policy/provincial horticulture policies, setting up of not for profit commercially run Pakistan Horticultural Development and Export Board (PHDEB)/Livestock and Dairy Development Board (LDDDB) and strengthening of legislative framework and enforcement mechanisms for health safety, quarantine and quality control initiative of all provinces and special areas.

About 2,000 agro-enterprises are expected to benefit from the agribusiness support fund operations over the five years of the project's life. Further, a number of institutions are expected to develop dedicated agribusiness finance functions, which put benefit and additional 10,000 agro-enterprises including up to 12,500 farmers entrepreneurs, by improving access to finance and providing significant jobs and income generating opportunities

ADB's loan comes from its concessional Asian Development Fund, carrying a 32 year term, including a grace period of 8 years. Interest is set at 1% per annum during the grace period and 1.5% per annum subsequently.

The Ministry of Food, Agriculture and Livestock is the implementing agency with different components being executed through the various bodies/financial institutions such as the ASF, PFIs, PHDEB, LDDDB, etc. A Project Steering Committee has been established in Ministry of Food, Agriculture and Livestock with Provincial Coordination Committees in provinces/special areas with representation from all stake holders including business and agriculture associations for coordinating the implementation of project activities.

Agribusiness Support Fund (ASF):

An Agribusiness Support Fund, a nonprofit company has been established and registered under Section 42 of Companies Ordinance 1984. The objectives of the company are to:

- i. Promote and facilitate the development and competitiveness of agribusiness enterprise.
- ii. Promote and strengthen existing and new entrants in agribusiness sector.
- iii. Provide financial support in form of grants to agribusiness enterprises to purchase BDS.
- iv. To make agribusiness enterprises aware of the benefits of employing BDS.
- v. Enter into a funding contract with selected agribusiness or BDS recipients.
- vi. Facilitate the development of private sector agribusiness and BDS markets through non-financial support.

INTERNATIONAL COOPERATION WING

The International Cooperation Wing deals with the activities of FAO and other UN agencies relating to agriculture sector of Pakistan. It is responsible for all matters relating to technical assistants and foreign training programmes of officers of MINFAL and its departments etc. It also concerns with all matters relating to agriculture cooperation with IMF, World Bank, IBRD/IDA, ADB, IDB, ECO, OIC, SAARC and OPEC Fund. The details of the major activities performed during the 2005-06 are as under:-

FAO ASSISTANCE

Pakistan is a contributing member of FAO. In fact Pakistan joined the FAO on 7th September, 1947 immediately after its independence. An amount of Rs.10,749,000.00 was paid as contribution for the year 2005-06. Pakistan also pays Rs.1,000,000.00 annually to FAO to meet local operating cost of their local office in Islamabad.

Since the launching of Technical Cooperation Programme (TCP) in 1976, FAO has implemented eighty projects under this programme in Pakistan at a cost of approximately US\$ 10 million. In addition to the assistance under the TCP, FAO has also provided assistance of US\$ 108.4 million and implemented 222 projects in the fields of agricultural policy, planning, research, livestock and fisheries. A list of FAO's ongoing projects as on 15th July, 2006 is enclosed. Currently there are 13 FAO projects on-going in Pakistan with a total outlay of US\$ 24,683,487.00. Eleven of the projects are regional in character. Pakistan is also included in two regional projects of the FAO spanning the Asia Pacific and control Asia regions pertaining to sharing of Agriculture Statistics and Trans-boundary Animal Diseases.

Pakistan has very warm relations with FAO. Apart from being contributory member of FAO, Pakistan has always been playing very active role in the specialized agencies working for the development of agriculture, livestock and fisheries.

**FAO PAKISTAN ONGONG PROJECTS
(AS ON JULY 15, 2006)**

S. No	Projects Code	Project Title	Budget (s)	Start Date	End Date
1	TCP/PAK/3003	Project Preparation and Capacity Building Support of the Water Sector Improvement Programme in Sindh Province	360,202	Sep-04	Sep-06
2	TCP/PAK/3004 (A)	Assistant in Up-Scaling Dairy Development in Pakistan	354,000	May-05	Jul-06
3	TCP/PAK/3005 (A)	Support to Fisheries Sector policy and Strategy Formulation	307,000	May-05	Oct-06
4	TCP/PAK/3006	Strengthening project development capacity of the Ministry of Food, Agriculture and Livestock (MINFAL)-Phase-II	135,000	Oct-05	Jul-06
5	TCP/PAK/3007	Emergency Assistance to the Rehabilitation of the Agricultural Sector and Household Livelihoods in Earthquake-affected Areas	400,000	Oct-05	Dec-06
6	TCP/PAK/3101 (T)	Strengthening the Extension Capacities of Community Demand-Driven Planning or Natural Resources Management in the Azad Jammu and Kashmir Region-Phase-II of TCP/PAK/2905 (T)	142,000	Apr-06	Aug-06
7	GCP/PAK/095/USA	Food Security/Poverty Alleviation through Arid Agriculture Development Balochistan: Pilot Project Phase	6,335,150	Apr-04	Jul-07
8	UTF/PAK/073/PAK	Training in Agriculture Research	8,678,880	Jun-03	Dec-06
9	UTF/PAK/096/PAK	Community LADDERS (Learning and Action for Demand Driven Extension and Rural Services)	3,117,150	Apr-05	Mar-08
10	UTF/PAK/097/PAK	Capacity Enhancement Assistance to MINFAL in WTO Related Policy and Strategy Development & Project Formulation	657,600	Apr-05	Oct-07
11	UTF/PAK/099/PAK	FAO/MINFAL Cooperation in Programme Development	196,669	Aug-05	Mar-07
Country Total			20,583,740		
Regional Projects					
12	GCP/RAS/184/JPN	Strengthening Regional Data Exchange System on Food and Agricultural Statistics in Asia and Pacific Countries	1,257,622	Dec-01	Dec-07
13	GTFS/INT/907/ITA	Controlling Transboundary Animal Diseases in Central Asian Countries	2,842,125	Jan-04	Dec-06
Regional Total			4,099,747		
Grand Total (Country + Regional)			24,683,487		

WORLD FOOD PROGRAMME (WFP)

World Food Programme is the food aid arm of the United Nation's system mandated to combat the hunger that afflicts one out of every seven people on earth. WFP was established in 1961 with its Head Quarters in Rome, through parallel resolutions of the UN General Assembly and the FAO Conference. It has evolved from an initial experimental programme of appropriately US \$ 100 million for three years to what is now one of the largest multilateral channels of Grant Aid to developing countries with a yearly expenditure of more than US \$ 6.00 billion.

The WFP is run by its Executive Board, which was constituted in its present form on 1st January 1996. The Board consists of 36 states members of the UN and FAO. The FAO Council and ECOSOC each elect half of the members. The Board, which meets four times per year, oversees WFP's humanitarian and development food aid activities.

WFP uses food aid to meet emergency needs and support economic and social development of the countries in need. WFP works to put hunger at the centre of international agenda, promoting policies, strategies and operations that directly benefit the poor and the hungry.

Pakistan was a member of the World Food Programme's Middle East Region based in Cairo, Egypt. However, from July 1st 2006, Pakistan's association with the Middle East Region based in Cairo Egypt has been de-linked and Pakistan has been attached to the Asia Region with its Head Quarters in Bangkok, Thailand. Pakistan is also a member of the WFP Executive Board elected by ECOSOC for the 3 years term 2004 – 2006. Pakistan held the Vice Chairmanship of WFP Executive Board for the year 2005. Pakistan contributed Rs.3.2 million to the WFP local office during the financial year 2005-06.

WFP has been active in Pakistan since 1968 and for the 38 years following its inception, it has invested more than \$ 1.5 billion in various development and emergency projects. In the last few years, WFP activities in Pakistan serve as a good example of utilizing food aid to support long term development targets, concentrating on the needs of the most vulnerable hungry poor-food-insecure women and their children.

WFP has developed a country programme for its activities in Pakistan in consultation with other UN agencies i.e. UNDP, UNFPA and UNICEF. The Country Programme is tightly linked with the Government of Pakistan's Poverty Reduction Programme, UNDAF and Millennium Development Goals and aims to help improve access to food in order to enable women and girls to take advantage of development opportunities. Its three active components are girl's primary education, safe motherhood and creating assets for rural women. WFP's current Country Programme (2005-09) which started from 1st January, 2005 is a continuation of the last Country programme (2002-04) with a commitment of US\$ 68.7 million in addition to the Earthquake Relief and Rehabilitation efforts.

In Pakistan, the following Projects of WFP are on-going:

- i. ***Education – “Assistance to Girls, Primary Education”*** – By concentrating on girl's education, WFP addressed a key development issue in Pakistan. Poverty is one of the main reasons for children not attending school and dropping out. In poor households, there is a strong bias for educating sons who are potential earners. About 76% of the female adult population is illiterate and 75% of rural girls drop out of the primary level. WFP's assistance to education is aimed at promoting primary education for girls in rural areas and increasing attendance rates in selected rural primary schools. As in health programme, WFP uses food aid as an incentive to encourage poor families to send their girls to school instead of keeping them at home – usually to help with household chores. Each girl takes home four- litre tin of edible oil if she attends school for 20 days in a month.
- ii. ***Health – “Promoting Safe Motherhood”*** – Pakistani women suffer from the highest maternal mortality rates in the region, 340/100,000 give births and only 29% of women receive antenatal and childbirth care from trained birth attendants. Recent statistics show that more than 45 percent under 5-mortality occur during the first month of life. These deaths are primarily the result of poor maternal health and nutrition, lack of antenatal care and awareness, inadequate coverage of pregnant women with tetanus toxoid immunization, and complications during delivery. Working with the Provincial Health Departments, WFP's health

programme is designed to promote the attendance of poor expectant mothers at rural government health centers by giving 4 litre tins of vegetable oil at critical milestones during pregnancy and after birth. The women are encouraged to obtain antenatal and postnatal checkups, vaccinations for themselves and their infants and receive health education and family planning messages. Results show that attendance and vaccination rates for women have increased remarkably as a result of WFP support.

- iii. ***Creating Assets for Rural Women*** –In line with WFP’s commitments to women and its policy of Enabling Development, as well as in keeping with Government’s Poverty Reduction Programme, this activity focuses on the creation and preservation of sustainable physical, economic and social assets for rural women and their families. WFP contributes to the daily wages using food stamps, which beneficiaries use to buy basic food items in nearby participating shops. This contributes to their overall household food resources during the implementation of these activities and results in tangible physical assets, enhanced skills or increased income for women. Around 60,00 recipients mostly women and their families are benefiting every year.
- iv. ***WFP’s assistance in the earthquake affected areas-*** The WFP had provided valuable assistance to the earthquake-affected people in NWFP and AJK through a food aid project. Currently, the WFP is implementing another project envisaging an expenditure of US \$ 67 million for relief and rehabilitation work in the earthquake areas. A Letter of Understanding (LoU) in this respect was signed between MINFAL and the WFP on 15th June, 2006.

The following MOUs/Agreements/Protocols signed with different countries during the year 2005-2006: -

1. MOU between Pakistan Agricultural Research Council (PARC) and Sri Lankan Council for Agriculture Research Policy (SLCARP) signed on 9th February, 2005.

2. MOU on Technical, Scientific and Economic Cooperation in the field of agriculture between Government of Pakistan and Government of Australia signed on 15th June, 2005.
3. Arrangement between Government of Pakistan and Government of Australia relating to the implementation of Agriculture Sector Linkages Program (ASLP) signed on 22nd November, 2005.
4. Declaration of Intent between the Government of Pakistan and Government of Norway signed on 24th Jan., 2006.
5. Agreement for cooperation in agriculture between Government of Pakistan and Government Vietnam signed on 6th June, 2006
6. Agreement between Government of the Republic of Uzbekistan and Government of the Islamic Republic of Pakistan on cooperation in the field of Plant Quarantine signed on 2nd May, 2006.
7. MOU between Government of the Republic of Uzbekistan and Government of the Islamic Republic of Pakistan on cooperation in the field of Agriculture signed on 2nd May, 2006.
8. Signed Agreed Modified Programme between Ministry of Jihad-e-Agriculture of the Islamic Republic of Iran and Government of Pakistan on 22-5-2006.
9. MOU between Government of the People's Republic of Bangladesh and Government of Pakistan signed on 13-2-2006.
10. Protocol between Government of Jordan and the Government of Pakistan in the field of Agriculture signed on 27th June, 2006.

The following MOUs/Agreements with different countries are under process:-

1. MOU between Government of the Mauritius and Government of the Pakistan is under process.

2. MOU on Agriculture cooperation between Pakistan and Malaysia is under process.
3. MOU on Agro-based Industry between Pakistan and Turkey is under process.
4. Agreement on Cooperation in the field of Fisheries and Establishment of Joint Ventures for Shrimps Farming between Pakistan – Yemen is under process.

In addition to above, proposals and implementation status for Joint Economic Commission/ Inter ministerial meetings with different countries shared with Economic Affairs Division for further improvement of Agriculture sector.

Coordination and follow up bilateral Agreements, MOUs and Protocols with different countries. Processed number of cases for visit abroad of Pakistani scientists to attend the meetings, trainings, workshops and seminars etc. in the field of Agriculture and Livestock sector.

World Trade Unit

The WTO Unit in MINFAL was incepted in September 2005, in response to a rising demand for information related to WTO food & agriculture-related matters (WTO-FARM) & analyses of the issues requisite for an informed participation in international trade negotiations & disputes on one hand and to inform domestic policy on change management under WTO food & agriculture regime. The WTO Unit MINFAL thus besides informing MINFAL, also supports WTO-related work of Ministry of Commerce (MOC), through economic, legal and technical analysis, on issues relating to trade in food & agriculture and was assigned following key tasks:

- Undertake analyses and provide technical support for the on-going WTO mandated negotiations on agriculture.
- Analyze the implications of the WTO negotiations on Pakistan's production, trade, income, food security etc.
- Monitor the implementation of the WTO Agreement on Agriculture (AOA), including activities of other WTO Members.
- Promote understanding, and help interpret emerging WTO rules relevant to agriculture & food sector.
- Prepare notifications on various parts of the agriculture Agreements (e.g. AMS and Green Box expenditures, SPS notifications etc).
- Promote awareness and help expand the over-all knowledge base of the stakeholders.
- Review and identify legislative changes in the context of SPS management.

Activities

In a short span of a few weeks the Unit examined and analyzed a large number of proposals, often based on original research, building novel databases and acquiring new skills. Some of the more significant proposals analyzed by the Unit are given below:

- a. US proposal on Sensitive Products & TRQ Expansion Feb 6, 2006
- b. G20 proposal on Food Aid; Feb 9, 2006

- c. Cairns group draft proposal on food aid; Feb 10, 2006
- d. G20 proposal on product specific caps; March 15, 2006
- e. Argentinean proposal on Para 24 of the Hong Kong Declaration; March 20, 2006
- f. African group proposal on food aid, March 20, 2006
- g. US proposal on food Aid; April 7, 2006
- h. US proposal on State Trading enterprises; April 10, 2006
- i. US proposal on DOMESTIC SUPPORT, April 10, 2006
- j. Chairman's reference papers on SSM, Export credits and Blue Box; April 13, 2006
- k. Brazilian proposal on fisheries subsidies; April 20, 2006

The Unit also arranged a series of countrywide awareness raising seminars in partnership with the civil society. These seminars were held in Islamabad, and, Hyderabad. The purpose of these seminars was to bring stakeholders on board and get feed back on issues of interest from WTO negotiation viewpoint.

The Unit regularly advises MINFAL on technical issues related to international trade, such as PTAs, FTAs, BITs, SPS/TBT related issues and their management. The agenda, the unit is currently working on, includes among others:

- i. Work on modalities
- ii. Examination of proposals
- iii. Preparation of compendia on tariffs, prices, TRQs, SPS/TBT notifications etc.
- iv. Preparation of electronic documentation of national legislation on SPS.
- v. Staff training proposal and program as per UTF.
- vi. Awareness raising seminars for provinces
- vii. Preparation of working paper on Food Standards Agency
- viii. Participation CDWP meetings for approval of the NAPHIS and other projects

3.0 AGRICULTURE SECTOR PERFORMANCE DURING 2005-06

Agricultural Crops Development Wing

The Wing places greater focus on high value agriculture crops including fruit and vegetables. The improvement in the area of high value agriculture is being made through creating an enabling agribusiness environment and setting up of agro based industries. This requires active participation of domestic and overseas private investors in setting up of packaging/processing units for fruit, vegetables and other products to avoid post harvest losses and perishing of commodities due to lack of market access on the part of growers. The performance and achievements of crops sector is given as follows:-

Wheat:

- The wheat area targets for (2005-06) were set at 8415 thousand hectares and production at 22.00 million tons (Table-I).
- The wheat (2005-06) crop size has been estimated at 21.7 million tons from an area of 8307 thousand hectares (Table -I). This is improvement of 0.4% in production over last year achievement of 21.6 million tons.
- The overall wheat stock position as on 28-05-2006 is 6.251 million tons viz. Punjab 3.731 million tons, Sindh 0.969 million tons, NWFP 0.137 million tons, Balochistan 0.066 million tons and PASSCO 1.348 million tons.
- The government, for public sector, has set minimum wheat procurement target of 5 million tons, viz Punjab 3.00 million tons, Sindh 0.7 million tons and PASSCO 1.3 million tons.
- The public sector as on 28-05-2006 has procured 4.193 million tons wheat against the target of 5 million tons. The procurement details are as follows:

Province/Agency	Procurement (Tons)
Punjab	2,387,999
Sindh	706,806
PASSCO	1,098,116
Total	4,192,921

- The private sector has also been encouraged to participate in the wheat procurement operations and State Bank of Pakistan has issued instructions to various banks to extend a cash margin facilities of 90:10 for procurement of domestically produced wheat. There will be no restriction on inter-district or inter-provincial movement of wheat.
- Government has decided to allow duty free import of wheat and wheat flour by the private sector according to the specifications prescribed by the Ministry of Food, Agriculture and Livestock. So far, the private sector has contracted 850 thousand tons wheat import from various sources, out of which 816 thousand tons wheat has already arrived at Karachi. Government has removed 15 percent duty levied on export of wheat flour.
- Support price of wheat for 2005-06 crop was raised from Rs. 400/- to 415 per 40 Kg. Government has imposed 10% regulatory duty on wheat import to Pakistan. This measure will discourage wheat imports and prompt the private sector to buy indigenous wheat ensuring better return to the wheat growers for their produce.
- Government has provided Rs. 50 million for launching of “Grow More Wheat Campaign 2005-06”. Ministry of Food, Agriculture and Livestock has started a vigorous media campaign aimed at creating awareness among the wheat growers by providing timely messages on the wheat production technology.

Cotton:

- The cotton crop (2006-07) production target has been set at 13.82 million bales from an area of 3.25 million hectares (Table-II).
- Cotton crop (2006-07) sowing is in progress. The cotton area sown as on 31st May indicate that in Sindh area sown was 339,230 hectares i.e. 53% of set target of 640,000 hectares. In Punjab as on 27/5/2006 the cotton area sown was 3417 thousand hectares.
- Cotton arrivals in ginning factories for 2005-06 as on 30-04-2006 were 12.395 million bales. In Punjab cotton arrivals in ginning factories were 9.849 million bales and in Sindh arrivals were 2.546 million bales.

- The Federal Committee on Agriculture (FCA) in its meeting held on 4th April, 2006 at Islamabad has estimated cotton (2005-06) production at 13.0 million bales from an area of 3.10 million hectares (Table-II).
- The Government has announced the intervention price of cotton (2006-07) by increasing it from Rs. 975/- to Rs. 1025/- per 40 kg of phutti (seed cotton).
- Ministry of Food, Agriculture and Livestock has prepared a Ten Years Cotton Developmental Program under the “Cotton Vision” as per the Prime Minister’s directive.
- Ministry of Food, Agriculture and Livestock has started a vigorous cotton (2006-07) media campaign aimed at creating awareness among the cotton growers by providing timely messages on the cotton production technology.

Sugarcane:

- The sugarcane (2006-07) targets are set at area 1005 thousand hectares and production at 50.5 million tons (Table-III).
- The sugarcane (2006-07) area sown is 1033.4 thousand hectares. This indicates increase of 14% against the last year achievement of 906.98 thousand hectares.
- The sugarcane crop production for (2005-06) is estimated at 44.3 million tons from an area of 907 thousand hectares (Table-III). The crop was badly damaged due to frost incidence during the month of January, 2006.
- There is surge in the sugar prices due to short sugarcane crops of 2004-05 and 2005-06. Efforts are underway to augment domestic sugar supplies through import of the commodity.
- Keeping in view the water shortages MINFAL has started to introduce sugar beet, a short duration crop in order to supplement sugarcane. MINFAL is now, focusing to further expand the sugar beet programme.

Rice:

- Rice crop (2005-06) production is 5.547 million tons from an area of 2621.5 thousand hectares (Table-IV). This indicates improvement of 10.4% over the last year achievement of 5.0 million tons.
- The rice (2006-07) targets are set at area of 2485 thousand hectares and production at 56.93 million tons (Table-IV).
- The rice production (2005-06) in Balochistan and Sindh indicated significant improvement and prices of Irri rice (paddy) were lowered to Rs. 250/- per 40 kg. To support the rice growers Government advised the PASSCO to procure Irri rice (paddy) from the growers at the rate of Rs. 300/- per 40 kg.
- This year (2005-06) the rice exports by surpassing 3 million tons level are setting at all time high record of export of this commodity.

Gram:

- The Gram (2005-06) area targets were fixed at 1112.5 thousand hectares and production at 857 thousand tons (Table -V).
- The gram crop (2005-06) production is estimated at 536 thousand tons from an area of 1066 thousand ha (Annexure-V). Gram crop was badly affected by dry weather conditions.

Maize:

- The maize crop (2005-06) production is estimated 3560 thousand tons (Table-VI). This indicates improvement of 27.3% over the last year production achievement of 2796.1 thousand tons.
- The maize (2006-07) targets of area are set at 1001.20 thousand hectares and production at 3278.8 thousand tons (Table -VI).

Chillies:

- The Chillies (2005-06) production is estimated at 120.46 thousand tons from an area of 59.4 thousand hectares (Table-VII). This

indicates improvement of 33% against the last year production achievement of 90.5 thousand tons.

- The Chillies (2006-07) targets of area are set at 65.7 thousand hectares and production at 128.90 thousand tons (Table-VII).

Onion:

- The onion (2005-06) area targets were fixed at 122.3 thousand hectares and production at 1853.0 thousand tons (Table-VIII).
- The onion (2005-06) production is estimated at 2050 thousand tons from an area of 145.87 thousand ha (Table-VIII). This indicates improvement of 16% against the last year's production achievement of 1853 thousand tons.

The area, production and yield position of major crops is given as below:-

Table -I

WHEAT:

Targets 2005-06

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	6403.00	17655.00	2757
Sindh	900.00	2478.00	2753
NWFP	767.00	1161.00	1514
Balochistan	345.00	706.00	2046
Total	8415.00	22000.00	2614

Achievement 2005-06

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	6322.00	16811.20	2660
Sindh	933.00	2896.80	3104
NWFP	743.00	1294.30	1742
Balochistan	309.00	706.00	2284
Total	8307.00	21708.30	2615

Table-II

COTTON

Achievements 2005-06

Province	Area (million ha.)	Prod. (million Bales)	Yield (Kg/ha.)
Punjab	2.43	10.25	719
Sindh	0.62	2.65	727
NWFP	0.01	0.01	170
Balochistan	0.04	0.09	383
Total	3.10	13.00	714

Targets 2006-07

Province	Area (million ha.)	Prod. (Million Bales)	Yield (Kg/ha.)
Punjab	2.56	10.58	703
Sindh	0.64	3.13	834
NWFP	0.01	0.01	170
Balochistan	0.04	0.10	425
Total	3.25	13.82	724

Table-III**SUGARCANE:****Achievements (2005-06)**

Province	Area (000 ha.)	Production 000 tons	Yield tons/ha
Punjab	625.20	28949.00	46.3
Sindh	183.18	11243.42	61.4
NWFP	98.60	4100.00	41.6
Total	906.98	44292.42	48.8

Targets 2006-07

Province	Area (000 ha.)	Production 000 tons	Yield (tons/ha.)
Punjab	670	33500	50.0
Sindh	230	11960	52.0
NWFP	105	5040	48.0
Total	1005	50500	50.2

Table-IV**RICE:****Achievements (2005-06)**

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab: Basmati	1526.00	2624.00	1720
Irri/Others	236.00	555.00	2352
Sub-total	1762.00	3179.00	1804
Sindh: Irri/Others	593.00	1721.00	2902
NWFP:	59.00	118.00	2000
Balochistan	207.00	529.00	2556
Total	2621.00	5547.00	2116

Targets (2006-07)

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab: Basmati	1480	2675.40	1880
Irri/Others	236	581.70	2465
Sub-total	1716	3257.10	1898
Sindh: Irri/Others	503	1807.5	3047
NWFP:	60	122.85	2048
Balochistan	206	506.10	2457
Total	2485	5693.10	2211

Table-V**GRAM:****Targets 2005-06**

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	956.40	760.60	795
Sindh	54.00	49.00	907
NWFP	68.00	19.50	287
Balochistan	34.10	28.30	830
Total	1112.50	857.40	771

Achievements 2005-06

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	928	436	470
Sindh	52	46	885
NWFP	50	24	480
Balochistan	36	30	833
Total	1066	536	503

Table-VI**Maize:****Achievements 2005-06**

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	530.0	2767.80	5220
Sindh	3.49	2.00	573
NWFP	492.0	784.00	1593
Balochistan	4.10	6.20	1512
Total	1029.59	3560.00	3458

Targets 2006-07

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	530	2539.0	4791
Sindh	3.0	1.6	533
NWFP	463.0	733.0	1583
Balochistan	5.2	5.2	1000
Total	1001.2	3278.8	3275

Table-VII**Chillies:****Achievements 2005-06**

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	4.86	7.87	1619
Sindh	51.74	108.11	2089
NWFP	0.40	0.98	2448
Balochistan	2.40	3.50	1458
Total	59.40	120.46	2028

Targets 2006-07

Province	Area (000 ha)	Production (000 tons)	Yield (kg/ha)
Punjab	11.30	19.20	1690
Sindh	51.00	105.00	2059
NWFP	0.40	0.40	1000
Balochistan	3.00	4.30	1433
Total	65.70	128.90	1962

Table-VIII**Onion:****Targets 2005-06**

Province	Area (000 ha)	Production (000 tons)	Yield (Tons/ha)
Punjab	27.90	275.00	9.86
Sindh	54.50	880.00	16.15
NWFP	8.50	119.00	14.00
Balochistan	31.40	579.00	18.47
Total	122.3	1853.00	15.16

Achievements 2005-06

Province	Area (000 ha)	Production (000 tons)	Yield (Tons/ha)
Punjab	31.00	305.60	9.86
Sindh	66.02	840.00	12.72
NWFP	10.75	205.44	19.12
Balochistan	38.10	699.20	18.35
Total	145.87	2050.24	14.06

LIVESTOCK WING

Livestock plays an important role in the economy of the country. Livestock sector contributed 50 percent of the agriculture value added and 11 percent to national GDP during 2005 - 06. It is a net source of foreign exchange earnings with approximately 8.0 % share annually. It registered rapid growth during the year 2005-06. The value of livestock in GNP at current cost factor has increased from Rs.687 billion in 2004-05 to Rs. 758 billion in 2005-06, showing an increase of 10.4%. Government realizing the importance of livestock sector in the national / rural economy and its role in alleviation of rural poverty, is working on bringing about radical changes for transforming it from subsistence to market oriented approach.

The livestock population and production of livestock products are given below:

Estimated Livestock Population

Species	2003-04	2004-05	(Million Nos.)
			2005-06 (Provisional)
Cattle	23.76	24.23	25.55
Buffalo	25.51	26.29	28.45
Sheep	24.74	24.92	25.49
Goat	54.68	56.66	61.95
Camels	0.743	0.736	0.738
Horses	0.315	0.313	0.339
Asses	4.12	4.2	4.3
Mules	0.234	0.251	0.274

Estimated Production of Livestock Products

Items	2003-04	2004-05	(Production 000 tons)
			2005-06 (Provisional)
Milk (Gross Prod.)	28624	29438	31294
Beef	1087	1115	1174
Mutton	720	739	782
Poultry Meat	378	384	463
Total Meat	2185	2238	2419
Eggs Million Nos.	8102	8529	9057

Strategy for livestock development in Pakistan will be *private sector-led development with public sector providing enabling environment and capacity building role*. Following measures have been taken to improve pace of development in livestock sector:

- i. Prime Minister has approved a new “Livestock Development Policy” in principle. It addresses legal framework and development strategies and action plan for farmers using livestock as supplementary source of income and development of Small and Medium Enterprises (SME) and large businesses. The policy will bring radical changes in the current livestock production system and help in exploitation of potentials of livestock sector.
- ii. Two private sector led companies namely “Livestock and Dairy Development Board” and “Pakistan Dairy Development Company” have been established to increase the pace of development in livestock sector.
- iii. Import of dairy and livestock machinery/equipment, not manufactured locally, is allowed duty free subject to certification by Ministry of Food, Agriculture and Livestock. On account of said policy, livestock value added sector is encouraged.
- iv. Consequent upon introduction of “Multi Agency Approach” by the Govt. and allowing commercial and domestic private banks for the provision of credit to farming community, the quantum of loan has increased.

POULTRY

Poultry sector faced a tough challenge on account of avian influenza outbreaks in the country. According to data collected, 67 flocks comprised of 100800 Broiler breeders, 96246 layers, 83300 broilers and 25 fancy birds were affected. 49 farm workers and persons residing in and around farms were tested and found negative for AI. No human case could be detected. Zero tolerance policy was observed regarding Avian influenza. The flocks were destroyed under the supervision of state veterinarians and district administration. The direct and indirect losses ran into billions of rupees. Consumer’s shift towards

other sources of meat (beef / mutton) imbalanced the supply situation which led to duty free import of meat and livestock.

An amount of Rs. 100 million has been allocated initially to handle the bird flu outbreak and for compensation of poultry birds destroyed on account of bird flu. This amount was disbursed to Provincial livestock departments. Poultry Research Institute, Karachi and Veterinary Research Institute (VRI), Lahore have been released funds for the production of Avian influenza Vaccine.

In the wake of Avian influenza, 12 laboratories in different poultry concentrated areas have been established/equipped for surveillance / diagnosis. A central laboratory at National Agricultural Research Centre, Islamabad has been especially developed to address Avian Influenza surveillance and monitoring. So far during the last one year, it has analyzed more than 28000 samples from poultry and more than 700 samples from migratory birds. The Ministry is constantly monitoring the situation on daily basis.

ANIMAL QUARANTINE DEPARTMENT

The statutory authorities and related regulations governing the inspection and transportation of animals and animal products for import and export and regulations designed to prevent the introduction and dissemination of diseases of foreign origin and issuance of Health Certificates are the responsibilities of the Federal Government under the constitution.

On the observation and implementation of the principles of policy in relation to the Affairs of the Federation on the subject, Animal Quarantine Department is responsible to regulate the import, export and quarantine of animals, birds and animal products in order to prevent the introduction or spread of diseases. The Animal Quarantine is not only important to safe-guard the Livestock Industry of Pakistan but also has a very important role from human health point of view since there are a number of parasitic, bacterial and viral diseases which are communicable from animals and animal products to human being.

The Animal Quarantine Department provided Central Certification Service to the importers and exporters of animals, birds and

animal products of uniform standard through examination and tests to meet the international trade requirements during the year under report as desired under the Act “Pakistan Animal Quarantine (Import and Export of Animals and Animal Products)” Act, 1979 and according to the Rules “Pakistan Animal Quarantine (Import and Export of Animals and Animal Products”) Rules, 1980. The Animal Quarantine Department is also responsible to control and prevent the unauthorized import and export of animals & animal products.

The objectives were achieved through facilities comprising on Microbiology Laboratories and offices located at Karachi, Lahore, Peshawar, Quetta, Islamabad, Multan and Sialkot. The details of health certificates issued for animals and animal products exported and clearance of reported cases of animals and animal products imported during the year 2005-2006 are provided in the following tables:

**Issuance of Health Certificates for Animals and
Animal Products Exported During 2005-2006**

Sr. No.	Animals & Animal Products.	Unit	Quantity	No. of H / C.	Value (US \$)
1.	MUTTON	CARCASS	438208	2236	14405855
2.	BEEF	PCS	143437	2549	11934436
3	ORGANS	CTNS	11822	1098	452770
4.	BULL	NO.S	14	1	4200
5.	COW	NO.S	30	1	9000
6.	SUCKLING CALVES	NO.S	20	1	0
7.	COW CALVES	NO.S	9	1	1350
8.	SHEEP & GOATS	NO.S			
9.	ANIMAL	NO.S	55	41	3000
10.	CAMEL	NO.S	1	1	450
11.	MILKING CAMEL	NO.S	33	0	14850
12.	BUFFALOS	NO.S	2	1	0
13.	BABY CAMEL	NO.S	40	0	2000
14.	HORSE	NO.S	14	14	1000
15.	BIRDS	NO.S	575382	1103	993049
16.	D.O.CHICKS	NO.S	20000	4	3300
17.	RABBITS	NO.S	26	36	5400
18.	LIVE CARABS	NO.S	2856	7	3753
19.	FROG	NO.S	900	2	300
20.	CATS	NO.S	101	99	10100
21.	DOGS	NO.S	150	129	10400
22.	LIVE MAMMAL/RATS	NO.S	2762	11	3454
23.	LEATHER	PCS	788921	536	9911730

		KGS	1552392		
		SQ.FT	567640		
		BUNDLE	1223		
		BALES			
24.	LEATHER GARMENTS	CTN	3	3	60
25.	LEATHER MEAL	M.TONS	112	2	5045
26.	TROPHY ,SKIN&HORN	KGS.	60	4	6000
27.	COW HIDE	KGS.	10270	2	20540
28.	WOOL	KGS.	4193562	311	2979482
29.	GOAT HAIR	KGS.	834982	56	365484
30.	GOAT SKINS	KGS.	95592	33	245533
		PCS	2185		
31.	HOVES & HORN	BAGS	13340	14	148665
		M.TONS	380		
		KGS.	122500		
32.	DRIED CATTLE EAR	CTNS	2172		
33.	HOVES & HORN MEAL	BAGS	17880	9	85858
34.	SHEEP CASING	HANKS	1650673	365	8497775
		YARDS	380323		
		PCS	30000		
		BALES	10		
		BUCKET			
		DRUMS	11554	300	8879152
35.	BEEF CASING	YARDS	125211	38	938233
		KGS	49240		
		BALES	1000		
36.	BEEF BLADDERS	PCS	215600	22	1950956
		KGS	14400		
		CTN	45		
		BALES	215		
37.	OMASUM	KGS	1031220	35	435036
38.	CALF STOMACH	PCS	661600	42	1420069
		KGS	68963		
39.	BONE GRIST	BAGS	12984	52	1609334
		M.TONS	3009		
		KGS	12861		
40.	DRY FISH BONE	KGS	14975	1	14975
41.	FROZEN FISH	KGS	62110	100	47516
		CTNS.	229		
42.	CONCENTRATED OX BILE	KGS.	14060	9	351500
43.	DRIED MAWS	KGS	10462	3	97378
44.	D.CRU.FISH.MEAL	BAGS	38400	8	136800
		KGS	50		
		M.TONS	180		
45.	DRY THROAT	KGS	30000	3	75000

46.	DESI GHEE	KGS	10388	3	33053
47.	CHOKO BISCUITS	KGS	96686	14	215231
48.	FRESH SWEETS	KGS	140886	378	757223
		CTN	8041		
49.	BEEF & MUTTON PRODUCTS	CTNS	2345	34	33251
		KGS	4930	2	12803
50.	CHICKEN TIKKA	CTN	70	3	1845
51.	CANED FOOD	KGS	51886	14	155658
52.	BUBBLE GUM,CHOCKLATE	KGS	186044	26	3441814
		CTN			
53.	CONDANCED MILK	KGS	1566	5	6000
54.	HONEY	KGS	138060	45	286120
		BOX	45		
55.	BEEF PATTIES	PCS.	20	1	5
56.	GELATIN	KGS	75678	124	5890665
57.	DESI GHEE	CTNS	1303	14	40143
		KGS	1420		
58.	MILK POWDER	CTNS	6671	20	435799
59.	MILK CEREALS	CTNS	17166	73	954434
60.	CREAM	CTNS	1010	5	16385
61.	CAT GUT.	CTNS	4	1	464
62.	KNOOR SOUP & CUBES	CTNS	511	7	13744
63.	BEEF IN CARTONS	CTNS	610	35	26668
64.	TABLE EGGS	DOZENS	306150	21	178530
65.	H.EGGS	NOS	232900	6	1150
66.	MARKHORS	NOS	44	44	4400
67.	BUTTER	CTN.S	13	13	2080
TOTAL NO OF CERTIFICATES					10171

**Clearance of Reported Cases of Animals and Animal Products Imported
During the Year 2005-06**

SR.NO.	ANIMAL & ANIMAL PRODUCTS	NO. OF CASES
1	HIDE AND SKINS	1490
2	WOOL	255
3	MILK	296
4	TALLOW	194
5	BUFFALO MEAT	132
6	FROZEN GOAT MEAT	7
7	CHICKEN & BEEF PATTIES	25
8	FROZEN FISH	51
9	LIVE FISH	52
10	WHEY POWDER	86
11	ANIMAL HORN	
12	CHEESE	32
13	BUTTER	3
14	FOOD STUFF	1

15	GELATIN CAPSCULS	6
16	SHEEP CASING	4
17	LEATHER	15
18	DOG	30
19	CAT	24
20	FRO.MEAT PRODUCTS	274
21	H.EGG	3
22	DAY OLD CHICKS	25
23	ANIMALS	64
24	SHEEPS & GOATS	17
25	BIRDS	65
26	HORSE	3
27	DEER	1
28	SEMENS.	2
29	FRO.SEA PRODUCTS	3
30	FOOD STUFF	11
31	MUTTON PRODUCTS	4
	TOTAL	3175

12850 samples were collected processed and subjected to laboratory examination during 2005-06. Development work on the following projects was carried-out.

1. Strengthening of Animal Quarantine Station, Quetta.
2. Lab. For Detection of Drug Residues in Animal Products at Karachi.

Receipt Budget

Deposited Rs. 18.336 million in National Bank of Pakistan. These were collected as certificates/laboratory examination fee of animals and animal products imported and exported during the year under report. The Non-Development Expenditure of this organization during the year under report was Rs.18.381 million

FISHERIES SECTOR

Fisheries as a sub-sector of agriculture plays a significant role in the national economy and towards the food security of the country, as it reduce the existing pressure on demand for mutton, beef and poultry. It contributes, on an average, about 1.0% to the total GDP and 4.0%

agricultural GDP. Moreover, it absorbs 1.0% of the country's labour force. It is considered as one of the most important economic activity along the coasting of Sindh and Balochistan. It has been estimated that about 400,000 fishermen and their families are dependent upon the fisheries for their livelihood.

ACHIEVEMENTS DURING 2005-06

- A national policy frame work and strategy for fisheries and aquaculture development in Pakistan has been finalized in June 2006 with the technical assistance of FAO and in consultation with Provincial Governments, private sector and stakeholders.
- An implementation manual/guideline for implementation of policy is being finalized by FAO international and national consultants. Policy will be implemented through a private sector led fisheries development board TORs for its establishment is under preparation with the assistance of FAO. An umbrella project for shrimp and fish culture will be launched as per recommendation of the policy.
- Negotiation has been made with Thai CP group. They have also visited coast areas of Karachi.
- Recently a Bangladeshi Shrimp Consultant also visited coastal areas of Sindh and Balochistan and had meetings with FAM, Secretary and authorities of Sindh Government.
- A PC-I for chartering of fisheries research and training vessel has been approved. MFD with the technical assistance of Norwegian consultants have prepared tender documents for advertising for acquiring vessel. Two projects have been approved by Planning Division for bilateral cooperation of MFD and Norwegian institution for undertaking stock survey and capacity building in Pakistan.
- Consultation was made with concerned stakeholders and EPB for finalization of recommendation in the National Fisheries Policy including promotion of exports.
- A mater plan/strategy paper with the technical assistance of FAO has been prepared for establishment of shrimp farming in coast areas of Sindh and Balochistan.
- Tuna fisheries which remained unexploited during the last 10 years has been revived in the EEZ of Pakistan which has

generated an income of Rs.210 million and export remittance of US\$ 22 million during the last year.

- Facilities and services at Marine Fisheries Department quality control laboratories upgraded and are being accredited. As a result Pakistan has been included in European Union's list of harmonized countries and fulfilled US criteria design for striping.
- Korangi Fish Harbour was made functional, jetty and other improvements are in hand. MINFAL is working on the provision of incentive package for colonization of industrial estate at the Korangi Harbour.
- GPS based tracking stations established at Karachi and Pasni to control illegal fishing. Later on it will be established at Gawadar.
- Breeding technology for Carp and Trout developed with stocking of natural water bodies. Fish farming developed over an area of 60,000 hectare (Sindh 81% Punjab 18% others 1%).

MARINE FISHERIES DEPARTMENT

Marine Fisheries Department an attached department of Ministry of Food, Agriculture and livestock (Livestock Wing) was established in 1951. It is the executive fishery agency of the federal government, with primary responsibilities for ensuring management and development of fishery resources in the interest of the nation. According to the constitution, the management of fisheries outside the limit of territorial waters (12 nautical miles) is a responsibility of the federal government. The department is also responsible for development of policy for the fisheries sector of Pakistan.

Aims and Objectives

- To Exploit and manage the fisheries and other living resources in the Exclusive Economic Zone of Pakistan.
- To conduct exploratory fishing surveys and biological research on various aspects of fisheries.
- To study of biological aspects including occurrence, life history and distribution of commercially important fish species.
- To manage and improve local fishing fleet.

- To introduce new fishing techniques and improve traditional fishing methods.
- To train fishermen in various disciplines including modern fishing techniques, engine maintenance, fish processing and quality control.
- To liaise with various national and international agencies.
- To collect, analyze, interpret and publish fisheries statistical data.
- To advise federal and provincial governments in matters relating to fisheries.
- To provide quality control services for export and domestic consumption of fish.
- To provide technical assistance and promotion of fish processing industry.

Performance of Fishery Sector

Fishery sector plays an important role in the national economy. It provides employment to about 379,000 fishermen directly. In addition, another 400,000 people are employed in ancillary industries. It is also a major source of export earnings. About 200 commercially important species are harvested in Pakistan. Shrimp is the most important commodity which is the mainstay of fisheries of Pakistan. It contributes about 40% in seafood export earnings. Finfish especially Indian mackerel, ribbonfish, croakers, cuttlefish tongue soles and freshwater fishes are increasingly exported to other countries. In 2005, export of dried/cured jellyfish and frozen clams (a shellfish) has also gained popularity.

In order to further improve the fisheries sector of the country, Marine Fisheries Department executed four developmental projects during the year 2005-06.

1. Strengthening of quality control laboratories

The ongoing project is aimed to meet conditionalities of WTO, European Union & other trading partners to sustain export of fisheries products of the country and to diversify the export to get more foreign exchange. Under this project, laboratories of Marine Fisheries Department were strengthened. State of the art equipment such as LC MS MS and HPLC has been procured. The total cost of the project is Rs

47.402 million. The execution of the project commenced on 1-07-2002 and is expected to be completed by 30th June, 2007.

2. Monitoring of deep sea fishing vessel through establishment of 03 GPS base stations and deputation of Marine Fisheries Department representative on each vessel.

The project is aimed to keep the deep sea fishing vessels within their limits as specified in the new deep sea fishing policy and to discourage the poaching of deep sea trawlers in the coastal areas. This project is being implemented since 1-10-2001 and would be completed on 30-06-2007. Total cost of the project is Rs. 25 million. Under this project two base stations have been established. One at MSA headquarters at Karachi and other at MSA office in Gwader. Since the start of this project, no case of poaching has been recorded.

3. Additional improvement in MFD labs in view of WTO requirement

The project is aimed to enhance the capabilities of the laboratories of Marine Fisheries Department to conduct various tests in respect of sanitary and phytosanitary requirement under the WTO regime. To provide the testing facility in the laboratories of MFD to the exporters so that all the essential parameters of consignment can be tested as per the requirements of importing countries under WTO regime. This project was approved at a total cost of Rs. 13.35 million and executed since 30-01-2004. The execution of the project will be completed on 30-06-2007. Under the project, laboratories have been further upgraded.

4. Reduction in seafood post harvest losses by improvement of fishholds of local fishing boats

The bulks of the catch get putrefied or its quality gets deteriorated due to poor handling and storage, making it unsuitable for export. The objective of the project is to provide technical assistances to other fishermen and boat owner for improvement of their boats. Under the project, fishholds of ten local fishing boats will be improved by providing appropriate insulation, making provision for storage of fish boxes and replacement of lining etc. The total cost of the project is Rs 10

million. Execution on this project was started on 1-7-2005 and it would be completed on 30-07-2007.

The fish production during 2001-2005 and export of sea food are given in the following tables. The fish production during 2005 increased to 595,464 M.tons as compared to the last year production of 572,866 M.tons reflecting an increase of 3%. The sea food export during the year 2005-06 was 100,000 M.tons against 96,709 M.tons during the last year indicating an increase of 3%.

Fish Production of Pakistan

(In M.tons)

YEAR	SINDH	BALOC HISTAN	EEZ	MARINE	INLAND	TOTAL
2001	278,476	123,342	-	401,818	153,307	555,125
2002	274,702	124,163	2,063	400,928	161,084	562,012
2003	270,522	126,755	3,223	400,500	165,703	566,203
2004	259,441	124,755	2,457	386,653	186,213	572,866
2005	258,000	112,642	5,476	376,118	219,346	595,464

Export of Sea Food of Pakistan

ITEMS	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
QUANTITY (In M.tons)	82,045	84,452	93,214	103,251	96,709	100,000
VALUE (In million US \$)	138	126	135	153	139	160

PAKISTAN OILSEED DEVELOPMENT BOARD (PODB)

Pakistan is deficit in vegetable oil production. We meet only 32% of our requirements through indigenous sources. The balance 68% is met through imports. The imported edible oil's budget is growing into billion of dollars, becoming a big drain on our foreign exchange reserves. Edible oil and oilseeds import cost 1.004 billion US\$ during 2004-05. The edible oil requirement stood at 2.764 million tons in the same year. This included 1.907 million tons from imported sources (oil and oilseeds). Local production remained at 0.857 million tons. Demand of edible oil is increasing at a rate of 5.16 % annually. At this rate, our annual requirement would be 3.555 million tons after five years and if local production is not increased rapidly annual import bill will raise to 1.291 billion US\$.

PODB is responsible for promotion of oilseeds crops and oil-bearing trees such as canola, sunflower, oil palm and olive in the country to reduce dependence on imports. Big strides have been made in the last five years to popularize sunflower and canola crops in the country.

The targets and achievements of sunflower and canola for 2005-06 are given below:

Sunflower and canola targets and achievements for 2005-06

Province	Sunflower			Canola		
	Targets (Acres)	Achievement (Acres)	% Achievement	Targets (Acres)	Achievement (Acres)	% Achievement
Punjab	326,500	282,562	86	238,500	239,934	100.6
Sindh	530,000	542,471	102	30,000	31,265	104.2
NWFP	20,500	13,575	66	23,500	23,795	101.3
Balochistan	45,000	36,603	81	28,000	28,315	101.1
Total	922,000	875,211	92	320,000	323,309	101

Sunflower has been cultivated on record area of 875,211 acres in the country. It is 8% less than the target set for 2005-06. However, it is 12% above the last year's achievement. A production of 612,000 tons sunflower crushing seed is expected this year. It will yield approximately 220,000 tons of quality sunflower oil resulting in import substitution of edible oil.

Canola was cultivated on 323,309 acres against the target of 320,000 acres for 2005-06. It shows an increase of one percent over target and 12 % increase over last year's achievement (288,351 acres in 2004-05). A production of 162,000 tons canola crushing seed is expected from this acreage, which will yield about 58,000 tons of good quality canola oil. Area and production of major oilseed crops are given below:-

Area and Production of Major Oilseed Crops

Year	2004-05			2005-06*		
	Area (000 Acres)	Production		Area (000 Acres)	Production	
		Seed (000 tons)	Oil (000 tons)		Seed (000 tons)	Oil (000 tons)
Cotton seed	7979	4470	536	7660	3980	478
Rapeseed- Mustard**	601	203	64	578	188	59
Sunflower	780	569	205	875	612	220
Canola	288	144	52	323	162	58
Total			857			815

* Provisional

DEVELOPMENT PROJECTS

i) Oilpalm Development Project

Realizing the success of pilot project on oilpalm, a new project titled "Oilpalm Development Pilot Project" was approved by CDWP at a total cost of Rs.113.08 million for a period of five years. The project has commenced operations from July 2005. The project aims at oilpalm plantation on about 12,000 acres, oilpalm model farming and establishment of a village level oilpalm processing mill with a crushing capacity of 20 tons/day. For oilpalm plantation 900,000 oilpalm pre-germinated seeds will be imported from Malaysia. An agreement for this purpose was signed in 2005. LC for import of 200,000 oilpalm seedlings has been established and seedlings are expected to arrive in August 2006. For establishment of palm oil extraction mill, Government of Sindh has reserved 30 acres land in Thatta. Malaysian Palm Oil Board (MPOB) is being approached to provide consultancy services for establishment of a small size mill and procurement of machinery

ii) Olive Projects

PODB is executing two projects on olive cultivation and promotion in the country:

Rapid Conversion of Wild Olive into Oil-bearing Species New Plantation of Olive in NWFP, Potohar and Balochistan and Maintenance of Orchards Established by PODB.

Targets and achievements of these projects are under

a) Rapid Conversion of Wild Olive into Oil-bearing Species

The project aims at conversion of 8 million wild olive trees into oil-bearing species in different areas of NWFP, Potohar and Balochistan. The project is progressing smoothly. About 7000 olive trees, which were planted/grafted earlier, have started bearing fruits. The progress made during 2005-06 and cumulative achievement since commencement of project is as under:

Top working of wild olive trees for conversion into oil-bearing species

(Trees in million)

Target for 2005-06	Achievements up to 31-05-2006	Cumulative achievement up to 31-05-2006
NWFP 0.734	0.712	1.567
Balochistan 0.533	0.284	0.710
Potohar 0.373	0.246	0.658
Total 1.640	1.242	2.935

b) New Plantation of Olive in NWFP, Potohar and Balochistan and Maintenance of Orchards Established by PODB

This project aims at maintenance of olive orchards established on 364 acres at different locations of NWFP under the project "Accelerated Promotion of Olive cultivation in NWFP and Potohar". Besides this, the project will produce 0.300 million olive saplings, establish 3 olive model orchards (10 acre each) in NWFP, Potohar & Balochistan, train 1000 growers in olive cultivation and import 2500 sapling of different olive varieties from abroad for experiment purposes

Progress of the project for the year 2005-06

Targets: (for year 2005-06)	Achievements:
i. Maintenance of 364 acres olive orchards.	In progress.
ii. Production of 60,000 olive saplings.	Cuttings planted and grafting/budding carried out for production of 57,810 olive saplings.
iii. Establishment of orchards on 86 acre land.	79 acres orchards completed.
iv. Training of 200 people in olive orchards management and nursery production.	111 growers were trained.

iii) SUNFLOWER CULTIVATION IN BALOCHISTAN

This project aims at sunflower cultivation on 30,000 acres during three year project life in ten selective districts of Balochistan i.e Zhob, Killa Saifullah, Nasirabad, Kacchi, Kalat/Mastung, Barkhan, Noshki, Kech, Panjgoor

Progress of the project in year 2005-06

- Sunflower cultivation on 1618 acres.
- 80 demonstration plants were laid out.
- 20 Field Days arranged.
- 32 local trainings for growers and field staff conducted.

iv. Sunflower Cultivation in Dera Ismail Khan District

This project aims at sunflower cultivation on 100,000 acres in D.I.Khan District during four-year project life. The project also aims to set a base and create scope for sunflower cultivation in D.I. Khan area; to standardize the production technology for obtaining maximum yield per unit area and to uplift the socio economic level of rural community.

Progress of the project in year 2005-06

During the year 2005-06, sunflower was cultivated on 7,690 acres in the areas of Prova, Paharpur and D.I.Khan..

v. Production of High Quality Canola Seed for Enhancing Productivity

This project aims at 1000 tons canola sowing seed production during five years project life. During first year of the project (2005-06), canola seed production was carried out on 400 acres. The crop has been harvested and seed is being processed for packing and storage.

INTERNATIONAL SEMINAR ON OLIVE AND SAFFRON CULTIVATION—D-8 COUNTRIES:

An International Seminar on Olive and Saffron Cultivation was held on 12-13 June, 2006 at Peshawar. The delegates from D-8 member countries, namely, Bangladesh, Egypt, Indonesia, Malaysia, Nigeria, Pakistan and Turkey presented papers on Olive and Saffron. At the end of the seminar the delegates of the member countries agreed on the following recommendations:

RESEARCH:

1. That there is a need for exchange of genetic resources with regard to different cultivars for trial purpose in potential areas of D-8 Olive and Saffron growing countries.
2. That the member countries may see the need to attach high priority to olive and saffron cultivation in potential areas. Necessary resources required for Research & Development (R&D) activities may be provided.
3. That there is need for exchange of scientific and technical information and expertise for production, processing and marketing of olive and saffron.
4. That it is necessary for member countries to exchange data and literature on the identification of insects/pests and diseases and their integrated pest management.

Human Resource Development:

1. That main producer of olive and saffron D-8 members may arrange programs for exchanging visits and trainings of the staff working on olive development, processing and marketing for the benefit of interested members.
2. That D-8 Secretariat may be strengthened and made responsible for stronger collaboration and interaction among member countries. The need for regular meetings for cooperation in the field of agriculture was also emphasized.
3. That D-8 Secretariat may compile technical information on olive and saffron for distribution to member countries.

Olive Oil Extraction Unit:

Participants in the Seminar also agreed that in-order to ensure on the spot oil extraction, acquisition and installation, small processing units are needed in the potential pockets among interested member countries. The main producers may provide the proto-types of such processing machines to interested member countries.

Agricultural and Livestock Products Marketing and Grading Department (ALMA)

The Agricultural and Livestock Products Marketing and Grading Department is responsible for:

1. Grading of Agricultural and Livestock Commodities meant for export.
2. Agricultural Commodities Research.
3. Marketing Intelligence.

ACHIEVEMENT

1. Grading and Research:

In order to improve the quality of Agricultural and Livestock Commodities and to establish the trade on scientific lines, the Department is administering the Agricultural Produce (Grading & Marking) Act. 1937. The Department has so far implemented grade standards of quality of 42 commodities under the said Act. Compulsory grading of the following items has been introduced for Export of Wool, Hair, Lamb Skin, Casings, Eggs, Bones, Citrus, Fruits, Lime and lemon, Chillies (Whole), Turmeric (Whole), Ginger (Whole) Garlic, Onion, Potato, Radish, Brinjal, Peas, Asparagus, Brussels, Sprouts, Cauliflower, Tomato, Turnip, Cucumber (Kheera) (Kakri), Carrot, Fresh Beans, Artichokes, Celery, Green Chillies (large), Lady Fingers, Arum, Guava, Molasses, Dates, Banana, Mangoes, Oil Cakes, including solvent Extracted Meals. The Grading activity pertaining to Fruit, Vegetables and Molasses have been held in abeyance since July, 2000.

However the grading and quality certification of Livestock Commodities meant for export was under-taken during the year is as under:-

S.No	Items	Quantity	Fee Received
1.	Wool	1486941 Kg	Rs.133422
2.	Animal Hair	8028232 Kg	Rs.38200
3.	Animal Bones	1207 M.T	Rs.9240
4.	Animal Casing	2259249 Hanks 12870304 Pieces	Rs.374905

2. AGRICULTURAL COMMODITIES RESEARCH WING:

This wing supplements the activities of the grading wing in preparation and finalization of standards of quality in respect of Agricultural and Livestock Commodities. The work includes market studies in relation to market practices, preparation techniques, concept of quality based upon sale and purchase etc, and to identify the inadequacies therein.

On the basis of these studies and keeping in view of international requirements in respect of quality and etc. National grade standard of quality of 48 items have been prepared and notified by this section. Draft Grade specification of quality of apple, honey, persimmon, apricot and plum have also been prepared and are being notified in the Pakistan Gazette to solicit public opinion as required under the Rules. Besides, the Grade standards of pears and peaches are under various stages of preparation. In pursuance of the Government Policy regarding the up-lift of Agricultural Sector of the country, the Department is executing the following project.

(I) Project Under Implementation:

Agri-Business Development and Diversification Project Costing Rs.4066 Million.

(II) Projects in Pipeline

1. Improvement of Agricultural and Livestock Marketing
2. Crops Scouting of Essential Items of Daily use by Common Man.

Marketing Intelligence:

With a view to keep the producers, traders and consumers abreast of the price situation the department continue to collect week-end wholesale prices of 200 items from 40 important markets. Wholesale prices of important items are also collected from Karachi market and disseminated through newspapers and Radio Pakistan on daily basis.

In order to widen the scope of Marketing Intelligence work, price and other market information in respect of 26 essential consumers items are also collected from 11 selected markets on daily basis and disseminated to various Economic Ministries on weekly basis.

The prices of different commodities with varying frequencies are collected, compiled tabulated and disseminated to various concerned agencies within the country and out of the country as well.

4.0 FOOD POLICIES AND MANAGEMENT

Food Wing

The Food Wing is important part of the MINFAL, which deals with food grain policy as well as matters relating to procurement and import of wheat, fertilizer and pesticides etc. It exercises administrative control over PASSCO, which implements government procurement policies and provides food grain storage facilities. The detailed stock and import position of wheat is as under: -

i) CARRYOVER STOCKS AS ON 01-05-2006

(Million tons)	
Provinces/PASSCO	01-05-2006
Punjab	1.367
Sindh	0.270
NWFP	0.137
Balochistan	0.055
PASSCO	0.277
Total:	2.106

ii) IMPORT OF WHEAT

A quantity of 0.815 million tons wheat had been imported during 2005-06 through private sector

iii) PROVINCE-WISE PROCUREMENT OF WHEAT FROM 2005-06 CROPS

(Million tons)		
PROVINCES	Target	Procurement
Punjab	3.000	2.556
Sindh	0.700	0.709
PASSCO	1.300	1.234
Total:	5.000	*4.499

* = Upto 26-06-2006

iv) RELEASES OF WHEAT TO FLOUR MILLS DURING (MAY 05-APRIL 06)

(Million Tons)

Provinces/Agencies	2005-06
Punjab	1.083
Sindh	0.233
NWFP	0.227
Balochistan	0.101
Others (AJK, NA, Def)	0.445
Total:	2.089

v) SUPPORT AND ISSUE PRICE OF WHEAT

- a) Government has fixed support price of wheat at Rs.415/- per 40 kgs for the crop 2005-06.
- b) Government has fixed an indicative issue price of wheat at Rs.425/- per 40 Kgs for the year 2005-06

vi) STORAGE CAPACITY DURING 2005-06

(Million tons)

Provinces/ Agencies	Capacity
Punjab	2.483
Sindh	0.709
NWFP	0.365
Balochistan	0.223
PASSCO	0.441
Total:	4.221

Pakistan Agricultural Storage & Services Corporation Limited (PASSCO)

PASSCO is a Public Limited Company under the MINFAL. It is responsible for procurement of foodstuff especially wheat according to target approved by the government. A board of directors appointed by the shareholders manages it. Its major role is to implement the approved price support and procurement policy of the government. The main objectives of PASSCO are as follows: -

- Ensure provision of support price to the farmers
- Price stabilization of minor crops for the benefit of consumers
- Ensure Food Security by maintaining reserve of wheat for distribution to the deficit provinces throughout the year
- Minimizing the storage losses

PROCUREMENT POLICY

PASSCO made all out efforts to achieve these objectives and the results obtained against each objective are given as under:-

a. Ensure Provision of Support Price to the Farmers

Procurement activity during wheat crop 2005, due to open wheat trade policy, was characterized by aggressive purchase by private sector that entered the arena with enormous cash credit. Consequently market price overtook, the support price. While this helped the farmers to get good return of their crop, the price differential marred the procurement by Public Sector who were mandated to purchase at the support price.

b. Price Stabilization of Minor Crops for the Benefit of Consumers

During the year 2005-06, in view of higher than estimated yield, PASSCO was tasked to procure Paddy (Irri-6) from Sindh and Balochistan to provide price stabilization to farmers in getting satisfactory price for their produce. Prime Minister approved to procure 200,000 M.Tons of paddy from Sindh & Balochistan @

Rs.300/- per 40 kgs and Finance Division, Islamabad was instructed to arrange credit limit of Rs.1.500 billion and also to pick up losses incurred during the course of procurement of paddy and its disposal.

c. Ensure Food Security by Maintaining Reserve of Wheat for Distribution to the Deficit Provinces Throughout the Year

There was a carry over stock of 147,138 M.Tons from the previous crop and procurement of 997,310 M.Tons during the year 2005 made it possible to meet requirements of the provinces/agencies as well as to maintain 0.5 million tonnes strategic reserve.

d. Minimizing the storage losses.

As a result of good governance and constant care of the wheat stock, PASSCO has been able to minimize the storage losses during the year.

3. DETAILS OF ACTIVITIES, ACHIEVEMENTS AND PROGRESS DURING THE YEAR 1ST APRIL, 2005 TO 31ST MARCH, 2006

a. Wheat Stock Handling

(1)	Carry over stocks crop 2004	147,138
(2)	Procurement during the year 2005 against the target of 1.2 Million Tons	997,310
	Total:-	1,144,448

b. Disposal of Wheat Stock

(1)	Wheat dispatched to Defence	125,174
(2)	Wheat dispatched to AJK	221,601
(3)	Wheat dispatched to N. Areas	63,585
(4)	Wheat dispatched to NWFP	288,263
(5)	Wheat dispatched to Balochistan	119,031
(6)	Wheat dispatched to WFP	30,003
	Total:-	847,657
	Stock carried over to next year	296,791

c. Procurement of Paddy (Irri-6)

Procurement of paddy during the year 2005-06 against the target of 0.2 Million Tons	41,000
---	--------

d. DISPOSAL OF PADDY

Upto 31st March, 2006, 15,230 Metric Tons of paddy procured had been husked and the husking of balance 25,770 Metric Tons is in progress.

FOOD POLICY REFORMS

A phased reform of government food policy is underway. The overriding objective of the reform program is to promote efficient markets for wheat in order to ensure market-based incentives for farmers. The reforms would include measures for increasing private sector involvement in the wheat market. Prior to the reform, the government has been intervening heavily in the wheat market, through procurement and sometimes through controls on movement of wheat for the purpose of influencing wheat price. The wheat policy until now has been distorting market operations, creating disincentives for farmers and traders, and costing the government huge expenditure on subsidy (nearly 10 billion rupees per year). These realizations led MINFAL to develop a market-oriented wheat policy for Pakistan.

The new market-friendly wheat policy was formulated through detailed discussions with the provincial governments, federal agencies involved in wheat marketing and storage, and with the private traders in three national level workshops organized by MINFAL during 2005, and through bilateral discussions with each provincial Food department. New directions for the wheat policy were endorsed by the federal ECC and provincial governments which include: a) a clear distinction will be made during stock build-up between Guaranteed Minimum Price and Procurement Price, b) a strategic reserve will be maintained (initially one million ton) separate from the operational stock needed for public distribution system, c) government will determine a price band for wheat procurement and marketing, of which the lower end is dictated by the objective of providing incentive to the growers and the upper ceiling is pre-determined to serve the interest of the consumers, and d) targeted subsidy programs would be extended to the food insecure groups.

Meanwhile, government has also initiated restructuring of provincial Food departments and directorates to make them lean and more efficient state-owned enterprises. In this regard, Punjab government has finalized ToRs for a study to restructure provincial Food department on commercial lines to compete on equal terms with the private sector. Similarly, Sindh government has undertaken restructuring of its Food department to allow greater role for the private sector. NWFP and Balochistan governments are also working on restructuring plans for their respective Food departments. Moreover, PASSCO role is being reviewed to encourage private sector involvement in wheat marketing and storage.

5.0 AGRICULTURAL SUPPORT SERVICES AND KNOWLEDGE SYSTEM

Pakistan Agricultural Research Council

The Pakistan Agricultural Research Council (PARC) is an autonomous body of the MINFAL. Its main purpose is to strengthen the National Agricultural Research System (NARS), comprising of federal and provincial agencies. Major functions of the PARC are to undertake, aid, promote and coordinate agricultural research, arrange expeditious utilization of research results and establish research institutions, mainly to fill the gap in the existing programs of agriculture; generate, acquire and disseminate information relating to agriculture and arrange training of scientists.

PARC has four Technical Divisions, titled, Crop Sciences Division, Natural Resources Division, Animal Sciences Division and the Social Sciences Division. Research activities, achievements for the year 2005-06 of each Division are summarized below:

PLANT SCIENCES DIVISION

The Plant Sciences Division has been focusing on improvement in productivity and quality of crop commodities along with conservation of natural resources for sustainable growth. The activities were undertaken with close collaboration of National Agricultural Research System (NARS) through implementation of cooperative research programs and development projects. The group has been successful in making significant achievements and made progress in solving emerging issues for sustained growth. During the year 2005-06 following achievements have been made.

RESEARCH ACHIEVEMENTS

Crop Sciences

- PARC attach high priority to variety development and has developed a National Agriculture Research System (NARS) through coordination of Federal & Provincial Research Institutes. Each year around 25000 accessions of various crops from exotic and

indigenous sources are maintained in the National Gene Pool which is being provided to all the partners of NARS for variety development purposes.

- PARC conducted the National Uniform Yield Trials (NUYT) and Nation Wide Disease Screening of Nursery (NWDSN) which contributed to the development of new varieties. PARC continued to provide summer nursery facility at Kaghan to all partners of NARS to have second crop in summer season in the same year to reduce the time needed for variety development. The National Uniform Yield Trials (NUYT) provides an independent system for evaluation of promising, elite and pipeline material ready for variety release. Through this system more than 300 varieties of different crops in collaboration with international, national and provincial agricultural research institutions have been developed and released in the past. During the report period three varieties of sugarcane one variety each of maize millet and sorghum, two hybrid of sunflower two of rice, one of mung were released/selected. Under the breeding Program on different crops more than 2500 breeding lines were evaluated and selections were made for further evaluation.
- Out of 33 advanced lines of wheat tested against rust diseases, two lines V-00125, 99B2278 and 99B4012 had desirable resistance against stripe (yellow) rust and one barley line (NRB37) was resistant to leaf (brown) rust.
- An extensive survey of wheat crop was conducted in Punjab, NWFP, and Sindh and 725 samples were collected and tested` by ELISA for detection of barley yellow dwarf virus (BYDV). Based on ELISA tests 24.9%, 23.2% and 12.3% BYDV incidence was recorded in Punjab, NWFP and Sindh respectively.
- Over 200 hybrids of maize, sorghum & millet were tested in the last year in the Adoptability trials. Since FSC&RD requires two years testing of any hybrid before its import on commercial scale, the number of hybrids in across location testing has increased tremendously.
- A total of 1112 accessions of various underutilized/medicinal crops were multiplied and rejuvenated in the field. These accessions were

characterized and evaluated for various morphological and agronomic traits. Based on field evaluation data, some elite lines for yield and yield related traits were identified.

- A catalogue was published on medicinal plants comprising 1778 accessions. In addition, 2023 entries of medicinal plants, vegetables and under-utilized crops were documented.
- To minimize the use of pesticide, it has promoted the concept of Integrated Pest Management (IPM) on Cotton, Sugarcane, Rice, Mango, Apple, Guava, Onion, Okra and Tomato in 15 districts of Punjab and Sindh. More than 600 Farmer Field Schools (FFS) were organized to train the farmers in IPM Technology. The farmers, who learnt this technology, were able to increase their crop yield and net income by 10 to 15% and were also able to reduce the use of pesticide on cotton by 30%. More recently, it has developed an IPM technology for control of fruit fly on mangoes, citrus and guava which is 95-100 percent effective.
- Conducted pesticide Residues Analysis of Rawal Lake water and its tributaries. Found four pesticides exceeding many fold from EEC limits of drinking water. Submitted a report.
- 29 water samples were tested to determine the pesticide residues in surface/ground water of cotton growing areas of Sindh. Based on retention time of standard pesticides (chlorpyrifos, malathion, profenofos, bifenthrin, fenvalerate, dimethoate, cyhalothrin, cypermethrin, endosulfan and monocrotophos) 22 (75.8%) water samples were found contaminated with detectable level of 5 pesticides (range of 0.0005-0.054 µg/L).
- Neem extract 2% solution effectively reduced the potato jassid population in comparison to the commercial pesticide with no residual effect.
- Neem extract 2% solution reduced the potato aphid population when compared with commercial pesticides with no residual effect.
- Mancozeb and Vitavax were equally effective for the economical and effective control of powdery scab of potato.

- Twenty genotypes of mungbean and mashbean were evaluated against seed transmission of urdbean leaf crinkle virus (ULCV). Two advanced lines; Mash-95017 and Mash-95009 were found resistant to seed transmission.
- Feeding of fruit fly *Bactrocera zonata* adults continuously for 16 days on diet containing 1000 ppm of acetone extract of turmeric caused 85% mortality and 84.7% reduction in the adult progeny of surviving individuals.
- Porcupine damage was assessed in vegetable crops (Potato, tomato and peas). Over all damage to potato crop was estimated to 4.23%. This damage was found at maturity stage of the crop. No damage was found to tomato and peas.
- Development of two IPM models for the management of porcupine population in pine seedlings and maize crop.
- Seventy five (75) species of predatory Coccinelids have been recorded and documented, among these 24 species and 3 subspecies were new records for Pakistan.
- Studies on breeding biology post-natal development and control trials against rodents damaging date-palm orchards in Baluchistan revealed that short-tailed mole rat (*Nesokia indica*) and Indian gerbil (*Tatera indica*) were pre-dominant species causing colossal losses to date-palm orchards. Feeding habit studies revealed that fruit and pith of the stem were consumed more than other parts of the tree.
- Khapra beetle damaged 12.07% stored wheat grain with a weight loss of 8.37%. Due to infestation of this insect the protein contents of the grain lowered as about 4.1%.
- Complete mortality of *Rhizopertha dominica* and *Tribolium castenum* by the application of CO₂ and NH₃ gas was achieved after 72 hour application.
- Weedicide Sencor @ 0.150 kg/ha followed by one hoeing effectively controlled weeds and in-turn produced maximum bulb yield (9.377 t/ha) in Garlic variety Lahsan Gulabi.

- Weedicide pendimethalin @ 2.5 liter/ha. followed by one hoeing effectively controlled weeds and in-turn produced maximum bulb yield (41.72 t/ha) in Onion variety Swat-I.
- The TPS families 9813 (24.05 t/ha) and 9802 (22.72 t/ha) produced higher yield as compared to control variety Diamant (17.5 t/ha.).
- True potato seed was found to be economical alternative source of seed potatoes.
- Non-availability of disease and virus-free seed potato in Pakistan had been draining out foreign exchange for seed imports. With tissue culture and biotechnology, Pakistan has almost achieved self-sufficiency in seed potato by increasing its yield three folds in 1997. Annual seed potato production has reached up to 1000 tones. Disease free banana suckers have also been produced through tissue culture technique for the farmers of Sindh.
- Established two Grain Quality Testing Laboratories one each in Islamabad and Karachi. The labs are capable of undertaking 27 diff to facilitate import and export of various agricultural commodities tests of grain quality and are in a process of getting ISO-17025 certification
- Introduction of zero-tillage technology that saves substantial input cost (20% water, 15% fertilizer) and increase yield by 25% in wheat cultivation.
- Wheat yield improved by splitting nitrogen dose in high rainfall area as a result of study which indicated that 30 percent higher grain yields were obtained when 1/3rd nitrogen was applied at planting and remaining 2/3rd at first node stage (5.5 t/ha) in comparison with single planting dose (4.2 t/ha)
- Band placement of fertilizers in wheat saves 50% fertilizer with 10% more yield.
- In P management experiment, maximum paddy and wheat grain yield was recorded by the application of 90 kg P₂O₅ ha⁻¹ to both the

crops and yield increase ranged from 47.7 to 75% in paddy while 6 to 50% in wheat.

- In K management experiment, the paddy yield increased from 30.9 to 50% while 19.41 to 41.91% in wheat with the application of 60 Kg K₂O ha⁻¹ applied to both the crops, residual K to paddy and wheat and residual K fertilizer on the yield of rice and wheat.
- In micronutrient studies the yield of chickpea increased significantly with the application of zinc @ 7.5 kg Zn ha⁻¹ a yield of 3257 kg ha⁻¹ obtained. Similarly under wheat and rice experiments zinc application also increased the yield significantly. The yield increase was 108 and 49% respectively.
- In case of effect of boron paddy yield was increased from 37 to 74% over control. However the wheat grain yield was increased from 15 to 71%.
- In case of gypsum experiments, when applied @ 2.0 t ha⁻¹ gave an increase in yield of 35 to 52% in paddy and 15 to 66% in wheat grain over control.
- Hormones GA & Kinetin alone or in combination decreased more flower shedding in mung bean through seed pre-treatment & pre-flowering spray.
- High weeds density was recorded in direct seeded rice, followed by transplanting on beds and double zero tillage. Infestation/population of insect pests was very low except leaf folder.
- Selection of early ripening citrus varieties e.g. salustiani, tarrocco, which mature in October –November with high yield potential, quality and seed-lessness thus increased availability period.
- Floor management system in fruit orchards improved soil fertility, plant health and increased profit margin.
- Top working of wild olive with cultivated species has been made successful.

- Off season production of onion through the use of sets was found economical.
- Onion set size of 21 mm diameter produced the highest marketable yield (26.57 t/ha) for autumn crop.
- Causal organism of Mango Sudden Death identified and developed protective measures. Detailed control practices are under study.
- Root stocks GF-677 introduced for stone fruits having tolerance to soil borne problems and nutrient uptake efficient. Multiplication standardized by Tissue Culture Techniques.
- Chilling straw berry runners at 4⁰C improved, plant growth, No. of flowers, fruit weight and number of runners were also significantly higher as response to higher chilling duration when compared to control.
- PARC has introduced tea cultivation in northern areas of Pakistan and established a tea nursery at the National Tea Research Institute (NTRI) at Shinkiari (Mansehra), NWFP. It has produced more than 3 million plants, introduced tea production in 517 acres and identified 150,000 acres suitable for tea cultivation in the country. Two Processing Plants one each for black and green tea are being operated successfully at the site.
- PARC has developed, designed and adapted a number of farm equipment and transferred the technology to 28 private sector engineering companies for their commercial production. The machines so far produced that are in operation include Reaper Windrower (27000 units); Paddy Thresher (500); Sunflower Thresher (30); Groundnut Thresher (1100); and Zero Tillage & Seed Drill (3500). In addition a Mobile Seed Processing Unit and a Mobile Flat Bed Grain Drier has been designed. The estimated savings resulting from reduced post harvest losses in case of wheat alone are estimated at Rs. 5 billion. Likewise in case of rice the financial impact of paddy thresher has been Rs. 220 million over the three year period 2002 – 2004.

- A mobile seed processing unit was developed with the objective of providing a mobile seed processing technology to the farmers and seed companies at farm level.
- To resolve problem of burning straw of wheat after combine harvesting and to use it for beneficial purpose, FMI developed 3rd prototype of the seeder at the workshop of its collaborating manufacturer. This is first year of the project. The anticipated benefits of seeder are i. It will result in conserving moisture ii. It will increase the efficiency of combine iii. It will increase the fertility of soil
- Different approaches for seed placement into soil for Zero-till systems have been attempted. FMI is working with Rice-wheat Consortium funding for the development of a Dibbler (Punch planter) for direct sowing of wheat in uniformly distributed heavy rice residue and a chaff spreader kit to be attached with combine harvesters.
- FMI has introduced and commercialized a tractor operated wheat straw chopper-cum-blower through local industry for addressing the stubble issues in rice wheat area. It is a trailed-behind machine. It harvests the stubbles and picks up the combine-ejected straw from the field, chops it into *bhoosa* and blows it into a trolley hooked at its rear. The trolley is covered with a steel mesh canopy for handling of *bhoosa* which is unloaded at a convenient point.

Natural Resources:

- Indigenized Sprinkler and Drip irrigation systems. The technology is being further refined to make it energy efficient, as the tariff of electricity and price of diesel fuel is continuously increasing.
- Sprinkler irrigation for fodder production gave 40 % higher water use efficiency as compared to basin method of irrigation.
- Developed Skimming Wells Technology to abstract fresh groundwater in the areas where thin layer of fresh groundwater is underlain by the brackish groundwater.

- Eight water distribution and diversion structures in Rod-Kohi areas have been constructed to monitor the impact of distribution quantities and equities on water use efficiency and disputes among the farming community.
- Supplemental irrigation at 80 % soil moisture deficit along with chemical fertilizers and Farm Yard Manure increased wheat yield by 36 % and 12.5% respectively as compared to rain fed wheat.
- Introduced and evolved Permanent Raised Bed farming technique, which reduces irrigation water requirements by 30-50%; increases crop yields 10 – 40 %; and increases farm profitability by 50 – 100 % compared to basin irrigation.
- Evolved EM Bio-Generator for Amending Sodic Groundwater. The incredible characteristics of EM for its propagability favours to develop a low- cost bio-generator at farmers' fields. One liter of basic EM can be extended into three generations with 10,000 liters of extended EM having pH of 4.0 as of basic EM. The three irrigations each of 3 acres inch (300500 liters of water) can amend water of pH 9.5 to a pH 8.5. The cost of irrigation is around Rs. 200. The total cost of system including one pacca tank of 10,000 liters capacity for 25 acres area is around Rs. 25000.
- Completed inventory of glaciers, glacial lakes and glacial lake outburst floods in HKH region of Pakistan.
- Recorded hydrological characteristics under scrub forest sub watersheds at Satrameel and Fatehjang.
- Conducted survey of Pothwar Plateau to estimate soils and their agricultural development potential in the region.
- Developed low-cost water control (application, diversion and distribution) structures and constructed water storage earthen ponds and sand filters, which provided safe water for livestock and domestic consumption in Rod-Kohi areas of Pakistan
- Agricultural Atlas of Pakistan, an important prerequisite for rational use of natural resources, is in advanced stage of preparation. A

number of maps and data etc. have also been collected and processed for the purpose. This would help improve agricultural productivity by cross matching with resource capacity.

- Initiated database development of cropped area and yield, climatic and Socio economic parameters. Developed databases of major crop i.e. wheat, cotton and rice using the district-wise crop data of the country.
- Biological evaluation of eleven selected grasses revealed that Mott grass (*Pennisetum purpureum*) and green panic (*Panicum maximum*) yielded significantly greater Dry Matter (DM) than blue panic (*Panicum antidotale*). Whereas green panic var. gatton had comparatively tender growth than Mott grass. With the passage of phenological stages, highly lignified woody base of Mott grass was injurious to the mouth part of grazing animals, hence its stall feeding was suggested.
- Higher leguminous plant material in animal diets increases protein content that enhances voluntary intake and digestibility of entire animal diet. Green panic var. Tanzania was grown with warm season legume, cowpea (*Vigna unguiculata* var. P-518) to study effect of inoculation and fertilizer application on different grass-legume mixtures. Effect of inoculation as well as fertilization was not significant on DM production. However, pure legumes produced comparatively higher DM yield. Since grasses were planted by tufts so it took them longer to establish, eventually inoculation and fertilization had negligible effect on pure grass as well as grass-legume mixtures' DM yield.
- Ecological parameters of Pabbi hills rangelands were determined by sampling within 10% of the population means. Total grazable DM was determined as 347.27 kg/ha. Annual carrying capacity for cattle and goats was estimated as 12 ha/animal unit (AU). Within the total plant cover of about 32%, Chammbur (*Eluissine indica*) was followed by mesquite (*Prosopis juliflora*). Future ecological interventions to maximize grazing potential of Pabbi hills would be based on these findings.

- Through research and development efforts of PARC, European honeybee was introduced in Pakistan in 1980s. Now more than 300,000 bee colonies exist in Pakistan, producing well over 3000 tonnes of honey valued at Rs.600 million per annum, making Pakistan an exporter of honey earning US\$ 220-250 million.
- National Herbarium established at NARC has 100,000 plant samples arranged in 214 families. Some more than a century old collection form a valuable input for various scientific studies.
- Jack Pump, using alternate energy sources viz., electric, diesel and solar has been successfully tested which needs only 20% power as compared to standard pumps. After its commercialization the local production cost would be almost half of its present import price.
- Microbial biotechnology has been used for bio-fertilizer production for chickpea, groundnut and other legume crops which increase yield by 12 – 40 % in various crops.
- Deep ploughing, weed control, contour plantation and improved fertilization through soil test, N and P band placed Zn and B in nutrient deficient water eroded lands ensured 19 – 23 % increase in wheat yield and 35 – 169 % increase in Maize yield over control. The increase in water use efficiency was 3 – 35 % for Wheat crop and 45 – 203 % for Maize crop due to rain water conservation and improved fertilization.
- Fertilizer use efficiency was further enhanced. Zinc and boron application increased rice yield by 10-15% and 15-20% respectively. Both of these nutrients increased cotton and wheat yield by 15%. The boron research at NARC earned the IIRI award for the year 2004. The benefit: cost ratio of these micronutrients in cotton is 15:1 and in rice is 30:1. Some senior scientists got borlaug and other awards for their excellent work.
- Shelterbelt technology, a United Nations Environmental Program (UNEP) award winner (1995), is widely being used in Thal sandy desert over thousands of hectares for reclaiming cultivated fields by checking shifting sand dunes.

- Seabuckthorn – a miracle plant has opened up new vistas of controlling landslide and erosion thus alleviating sedimentation of dams. It is a native wild bush in Northern Areas, that has developed as potential livelihood source within ten years by preparing and marketing high value seabuckthorn products as well as its seed export through involvement of local communities.
- The high forage as well as watershed value of Fourwing Saltbush (*Atriplex canescens*) was explored to mitigate the sharply edged problems relating to animal grazing and ground water recharge in Balochistan. This plant species is now widely promoted to convert vast barren lands into green belts.
- Sloping Agriculture Land Technology (SALT) model was strategically reinvented for converting local fragile mountain lands into productive agricultural fields. Rural Support Program Network (RSPN) is currently promoting it among rural households.
- Fifteen species of migratory as well as resident waterfowls were identified. Main threats to the lake ecosystem included disturbances by the fishermen, motorized boating by the tourists and boating clubs, human settlements, deforestation, intense grazing by livestock and dumping of industrial waste in catchment area. Preventary measures are required to conserve the biodiversity at Rawal Lake.

ANIMAL SCIENCES DIVISION

During the year 2005 research conducted by the ASD, PARC (including all the units under its control at NARC and outstations) focused on the disciplines of Animal Reproduction, Animal Health, Dairy Technology, Animal Nutrition and Aquaculture and Fisheries in addition to implementation of two national coordinated programmes on large ruminants breeding and small ruminants breeding; and one national coordinated research and development project for improvement of wool quality was also carried out. Targets set out for the preceding financial year, the activities and the achievements have been made during the year.

Genetic and Reproductive Efficiency in Livestock

Targets 2005

- Pregnancy diagnosis in goats using ultrasonography.
- Use of frozen thawed oocytes for in-vitro buffalo bull fertility test.
- Ovarian follicular dynamics and endocrine activity in postpartum anoestrus buffaloes.
- Effect of antioxidants in TCA extender on post thaw motility, membrane integrity, acrosome morphology, morphological abnormalities & in-vivo fertility of buffalo bull semen.

Activity-1:

- Productivity improvement and national and international linkages

Achievement:

- Integrated approach for improving small scale market oriented dairy system in Pakistan. Economic analysis of milk production indicated that the livestock are under fed for metabolizable energy during the hot summer season.

Activity-2:

- Genetic and reproductive efficiency in Livestock

Achievements:

- Establishment of production performance data base for cattle and buffaloes. Data base for 3289 animals with 3121 lactation comprising milk yield, calving interval, lactation length, age at first calving and dry period has been established and genetic evaluation of above said data are being used for statistical interpretation.
- Ranking of Nili-Ravi buffaloes bulls using animal models in Punjab. The ranking of Nili-Ravi buffalo bulls is under process. Currently 142 bulls and their 1536 daughters are under study in Punjab. Establishment of nucleus herd of Holstein Friesian cows at Harichand Farm. The genetic trend of milk yield in Jersey and

Holstein Friesian cows showed that the genetic means were highest in year 1997 and lowest in 1999. The situation is improving since then. The regression line of milk yield in these cows is as under:

$$y + 0.4421x - 879.43$$

- Establishment of nucleus herd of Holstein Friesian cows at Govt. Dairy Farm Quetta. The genetic trend of milk yield in Holstein Friesian cows indicated highest genetic means in 1979 whereas it fluctuated in the remaining years. The regression line for milk yield indicated a decrease at the rate of 1.1 kg per year.
- Milk production performance in Tharparkar cattle are being kept at Livestock Experiment Station, Nabisar Road, Distt. Umerkot. The average milk production was 1198.14 + 64.44 kg with 23.14% coefficient of variation. The heritability of milk yield was 0.31. The genetic trend could not be calculated due to lack of complete pedigree information.
- Genetic improvement of buffaloes in Pakistan. Genetic evaluation of Kundi buffaloes: The data on milk yield, age at first calving and calving interval were statistically analyzed to estimate the magnitude of various genetic and environmental sources of variation in these traits. Incomplete lactations or showing any abnormality were not utilized. The data were analyzed for fixed effects (year of birth, year and season of calving, lactation number) using Harvey Model 1). Results indicated that milk yield was significantly affected by year of birth and season of calving.
- Development of early pregnancy test in buffaloes and sheep using ultrasonography. **Buffalo:** Pregnancy was diagnosed earliest with 100% accuracy on day 26 post breeding using ultrasonography. **Sheep:** Ultrasonic observations for pregnancy test and fetal development were made from day 30 to day 60 post breeding twice weekly using a 3.5 MHz probe in 10 Balkhi sheep. For 100% accurate pregnancy detection by ultrasonography in ewes they should be checked at day 45 post breeding.
- Studies on ovarian activity of postpartum buffalo kept on optimum NRC nutritional requirements with and without mineral supplementation. Eighty percent buffaloes acquired and maintained

ovarian cyclicity within four months after calving when kept on NRC recommended feed. Mineral-supplementation had no edge over non-supplementation in terms of triggering ovarian activity of the 20% non cyclic buffaloes. Optimum management and NRC recommended nutrition resulted in 100% conception in summer-calving buffaloes within four months after calving irrespective of extra mineral supplementation. However a higher percentage of winter-calving 'mineral-supplemented buffaloes' resumed ovarian activity and conceived within 4 months after calving as compared to non-supplemented ones (75% vs. 33.3%, respectively). Starting from month of July ovarian activity was recorded thrice a week by ultrasonography in nine Nili-Ravi buffaloes. The duration of CL presence was recorded at $8.11+0.65$ days (Mean+SE) in first cycle after prolonged anoestrous in all nine animals. Subsequently, the length of regular cycle was recorded as $21.35+0.32$ (Mean + SE) days of 18 cycles studied in the nine animals. The diameter of ovulatory follicle on day 0 of cycle was recorded as $13.22 + 0.23$ mm (Mean + SE). The results showed that following summer anoestrus, ovarian activity resumed with short cycles and non-exhibitory oestrous in buffaloes.

- Studies on Prevalence, Etiology and Control of Retention of Placenta in Buffaloes in District Poonch and Kotli, Azad Kashmir. According to the survey conducted during this study, majority of the farmers (86%) hold only one buffalo in Tehsil Rawalakot, district Poonch, AJK. The other major species of animal kept by farmers in this tehsil is goat (33.7%). Main practices of feeding the animals are grazing (75%) and stall feeding (87%). An average of 1.6 kg concentrate per buffalo per day is also offered to the animals. The main management practice for milk let down is calf suckling (49.5%) followed by the use of oxytocin (12.4%). The incidence of retained placenta in buffaloes, calculated from the history of 348 buffaloes was 12.6%. Retained placenta was mainly treated by Stock Assistant or Siana (an expert villager) (77.4%) followed by a qualified veterinarian (18.2%). The medicinal treatment offered to affected animals was antibiotics (54.5%) uterine pessaries (40.9) and pain killing drugs (50%). The reduction in milk yield was reported in 72.7% cases following retention of placenta. In district Kotli, majority of the farmers (64.7%) hold only one buffalo. The other major species of animal kept by farmers in this district is goat (94.1%). Main

practices of feeding the animals are grazing (100%) and stall feeding (100%). An average of 2.7 kg concentrate per animal per day is also offered to the buffaloes. The main management practice for milk let down is calf suckling (78.9%) following by the use of oxytocin (12.9%). The incidence of retained placenta calculated from the history of 443 buffaloes was 17.8%. Retained placenta was mainly treated by Stock Assistant or Siana (an expert villager) (68.3%) followed by a qualified veterinarian (19.0%).

Animal Nutrition: Resources and Strategies

Targets 2005

- Establishment of growth curve model in Nili-Ravi buffalo calves on different plans of nutrition from 6 to 18 months.
- Influence of microbial inoculant on cereal fodder silage quality and feeding value in sheep.
- Effect of varietal difference of maize, wheat and rice grains on their nutritional composition and metabolizable energy in chicks.
- Effect of enzyme supplementation on the growth performance and digestibility of broiler chicks.
- Influence of mechanically separated particle sizes of wheat straw on growth performance, digestion kinetics and rate is low in sheep.
- Development of milk replacer and early weaning diets for sustainable calf rearing (on-going ALP project).
- Development of database on minerals profile of feedstuffs, their availability and strategic supplementation of minerals block to dairy animals (new ALP project)

Activity-1:

Animal Feed: Resources and Strategies

Achievements:

- Establishment of growth curve model in Nili Ravi buffalo calves on different plan of nutrition. A longitudinal study was conducted on buffalo calves fed different plan of nutrition to establish growth curve model, nutrient utilization and carcass traits at 6 to 12 months age. Fifteen Nili Ravi buffalo calves were randomly divided into 3

groups and fed 80, 100 and 120 percent NRC recommended feed allowance. It was concluded that feeding of calves 120% NRC requirements yielded better results compare to other two rations.

- Influence of microbial inoculant on nutrient digestibility of maize silage. Results indicated that lactic acid content in maize silage with inoculant was higher as compared to without inoculant. pH value of all the silages were within normal range (3.8-4.2). Silage inoculant at 100 and 125 percent of recommended levels significantly improved digestibility of dry matter, crude protein and crude fiber compare to without inoculants and 75% recommended dose. It is concluded that 100 and 125% recommended dose of inoculants improved the quality of silage.
- Effect of non-starch polysaccharide(NSP) enzyme supplementation on the growth performance of broiler chicks. Non significant difference was observed for all the growth parameters of chicks fed on diets with and without NSP enzyme addition. However, high fiber in diet depressed weight gain and feed gain ratio. Bone meat ratio was 70:30 in broiler chicks on all diets. Growth performance of birds revealed that NSP enzyme did not positively respond at both the fiber levels in diet.
- Effect of UMB supplementation on production performance of calves fed green roughages as basal diet. Finding of this study suggested that supplementation of UMB (urea molasses block) had improved production performance of calves.
- Development of milk replacer and early weaning diets for sustainable calf rearing. Liquid milk replacer was prepared using milk replacer powder and water with 1 : 6 and 1: 7 ratio for each type of milk replacer and tested for their solubility and sedimentation rate. Results showed that vegetable oil based milk replacer was soluble at 40°C and tallow based milk replacer was completely soluble at 55°C. No sedimentation appeared in any of liquid milk replacer within 90 minutes. The results lead to the conclusion that vegetable oil as fat source is better than animal fats.

Animal Health: Epidemiology and control of diseases

Targets 2005

- Studies on the persistence & shedding of AIV in domestic birds.
- Efficacy of aerosol *Pasteurella multocida* vaccine in cattle & buffaloes
- Studies on biology and mapping of warble fly in Pakistan (on-going ALP project).
- Protection of buffaloes against Brucellosis (on-going ALP project).
- Up-gradation of animal health lab to serve as National Reference Lab. for poultry diseases (on-going PSDP project)
- Control of PPR in small ruminants (new ALP project)

Activity-1:

- Studies on the immuno-genicity and protective efficacy of live Hemorrhagic septicemia vaccine in cattle and buffaloes.

Achievement:

- A live vaccine against HS developed in Myanmar has been successful in controlling the disease in Pakistan. Protective efficacy of live aerosol vaccine is being tested and compared at LRS, NARC, Islamabad, ICT area, Landhi and Nagori cattle colony in Karachi. Aerosol vaccine, oil based ISA 206 vaccine, oil based liquid paraffin vaccine, aerosol vaccine, oil based liquid paraffin vaccine and a control were used in 2993 buffaloes at day zero and first blood sampling was carried out from each group. Blood sampling will be conducted on quarterly interval for one year. The experiment is underway.

Activity-ii:

- Studies on biology and mapping of warble fly infested areas in Pakistan.

Achievement:

- The disease has been reported from all provinces particularly from hilly, semi hilly and desert areas (Bahawalnagar and Sanghar) of

Pakistan. A proforma was circulated amongst the field staff for gathering the information on disease prevalence and biology of fly. Up-till now a total of 832 proformae have been received (Punjab = 133, Sindh = 244, NWFP = 318, Balochistan = 137).

Activity-iii:

- Studies on the epidemiology of PPR (Peste des Petits Ruminants) in Pakistan.

Achievement:

- Six suspected outbreaks of PPR were attended and morbid materials were collected. Positive samples were tested for haemagglutination (HA) test and virus isolation. One thousand and ninety six samples were found positive for PPR using competitive ELISA. Animals are being sampled on monthly intervals for the study of dynamics of antibodies against PPR virus.

Activity-iv:

- National Reference Laboratory for poultry diseases.

Achievement:

- Eleven Avian Influenza monitoring labs were established at provincial level along with the National Reference Laboratory for Poultry Diseases at NARC, Islamabad. Avian Influenza H5N1 type was diagnosed for the first time from Charsadda and Abbotabad. National contingency plan was made which includes SOP'S for all kind of situations that could arise in the case of Avian Influenza H5N1 outbreak in the country.

Activity-v:

- Development of National and international linkages.

Achievements-

- International linkages were developed with FAO, Chinese, Italian Trust Fund, WHO, EU and USAID for control of avian influenza, PPR and HS.
- At National level, linkages were developed with provincial livestock departments of Sindh, NWFP, Punjab, Balochistan and ICT for developing vaccine/diagnostics and field investigations.

DAIRY TECHNOLOGY

Targets 2005

- Isolation and characterization of milk clotting fractions of the Sodom apple (*Calotropis procera*) and paneer booti (*Withania coagulans*).
- Qualitative determination of chemical adulterants in raw milk.
- Development of local starter culture technology for preparation of fermented milk products (on-going ALP project).

Activity-1:

- Development of Local Starter Culture Technology for Preparation of Fermented Milk Products.

Achievement:

- About 120 milk/dahi samples of indigenous origin were processed to hunt potential strains of these bacteria. Because of growth pattern on selective media, staining, biochemical characteristics and a negative response to catalase test, 48 strains of cocci and 40 that of rod totaling 88 were identified as “potential starter strains”. On the basis of chemometric estimation for lactose fermentation, 50 strains have been preserved in a special medium, the “Microbank”.

Activity-2:

- Estimation of Certain Chemical Adulterants in Raw Milk

Achievement:

- In Pakistan, the milk is mostly produced in remote areas and it takes a long time to reach the urban consumers. Being a perishable commodity and due to lack of chilling facilities adulterants are added to increase shelf life and to conceal deteriorated compositional quality. These adulterants affect the functional properties of the milk so that good quality products cannot be prepared apart from their health risk. Therefore, a study was planned to detect the type and frequency of adulterants in the milk so that remedial measures can be suggested.

Activity-3:

- Isolation and Characterization of Milk Clotting Fractions of *Withania caogulans* (Paneer Booti). Small-scale cheese production is a new concept of small holders' enterprises in this country. However, availability and cost of some vital starting materials, such as rennet, which is not produced domestically, is the major bottleneck in the way to development and expansion of this industry further. If calf-rennet or its substitute for preparation of cheese is made available it will give a quantum leap to the existing production capacity.

AQUACULTURE AND FISHERIES

Targets 2005

- Monoculture of big-head carp *Aristichthys nobilis* in pond culture system with and without supplementary feed.
- Breeding trials on channel catfish by using hormonal analogue.
- Studies on predator-prey relationship between Channel Catfish and Tilapia.
- Studies on the prevalence of parasitic and bacterial diseases of fishes.
- Studies on the prospect of introducing American channel catfish (*Ictalurus punctatus*) in pond fish culture system of Pakistan.
- Effect of civic pollution on fish and fisheries in reverine system (on-going ALP project).

Activity-1:

- Studies on biology, reproductive performance and stress in relation to environmental changes in Bighead carp, *Aristichthys nobilis* imported for aquaculture into Pakistan (Non-development).

Achievement:

- Monoculture experiments were conducted in two ponds with and without supplementary feeding. Bighead carp has achieved 902g/year without supplementary feeding and 1090g/year with supplementary feeding. The maximum growth has achieved during the month of July (avg. Temp. 31 °C) and minimum in January (avg. Temp. 12 °C).

Activity-2:

- Cost-effective floating fish feed for commercially important carps (Non-development)

Achievement:

- An experiment was conducted to observe the effects of floating and sinking pelleted supplementary feeds on the growth performance of major viz. *Labeo rohita*, *Cirrhinus mrigala* and *Catla catla* and Chinese carps viz., *Hypophthalmichthys molitrix* and *Ctenopharyngodon idella* in earthen ponds for a period of 230 days. The floating feed was found better than the sinking feed for increasing per hectare pond production.

Activity-3:

- Studies on the prospects of introducing American Channel Catfish (*Ictalurus punctatus*) in pond fish culture system of Pakistan A pilot project (ALP completed on 31-12-2005).

Achievement:

- Channel catfish was cultured in polyculture system with Major and Chinese carps in fertilized fish pond. The results showed that catfish

could be cultured successfully in polyculture with Chinese carps and major carps. It was also noted that catfish can be reared in fertilized fish ponds without artificial feeding, however artificial feeding had increased channel catfish production in ponds. Fingerlings affected with body ulcers and fin rot were treated with saline water (10 ppt and 20 ppt bath) and then with antibiotic Terramycine (Pfizer). The fish were successfully cured from the disease.

Activity-4:

- Effect of civic pollution on fish and fisheries in the riverine system

Achievement:

- Six sampling sites of Nalla Lai Rawalpindi/Islamabad. Three sampling sites of Korang river and seven sampling sites of Kabul River have shown unsuitable values of water quality parameters i.e. Alkalinity (251-342mg/l), Hardness (315-412 ,mg/l), electrical conductivity (637 us/cm – out of E.C. meter range), pH (4.5-5.0) and dissolved oxygen (2.0 – 3.0 mg/l). In River Soan all the values of water quality parameters were found within tolerable range. The levels of heavy metals (Arsenic, Copper, Cadmium, Lead, Nickel and Zinc) in different fish organs (gills, scales, liver, heart, gut, kidney and muscle) and plankton collected from different rivers were estimated and found higher than normal ranges. No pesticide/insecticide was detected in water and fish samples collected so far. LC₅₀ of Nickel and Copper were worked out for Bighead carp (*Aristichthys nobilis*) and *Cyprinus carpio*. LC₅₀ values of Nickel and Copper for bighead carp were found to be 50 mg/L and 1.5 mg/L respectively. LC₅₀ values of Nickel for *Cyprinus carpio* was estimated and found to 100 mg/L.

NATIONAL COORDINATED SMALL RUMINANT RESEARCH PROGRAMME

Targets 2005

- Evaluation of Balkhi sheep for production traits of economic importance for increase in mutton production

- Establishment of nucleus flock of Beetal goats and study the impact of Lohi ram distribution on economically important traits under field condition in Okara area (LPRI Okara, Punjab).
- Establishment of nucleus flock of Dera Din Panah goat and study the production traits of economic importance (Rakh Khairewala, Punjab).
- Establishment of nucleus flock of Kooka sheep and study the economic traits (Tando Mohammad Khan, Sindh).
- Establishment of nucleus flock of Balochi sheep and Barbari goat (Usta Muhammad, Balochistan).
- Impact of Rambouillet crossbreeding with native sheep in NWFP area (Jabba, NWFP).
- Evaluation of Poonchi sheep for the production traits of economic importance (Muzaffarabad, AJ&K).

Activity-1:

- Evaluation of Balkhi sheep for production traits of economic importance.

Achievement:

- The results show that the average adult ewe body weight was 54.3 kg with a fertility rate of 82% and twinning rate 6%. Mean birth weights were 4.8 and 4.5 kg for males and females, respectively. Mean weaning weights were 33.8 and 27.0 kg in males and females, respectively. The average pre-weaning daily weight gain was 242 and 187 g in males and females respectively. The hogget weight was 48 and 44.8 kg in males and females, respectively with an average daily gain of 144 and 134 g in males and females, respectively.

Activity-2:

- Establishment of nucleus flocks of different sheep and goat breeds at coordinating units and distribution of elite rams/bucks.

Achievement:

- The Program has coordinating units at LPRI Bahadurnagar (Okara) and Rakh Khairewala (Layyah) in Punjab, Tando Muhammad Khan,

Sindh; Usta Mohammad, Balochistan; Jaba, NWFP; Muzaffarabad, AJ&K. Coordinating units have established nucleus flocks of Lohi, Kooka, Balochi, Rambouillet sheep and Beetal, Dera Din Panah, kamori, Barbari goat breeds and are recording data on important production traits of economic importance. Elite rams and bucks are also being distributed in respective areas

NATIONAL COORDINATED RESEARCH AND DEVELOPMENT PROJECT FOR IMPROVEMENT OF WOOL QUALITY (PSDP)

Targets-2005

- Selection of sites for the establishment of wool shearing centers in all the provinces.
- Training of farmers on the efficient use of machines for uniform shearing of wool its segregation into various parts.
- Survey on breeding, feeding, health and marketing aspects of sheep production within the vicinity of each shearing center of the provinces.
- Study of characteristics of wool quality in indigenous sheep breeds.

Activity-1:

- Training of Farmers for Improvement of wool Quality.

Achievement:

- This project was initiated in July, 2004 with 5 units in Mansehra (NWFP), Multan (Punjab), Usta Mohammad (Balochistan), Tando Jam (Sindh), Muzaffarabad (AJK) and NARC. Five hundred farmers were given training on quality wool production and animal husbandry management in Punjab province and twenty farmers were given training on mechanical shearing of wool at different coordinated units all over the country. Fifteen hundred Wool samples were received from different provinces and analyzed for Clean wool yield, Staple length, Fibre diameter, Medullation and Bulk at Wool Laboratory, NARC.

STRENGTHENING OF LIVESTOCK & FISHERIES RESEARCH IN PARC RESEARCH SYSTEM

Targets 2005

- To sustain on-going research projects on Livestock & Fisheries by providing operational funds.
- Provide the much needed capital equipment to the research system for improving efficiency.

Achievement:

- The project was launched at ASD (PARC), ASI NARC, AZRC Quetta, SARC Karachi, KARINA Gilgit and AZRI Bahawalpur. On-going research projects on livestock and Fisheries were strengthened at all units by providing operational funds. Animals, agriculture machinery and much needed equipments were purchased for improving the efficiency of research system. Farm building, vehicles and existing machinery/ equipment got repaired. Farmers were trained about animal health coverage and farm management, through participatory approach.

SARC Karachi

Activity-1:

- Genetic and Reproductive Efficiency Improvement in Livestock.

Achievement:

- A survey of cattle colonies in Karachi conducted to identify various nutritional practices on buffalo and its impact on economics of milk production revealed that almost 75% of farmers are using wheat barn and cotton seed cake as major ingredient. On the average around 5.9 kg/day fodder and 5.5 kg/day wheat straw was fed to animals along with 8.2 kg/day of concentrate. Milk production per animal on average was 8.3 liter per day giving an income of Rs.200/- per animal/day with average cost of Rs.95/- per animal/day and giving net profit of Rs.104/ per animal/day.

Activity-2:

- Inland Fisheries

Achievement:

- In studies on polyculture of Freshwater Prawn (*Macrobrachium malcolmsonii*) with Indian major and Chinese carps at farmer's pond, yield of prawn in polyculture was achieved as 223.5 Kg/ha and 568.0 kg/ha respectively at farmer's ponds District Thatta, while monoculture with prawns only yield up to 172.5 kg/ha. Production of fish in polyculture was 4876.5 kg/ha at both farms and in monoculture, the production was 4440 kg/ha.

AZRI, Bahawalpur

Activity-1:

- Animal feeds: Resources and strategies

Achievement:

- Under ASPL-II project on strengthening of Livestock and Fisheries research in PARC system, studies were initiated on the improvement of productivity of small and large ruminants in the Cholistan desert and its adjoining areas in Bahawalpur with a special focus on the nutritional and health management of livestock being reared in the area.

Activity-1:

- Inland Fisheries

Achievement:

- To make an efficient and alternate use of salinity affected land and water resources, a pilot scale innovative study on the evaluation of prospects of Saline Aquaculture at AZRI, Bahawalpur is being carried out as a continuous activity since last two years. Out of the three indigenous and four exotic species tested under slightly saline

water conditions (1189 ppm) one local popular fish species namely *Labeo rohita* (Rohu) and two Chinese species namely grass carp and silver carp showed remarkable growth performance and a weight gain of about 1.50 kg per year was recorded in each case.

AZRC Quetta

Activity-1:

- Epidemiology and control of Animal Diseases:

Achievement:

- Overall 80.6% animals (27% sheep and 54% goats) were found infested with nineteen species of internal parasitic infestation at three slaughter-houses (Quetta, Kuchlak and Mastung). Among external parasites ticks (3%) and warble fly (2.5%) infestation was recorded in goats. Veterinary Camp was organized under Saline Agriculture Farmers Participatory Development Project (SAFPDP) in nine villages of project area near Suhbatpur (Jafferabad District) for three days. A total 2868 animals (sheep, goats, cattle and buffaloes) were given drenched against internal parasitic infestation treated for various diseases and vaccinated against foot and mouth disease and Hemorrhagic Septicemia.

Activity-1:

- Genetic and Reproductive Efficiency, Improvement in Livestock.

Achievement:

- At AZRC Range Livestock Research Station overall 86% (38/44) lambing rates and 4% lamb mortality were recorded during the year with range grazing and supplemental feeding that was quite satisfactory keeping in view the poor forage availability from rangelands because of drought prevalent in the area. At Siddiqabad Site farmers' lambs mortality percentage were improved from 30% to 5% with demonstration of proper health and management.

SOCIAL SCIENCES DIVISION

Social Sciences Division (SSD) strives to explore the impediments of low productivity and suggests measures for making agriculture a prosperous enterprise in Pakistan. It promotes science-based and knowledge-led agriculture in the country through its four Directorates at the headquarters. Directorate of Agricultural Economics, addresses socioeconomic and policy issues concerning resource-use efficiency, value chain, and narrowing yield gap and impact analysis for export-driven farm production. Directorate of Agribusiness and Marketing attempts to commercialize the PARC-generated technologies forging public-private partnership by signing Memorandum of Understanding (MOUs) and agreements. SSD has countrywide network of Technology Transfer Institutes (TTIs) under the Directorate General of Technology Transfer. This is a unique function undertaken by a research organization which distinguishes PARC from rest of the national, and provincial agricultural research systems whereby the science-based knowledge is purveyed to the growers. The feasibility of new technologies in social, economic and environmental context and constraints in their diffusion and adoption are studied by the scientists working in technology transfer institutes.

The Directorate of WTO aims at preparing all farm sector stakeholders to meet the challenges and benefits from the globalization and trade liberalization. It also supports different institutes to carry out empirical research in the areas of comparative advantage, impact and agricultural policy analysis *w.r.t.* WTO Agreement on Agriculture (AoA) and Agreement on Application of Sanitary and Phytosanitary Measures (SPS).

Objectives

In line with the Medium Term Development Framework 2005-10, SSD tailored its research priorities for the year 2005-06 focusing on the following six intertwined themes: i) post-harvest technologies and value chain, ii) high value agriculture iii) WTO compliance, iv) resource conservation technologies, v) public-private partnership, and vi) technology transfer.

Achievements in 2005-06

During 2005-06, Social Sciences Division conducted 41 socioeconomic research studies covering all the ecologies of the country. Brief details of research and Technology transfer activities is documented below:

Post-harvest Technologies and Value Chain

Adoption of improved and state-of-the-art technologies in post-harvest operations initially require quantification of losses at different stages of marketing processes. The study carried out in Punjab revealed that marketing channel i.e. contractor-market intermediaries–shopkeeper has post-harvest losses in Guava to the extent of 22.67 percent. This indicates the importance of better and improved post-harvest management practices to achieve higher marketable surplus. Tomato cultivation in the central valley plains of NWFP suffered loss of about 20 percent of the total production due to poor harvest handling. Another study estimated that mango post harvest losses of Rs 486 million and Rs 1065 million for Sindh and Pakistan, respectively during the season 2004-05.

High Value Agriculture

Pakistan's northern areas are endowed with the bounties of nature and hold tremendous scope of high value agriculture. Production of fruits, vegetables and potato seed and farming of trout are the avenues waiting to be tapped. Deserts of Pakistan have promising scope of livestock production and it was revealed that crossing indigenous cattle breeds of desert (Thal and Cholistan) with exotic milk breeds, like Sahiwal and Friesian is common with the sole objective of increase in milk availability and stout calves. A study conducted in Sindh province estimated cost of eggs production to the tune of Rs 9.9/dozen in summer and Rs 10.13/ dozen in winter. The net profit margin of producer was Rs 12.1/dozen and Rs 32.8/dozen in summer and winter seasons, respectively.

WTO Compliance

To safeguard Pakistan's agriculture from the onslaught of globalization and WTO regime, efforts have been made on various fronts such as awareness campaign, dissemination of information through printed material, and organization of workshops/seminars. During the year, two international workshops were organized under ALP program of PARC on the important topics of Food Safety Standards in Better Export of Fruits and Vegetable Products and Intellectual Property Rights in Agriculture. Thirteen (13) APO member countries participated in the events and presented their papers. The workshops hinted that massive efforts need to be done for bringing competitiveness and quality improvement in Pakistan's food sector exports. Many institutional and legislative reforms are also required for promoting innovations and granting patent rights in agriculture.

Government endeavours to have a big chunk of world's textile market require production of contamination free cotton. A study revealed that efforts being made in this regard are fruitful as 92 percent cotton traders reported improvement in the quality due to Good Agricultural Practices (GAP) adopted by the farmers.

To assess the comparative advantage and competitiveness of Pakistan in production of crops, studies showed that the country has comparative advantage in cotton production with good economic efficiency in Punjab and Sindh. However, Basmati rice competitiveness is low at farm level but has strong economic efficiency/comparative advantage. Reduction in disincentives through policy interventions such as enhancing domestic prices is required to increase competitiveness at farm level.

Resource Conservation Technologies

On the front of resource economics, it was observed that small farmers were getting 18.6 percent higher output per acre than large farmers depicting inverse relationship between farm size and productivity. Absolute and relative profitability of maize, sugarcane, rice, wheat, cotton were in decreasing order with increase in farm size. The findings showed the need of better resource management at all levels particularly at medium and large farms.

The global research network argues to move from excessive to low and no tillage for moisture conservation in the soil. No tillage offers an opportunity of using the conserved moisture for planting of subsequent crop. The study on zero-tillage technology in Punjab revealed that at regional level, farming community saved Rs.1338 million, 1085 million litres of tractor diesel, and 2.05 million hours of tractor services while 10.25 thousands hectare feet water was over pumped. However, due to successive use of ZT technology, the wheat yield declined @ 6.23 percent per annum viz-a-viz a growth of 2.40 percent on dis-adopters' field. Hence, ZT plantation is significantly contributing in light soils with good drainage than the heavy ones.

A study on farm mechanization depicted that use of thresher can conserve resources on rice paddy threshing and cost only Rs 900/acre whereas bullock and drum beating cost Rs 1080 and Rs 1200 per acre, respectively. Paddy thresher also saves time and can do job in 2hours/acre than other methods which require more than 2 days to finish the same job.

Public-Private Partnership

To achieve tangible benefits of agricultural research and promote public-private partnership, the division inked three agreements in the field of embryo transfer, calves feedlot and paddy thresher with private firms for adoption of the technologies at commercial scale.

Technology Transfer

To address the specific needs of the local farmers, TTIs offer a combination of different techniques and undertook diverse activities for knowledge dissemination and farmers capacity building. In total, 75 farmers' field days on the topics pertaining to crops, horticulture and livestock production technologies were conducted across the country. Thirty four (34) radio talks were aired by Hyderabad, Faisalabad, Quetta, Peshawar, Gilgit and Muzaffarabad radio stations. Technology Transfer Units (TTUs) also developed and distributed 35 brochures/leaflets for creating awareness, disseminating knowledge and promoting new technologies. Language poses a big barrier in clear understanding of knowledge and innovation. To overcome this barrier, TTIs published 54 popular articles in local languages. To shoulder the

government efforts in poverty reduction, technology transfer institutes have also launched six poverty alleviation projects under ALP in 26 selected districts of all provinces, NAs, and AJK. The philosophy adopted for these projects is to enhance farm productivity through transfer of proven technologies at farm level and capacity building of farmers following participatory approach.

Collaboration of biometrics program with the national coordinated wheat program showed an improvement of eight (8) to nine (9) percent in precision level through Alpha Lattice Design than the conventional method of Randomized Complete Block Design (RCBD).

In last but not least, debate and dialogue is a lifeline of knowledge development and creativity process. To promote this activity, SSD collaborated with Ministry of Food, Agriculture and Livestock (MINFAL), International Food Policy Research Institute (IFPRI), USA and Innovative Development Strategies (IDS) in organization of four national and international level seminars.

Department of Plant Protection

The Department of Plant Protection is an attached department of MINFAL, which is responsible for protection of crops from insects, pests, diseases, locust, weeds control etc. The Department of Plant Protection provides facilities, such as, locust survey and control, pest control by air on field crops, quarantine facilities for agricultural commodities, pesticides registration and quality testing etc. It has a network of laboratories, air surveillance facilities and maintains quality control on import of pesticides. The department also conducts sanitary and phyto-sanitary (SPS) tests for export of agricultural commodities in accordance with WTO requirements.

Main Functions of the Department of Plant Protection

Regulatory

- Enforcement of Plant Quarantine Act 1976
- Agricultural Pesticides Ordinance 1971
- Agricultural Pesticides (Amendment) Act 1992 and 1997

Extension

- Locust survey and control in desert areas, international coordination with FAO and other locust affected countries.
- Crop pests control by air.

Advisory

- Advise the Government on all aspects of plant protection including international obligations

ACHIEVEMENTS

Details of achievements during 2005-06 are as under:

1. LOCUST SURVEY & CONTROL

Winter/Spring Areas

The Department kept constant watch by regular fortnightly survey. Pakistan was free from locust activity and no solitary adult was reported in the winter/spring breeding areas of Balochistan.

Summer Areas

Locust survey work in summer/monsoon breeding areas has commenced from 15.06.2006. Strong winds from N.W to N.E prevailed in the entire breeding area. Although there is no locust activity in the winter/ spring areas of Balochistan due to prevailing hot and dry weather the adult migration to summer breeding areas which may concentrate in rain fed areas.

2. PLANT QUARANTINE

The Plant Quarantine Division enforce the Pakistan Plant Quarantine Act 1976 and Rules 1967 through which the country is protected from the entry and spread of exotic insect pests and disease and trade of plants and plant products is facilitated. The Plant Quarantine Act and Rules are aligned with the International Plant Protection Convention.

The major achievement of the Plant Quarantine Section is signing of M.O.U.s with China for export of Citrus, Mango and Rice and with Iran for export of Citrus and Mango.

Details of Plant Quarantine services rendered are as presented below:

Phytosanitary Certificates Issued	62,256
Import Permits Issued	13,034
Release Order Issued	27,595

Central Plant Quarantine Laboratory processed different samples and passed 386 samples and rejected 05 samples.

3. AERIAL PEST CONTROL

The Department carried out aerial spray on orchard on an area of 22,495 acres in the province of Balochistan in May 2006

The scheduled field crops surveys are in progress in Punjab, NWFP and Sindh provinces since first fortnight of June 2006 and would last till October, 2006

4. PESTICIDES REGISTRATION

The Department enforces the Agricultural Pesticides Ordinance 1971. The responsibility of registration/permission for import and quality control is executed through the Department of Plant Protection. Due to the efforts of the Department, the prices declined by 30-50%. Availability of effective, safe and inexpensive pesticides to the farmers are now there. The Department has added 57 more pesticides to the Generic List that now contains 120 pesticides. This step has resulted in broadening sources; bring the prices further down of the supply base and lowering of pesticides.

Details for services rendered in the matter are as presented below: -

SCHEME	APPLICATION ON	REGISTERED
Brand Name	Form 01	23
Generic Name	Form 16	448
Registered Abroad	Form 17	30
	TOTAL	501

Detail of import of pesticides is as under: -

Year	Quantity Metric Tons	Value Million Rupees
2005	104433	10379
2006	27571	2375

5. PESTICIDES QUALITY CONTROL

The Federal Pesticides Testing and Reference Laboratory of the Department analyzed all import consignments samples, registration samples and resolved disputes over analysis results of the Provincial laboratories on appeals from the importers/dealers.

6. REVENUES COLLECTED

The details are as under:

SERVICE	REVENUE
Plant Quarantine Services	Rs.54.80 Million
Pesticides Registration Fees	Rs.16.005 Million
TOTAL	Rs.70.80 Million

7. FEDERAL PESTICIDES TESTING AND REFERENCE LABORATORY

Sample analyzed 2005-2006=1698

The Department of Plant Protection, through decisions and action, has been instrumental in providing effective plant protection coverage and thus has contributed in the achievement of objectives of the Ministry.

Federal Water Management Cell

Federal Water Management Cell (FWMC) deals with water sector problems, solution, formulation of On Farm Water Management (OFWM) programmes and Land Development Projects prepared in consultation with the Provincial Governments and plays its role for overall coordination for projects executed in the Provinces. The main functions of the OFWM programme are to: -

- Redefine government's role for sustainable development of water sector
- Minimizing water losses at farm level through watercourse lining and precision land leveling
- Control water logging and salinity through change in cropping pattern and bio-techniques.
- Increase agricultural production through efficient use of water thereby allowing increase availability of water to bring more land under cultivation.
- Encourage farmers participation in water management practice and to increase their income through providing jobs in irrigated agriculture sector development

Country is facing water shortages for agriculture. The existing irrigation mechanism has reportedly 40 – 45% efficiency. In order to improve the existing system, various steps for sustainable development of water sector, especially to control heavy water losses through farmers' participation have been under taken. In this regard, various On-Farm Water Management (OFWM) projects have been started in all four provinces including FATA, FANA, ICT and AJK.

The main activities of the OFWM programme are water conservation through promotion of efficient irrigation techniques, watercourses lining, construction of water storage tanks, precision land leveling, establishment of demonstration centers, land development and training to the professionals and farmers.

At present FWMC is executing the following projects to introduce water conservation and its better utilization for agriculture purpose in all the four Provinces including FATA, FANA, ICT and AJK.

Targets and Achievements

Sr. No.	Activity	Project Cost (Rs. million)	Project Activity	Project Target	Achievement for 2005-06	
					Target	Achievement
1.	National Programme for Improvement of Watercourses in Pakistan	66,373.486	Improvement of water courses (lining)	86,003	15,050	15,050
2.	Land and Water Resources Development Project for Poverty Reduction in Pakistan	3,400.000	To bring 225,000 Ha land under cultivation through reclamation of culturable waste lands	300 (Baloch 200 and NWFP 100)	300	Tender finalization under process.
3.	Improvement of Water Management Practices in Northern Areas Project	37.781	Water Channels	60	10	10
			W. S. Tanks	30	3	3
			Demonstration	20	4	4
			Flood protective Structures	29	6	6
			Precision Land Leveling (Ha)	20	3	3
			Green Tunnels	5	2	2
4.	Chaghai Water Management and Agriculture Development	567.170	Improvement of water courses (Nos)	325	25	Physical work could not be started

	Project (IDB Assisted)		Constructi on of Water Storage Tanks (Nos)	265	25	due to non- receipt of loan proceed s from the donor (IDB). The loan proceed has recently been received .Physical work will be started during financia l year 2006- 07.
			Installatio n of Trickle Irrigation Systems (Ha)	200	40	
			Installatio n of Bubbler/R ain gun Irr. Systems (Ha)	200	40	
			Sailaba agricultur al dev. Bundants (Nos)	100	20	
			Maintenan ce of Karezes (No)	15	03	
			Installatio n Of Tube Wells/ Dugs well	50	08	
5.	Exploitation & Mgt. of Water Resources Deve. for Peri- Urban Islamabad Capital Territory	27.206	Constructi on of Green Tunnels (Nos)	6	-	-
			constructi on of Water Storage Tanks (Nos.)	15	-	-
			Constructi on of weirs (Nos)	6	-	-

			Watercourse lining	15	-	-
			Micro Irrigation System	15	5	1
			Precision Land Leveling (Ha)	50	15	2.5 Ha
			Training of staff	250	-	-
			Installation of tube wells	15	4	4
6.	On-Farm W.M Phase-IV (World Bank Assisted) Project	134.100	Overall Coordination and Monitoring of Project activities to be executed in Provincial Government (s)			
7.	Federal Programme Management Unit (FPMU)	199.000	Overall Coordination and Monitoring of mega Project of National Programme for Improvement of Watercourses in Pakistan being executed in four provincial Governments/other areas.			

Other than above, FWMC is formulating project for effective utilization of available water resources through following activities:

- Introduction of High Efficiency Irrigation Systems i.e. Sprinkler /Drip systems for high value crops.
- Introduction of Permanent Raised Bed farming in Maize-Wheat and Cotton-Wheat farming systems.

Soil Survey of Pakistan

The Soil Survey of Pakistan is the sole custodian of land resource data in Pakistan. This organization provides a range of services including Soil surveys & mapping (at reconnaissance, semi-detailed, detailed and ultra detailed level), soil inventories, detailed soil and water studies, chemical and physical analyses of soils and water, land inventories including land evaluation, spatial system analyses, training and consultancy in planning of sustained use of land resources.

ACHIEVEMENTS 2005-2006

a. PROJECT ACTIVITIES

National Agricultural Landuse Plan

1. Completed reports and maps (Landforms & Soils, Land Capability, Land Suitability and Landuse) of the following districts:
Lahore, Sheikhpura, Okara, Sahiwal and Pakpattan.
2. Completed the Land Resource Surveys and Evaluation of the following districts:
Mandi Baha-ud-Din, Multan, Sialkot, Gujranwala, Gujrat, Mardan, Charsada, Quetta, Pishin, Toba Tek Singh, Faisalabad and Hafizabad. Reports writing and maps preparation of these areas is in progress
3. Edited and composed rainfall, deep and shallow ground quality maps of Sheikhpura and Lahore Districts.
4. Land evaluation research on soils of Pakistan

DIGITIZATION/EDITING OF MAPS

- Re-rectification of the mosaics of Muzaffargarh, Gujranwala and Ghotki Districts using relevant soil maps
- Prepared mosaics of Quetta, Gujrat and Multan Districts from the relevant SPOT images.

- Redigitized and edited soil mapping units and infrastructure from topo-sheets at 1:50,000 scale of Hyderabad, Gujrat, Mardan, Sialkot and Mandi Baha-ud-Din Districts to overlay on the relevant spot images sheets
- Map digitization (80 different maps completed)
- Image processing/rectification of Spot Images scenes of different areas are in progress with the collaboration of SUPARCO

b. NON-PROJECT ACTIVITIES

- Completed report of the AJ&K
- Composed “Soils and Landform” map of AJ&K
- Finalized Soils and Landform, Land Capability and Present Landuse Maps of Baltistan area in Arc-view
- Completed Reconnaissance Soil Survey reports and maps of Turbat, Awaran and Punjgoor Districts
- Completed the soil survey of the remaining un-surveyed part (about 10,000 sq,km) of Baltistan area.
- Reconnaissance Soil Survey report and maps Preparation of Baltistan District in progress
- Analysed 450 soil and 125 water samples for different parameters
- Assisted/guided Commanding officer and a Major from Pak. Army, Survey Unit, Lahore about Soils of Cholistan.
- Delivered lecture and demonstrated Tfc assessment in the field to NCOs Cadre, Pak. Army (100 participants)
- Presented following research papers at International Soil Science Congress at NARC, Islamabad:

- Completed water quality data draft about study “Evaluation of tubewell water along Mananwala distributary and its effect on soil health
- Developed the “Soils & Landforms map” and prepared a brief about soils of the Azad Jammu & Kashmir (earthquake area) for Ministry of Foreign Affairs Islamabad.
- Reviewed and updated “Key to Soil Taxonomy, 2003” of Balochistan.
- Prepared Soil map of Thar South area
- Provided different Soil Surveys reports and maps to WAPDA authorities related to BASHA Dam

Economic Wing

The Economic Wing is a research and publication Wing of the Ministry of Food, Agriculture and Livestock. This Wing is responsible for collection, compilation and dissemination of agricultural statistics at national and international level and to provide MINFAL timely and relevant economic and policy support under the rules of business. The achievements of different sections of this Wing during the year 2005-06 are as under:-

AGRICULTURAL ECONOMICS AND STATISTICS SECTION

This section is responsible for data collection, compilation and analysis of crop area/production and other agricultural data from Federal and Provincial Governments, the FBS and other agencies. The data is compiled, computerized and disseminated in the form of publications on yearly basis. The Economic Wing published following books during the period under report.

1. Agricultural Statistics of Pakistan 2004-05.

The publication covers:

- Area, production and yield of major and minor crops including cereals, pulses, oilseeds, condiments, fodder, fruit and vegetables etc.
- Land use statistics.
- Use of inputs.
- Agricultural credit.
- Agricultural mechanization.
- Livestock, fisheries and forestry statistics.
- Trade statistics.
- Prices of agricultural commodities.
- Miscellaneous statistics.
- Conversion factors.

2. Crops Area Production (by districts)

Economic Wing releases Area Production (by districts) after every three years. Since the devolution of power and formation of district governments, the MINFAL realized the importance of district data for formulation of district development plan. Keeping in view the need of data, the MINFAL decided to publish district-wise Crops Area Production data on yearly basis instead of three years. This publication contained latest district-wise data on major/minor crops including condiments, fruit and vegetables for the years 2003-04 and 2004-05.

3. Fruit, Vegetables and Condiments Statistics of Pakistan

Economic Wing released Fruit, Vegetables and Condiments Statistics of Pakistan 2004-05 containing province-wise data for the year 1998-99 to 2004-05. It also contains data on exports, imports (by destination) and wholesale prices which brings updated information for researchers, government functionaries, exporters and all those interested in the issues concerning the agriculture sector.

4. Year Book for Cabinet

In pursuance of Rule 25(2) of the Rules of Business, 1973, the Economic Wing published Year Book 2004-05 containing details of activities and achievements of MINFAL, its attached departments and autonomous bodies.

Issuance of MINFAL Resolutions of Final Estimates:

The Wing also issued final estimates of about 54 major and minor crops in the form of resolutions to Federal, Provincial Governments, departments/autonomous bodies and private sector agencies at national and international level.

The Wing prepared:

- Briefs on review of agricultural commodity prices for ECC meetings.
- Weekly review of national/international prices of essential commodities.

- 15 questionnaires were provided to FAO, Rome duly filled in by Economic Wing.
- Briefs for the meetings of Annual Plan, National Statistical Council (NSC) and National Accounts Committee (NAC).
- Data for IMF and Prime Minister's Secretariat.
- Replies of various National Assembly/Senate Questions
- Presentation on crop estimation procedure to improve the existing crop estimation system.
- Presentation for the Prime Minister's Committee on Prices for the following items;
 - i. Present Status and Future Plans for Improvement of Marketing System by Giving Specific Recommendations for Taking Policy Decisions by the Committee.
 - ii. Presentation on the Issues Relating to Seed Industry Including Import of Duty Free Seed from Regional Countries through Private Sector and Suggesting Amendments in the relevant laws.
 - iii. Livestock Markets and their Improvement
- Brief for delegations attending the international seminars under FAO, OIC, ECO, SAARC and other organizations.
- Data exchange with FAO, national/international NGOs/agencies.

AGRICULTURAL CREDIT SECTION:

Agricultural credit plays an important role in agricultural development of the country. Credit is advanced to farmers to supplement their resources for purchase of seeds, fertilizer, 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 terms and conditions as well as to protect them in case of any natural hazards and calamities. Keeping in view the increasing demand of agricultural credit, the Economic Wing has been arranging meetings on availability of agricultural credit under the Chairmanship of FAM since September 2001. So far ten meetings have been held to monitor disbursement of agricultural credit.

The 10th meeting of Agricultural Credit Review Committee was held on 15th June, 2006 under the Chairmanship of the Minister for Food, Agriculture and Livestock to review disbursement, availability of Agricultural Credit and bottlenecks involved in it. The Economic Wing monitors disbursement of agricultural credit on monthly basis to ensure timely release of agricultural credit to farming community. The credit disbursement during 2005-06 has been highest in the history of Pakistan i.e. Rs.137.5 billion by all banks as against credit targets of Rs.130 billion. Institutional credit to the farmers is being provided through ZTBL, Commercial Banks, Cooperative and Domestic Private Banks. The targets and achievements of ZTBL, PPCBL, Commercial Banks and Domestic Private Banks according to the data released by SBP as per statement given below:-

(Rs. in billion)

Name of Institution	Targets			Achievement			Achievement (In percent)	
	2004-05	2005-06	%Change	2004-05	2005-06	%change	2004-05	2005-06
(ZTBL) (a)	34	43	26.5	37.4	47.6	27.3	110.0	110.7
(PPCBL) (b)	8	9	12.5	7.6	5.9	-22.4	95.0	65.6
COMMERCIAL BANKS								
NBP	15	23	53.3	19.4	24.5	26.1	129.3	106.3
HLB	10	20	100.0	17.2	22.8	32.6	172.0	114.0
MCB	5	7	40.0	5.5	6.5	18.2	110.0	92.9
UBL	5	8	60.0	5.5	9.2	67.3	110.0	115.0
ABL	3	5	66.7	3.7	5.1	37.8	123.3	102.0
Total Com. Banks (c)	38	63	65.8	51.3	67.9	32.4	135.0	107.8
Total DPBs (d)	5	15	200.0	12.4	16.0	29.0	248.0	106.7
G.Total (a+b+c+d)	85	130	52.9	108.7	137.4	26.4	127.9	105.7

Corporate Agriculture Farming

- The Federal Minister for Food, Agriculture and Livestock had presided over inter-provincial/inter-ministerial meetings held on 29-11-2005 and 15-03-2006 to resolve the issues, hindrance in the implementation of Corporate Agriculture Farming (CAF) policy package approved by the Federal Cabinet.
- Prepared summary on pending issues of Corporate Agriculture Farming (CAF) for Inter-Provincial Coordination Committee (IPCC) meeting.
- Prepared working papers on agricultural Credit for the Federal Committee on Agriculture (FCA) Kharif and Rabi meetings.

- Processed complaints received from the farming community regarding agricultural credit
- Prepared briefs on working papers of ACAC and NCC mid terms and annual meetings for the period under report

ECONOMIC STUDIES SECTION

The Economic Studies Section performed the following work during 2005-06.

Seminars/Meetings for delegations

- Prepared briefs for head of delegation attending International Conferences/Seminars/Meetings etc.
- Prepared country statements/position papers for SAARC Conferences, OIC and FAO etc.

Briefs for Joint Ministerial Commissions (JMC)

- Prepared briefs for JMC meetings held from time to time during 2005-06.

Miscellaneous Activities

This section contributed and assisted MINFAL in discharging technical work. Among them the major activities performed are as under:

- Prepared a detailed report for presentation in International conference on “Agrarian Reforms and Rural Development” held in Brazil on March 2006.
- Prepared comments on Crop Acreage Return (Goshwara Ginswar)
- Invited suggestions/proposals from relevant agencies/stakeholders and consolidated proposals for onward

transmission to Commerce Division to be included in the Trade policy 2006-07.

- Prepared brief on progress/achievements and future plans of Economic Wing for the 84th meeting of High Powered Federal Committee on Agriculture.
- Prepared brief on the latest trends in production of Major Agriculture Crops.
- Prepared comments on report entitled “Strategic Review of Ministry of Food, Agriculture and Livestock”.
- Prepared brief for Secretary on “Donor Harmonization, Alignment and AID Effectiveness in Pakistan”.
- Coordinated in the preparation of Country Report with regard to World Food Summit Plan of Action covering period up to March 2006.
- Prepared comments on project entitled “Monitoring of Crop through Satellite Technology” for FAO.
- Prepared comments on report entitled “Grow More Wheat Campaign” 2004-05 prepared by PARC.

DEVELOPMENT PROJECTS

I) Pilot Project for Monitoring & Managing Agriculture through Satellite Technology”

The above project was approved by DDWP of MINFAL on 16th March 2005 at a cost of Rs.29.510 million to be funded from ASPL-II project. The main objectives of the project were:

- a) Develop program/algorithms to estimate area of cotton crop during Kharif season in 15 main growing districts of Punjab and Sindh through use of satellite technology.

- b) Subsequently carry out similar studies on wheat crop in the same region during Rabi season.
- c) Early warning and crop stress
- d) Develop Crop Yield Forecast Models for cotton and wheat crops.
- e) Transfer technology to stakeholders including Ministry of Food, Agriculture and Livestock (MINFAL), Federal Bureau of Statistics (FBS), Pakistan Meteorological Department (PMD) and Provincial Crop Reporting Services.

MINFAL invited an FAO mission to evaluate the project proposal and make recommendations for its effective implementation. A two member FAO mission visited Pakistan in May 2005. It visited provincial Agriculture Departments, Federal Bureau of Statistics, Pakistan Meteorological Department, MINFAL and SUPARCO. This mission made the following recommendations.

- a) The project area proposed is too large and to make a beginning, MINFAL/SUPARCO should take up a pragmatic area.
- b) The project should focus on training requirement focusing on transfer of technology from international sources particularly on Crop Yield Modeling.
- c) The project should work in close cooperation with provincial Crop Reporting Services, PMD, FBS and MINFAL and a local training component should be added to share experiences and transfer of technology.
- d) Project should cover NWFP and Baluchistan also where crop reporting procedures are less precise.

Activities, Achievements and Progress

a) Selection of Project area:

MINFAL supplied a budget of Rs.4.410 million on June 11, 2005 and advised SUPARCO to work in contiguous cotton growing

areas of Punjab and Sindh. On this advice SUPARCO selected Bahawalpur, Rahim Yar Khan and Ghotki districts and selected 15 villages from the Area Frame of Punjab and Sindh for Ground Truthing Surveys (GTS). The satellite Imagery covered these three districts under 26 images down loaded from SPOT constellation of satellites. These images were ortho-rectified, mosaiced and classified using standard algorithms. The area sown under cotton and wheat crops in these districts was worked out. The results were reported to MINFAL and provincial Crop Reporting Services.

b) Trainings:

Two trainings were arranged for functionaries of MINFAL, FBS, PMD and CRS in Feb and June 2006 in order to transfer knowledge in the SRS data based Crop Reporting System developed by SUPARCO.

c) Revision of PC-1:

In order to cover all the federating units of Pakistan, MINFAL advised SUPARCO to revise the PC-1 and submit it to the Planning Commission for consideration and approval. The PC-1 was accordingly revised and submitted to Planning Commission for approval. The CDWP of the Planning Commission approved this revised PC-1 on Jan 21, 2006 at a cost of Rs.111.000 million. It is now planned to work on cotton, wheat, rice, sugarcane and maize crops. A strong training component both within country and abroad has been provided and all the stakeholders (provincial Crop Reporting Services (CRS), FBS, PMD, and MINFAL) are taken on board of the project.

Program of Activities and Targets for 2005-06

The program of activities and targets for 2005-06 for various components of the project are as follows:

i) Selection of Project areas:

The Project area has been expanded to cover Cotton, Rice, Maize, Sugarcane and Wheat crops. About 50 plus districts each with major ecologies for the project crops have been selected in Punjab, Sindh and NWFP to carry out monitoring of above crops through satellite technology.

ii) Estimation of area of crops and development of Yield Forecast Models.

a. Kharif -Cotton, Sugarcane, Rice and Maize crops :

• **Crop Area**

The data on area planted under sugarcane and cotton crops will be acquired through satellite during June-August 2006. The Ground Truthing Surveys (GTS) will be simultaneously carried out during this period. The district mosaics will be developed and the images will be processed and classified and area sown under various crops will be worked and reported to MINFAL in September 2006.

• **Yield Forecast Models**

Crop yield calibration curves will be carried out and forecast models will be developed in cooperation with FAO.

b. Rabi – Wheat Crop:

• **Crop Area**

The data on area planted under wheat crop will be acquired from the satellite data January 2007 and Ground Truthing Surveys will be carried out in January /February 2007. The processing of the images, development of district mosaics and classification will be carried out and results will be reported in February, 2007.

- **Yield Forecast Models Yield:**

The Crop Yield Calibration curves will be worked out in March 2007 and Yield Forecasting Models will be developed in cooperation with FAO.

iii) UTF with FAO

Attempts are under way to sign a Unilateral Trust Fund (UTF) with FAO to:

- a) Recruit international Crop Yield Modeling/Forecasting Expert.
- b) Arrange foreign training in two batches of 15 each for SUPARCO functionaries/Stakeholders for Crop Yield Modeling.

iv) Development of database:

A database will be developed to gather information on:

- a) Weather data at various phenological stages of crop growth
- b) Agricultural inputs as seeds, fertilizers, pesticides and agriculture credit
- c) Water and rainfall situation and pattern

II) Capacity Building Project of Economic Wing

In order to improve the efficiency and quality of work, Economic Wing has launched this project. The main theme of the project is to equip the Wing with appropriate data handling facilities and trained staff capable to operate an improved and updated system of data collection, management, processing, analysis, and reporting and enhancing the capacity of planning, policy formulation and analysis of policy issues.

III) Strengthening of Capacity for Improvement of Agriculture Statistics in Pakistan

The production estimates of major crops in Punjab, Sindh and NWFP are based on the crop cutting surveys conducted by the Crop Reporting Service (CRS) of respective Agriculture Departments. However, in Balochistan, the crop estimates are based on the personal judgment of officials of agriculture department with consultation of grower's of that area. The crop reporting system in Punjab is fairly good, whereas in other provinces, there is need to improve the crop reporting system. To improve the system, Economic Wing has prepared the project entitled "Strengthening of Capacity for Improvement of Agriculture Statistics in Pakistan", which was approved by the CDWP on March 23, 2006 at a cost of Rs.432.95 million. The duration of the project is 36 months. Under this project technical equipment, vehicles, motorcycles, computers and training to the staff in the field of data collection, sampling and crop forecasting will be provided.

The implementation of above projects will improve the crop reporting and forecasting system, which will help the planners, policy makers and researchers. It will also help to enhance the productivity of agriculture sector in the country.