LAND RESOURCES, THEIR MANAGEMENT AND USE IN PAKISTAN

Dr. S. M. Younus Jafri*

1. INTRODUCTION

Pakistan occupies the eastern most basin of the three great rivers that traverse the steppe desert of the old world--the Nile, the Tigris-Eupharates and the Indus. Pakistan is located between 24° and 37° N latitudes and 61° and 77° E longitudes. It has a land area of 796,100 sq km and a population of 149 million, which is increasing at a rate of 1.9 percent per annum. About 68 per cent of the people live in rural areas and 32 percent in urban areas. The climate is characterized by irregular rainfall, low relative humidity and extreme temperatures. In the plains the maximum temperature exceeds 40 C in summer and goes below the freezing temperature in winter. Most part of the land is arid or semi-arid in the sub-tropical continental zone. The average annual precipitation ranges from 100 mm in the central zone to more than 1250 mm in the Himalyan foothills. About three-fourth of the country receives less than 250 mm rainfall therefore the irrigation plays a vital role utilizing Pakistan's land resources for agriculture purpose.

Agriculture is the mainstay of Pakistan's economy and accounts for over 23 percent of gross domestic production (GDP). It employs about 42 percent of the labour force, and provides about 70 percent of export earnings, including processed agricultural exports. Although the share of agriculture in GDP has declined over the years due to diversification towards industry, infrastructure and services it remains most important sector of the economy, providing livelihood to over 68 percent of the rural population. Over the last two decades, agriculture has maintained an average annual growth rate of 3.9 percent. (GOP 2004b). The key economic resources in the agriculture sector, land and water are both close to maximum utilization. While the barani and mountainous areas are capable of yielding higher production through improved management of the agricultural production systems, the real hope for breakthrough in the medium term for rapidly increasing agricultural production is in the vast irrigated area. As such, the potential for economic growth lies in better management and more productive and sustainable use of the existing resources rather than an increased availability of resources.

The paper briefly reviews the land resources of Pakistan and their use, with special reference to agriculture. After introduction, land and water resources and land resources inventory system, respectively are discussed in sections 2 and 3. Section 4 is devoted to present land use, whereas issues such as farm size, crop production, land management system, use of inputs, forest and rangelands and land use problems are also discussed in this section. The futuristic policies and strategies are delineated in section 5, and conclusions are presented in the final section 6 of the paper.

* The author is working as Deputy Director General in the Federal Bureau of Statistics, Islamabad

2. LAND AND WATER RESOURCES

The total geographical area of the country is 79.61 million hectares (mha), of which 22.11 million hectares are cultivated. The cultivated area consists of four fifth (18.22 million hectares) of irrigated land and the remaining one fifth (3.89 million hectares) of rainfed land. Agriculture is largely dependent on the supply of irrigation water in the Indus Basin, which is the largest contiguous irrigation system in the world. It comprises 22 dams and barrages, 57,000 km of canals and about 90,000 watercourses. The total availability of water is estimated to be 131 million acre feet. Surface water accounts for 61 percent of the total delivery at farmgate and tube-wells supply 39 percent (GOP, 2004a and 2004b)

The canal commanded area (CCA) consists of 13.56 million hectares. About 31 percent of the soil in CCA is classified as very good (class 1) and 30 percent as good (class II). These constitute the prime agricultural lands in Pakistan (Mian and Ali, 1980). While 95% of the area commanded by Indus Irrigation System has been classified as moderate to very good capability for crop production, it is being increasingly affected by water logging and salinity.

The data on land utilization are presented in Table-1. Out of total reported area of 59.47 million hectares. 24.32 million hectares are not available for cultivation, 9.00 million hectares are culturable wasteland that cannot be brough under cultivation for lack of water, 4.04 million hectares are under forest and 22.11 million hectares are under cultivation that in nearly 37 percent is used for agriculture. And out of total land area of 79.61 million hectares only one third i.e. 26.15 million hectares is suitable for agriculture and forestry.

The overall cropping intensity in the country is 99 percent. It is influenced by the availability of irrigation water. In areas having sweet tubewell water in addition to canal supplies, the cropping intensity reaches as high as 150 percent.

Table 1: Land Utilization (2002-03)

Area	Area million hectares	Percent
Reported geographical area*	79.61	
Reported area**	59.47	100.0
- Not available for cultivation	24.32	40.89
- Culturable waste	9.00	15.14
- Forest area	4.04	6.79
- Cultivated area	22.11	37.18
- Current follow	6.53	
- Net area sown	15.58	
- Area sown more than once	6.27	
- Total cropped area	21.85	
- Cropping intensity		98.8

* For four provinces only

** Area actually surveyed

Source: GOP (2004a)

3. LAND RESOURCE INVENTORY SYSTEM

The soil survey of Pakistan has carried out a systematic reconnaissance soil survey of 61.8 million hectares covering all the agriculturally important areas of the country's total land areas of 88.2 million hectares. Through these surveys about 400 soil series, the basic unit of soil classification, have been established. These soil series have been grouped tentatively into 150 soil families. After considering the area occupied by each soil family, it was found that 23 soil families are very extensive, covering about 80 percent of the agriculturally important land of the country (SSP, 1987).

The grouping of soils on the basis of their relative suitability for sustained agricultural production determines the land capability class. Eight classes have been established. Soils placed in the highest class (I), 5.2 mha have the least limitations for agricultural use while in the next two classes (II and III), 11.8 mha there are increasingly severe limitations. The limitations are still more severe in soils of class IV 3.0, mha which have little possibility for improvement. Soils in the lowest four classes (V to VIII), consisting 40.0 mha are not suited to arable farming. These soils, can however, be used for rangeland or forestry. Further, 1.8 mha is allocated to towns, riverbeds and non-agriculture uses. Implicit in the classification is a ranking of the soil potential under a high level of management. The proportion to cultivable land is not likely to increase much, since, the un-surveyed area of 26.4 mha consists mainly of barani and in-accessible mountains or deserts. Detail of land capability classification is shown in Annexure-1. This classification provides land users and planners with a comparative assessment of different types of land for agriculture, together with their limitation and problem, specific development possibilities and their production potential. As several changes have occurred since 1947 in the ways land use/classification statistics have been collected land use statistics need to be interpreted with care.

Canal Commanded Area

The canal commanded area (CCA) of Pakistan is 13.56 million hectares. It does not include the area irrigated by tubewells. The land capability classification of CCA is presented in Annexure II. Nearly 10 million hectares under CAA which in close to half of the total cultivated land in Pakistan, constitute good to very good classes, implying that a large number of crops can be grown without any serious physical constraints. Nevertheless, there are 2.3 million hectares which are salt-affected and are being cultivated through proper drainage and treatment with gypsum. The various features of the land capability classes under CCA are outlined as under:

i) Very Good Class-I Agricultural Land

Approximately 30.7 percent (4.15 million hectares) of the canal commanded area comprises very good agricultural land (Class-I) which is suitable for a wide variety of crops and intensive irrigated agriculture. This land has a high response to good management, and gives very high returns to inputs of water, improved crop varieties, fertilizers and insecticides.

ii) Good Class-II Agricultural Land

About 42.9 percent (5.82 million hectares) of the CCA constitutes good agricultural land (Class-II), which has minor limitations, restricting the choice

of crops but is well suited to a few crops, such as rice and wheat. Most of it (4.07 million hectares) is clayey, posing minor problems of workability and seedbed preparation. Some 0.8 million hectares is affected by patchy salinity/sodality, while a part (0.64 million hectares) is somewhat sandy or moderately shallow over sand. A small part (0.26 million hectares) of class-II land is seasonally imperfectly drained due to wet surface and/or high water table.

iii) **Moderate Class-III and Class-IV Agricultural Land**

The moderate land (Class-III) occupies 5.7 percent (0.78 million hectares) and gives low to moderate crop yields, which can be economically increased by improved management. However, the Class-IV land, covering about 3.5 percent (0.48 million hectares) of irrigated area, has severe limitation such as salinity and sodality problems. This is marginal agricultural land whose improvement to higher level of productivity is not economical.

iv) **Un-cultivated Saline And Sodic Soils Class V and VI**

The un-cultivated part (2.3 million hectares) of the canal commanded area mostly comprises saline-sodic soils in the upper Indus plain and strongly saline-gypsiferous soils in the lower Indus Plains, both covering about 1.96 million hectares, while very sandy soils, severely eroded soils and marsh land comprise the rest. About 70 percent area of the un-cultivated salt-affected soils is economically reclaimable but shortage of irrigation water usually stands in the way. The rest of the saline soils, sandy and eroded area are not cultivable.

Dry-Farmed ('Barani') Area

The term dry-farmed and 'barani' or rainfed are used interchangeably to describe crop production without controlled irrigation. The 'barani' cultivation includes: (i) rainfed cultivation entirely dependent on rainfall (ii) flood-watered ('sailaba') farming dependent on the residual moisture of summer floods and rains in rive-rain areas, (iii) torrent-watered ('rod kohi') cultivation practiced by diverting and spreading the intermittent flow of hill torrents in piedmont plains; and (iv) dry farming ('khushkaba') in low rainfall areas by a water harvesting technique in which the run-off from large un-cultivated blocks of land is diverted to cultivated fields (GOP, 1988).

The rainfed areas are concentrated in the Pothwar uplands, northern mountainous and north-eastern plains of the country. The annual rainfall limits for rainfed cultivation are above 250 mm in case of sandy loams and 300 mm in case of heavier soils. Torrent-watered cultivation is practiced in the piedmont plains of Kohat , Bannu, D.I.Khan, D.G. Khan, Larkana and Dadu districts and in some mountain valleys of Baluchistan. The 'sailaba' cultivation is carried out in the active flood plains of the major rivers, while 'khushkhaba' cultivation is practiced in the cooler western highlands of Balochistan through water harvesting techniques in areas receiving 200 to 300 mm annual precipitation.

About 50 percent of the dry-farmed area comprises moderate land which produce one moderate crop per year. About 50 percent of these areas fall in land capability class-IV, constituting marginal agriculture land. Concerted effort is required by the specialized agencies set up both at the Federal and

Provincial levels to improve crop production and to help conserve soil and moisture of dry-farmed area.

4. PRESENT LAND USE

The distribution of farm size has been given in the Table 2. According to the 2000 Census of Agriculture, the total number of agricultural farms in the country are 6.62 million, about 58 percent of which have less than 2 hectares of land, but cover only18 percent of the cultivated area. About 39 percent of the farms are in the range of 2 to 10 hectares and cover 50 percent of the cultivated area. The farms of 10 hectares and more are only 5 percent of all farms but they constitute 32 percent of the total cultivated area (GOP, 2003).

The Table 2 also shows that 86 percent of the total private farms are less than 5 hectares, constituting 48 per cent of the cultivated area. The bigger farm sizes of more than 20 hectares, although constituting only 1 percent of all farms, represent 16 percent of the total cultivated area. We consider in Pakistan the farm sizes of 5 hectares to be the minimum farm size for sustaining a farm family. In fact, the land tenure system which Pakistan inherited in 1947 was characterized by a highly differentiated structure of interests in land i.e. land lord-tenant system. Three major land reforms in the land tenure system respectively were made in 1959, 1972 and 1977. the reforms were done to rationalize the farm holding and granting security to tenants and improving their share of production.

During intercensal period from 1980 to 2000, the situation of distribution of farms size has worsened for the poor farmers having less than 5 hectares, as their number increased by 12 percent, whereas farm area under their possession increased only by 10 percent. Further, during this period farm area and cultivated area beyond 5 hectares both have declined by 10 to percent (Annexure-III). This phenomenon of fragmentation and shrinking of medium and large size farms, would have shifted population to below poverty line.

Table 2: Number and Area of Private Farms, Classified by Size 2000

Size of Farm (Hectares)	Farms		Farm Area		Cultivated Area*	
	Number	%	Million Hectares	%	Million Hectares	%
Under 0.5	1.29	19	0.36	2	0.34	2
0.5 to under 1	1.10	17	0.82	4	0.74	5
1 to under 2	1.42	22	1.98	16	1.83	11
2 to under 3	0.97	15	2.26	11	2.06	12
3 to under 5	0.89	13	3.44	17	3.01	18
5 to under 10	0.58	9	3.89	19	3.24	20
10 to under 20	0.26	4	3.32	16	2.58	16
20 to under 60	0.10	1	2.65	13	1.77	11
60 and above	0.01	**	1.68	8	0.88	5
Total	6.62	100	20.40	100	16.48	100

*This represents the year 2000 whereas the present cultivated Agriculture Census, 2000 area is 22.11 million hectares

Crop Production

The area and production of different agricultural crops for the year 2002-03 are given in Annexure-IV. The share of different crops in the cropped

area are presented in Table-3. Wheat is grown on 36.9 percent of the cropped area, rice on10.1 percent, other food-grains on 7.8 percent, cotton on 13.7 percent, pulses on 6.5 percent and sugarcane on 5.0 percent. Wheat, cotton rice and sugarcane, the four principal crops are grown on 65 percent of total 21.85 million hectares of cropped area in the country. Onion, potatoes and fruits though are grown in relatively less area, but their yield per hectare is higher compared to major crops. Their contribution to gross value addition relative to land use is higher. These activities may therefore required to be encouraged further.

Table 3: Percent Share of Important Crops in the Cropped Area During 2002-03

Crops	Area (000 Hectares)	% Share in the Total Cropped Area
Wheat	8.03	36.9
Rice	2.22	10.1
Other Food Grains	1.73	7.8
Sugarcane	1.09	5.0
Cotton	3.00	13.7
Pulses	1.42	6.5
Oil Seeds	0.59	2.6
Fruits	0.65	3.0
Vegetables	0.52	2.4
Other Crops(Fodders etc)	2.62	12.0
Total	21.85	100.0

Pakistan is nearly self-sufficient in wheat, sugar and pulses. The country is surplus in rice, cotton and fruits, however, it is seriously deficient in edible oils. About 65 percent of the domestic consumption of edible oil is imported. The present population growth rate has serious implications with regard to the sufficiency of future food supplies, nutritional levels and living standards. The present agricultural growth rate of 3.3 percent per year would at least have to be maintained, in order to cope with the population growth rate close to 2 percent per annum. There is very little scope for increasing the arable land or cropped area. Under these circumstances, the only option for increasing agricultural production is through the adoption of modern farming technology. **Crop yields are low**, not only in comparison to those in advanced countries but also compared to those obtained under well-managed conditions at research farms, as can be seen from the gaps between the present and potential yields (obtained at research farms) of main crops presented in Table 4.

Table 4: Yield Gap of Various Crops in Pakistan*

Commodity	Yield Potential (kg/ha)	National Yield (Kg/ha)	Yield Gap (kg/ha)	Unachieved Potential %
Wheat	6425	2388	4937	63
Rice (Paddy)	9489	2013	7476	79
Maize	6944	1857	5087	73
Sugarcane	256000	47300	208700	81
Rapeseed & Mustard	2743	837	1906	69

* Estimates based on Pakistan Agricultural Research Council data

The unachieved potential of different crops ranges between 63-81 percent. It can be generally stated that we are exploiting only one third of the yield potential and there is tremendous scope to increase the productivity of crops through the use of fertilizer, better quality of seed, optimum number of plants and control of pest, besides improving cultural practices and improved production technology.

Trends in Land Management Systems

The use of land in Pakistan is based on the decision of over 6 million farmers cultivating 22.12 million hectares of land. However, through farmers experience over ages, certain definite trends in land use have emerged. These are generally controlled by climatic conditions, soil characteristics, availability of irrigation water, drainage conditions, size of the farm and local environs. For example, in the sub-humid sub mountainous areas in the north, a maize zone has developed, controlled mainly by the climate. A definite zone of fine quality rice has formed in the central Punjab, depending mainly on the climate and soil drainage conditions. Similarly, a definite cotton zone has emerged in lower Punjab and Upper Sindh, dictated by climatic conditions. Coarse rice is grown in western and southern parts of Sindh. Similarly production of deciduous fruits has been established in Balochistan and North West Frontier Province.

The Use of Inputs

Chemical fertilizers have played a major role in increasing crop production. Over the last three decades, the consumption of fertilizer has increased from about 2kg per hectare in 1960-61 to about 138 kg per hectare in 2002-03. Though the application of fertilizer kg/hectare in Pakistan is low compared to other developed countries (Netherlands 470, Germany 232, France 225 and Italy 211) its balance use is to be promoted. Pesticides is another input, the use of which has increased phenomenally in recent years and has contributed in increasing the productivity of cotton, paddy, tobacco, fruits and vegetables. The use of pesticides has increased from about 5 million tonnes in 1960-61 to about 95 million tonnes in 2002-03. Quality seed plays a pivotal role in boosting agricultural production. In recent years production, processing and marketing of quality seed have improved especially for the wheat and cotton crops. Wider supply demand gap of certified quality seed of high-yielding varieties of major crops, fruits,

vegetables and oil seeds may be bridged through better incentives to the local and multinational companies involve in these activities.

Forests and Rangelands

Forestry is the main land use in high and steep mountains. Some irrigated forestry is practiced in the canal irrigated land. Forests are also grown in some parts of the riverine land, utilizing the flood moisture and the ground water. In all, forests cover only about 7 percent of the country. Recently, farm forestry has been given due importance in order to meet growing demand for timber and fuelwood. About 10-17 million hectares are rangelands (Supple etal 1985) these are used for grazing approximately 77 million sheeps and goats. Due to ever-increasing pressure of animals and absence of modern range management techniques, the condition of rangelands is deteriorating rapidly.

Land Use Problems

Non-agricultural uses such as housing colonies, industrial estates and roads are putting ever-increasing **competitive demands on land**, especially the prime agricultural land around cities. In addition to this, degradation process of soil erosion and water logging are also adversely affecting the productivity of this valuable resource. Land being the key element and basic resource for agricultural production system has to be exploited in a manner that harmonizes with climate and soil characteristics for providing sustenance on long term basis. Programmes need to be undertaken for the development of cultivable wasteland through land leveling and provision of water. State lands which have not distributed so far, need to be distributed among landless peasants.

The present land use has emerged out of the human demand blended with agro-ecological suitability. In this process, however, a tilt towards demand pressures, with hardly any investment on resource sustenance, has produced some dangerous effects on the resource base. **Soil damage through degradation process** such as soil compaction, salinity and sodicity associated with poor drainage has affected the agricultural productivity. A scientific approach is the basic requirement for a viable land use plan. Such a planning calls for a detailed agro-ecological analysis relevant to a crop sequence suitability. A package of technology based on such an analysis has to be developed in relation to a particular location and has to be extended to the farming community to enhance agricultural production in consonance with demands. Such a system simultaneously provides sustenance to the production base which cannot be ignored in an effort to enhance production.

5. POLICIES AND STRATEGIES

Land resources management and planning is concerned with the development of land, soil and water resources through the application of engineering, biological and management principles. It covers the physical and human resources of an area, the land quality; land capability and land suitability for specific uses under defined conditions of management and the role of soil conservation, irrigation and drainage. The recommendations for future policies and strategies on land use and management are presented as follows:

- A long term plan should be prepared to arrest land degradation and appropriate measures developed for conserving the valuable land resources. To ensure increasing crop yields per units of land, emphasis should be placed on integrated management of agriculture, irrigations and drainage.
- Meeting the doubled food demand that is anticipated over the next four decades will be feasible but will require, well managed cultivated soil and substantial productivity gains. Intensification of production besides better applications of existing knowledge about resource management and development of new agricultural techniques, will also involve the application of much higher level of fertilizers and pesticides as well as significant improvement in the allocation of water for agricultural use. Such gain in food production increase the risk of soil d degradation, misuse of pesticides spillovers from chemical applications and excessive draw-down of water. Techniques such as integrated pest management, minimum tillage, agro-forestry, integrated crop and livestock management and soil enriching crop rotations are needed to reduce land degradation and increase yields. (World Bank, 1992)
- Since land and water resources are limited, future emphasis in agriculture has to be placed on increasing the productivity per unit of land through adopting packages of modern production technology.
- Capability and capacity of all concerned agencies be enhanced to plan, implement, maintain an integrated and efficient programmes of irrigation, agriculture and to strengthen farmers participation for improving water and non-water input management. Efforts should be focused in developing water reducing in-equities in water deliveries between the head and the tail reaches. Eventually this will increase the cropping intensify (GOP, 1994)
- To protect land and increase surface water supplies, "Saliba" areas should be protected and developed in an environmentally safe manner. Additional water storage to be constructed. Water conveyance efficiency of canals and drains should be improved by their lining and remodeling. And small surface irregation schemes, check dams, infiltration galleries, divertion weirs, delay action dams and flood irrigation schemes should be constructed especially in backward regions (GOP, 1994)
- The area under forests should be increased from the prevailing 7 percent to about 20 percent. Lands which are not suitable for growing crops may be utilized for this purpose.
- Water logging, sodicity and salinity problems are being tackled by the Government. However, accelerated efforts are required to overcome this menace through proper water management, drainage and amelioration of sodic soils by treatment with gypsum. Research needs to be undertaken on bio-saline agriculture
- Non-agricultural uses of land for housing colonies, industrial estates, roads, etc should not be allowed on agricultural land. These activities could be restricted to unproductive land.
- There is a strong need to build up a sound data base on land resources of the country for proper planning and utilization.

6. CONCLUSIONS

The paper discusses the land resources of the country and the present land use. Pakistan has a total geographical area of 79.61 million hectares of which 22.11 million hectares are cultivated. Agriculture is the mainstay of Pakistan's economy, accounting for about 23 percent of gross domestic production and employs 42 percent of total labour force in the country. About 55 percent of the total cropped area is under food crops, besides cotton, which constitutes about 14 percent. The overall cropping intensity is 99 percent. The use of fertilizer is one of the key input for crop production. The fertilizer use rate during 2002-03 was about 138 kg per hectare. The yield potential of crops indicates that hardly 30 per cent of the potential is being exploited. For example, the national yield of wheat is about 2.4 tonnes per hectare against about 6.4 tonnes per hectare potential yield obtained at the research farms. Future strategy would require planning the land use on the basis of agro-ecological considerations using the latest scientific packages of technology. Since land and water resources are limited, the future emphasis will be on raising productivity per unit of land. The area under forest need to be increased. The non-agricultural use of land has to be restricted to unproductive land. Finally, the need to build a sound data base for land resources can hardly be over emphasized.

REFERENCES

Government of Pakistan (1988), Report of National Commission on Agriculture, Ministry of Food, Agriculture and Livestock, Islamabad.

Government of Pakistan (1994), Eighth Five Year Plan 1993-98, Planning Commission, Islamabad.

Government of Pakistan (2003), Pakistan Census of Agriculture 2000 (various issues). Agricultural Census Organization, Lahore

Government of Pakistan (2004a), Agricultural Statistics of Pakistan 2002-03, Ministry of Food, Agriculture and Livestock (Economic Wing), Islamabad

Government of Pakistan (2004b) Economic Survey 2003-04, Finance Division, Economic Adviser's Wing, Islamabad.

Main M. A. and Ali M. A. (1980) Land Resources in the Irrigated Plains of Pakistan. Pakistan Soils Bulletin # 13. Soil Survey of Pakistan, Lahore.

Soil Survey of Pakistan (1987), Reconnaissance Soil Survey Reports (1965-86), SSP, Lahore

Supple, K. R., I. Saeed, A. Razzzaq and A. D. Sheikh (1985) Barani Farming System of the Punjab. Constraints and Opportunities for Increasing Productivity. Agricultural Economic Research Unit, NARC, Islamabad.

World Bank (1992), Development and the Environment, World Development Report 1992, Oxford University Press, New York

Annexure I

LAND CAPABILITY CLASSIFICATION

CLASS	DESCRIPTION	AREA (mha)	SOIL LIMITATIONS	PRODUCTION POTENTIAL
I	Very Good Agricultural Land	5.2	None for general agriculture	Very High
II	Good Agricultural Land	7.0	Minor	High for general agriculture
III	Moderate Agricultural Land	4.8	Moderate	Moderate -- for general crops
IV	Poor (Marginal) Agricultural Land	3.0	Severe	Low—for a few crops only
V	Good Forest or Rangeland	0.2	None/minor for forestry/rangeland	High for forestry / range development
VI	Moderate Forest or Rangeland	1.3	Moderate	Moderate for forestry/ range development
VII	Poor Forest or Rangeland	15.4	Severe	Low for forestry/ range development
VIII	Nonagricultural land	23.2	Severe	None for any economic use
IX	Unclassified	1.8	--	--
	TOTAL SURVEYED	61.8		
	Unsurveyed	26.4	--	Mainly barren or inaccessible land
	GRAND TOTAL	88.2		

Source: SSP(1987)

Annexure II

KIND OF LAND IN CANAL COMMANDED AREA

Type of Land	Area ("000" ha)	Percent of CCA
a) CULTIVATED LAND	**11231**	**82.8**
Class I Flawless	**4156**	**30.7**
Class II	**5820**	**42.9**
Clayey	4067	30.0
Sandy/Shallow	636	
Waterlogged	257	
Uneven	58	
Slightly saline or saline in surface only	801	
Class III	**776**	**5.7**
Sandy/Shallow	305	
Waterlogged	219	
Saline-sodic and saline gypsiferous	252	
Class IV	**479**	**3.5**
Sandy/Shallow	325	
Waterlogged	9	
Saline-sodic	145	
b) UNCULTIVATED LAND	**2326**	**17.2**
Class V	**2102**	**15.5**
Severely eroded	9	
Sandy	312	
Marsh	1	
Severely saline	1780	
Class VI	**224**	**1.7**
Shifting dunes	43	
Very severely saline	181	
Total Canal Commended Area	**13557**	**100.0**

Annexure III

Number and Areas of Private Farms

Size of Farm (Hectares)	% of Farms			Farm Area						Cultivated Area							
				Million Hectares			Percentage			Million Hectares				Percentage			
	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000		1980	1990	2000	
Under 2	34	47	58	1.35	2.15	3.16	6	12	16	1.23	1.98	2.94		8	13	18	
2 to under 5	40	34	28	5.20	5.28	5.70	28	27	28	4.79	4.79	5.07		30	31	30	
5 to under 20	23	17	13	8.09	7.17	7.21	43	38	35	6.90	5.96	5.82		43	38	36	
20 and above	3-1	2	1	4.42	4.55	4.33	23	23	21	2.95	2.89	2.65		19	19	16	
Total	100 (4.06)	100 (5.07)	100 (6.62)	19.06	19.15	20.40	100	100	100	15.87	15.86	16.45		100	100	100	

Note: Figures in percentage are numbers in million Source: Agriculture Censuses 1980, 1990 and 2000 (GOP,

Annexure IV

AREA AND PRODCUTION OF VARIOUS CROPS

2002-03

Crops	*Area (000 hectares)*	*Production (000 Tonnes)*
Cereal		
Wheat	8034	19183
Rice	2225	4478
Maize	936	1737
Other Cereals	795	492
Cash Crops		
Cotton	2794	1737
Sugarcane	1099	52056
Tobacco	47	88
Fibre Crops	10	6.2
Pluses		
Gram	963	675
Other Pluses	461	225
Oilseeds	572	352
Vegetable		
Onion	108	1428
Potato	116	1946
Other Vegetables	197	541
Fruits	652	5742
Other Crops	2841	295
Total	**21850**	

Source: Agricultural Statistics of Pakistan, 2002-03 (GOP 2004a)