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SALIENT FEATURES OF THE BHAKRA-NANGAL PROJECT

BHAKRA-NANGAL PROJECT	
Total Cost : Rs. 245.28 crores	
Bhakra Dam	
Type of Dam	Concrete straight gravity
Height above the deepest foundation	225.55 metres (740 feet)
Height above river bed	167.64 metres (550 feet)
Length at top	518.16 metres (1700 feet)
Width at top	9.14 metres (30 feet)
Length at bottom	99 metres (325 feet)
Width at base	190.5 metres (625 feet)
Elevation at top of dam above M.S.L.	El. 518.16 metres (1700 feet)
Reservoir	
Catchment Area	56980 sq. kms.
Normal reservoir level	El. 512.06 metres (El. 1680 feet)
Dead storage level	El. 445.62 metres (El. 1462 feet)
Area of reservoir	162.48 sq. kms.
Length of reservoir	96.56 kms.
Live storage capacity at EL 1680 ft	6911 m cum (5.60 MAF)
at EL 1685 ft	7191 m cum (5.83 MAF)
Gross storage capacity at EL 1680 ft	9340 m cum (7.57 MAF)
at EL 1685 ft	9621 m cum (7.80 MAF)
Dead Storage capacity	2430 m cum (1.97 MAF)
Bhakra Power Plants	
Number of Power Houses	2
Installed capacity of Left Bank Power Plant	540 – 5 units of 108 MW each
Installed capacity of Right Bank Power Plant	660 MW – 5 units of 132 MW each
Nangal Dam	
Height	29 metres (95 feet)
Length	304.8 metres (1000 feet)
Power Houses on Nangal Hydrel Channel	
Number of Power Houses	2 (Ganguwal & Kotla)
Total installed capacity of each Power House	77.65 MW each (2 units of 24.20 MW and one of 29.25 MW each)

Source: BBMB 2002a

BEAS PROJECT UNIT I	
Total Cost : Rs. 449.17 crore	
Pandoh Dam	
Type of dam	Earth-cum-rockfill
Height above river bed	61 metres (200 feet)
Height above deepest foundation	76.2 metres (250 feet)
Elevation at top of dam	El. 899.16 (El. 2950 feet)
Length at top	255 metres (835 feet)
Width at base	268.22 metres (880 feet)
Width at top	12.19 metres (40 feet)
Reservoir	
Maximum reservoir level	El. 896.42 metres (El. 2941 feet)
Normal reservoir level	El. 883.92 metres (El. 2900 feet)
Minimum reservoir level	El. 883.92 metres (El. 2900 feet)
Gross storage capacity	4100 ha metres (33240 acre feet)
Live storage capacity at El. 2941 ft.	1855.98 ha metres (15039 acre feet)
Pandoh Baggi Tunnel	
Capacity	254.85 cumecs (9000 cusecs)
Sundernagar Balancing Reservoir	
Capacity	370 ha metres (3000 acre feet)
Maximum width of reservoir	449.88 metres (1476 feet)
Capacity of Syphon Escape	328.48 cumecs (11600 cusecs)
Dehar Power Plant	
No. of units	6
Installed Capacity	165 MW x 6 = 990 MW

Source: BBMB 2002a

BENEFITS OF THE PROJECT

New areas irrigated	28.8 lakh ha
Area where irrigation was improved	9 lakh ha
Energy	6500 MU/year

Source: Board at the dam site.

Annual Increase in Agricultural Production

As Claimed by BBMB

Project	Annual Increase			
	Foodgrains	Cotton	Pulses, Vegetables, Oil, seeds, fodder etc.	Sugarcane
Bhakra Nangal	1.57 m tons	0.185 m tons	0.44 m tons	0.365 m tons
BSL (Beas Unit-I)	0.224 m tons	0.051 m tons	0.965 m tons	0.031 m tons

Source: BBMB 2002a Page 50

SOME IMPORTANT DATES AND EVENTS

Date/Year	Event
3000 BC – Early 19 th Century	Number of inundation channels and diversion channels from various Indus basin rivers constructed with increasingly extensive canal systems. Development of well irrigation.
1355	Canal constructed taking off from the Jamuna river with a aim to provide water to the hunting estate of the Emperor Feroz Shah Tughlak in Hissar. This is the precursor of today's Western Jamuna Canal. Canal fell into disuse later.
1568	Emperor Akbar restores the Jamuna canal. Small areas of land irrigated from it.
1605-1623	Emperor Jehangir builds a 80 km long canal off-taking from the river Ravi to take water to his fortress and hunting ground near Sheikhpura.
1633	Ali Mardan Khan, celebrated engineer of Shah Jehan, builds another canal known as Hansli, off-taking from the left bank of Ravi. This irrigates a part of the Bari Doab area. This is the precursor of the Bari Doab Canal irrigating large areas today in Punjab.
Upto Early 19 th Century	Several other canals built on the Indus basin rivers irrigating large areas.
1809	British enter Indus basin with Government of India accepting the allegiance of the Sikh rulers, extending the British rule to the tract between Jamuna and Sutluj.
1817	First phase of the British interventions in irrigation in the Indus basin begins with restoration of the Western Jamuna Canal. This is followed by restoration, improvement in several other important canals.
1843	British annex Sindh and it is attached to the Bombay province.
1849	The portion north and west of Sutluj (Maharaja Ranjit Singh's empire) annexed by the British. Full Indus basin comes under the British.
1869	Second Phase of British intervention in irrigation in Indus basin – construction of new canal systems – begins with construction of the Sirhind Canal system with headworks at Ropar. This system even today irrigates a large part of Punjab. Large number of systems were constructed following this.
1901-1903	First Irrigation Commission set up and completes its work.
1908	First Bhakra scheme mooted. Sir Louis Dane moots the idea of a storage dam near Bhakra after coming from a trip from the area.
1910	Detailed report on the Bhakra site prepared. Costs found prohibitive and hence proposal dropped.
1915	Bhakra proposal revived, with a note concluding that the revenue earning possibilities had been greatly underestimated. Project Division opened in October 1915.
1919	The first detailed and comprehensive project report for a high dam at Bhakra prepared. Height of the dam 120.40 m (395 ft) Gross Storage 2.58 MAF (3182.38 MCM). Scheme not taken up. Investigations continue.
1914-1919	First World War

Date/Year	Event
1921	Sutluj Valley Project consisting of four headworks and number of canal systems on the Sutluj sanctioned. Built over next few years.
1923	Sukkur barrage on the Indus river sanctioned. This was the most important project in Sindh.
1927	Committee recommends revised (increased) height of 152.4 m (500 ft) for the dam at Bhakra. Storage was to be 4.75 MAF
1932	Investigations for 500 high dam at Bhakra carried out.
1935	Anderson Committee on “Distribution of Waters of the Indus” appointed by Government of India. To recommend an allocation that is “acceptable and equitable to all parties”, the main parties being Sindh and Punjab provinces.
1935	Government of India Act passed. Becomes effective in 1937. Water becomes a provincial subject.
1937	Sindh constituted as a separate Province (splitting it off from Bombay)
1939	Detailed Project Report for the 500 ft high Bhakra dam taken up by Dr. A.N. Khosla. Maximum Reservoir Level (MRL) was to be 1600 ft
1939-1944	Second World War
1941	Indus Commission (Rau Commission after its Chair Jst. Rau) – a quasi-judicial commission – constituted to look into the water dispute between Sindh and Punjab provinces.
1942	Rau Commission gives its report.
1943	Bengal Famine
1944	D.L. Savage, Chief Engineer of US Bureau of Reclamation requested to examine the site and report on feasibility of construction of a dam with Maximum Reservoir Level 1600 ft. Positive recommendation with suggestions for further explorations of foundations etc. Carried out 1945-47.
1945	Draft Bilaspur Agreement between Punjab Government and Raja of Bilaspur restricts Bhakra dam MRL to 1580 ft.
1945	Specification Design of the Bhakra Project with MRL 1580 ft drawn up. Height of dam was 146.3 m (480 feet) above bed rock.
1946	Work on the Nangal project begins
1947	Partition of India and Pakistan
1 April 1948	Standstill agreement ends; India shuts off irrigation channels to Pakistan from Headworks controlled by India –to the Dipalpur canal from Ferozpur on Sutluj and to the UBDC from Madhopur on Ravi.
1948	Work starts on Harike barrage at the confluence of Sutluj and Beas. Completed in 1952.
1948	Post partition redesign of the Bhakra project to a Full Reservoir Level of 1680 ft, later increased to 1685 ft. with the Bilaspur state no longer considered an impediment.
1948	Prime Minister Pandit Jawaharlal Nehru calls for food self sufficiency by 1951
26 Jan. 1950	East Punjab (Indian Punjab) formally renamed as Punjab
1951/53	Final Project Report of Bhakra dam and project
1951	First Five Year Plan begins
1952	Harike Barrage completed

Date/Year	Event
1956	End of First Five Year Plan. Virtually all restrictions and control on food dismantled.
8 Nov. 1953	The “Bhakra Dam Sufferers' Association” present a sheet outlining “Our Demands”. They petition Prime Minister Jawaharlal Nehru for settling them together at one place.
8 July 1954	Nangal Hydel Channel and network of Bhakra canals declared open. First irrigation deliveries begin from Nangal project.
1956	India begins food grain imports under PL480. (PL 480 passed by the US Congress in 1954.)
Nov. 1956	Merger of PEPSU into Punjab
14 March 1956	Letter of the Bhakra Dam Sufferers Association written to Pt. Jawaharlal Nehru reiterates their demand for settling people together.
1955-56	Irrigation from Bhakra- Nangal reaches one million acres mark.
1956-61	Second Five Year Plan
31 March 1958	Construction of Rajasthan Canal formally inaugurated by G.B. Pant, Home Minister, Union of India.
July 1958	First impoundment at Bhakra dam. Storage at Govind Sagar begins.
1 July 1958	Sirhind Feeder opened.
1959	Bhakra Nangal Agreement between the states of Rajasthan and Punjab on the sharing of the water and power from the project and Sutluj river.
1959	Ford Foundation Team (Agricultural Team) comes to India and presents its report on tackling the Food Crisis.
1960	Indus Waters Treaty signed between India and Pakistan
1961-65	Third Five Year Plan
1961	The Intensive Agricultural Districts Program (IADP) begins on the recommendations of the Ford team in 13 districts in the country. Ludhiana is the district in Punjab.
11 Oct. 1961	First water released in Rajasthan Canal
1962	Publication of “Silent Spring” by Rachel Carson, highlighting for the first time the huge impacts and danger of pesticides used in agriculture.
22 Oct 1963	Bhakra dam completed and dedicated to the nation by then Prime Minister Jawaharlal Nehru.
1966	India’s food imports reach its peak of 10 million tons of cereals
1 Nov. 1966	Punjab divided into Punjab and Haryana with some districts going to Himachal Pradesh
1966	Mexican varieties of High Yielding Seeds introduced in India. The beginning of the Green Revolution.
1966-69	Plan Holiday (Three annual plans)
1969-74	Fourth Five Year Plan
December 1971	Indo-Pak war and liberation of Bangladesh
1971	Foodgrains imports reach negligible levels; food “exported” to Bangladesh.
1975	Foodgrains imports touch another high at around 8 million tons
25 June 1975	Internal Emergency declared in the country.
7 July 1977	Diversions from river Beas into Bhakra reservoir begin through the Beas Sutluj Link (Beas Unit I)

Date/Year	Event
1977-78	Number of tubewells in Punjab touch half a million mark
1984	Operation Blue Star
1985	Punjab Government sets up the first committee to recommend measures to diversify its cropping pattern. (Johl Committee)
1990	One of the earliest reports of suicides by farmers in Punjab brought out.
1998	IDC, Chandigadh publishes its study on “Suicides in Rural Punjab” entrusted to it by Punjab Government. It confirms the large number of debt-driven suicides of farmers in Punjab.
2000	Another study on Suicides of farmers in Punjab published by Dr. Gopal Iyer and Dr. Meher Singh Manick. This also confirms farmers' debt and adverse economics of agriculture as the major causes of farmers suicides.
2002	Punjab Government again sets up a committee to advise it on diversification of the cropping pattern, headed by the same person as in 1985. (Johl Committee)
12 July 2004	Punjab Assembly passes the Punjab Termination of Agreement Act 2004 annulling water agreements entered by Punjab with other states including the 1981 Agreement.

GLOSSARY*

Foodgrains	Total cereals and total pulses. Oil seeds are not included in the calculations of foodgrains
<i>Reh</i>	Local word used in Punjab and Haryana for 'Soil Salinity'
<i>Sem</i>	Local word used in Haryana for waterlogged area
<i>Arthiya</i>	Commission Agent who acts as a broker for the farmers in selling their grains at the <i>mandi</i> . He also acts as a local moneylender and is the most important source of short-term credit that farmers need for cultivation expenses. The rates of interest charged by the <i>arthi</i> range from 2% per month (24% per year) to 5% (60 % per annum).
Partition	The partition of British ruled India into India and Pakistan in 1947.
Pre-Partition Punjab	The Punjab province as before 1947. This includes today's Indian states of Punjab and Haryana and the Pakistani province of Punjab. Some parts of today's Punjab and Haryana were princely states prior to 1947 and hence were not in the British Province of Punjab.
Undivided Punjab	The Indian state of Punjab from 1947 to 1966. During this Punjab consisted of what are today the states of Punjab and Haryana. On 1 Nov. 1966, the undivided Punjab was divided into the states of Punjab and Haryana, with some areas going to Himachal Pradesh. PEPSU had merged with the undivided Punjab in 1956.
PEPSU	Patiala and East Punjab States' Union – A union consisting of the princely states of Patiala, Jind, Kapurthala, Nabha, Maler Kotla etc. PEPSU merged with Punjab in 1956.
Weir	An ungated structure built at right angles to the flow of a river to help divert the flow into a canal or channel. The weir is not a storage structure and generally the water level remains within the riverbank levels. Flood or high discharge flows on downstream over the weir.
Barrage	Same as a weir but with gates.
Dam	The dam is also built across the flow of the river and is typically a storage structure and will create a reservoir.
Gross or Geographical Command Area (GCA)	The whole or geographical area that a canal network reaches. This will include also roads, uncultivable area, built up area etc.
Culturable or Cultivable Command Area (CCA)	The part of the Gross Command Area that is cultivable.
Annual Irrigation	The area actually irrigated annually in an irrigation command.
Intensity of Irrigation	Ratio of the area actually irrigated annually to the Cultivable Command area.
Net Area Irrigated	Area irrigated, without double counting. If part of the area is irrigated for two crops in a year, it is counted only once.
Gross Area Irrigated	The total area irrigated annually, with multiple counting of areas irrigated for more than one crop a year.

* Not in alphabetical order so as to keep related terms together.

Net Sown Area	Area sown in a year, without double counting. If part of an area is sown more than once in a year, it will be counted only once.
Gross Sown Area	The total area sown in a year, with multiple counting of areas sown for more than one crop a year.
<i>Kanak</i>	Wheat (Literally, gold)
<i>Jiri</i>	Paddy
Rim Station	The point at which the river leaves the mountains to descend on the plains.
<i>Kharif</i>	Monsoon (summer) crop or crop season
<i>Rabi</i>	Winter crop or crop season

ABBREVIATIONS

A.I.C.C.	All India Congress Committee
B.B.M.B.	Bhakra Beas Management Board
B.M.B.	Bhakra Main Branch
B.M.L.	Bhakra Main Line
B.S.L.	Beas Sutluj Link
C.A.G.	Comptroller and Auditor General
C.C.A.	Culturable Command Area
C.W.C.	Central Water Commission
D.P.R.	Detailed Project Report
E.I.A.	Environmental Impact Assessment
F.R.L.	Full Reservoir Level
G.A.I.	Gross Area Irrigated
G.C.A.	Gross Command Area
G.M.F.	Grow More Food
G.S.A.	Gross Sown Area
H.O.P.P.	Haryana Operational Pilot Project
H.P.	Horse Power
H.P.	Himachal Pradesh
H.Y.V.	High Yielding Variety
I.A.A.P.	Intensive Agricultural Areas Program
I.A.D.P.	Intensive Agricultural Districts Program
I.G.N.B.	Indira Gandhi Nahar Board
I.G.N.P.	Indira Gandhi Nahar Pariyojana
M.A.F.	Million Acre Feet
M.C.M.	Million Cubic Metres
M.R.L.	Maximum Reservoir Level
M.S.P.	Minimum Support Price
M.U.	Million Units
M.W.	Mega Watts
N.A.I.	Net Area Irrigated
N.B.A.	Narmada Bachao Andolan
N.H.	National Highway
N.H.C.	Nangal Hydrel Channel
N.S.A.	Net Sown Area
N.W.F.P.	North Western Frontier Province (Pakistan)
P.A.U.	Punjab Agricultural University
P.E.P.S.U.	Patiala and East Punjab States Union
S.V.P.	Sutluj Valley Project
S.Y.L.	Sutluj Yamuna Link
SANDRP	South Asia Network on Dams, Rivers and People
T.I.N.A.	There Is No Alternative
T.V.A.	Tennessee Valley Authority
U.B.D.C.	Upper Bari Doab Canal
W.C.D.	World Commission on Dams
W.J.C.	Western Jamuna Canal
W.T.O.	World Trade Organisation

UNITS

Killa	One Acre
Kanal	1/8 th Acre (8 Kanal = 1 Acre)
Marala	1/20 th of a Kanal (hence = 1/160 th of an acre). The standardised marala of the revenue dept was 25 sq. yards.
Murrabba	25 acres
Maan	20 kilos
MAF	Million Acre Feet (= 1234 Million Cubic Meters)
Ha-m	Hectare-Meter
MCM	Million Cubic Meters
Ha	Hectare (= 2.47 acres)
Cusecs	Cubic Feet per Second
Cumecs	Cubic Meters per Second

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Harshinder Singh, Chandigarh
Himanshu Thakkar, New Delhi
Himanshu Upadhyaya, Surat
HIRMI & Staff, Kurukshetra
ICRISAT
Inderjeet Singh Jayjee, Chandigarh
Inderjeet Singh, Village Sahauli
Institution of Engineers, Chandigarh
Irrigation Department Haryana & Staff, Chandigarh
Irrigation Department Punjab & Staff, Chandigarh
Jagdeep Singh
Jagdish Chandra, Mundhal
Jagjit Singh Chandel, Bilaspur
Jagman Singh, Chandigarh
Jai Bhagwan Singhla
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Satpal, Kheti Virasaat, Nabha
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MAJOR PROJECTS ON INDUS BASIN RIVERS

	Across Ravi	Across Beas	Across Sutlej	Across Chenab	Across Jhelum	Across Indus
In India	Thein	Pandoh (BSL)	Bhakra			
	Madhopur HW	Pong	Nangal			
			Ropar H/W			
			Harike H/W			
			Ferozepur H/W (Obselete)			
In Pakistan	Balkoi		Sulemanki	Marala	Mangala	Tarbela
	Sidhnai		Islam	Khanki	Rasul	Kalabaugh
			Panjnad	Qadrabad		Chashma
				Trimmu		Taunsa
						Guddu
						Sukkur
						Kotri (Hydrabad)

See Also Map 2

DISTRIBUTION OF RIVER WATERS AMONG PUNJAB, HARYANA AND RAJASTHAN

The figures for the water available in the rivers of Punjab and Haryana and its distribution have often been at the centre of controversy. Different sources sometimes give differing figures, and some figures have been changing over time – not only due to reasons of improving measurements, but due to reasons of water disputes. We will ignore these factors and look at the broad figures of the water availability in the rivers of the three states and their sharing. Given our mandate, we will focus on Sutluj.

Indus and Tributaries – Division Between India and Pakistan

We have already seen the figures for Indus and its tributaries in Chapter 1. The table is repeated here for convenience.

Catchment and Runoff of the Indus Rivers at Rim Stations¹

River	Gauging Station	Catchment Area (Sq. Km)	Average Annual Run-off 1922-61 (Million Acre Feet)
Sutluj	Ropar	48044	14
Beas	Mandi Plain	16834	13
Ravi	Madhopur	8028	7
Chenab	Marala	29525	26
Jhelum	Mangala	33410	23
Kabul	Warsak	67339	17.4
Indus	Attock	264178	93

It appears that the figures for Kabul are included in the Indus figures.

Same figures as given by Gulhati are:

Mean Volumes of Flow
(Million Acre Feet)

River	April-June	Jul- Sept.	Oct. -Dec	Jan.-March	Annual
Sutluj	3.2	8.4	1.2	0.8	13.6
Beas	1.9	8.5	1.3	1.0	12.7
Ravi	1.9	3.3	0.5	0.7	6.4
Chenab	6.7	13.1	1.7	2.0	23.5
Jhelum	9.9	8.2	1.8	2.7	22.6
Indus	27.9	48.7	7.1	5.8	89.5
	51.5	90.2	13.6	13.0	168.3

Note: Flows as at rim stations, mean for 25 years (1921-22 to 1945-46)
Source Gulhati 1973: Page 452

As we can see there are small differences, but more or less the figures tally.

Annual mean flows of Sutluj range are of the order of 13-14 MAF.

The Indus Waters Treaty of 1960 divided this between India and Pakistan with India getting the complete right over waters of the three eastern rivers namely Sutluj, Beas and Ravi.

¹ Michel 1967: Page 33

Ravi Beas Waters - Inter State Agreement of 1955 and Others

On 29 January, 1955, an inter-state conference held at New Delhi allocated the Ravi and Beas waters – surplus to the pre-partition uses –to various states. The allocations were as follows²:

Mean annual Ravi-Beas Flows as per 1921-45 series: 19.28 MAF

Pre-partition uses:

Punjab	1.98 MAF
Rajasthan	1.11 MAF
J&K	0.04 MAF
Total	3.13 MAF
Losses	0.30 MAF

Net Available for Distribution: 15.85 MAF

Allocation

Punjab (including share of Delhi of 0.2 MAF)	5.9 MAF
PEPSU	1.30 MAF
Rajasthan	8.00 MAF
J & K	0.65 MAF
TOTAL	15.85 MAF

Any variations in the flows were to be divided on a pro-rata basis, subject to J&K share remaining fixed at 0.65 MAF.

In 1956, with PEPSU merging in Punjab, the total share of Punjab went to 7.2 MAF.

When Punjab was divided in 1966 into Haryana and Punjab, a dispute arose between the two on sharing of this 7.2 MAF. Ultimately, the Government of India, through its Notification dated 24.3.76 allocated 0.2 MAF to Delhi and the remaining was divided equally between Punjab and Haryana – 3.5 MAF each.

The dispute however continued and in 1981, an agreement was effected between the concerned states. The new allocations were:

State	MAF (Million Acre Feet)
Punjab	4.22
Haryana	3.50
Rajasthan	8.60
Delhi Water Supply	0.20
Jammu & Kashmir	0.65
Total	17.17

It may be seen that the net surplus available in Ravi-Beas had gone up from the earlier 15.85 MAF and this has helped increase the share of Punjab. This “device” was to be used later on also. The 1981 agreement also ran into problems, and the dispute persists even till date. This agreement has been in the news recently due to the Act passed by the Punjab Assembly nullifying all its interstate water agreements.

² Dhillon 1983: Pages 22-23

Bhakra Nangal Agreement 1959

It may be noticed that the Sutluj waters did not figure in this. This is because Sutluj waters were already allocated as a part of the Bhakra project. Though the formal Bhakra Nangal Agreement between Punjab and Rajasthan was signed in 1959, “Important decisions regarding details of areas to be irrigated, irrigation canal systems, share in power generation were taken in a special meeting of Bhakra Control Board held on 27th and 28th August 1951.”³

According to clause 9(2) of the Bhakra Nangal Agreement of 13.1.1959, the shares of the parties in the stored water supplies are under⁴:

Punjab(including Haryana)	84.78%
Rajasthan	15.22 %

On bifurcation of Punjab into Punjab and Haryana, the share was divided between them. The final figures however do not exactly match the earlier figures. The final figures as follows⁵:

Distribution of Sutluj Waters

Punjab	57.88%
Haryana	32.31%
Rajasthan	9.81%

Distribution of Power From Bhakra Complex

Punjab	46.21%
Haryana	33.49%
Rajasthan	15.22%
H.P.	2.12%
Chandigadh	2.97%

Some sources maintain that the share of Rajasthan in Sutluj waters remains 15.22% but that the actual share works out to be 11% as consideration has to be given to pre-Bhakra supplies of Sirhind⁶.

For our purpose, the broad figures will suffice. Thus, if take the average flow of Sutluj to be 13 MAF, the state-wise shares come to be:

Distribution of Sutluj Waters

Punjab	7.52 MAF
Haryana	4.23 MAF
Rajasthan	1.27 MAF

³ Government of Rajasthan 2002c: Page 119

⁴ <http://www.rajirrigation.gov.in/4bhakhra.htm#waters> downloaded on 11 October 2004

⁵ <http://wrmin.nic.in/cooperation/rvbtribunal.htm> Downloaded on 23 Jan 2002

⁶ Government of Rajasthan 2002c: Page 96

All India
AREA, PRODUCTION AND YIELD OF WHEAT AND RICE

Year	Wheat			Rice		
	Area (M ha)	Production (M Tons)	Yield (Kh/Ha)	Area (M ha)	Production (M Tons)	Yield (Kh/Ha)
1950-51	9.75	6.46	663	30.81	20.58	668
1951-52	9.47	6.18	653	29.83	21.30	714
1952-53	9.83	7.50	763	29.97	22.90	764
1953-54	10.68	8.02	750	31.29	28.21	902
1954-55	11.26	9.04	803	30.77	25.22	820
1955-56	12.37	8.76	708	31.52	27.56	874
1956-57	13.52	9.40	695	32.28	29.04	900
1957-58	11.73	7.99	682	32.30	25.53	790
1958-59	12.62	9.96	789	33.17	30.85	930
1959-60	13.38	10.32	772	33.82	31.68	937
1960-61	12.93	11.00	851	34.13	34.58	1013
1961-62	13.57	12.07	890	34.69	35.66	1028
1962-63	13.59	10.78	793	35.69	33.21	931
1963-64	13.50	9.85	730	35.81	37.00	1033
1964-65	13.42	12.26	913	36.46	39.31	1078
1965-66	12.57	10.40	827	35.47	30.59	862
1966-67	12.84	11.39	887	35.25	30.44	863
1967-68	14.99	16.54	1103	36.44	37.61	1032
1968-69	15.96	18.65	1169	36.97	39.76	1076
1969-70	16.63	20.09	1208	37.68	40.43	1073
1970-71	18.24	23.83	1307	37.59	42.22	1123
1971-72	19.14	26.41	1380	37.76	43.07	1141
1972-73	19.46	24.74	1271	36.69	39.24	1070
1973-74	18.58	21.78	1172	38.29	44.05	1151
1974-75	18.01	24.10	1338	37.89	39.58	1045
1975-76	20.45	28.84	1410	39.48	48.74	1235
1976-77	20.92	29.01	1387	38.51	41.92	1089
1977-78	21.46	31.75	1480	40.28	52.67	1308
1978-79	22.64	35.51	1568	40.48	53.77	1328
1979-80	22.17	31.83	1436	39.42	42.33	1074
1980-81	22.28	36.31	1630	40.15	53.63	1336
1981-82	22.14	37.45	1691	40.71	53.25	1308
1982-83	23.57	42.79	1816	38.26	47.12	1231
1983-84	24.67	45.48	1843	41.24	60.10	1457
1984-85	23.56	44.07	1870	41.16	58.34	1417
1985-86	23.00	47.05	2046	41.14	63.83	1552
1986-87	23.13	44.32	1916	41.17	60.56	1471
1987-88	23.06	46.17	2002	38.81	56.86	1465
1988-89	24.11	54.11	2244	41.73	70.49	1689
1989-90	23.50	49.85	2121	42.17	73.57	1745
1990-91	24.17	55.14	2281	42.69	74.29	1740
1991-92	23.26	55.69	2394	42.65	74.68	1751
1992-93	24.59	57.21	2327	41.78	72.86	1744
1993-94	25.15	59.84	2380	42.54	80.30	1888
1994-95	25.70	65.77	2559	42.81	81.81	1911
1995-96	25.01	62.10	2483	42.84	76.98	1797
1996-97	25.89	69.35	2679	43.43	81.74	1882
1997-98	26.70	66.35	2485	43.45	82.53	1900
1998-99	27.52	71.29	2590	44.80	86.08	1921
1999-2000	27.49	76.37	2778	45.16	89.68	1986
2000-01	25.73	69.68	2708	44.71	84.98	1901
2001-02	25.92	71.81	2770	44.62	93.08	2086

Source – Department of Agriculture Co-operation, Ministry of Agriculture website -
<http://agricoop.nic.in/statistics2003/chap4a.htm#chap45a>, Accessed on Oct.7, 2004

All-India
AREA, PRODUCTION AND YIELD OF FOODGRAINS
 Along with Percentage Coverage Under Irrigation

Year	Area Million Hectares	Production Million Tons	Yield Kg./Ha	% Coverage Under Irrigation
1950-51	97.32	50.82	522	18.1
1951-52	96.96	51.99	536	18.4
1952-53	102.09	59.20	580	18.1
1953-54	109.07	69.82	640	18.1
1954-55	107.86	68.03	631	18.4
1955-56	110.56	66.85	605	18.5
1956-57	111.14	69.86	629	18.2
1957-58	109.48	64.31	587	19.3
1958-59	114.76	77.14	672	18.7
1959-60	115.82	76.67	662	18.8
1960-61	115.58	82.02	710	19.1
1961-62	117.23	82.71	706	19.1
1962-63	117.84	80.15	680	19.8
1963-64	117.42	80.64	687	19.8
1964-65	118.11	89.36	757	20.2
1965-66	115.10	72.35	629	20.9
1966-67	115.30	74.23	644	22.2
1967-68	121.42	95.05	783	21.6
1968-69	120.43	94.01	781	23.6
1969-70	123.57	99.50	805	23.7
1970-71	124.32	108.42	872	24.1
1971-72	122.62	105.17	858	24.5
1972-73	119.28	97.03	813	25.4
1973-74	126.54	104.67	827	24.5
1974-75	121.08	99.83	824	26.5
1975-76	128.18	121.03	944	26.5
1976-77	124.36	111.17	894	27.4
1977-78	127.52	126.41	991	27.7
1978-79	129.01	131.90	1022	28.8
1979-80	125.21	109.70	876	30.3
1980-81	126.67	129.59	1023	29.7
1981-82	129.14	133.30	1032	29.6
1982-83	125.10	129.52	1035	30.8
1983-84	131.16	152.37	1162	30.9
1984-85	126.67	145.54	1149	31.9
1985-86	128.02	150.44	1175	31.4
1986-87	127.20	143.42	1128	32.6
1987-88	119.69	140.35	1173	33.5
1988-89	127.67	169.92	1331	34.4
1989-90	126.77	171.04	1349	35.0
1990-91	127.84	176.39	1380	35.1
1991-92	121.87	168.38	1382	37.4
1992-93	123.15	179.48	1457	37.4
1993-94	122.75	184.26	1501	38.7
1994-95	123.86	191.50	1546	39.6
1995-96	121.01	180.42	1491	40.1
1996-97	123.58	199.44	1614	40.0
1997-98	123.85	192.26	1552	40.8
1998-99	125.17	203.61	1627	42.4
1999-2000	123.10	209.80	1704	43.9
2000-01	121.05	196.81	1626	NA
2001-02	121.91	212.03	1739	NA

Source – Department of Agriculture Co-operation Department, Ministry of Agriculture website – <http://agricoop.nic.in/statistics2003/chap4a.htm#chap45a>, Accessed on Oct.7, 2004

All-India
NET AVAILABILITY OF FOODGRAINS
(Gms/Capita/Day)

Year	Rice	Wheat	Other Cereals	Total Cereals	Gram	Total Pulses	Total Foodgrains
1951	158.9	65.7	109.6	334.2	22.5	60.7	394.9
1952	158.5	57.6	109.3	325.4	19.8	59.1	384.5
1953	165.9	62.5	121.5	349.9	24.2	62.7	412.6
1954	194.1	58.0	136.0	388.1	27.3	69.7	457.8
1955	179.7	58.3	134.9	372.9	31.0	71.1	444.0
1956	187.7	61.5	111.2	360.4	29.0	70.3	430.7
1957	192.7	71.6	111.0	375.3	32.8	71.8	447.1
1958	164.8	66.5	119.0	350.3	25.3	58.5	408.8
1959	191.0	78.5	123.9	393.4	35.5	74.9	468.3
1960	187.8	78.3	118.0	384.1	27.7	65.5	449.6
1961	201.1	79.1	119.5	399.7	30.2	69.0	468.7
1962	203.2	84.2	111.5	398.9	27.3	62.0	460.9
1963	186.9	79.2	117.9	384.0	24.7	59.8	443.8
1964	201.4	90.1	109.5	401.0	20.3	51.0	452.0
1965	210.2	93.6	114.7	418.5	25.5	61.6	480.1
1966	161.9	95.4	102.6	359.9	18.3	48.2	408.1
1967	154.0	90.5	117.3	361.8	15.3	39.6	401.4
1968	183.7	95.8	124.6	404.1	24.6	56.1	460.2
1969	190.5	100.5	106.8	397.8	17.4	47.3	445.1
1970	190.2	102.3	110.6	403.1	21.9	51.9	455.0
1971	192.6	103.6	121.4	417.6	20.0	51.2	468.8
1972	197.8	126.0	95.3	419.1	19.0	47.0	466.1
1973	172.0	118.1	90.4	380.5	16.7	41.1	421.6
1974	190.4	108.8	111.2	410.4	14.8	40.8	451.2
1975	158.9	112.1	94.8	365.8	14.2	39.7	405.5
1976	187.2	79.5	107.1	373.8	20.2	50.5	424.3
1977	168.8	114.5	103.0	386.3	18.4	43.3	429.6
1978	196.2	126.3	100.0	422.5	17.8	45.5	468.0
1979	200.3	132.3	99.2	431.8	18.6	44.7	476.5
1980	166.1	126.8	86.6	379.5	10.7	30.9	410.4
1981	197.8	129.6	89.9	417.3	13.4	37.5	454.8
1982	193.2	127.9	94.8	415.9	14.0	39.2	455.1
1983	169.8	144.4	83.3	397.5	15.6	39.5	437.0
1984	197.8	140.8	98.9	437.6	13.7	41.9	479.5
1985	188.8	138.6	87.9	415.3	12.9	38.1	453.4
1986	212.0	151.0	70.7	433.7	16.2	43.8	477.5
1987	206.0	157.8	71.0	434.8	12.3	36.4	471.2
1988	188.2	154.2	68.8	411.2	9.6	36.4	447.6
1989	215.0	156.2	80.3	451.5	13.4	41.9	493.4
1990	212.1	132.6	86.8	431.5	10.7	41.1	472.6
1991	221.7	166.8	80.0	468.5	13.4	41.6	510.1
1992	217.0	158.6	58.9	434.5	10.1	34.3	468.8
1993	201.1	140.2	86.6	427.9	10.7	36.2	464.1
1994	207.4	159.5	67.1	434.0	11.8	37.2	471.2
1995	220.0	172.7	64.9	457.6	14.9	37.8	495.5
1996	204.4	176.0	62.0	442.5	11.3	32.7	475.2
1997	214.0	179.1	72.9	466.0	12.4	37.1	503.1
1998	200.3	151.5	62.4	414.2	13.4	32.8	447.0
1999	203.4	162.3	63.4	429.2	14.6	36.5	465.7
2000	203.7	160.0	59.0	422.7	10.8	31.8	454.4
2001	190.5	135.8	56.2	386.2	8.0	30.0	416.2

Source – Department of Agriculture Co-operation, Ministry of Agriculture website – <http://agricoop.nic.in/statistics2003/chap10.htm#chap101>, Accessed on Oct 7, 2004

All-India
CONSUMPTION OF FERTILISERS
(In Terms of Nutrients N, P & K)

Year	N (‘000 Tons)	P (‘000 Tons)	K (‘000 Tons)	TOTAL (‘000 Tons)
1951-52	58.7	6.9	-	65.6
1952-53	57.8	4.6	3.3	65.7
1953-54	89.3	8.3	7.5	105.1
1954-55	94.8	15	11.1	120.9
1955-56	107.5	13	10.3	130.8
1956-57	123.1	15.9	14.8	153.8
1957-58	149	21.9	12.8	183.7
1958-59	172	29.5	22.4	223.9
1959-60	229.3	53.9	21.3	304.5
1960-61	210	53.1	29	292.1
1961-62	249.8	60.5	28	338.3
1962-63	333	82.8	36.4	452.2
1963-64	376.1	116.5	50.6	543.2
1964-65	555.2	148.7	69.3	773.2
1965-66	574.8	132.5	77.3	784.6
1966-67	737.8	248.6	114.2	1100.60
1967-68	1034.6	334.8	169.6	1539.00
1968-69	1208.6	382.1	170	1760.70
1969-70	1356	416	210	1982.00
1970-71	1487	462	228	2177.00
1971-72	1798	558.2	300.6	2656.80
1972-73	1839	581.3	347.6	2767.90
1973-74	1829	649.7	359.8	2838.50
1974-75	1765.7	471.5	336.1	2573.30
1975-76	2148.6	466.8	278.3	2893.70
1976-77	2456.9	634.9	319.2	3411.00
1977-78	2913	866.6	506.2	4285.80
1978-79	3419.5	1105.9	591.5	5116.90
1979-80	3498.1	1150.9	606.4	5255.40
1980-81	3678.1	1213.6	623.9	5515.60
1981-82	4068.6	1322.3	673.2	6064.10
1982-83	4224.3	1437	727	6388.30
1983-84	5204.4	1730.3	775.4	7710.10
1984-85	5486.1	1886.4	838.5	8211.00
1985-86	5660.8	2005.2	808.1	8474.10
1986-87	5716	2078.9	850	8644.90
1987-88	5716.8	2187	880.5	8784.30
1988-89	7251	2720.7	1068.3	11040.00
1989-90	7386	3014.2	1168	11568.20
1990-91	7997.2	3221	1328	12546.20
1991-92	8046.3	3321.2	1360.5	12728.00
1992-93	8426.8	2843.8	883.9	12154.50
1993-94	8788.3	2669.3	908.4	12366.00
1994-95	9507.1	2931.7	1124.7	13563.50
1995-96	9822.8	2897.5	1155.8	13876.10
1996-97	10301.8	2976.8	1029.6	14308.10
1997-98	10901.8	3913.6	1372.5	16187.90
1998-99	11353.8	4112.2	1331.5	16797.50
1999-2000	11592.7	4798.3	1678.7	18069.70
2000-01	10920.2	4214.6	1567.5	16702.30
2001-02	11310.2	4382.4	1667.1	17359.70

Source- Department of Agriculture Co-operation, Ministry of Agriculture website -
<http://agricoop.nic.in/statistics2003/chap15.htm#chap151>, Accessed on Oct 7, 2004

PUNJAB AT A GLANCE

General	
Geographical Area (000 Ha)	5036.2
Divisions	4
Districts	17
Tehsils	72
Cities	14
Towns	143
Villages	12780
Inhabited Villages	12413
Population	
Population	24,289,296
Males	12963362
Females	11325934
Sex Ratio	874 F/1000 Males
Sex Ratio (0 – 6 Years)	793 F/1000 Males
Rural Population	16043730
Percentage to Total	66.05%
Urban Population	8245566
Percentage to Total	33.95
Density	482
Literate And Educated Persons	14853810
Literacy Rate	69.95
Scheduled Castes (1991)	5742528
Percentage (1991)	28.31 %
Climate	
Average Rainfall	462.8
Agriculture	
Total Cultivable Area	4311
Net Area Sown (000 Ha)	4268
Gross Area Sown (000 Ha)	7941
Cropping Intensity [(GSA/NSA)x100]	186.05 %
Production of Crops (000 MT)	
Total cereals	24,867
Total pulses	31
Total foodgrains	24,898
Cotton	221.85
Total Oilseeds	84
Irrigation	
Net area irrigated by (000 Ha)	
Govt. Canals	987
Wells/Tube wells	3068
Others	2
Total (Net Irrigation)	4057
Net Area Irrigated as % to Net Area Sown	95.05 %
Net Area Irrigated as % to Total Cultivable Area	94.11 %
Gross area irrigated (000 Ha)	7607
No. of Tube wells and Pumping sets (Lakhs)	9.25
Forest	
Area under forests (000 Ha)	305.5
Electricity	
Consumption of electric power (Million KWH)	19,441
Unit sold per capita (KWH)	821
Roads	
Metalled Roads Per 100 SqKM	91.2
Villages connected with pucca roads	
Gross Domestic Product (Crore Rupees)	46,444

Punjab
NET AREA SOWN AND GROSS AREA SOWN (M HA.)

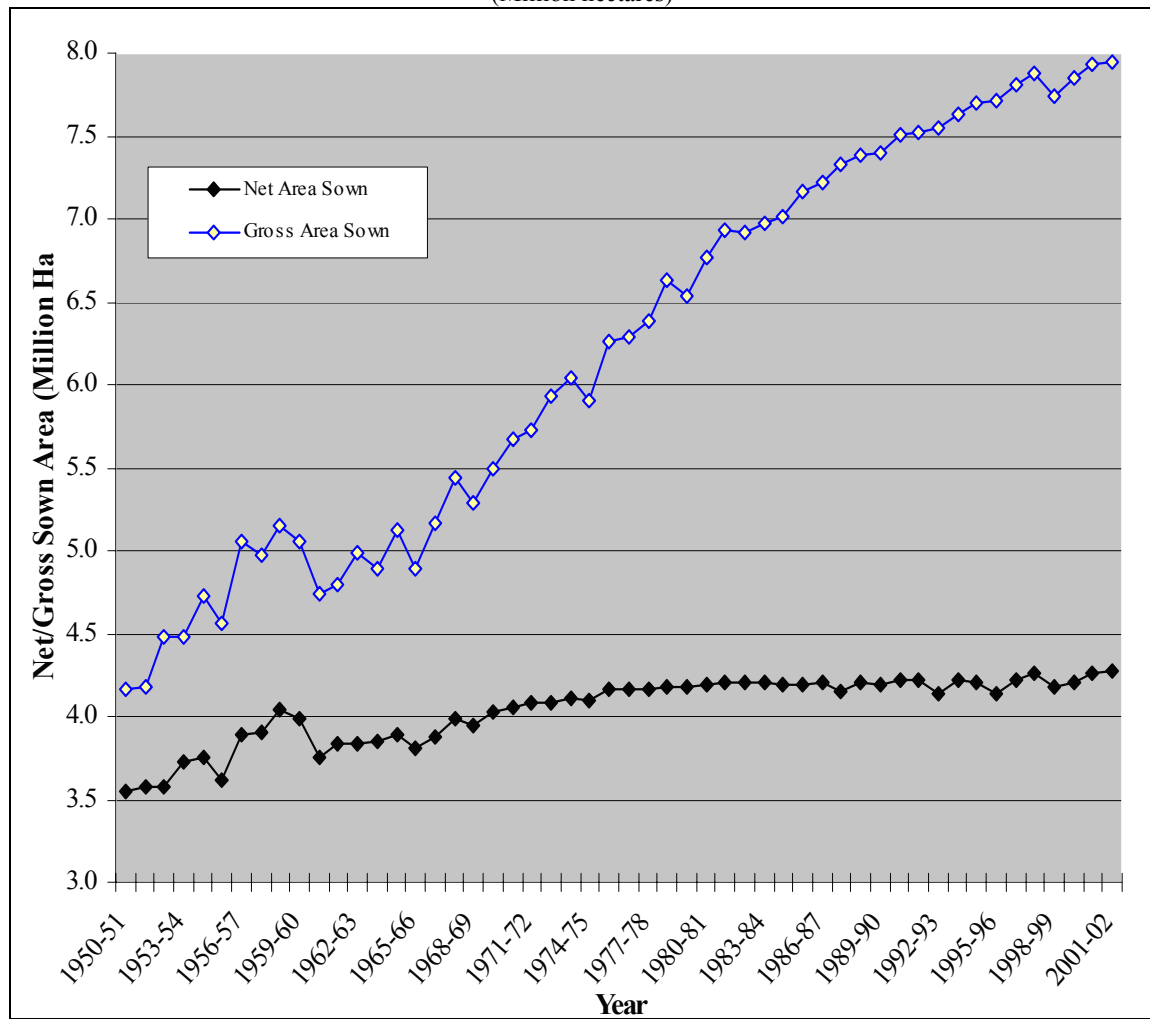
Year	Cultivable Area	Net Sown Area	Gross Sown Area	NS as % to Total Cultivable	Cropping Intensity
1950-51	4.814	3.544	4.170	73.62	117.66
1951-52	4.769	3.574	4.182	74.95	116.99
1952-53	4.730	3.575	4.473	75.59	125.12
1953-54	4.708	3.721	4.479	79.04	120.38
1954-55	4.703	3.754	4.724	79.81	125.84
1955-56	4.701	3.615	4.567	76.90	126.33
1956-57	4.657	3.885	5.049	83.43	129.95
1957-58	4.682	3.909	4.977	83.49	127.33
1958-59	4.638	4.041	5.153	87.13	127.51
1959-60	4.508	3.987	5.061	88.45	126.94
1960-61	4.341	3.750	4.737	86.39	126.32
1961-62	4.344	3.836	4.800	88.31	125.13
1962-63	4.321	3.833	4.981	88.71	129.95
1963-64	4.310	3.855	4.884	89.44	126.69
1964-65	4.318	3.895	5.125	90.20	131.58
1965-66	4.317	3.803	4.889	88.09	128.56
1966-67	4.319	3.870	5.171	89.60	133.62
1967-68	4.325	3.992	5.441	92.30	136.30
1968-69	4.287	3.941	5.288	91.93	134.18
1969-70	4.283	4.027	5.499	94.02	136.55
1970-71	4.291	4.053	5.678	94.45	140.09
1971-72	4.297	4.076	5.724	94.86	140.43
1972-73	4.297	4.086	5.931	95.09	145.15
1973-74	4.297	4.113	6.037	95.72	146.78
1974-75	4.296	4.092	5.904	95.25	144.28
1975-76	4.298	4.158	6.255	96.74	150.43
1976-77	4.296	4.167	6.285	97.00	150.83
1977-78	4.295	4.171	6.390	97.11	153.20
1978-79	4.292	4.177	6.630	97.32	158.73
1979-80	4.290	4.182	6.535	97.48	156.26
1980-81	4.287	4.191	6.763	97.76	161.37
1981-82	4.294	4.210	6.929	98.04	164.58
1982-83	4.289	4.202	6.915	97.97	164.56
1983-84	4.290	4.212	6.977	98.18	165.65
1984-85	4.296	4.189	7.013	97.51	167.41
1985-86	4.298	4.197	7.158	97.65	170.55
1986-87	4.297	4.202	7.217	97.79	171.75
1987-88	4.287	4.157	7.326	96.97	176.23
1988-89	4.306	4.205	7.387	97.65	175.67
1989-90	4.309	4.193	7.393	97.31	176.32
1990-91	4.385	4.218	7.501	96.19	177.83
1991-92	4.372	4.215	7.518	96.41	178.36
1992-93	4.300	4.134	7.550	96.14	182.63
1993-94	4.300	4.223	7.627	98.20	180.62
1994-95	4.258	4.210	7.693	98.87	182.73
1995-96	4.247	4.136	7.712	97.39	186.46
1996-97	4.368	4.223	7.808	96.68	184.89
1997-98	4.370	4.266	7.871	97.62	184.51
1998-99	4.288	4.173	7.740	97.32	185.48
1999-00	4.281	4.211	7.847	98.36	186.35
2000-01	4.321	4.264	7.935	98.68	186.09
2001-02	4.308	4.268	7.941	99.07	186.06
2002-03	4.302	4.224	7.826	98.19	185.27

Source: Various Statistical Abstracts of Punjab, Statistical Handbook of 1995.

Comment: 1. Total Geological Area - 5.04 M Ha.

2. Data between 1950-51 to 1954-55 and 1956-57 to 1959-60 are not comparable with data for rest of the years.

Punjab
NET AREA SOWN AND GROSS AREA SOWN
 (Million hectares)



Punjab
NET AREA IRRIGATED AND GROSS AREA IRRIGATED

Year	Net Area Irrigated by Source			Gross Area Irrigated (M Ha)	NAI as % to Net Area Sown	GAI as % to Gross Area Sown
	Canal	Well/TW (M Ha)	Total (M Ha)			
1950-51				2.28		54.67
1951-52				2.35		56.22
1952-53				2.37		52.99
1953-54	1.40	0.83	2.24	2.47	60.15	55.03
1954-55	1.48	0.92	2.42	2.60	64.42	54.94
1955-56	1.43	0.88	2.32	2.60	64.06	56.90
1956-57	1.28	0.79	2.08	2.66	53.57	52.72
1957-58	1.26	0.74	2.01	2.63	51.44	52.89
1958-59	1.18	0.74	1.93	2.73	47.73	52.95
1959-60	1.16	0.73	1.93	2.69	48.49	53.13
1960-61	1.18	0.82	2.02	2.65	53.84	55.88
1961-62	1.24	0.74	2.00	2.70	52.06	56.15
1962-63	1.24	0.85	2.11	2.83	55.00	56.84
1963-64	1.22	0.83	2.13	2.87	55.36	58.78
1964-65	1.22	0.84	2.11	3.04	54.07	59.26
1965-66	1.30	0.89	2.26	3.14	59.51	64.12
1966-67	1.27	0.98	2.28	3.37	58.81	65.09
1967-68	1.29	0.99	2.29	3.46	57.34	63.66
1968-69	1.29	1.35	2.65	3.82	67.29	72.30
1969-70	1.31	1.52	2.84	4.08	70.40	74.20
1970-71	1.29	1.59	2.89	4.24	71.26	74.72
1971-72	1.37	1.55	2.96	4.38	72.50	76.47
1972-73	1.28	1.65	2.94	4.57	71.95	77.01
1973-74	1.29	1.68	2.98	4.62	72.36	76.51
1974-75	1.41	1.77	3.18	4.77	77.79	80.80
1975-76	1.37	1.74	3.12	4.93	75.01	78.83
1976-77	1.39	1.80	3.19	5.08	76.65	80.83
1977-78	1.39	1.86	3.29	5.19	78.78	81.29
1978-79	1.39	1.84	3.26	5.51	78.09	83.04
1979-80	1.52	2.00	3.52	5.71	84.24	87.34
1980-81	1.43	1.94	3.38	5.78	80.70	85.48
1981-82	1.32	2.07	3.41	5.97	80.95	86.10
1982-83	1.46	2.08	3.55	6.15	84.48	88.92
1983-84	1.48	2.12	3.61	6.27	85.68	89.92
1984-85	1.40	2.21	3.62	6.35	86.44	90.51
1985-86	1.41	2.27	3.69	6.51	87.92	91.01
1986-87	1.44	2.27	3.72	6.59	88.46	91.31
1987-88	1.42	2.31	3.72	6.73	89.58	91.89
1988-89	1.46	2.31	3.78	6.84	89.80	92.55
1989-90	1.47	2.44	3.92	6.92	93.47	93.58
1990-91	1.58	2.23	3.82	7.05	90.47	94.05
1991-92	1.52	2.42	3.94	7.11	93.48	94.59
1992-93	1.45	2.39	3.84	7.15	92.94	94.70
1993-94	1.54	2.39	3.93	7.24	93.00	94.90
1994-95	1.54	2.40	3.95	7.29	93.80	94.81
1995-96	1.56	2.28	3.84	7.34	92.94	95.13
1996-97	1.62	2.41	4.04	7.45	95.55	95.45
1997-98	1.55	2.47	4.02	7.56	94.26	96.06

Year	Net Area Irrigated by Source			Gross Area Irrigated (M Ha)	NAI as % to Net Area Sown	GAI as % to Gross Area Sown
	Canal	Well/TW (M Ha)	Total (M Ha)			
1998-99	1.05	2.91	4.02	7.44	96.31	96.15
1999-00	1.09	2.86	3.97	7.54	94.18	96.14
2000-01(P)	1.00	3.02	4.02	7.65	94.30	96.38
2001-02(P)	0.99	3.07	4.06	7.67	95.06	96.59

Source

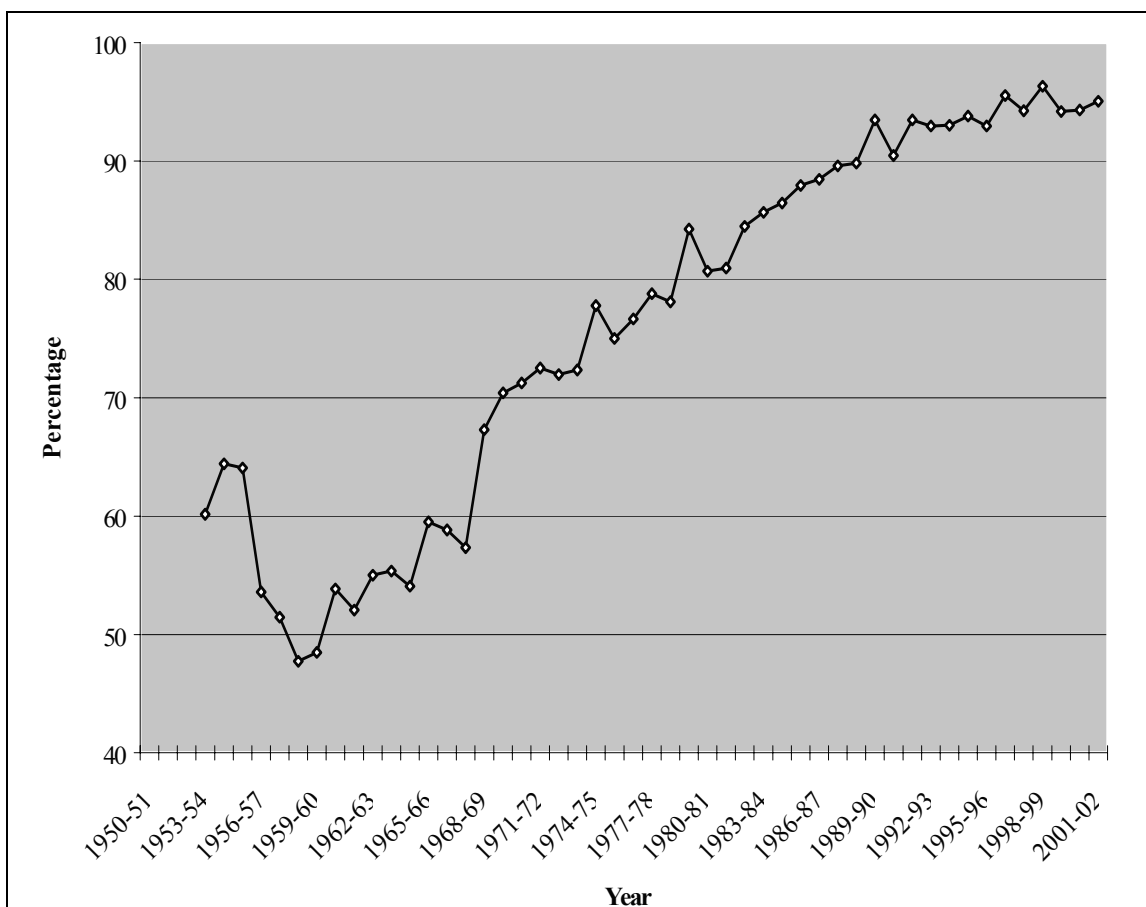
- Various Statistical Abstracts of Punjab, Statistical Handbook of 1995.
- Government of Punjab website - <http://www.punjab.gov.in/webii/General/Abstract/PDF/157-223.pdf> and <http://www.punjab.gov.in/webii/General/Abstract/PDF/239-251.pdf> Downloaded on Oct.7, 2004

Comment

- "Other" source not listed but included in total Net Irrigated Area.
- Data between 1950-51 to 1954-55 and 1956-57 to 1959-60 are not comparable with data for rest of years

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Punjab
NET AREA IRRIGATED AS % OF NET SOWN AREA

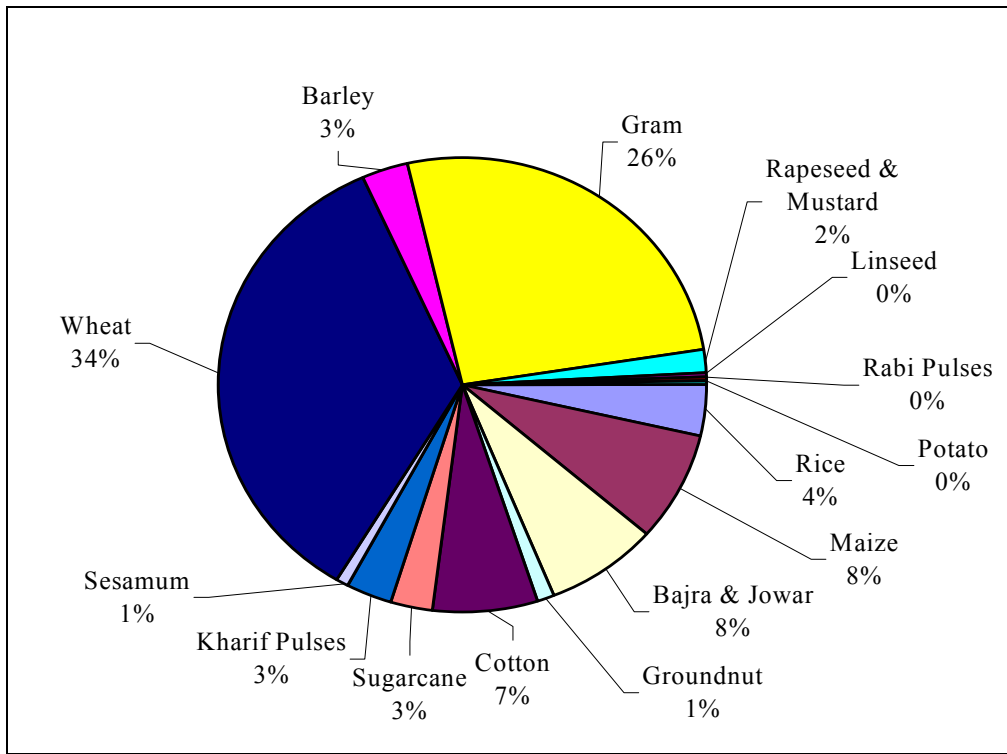


Punjab
SHIFT IN CROPPING PATTERN (1950-51 TO 2000-01)
 (Area Sown in '000 Ha)

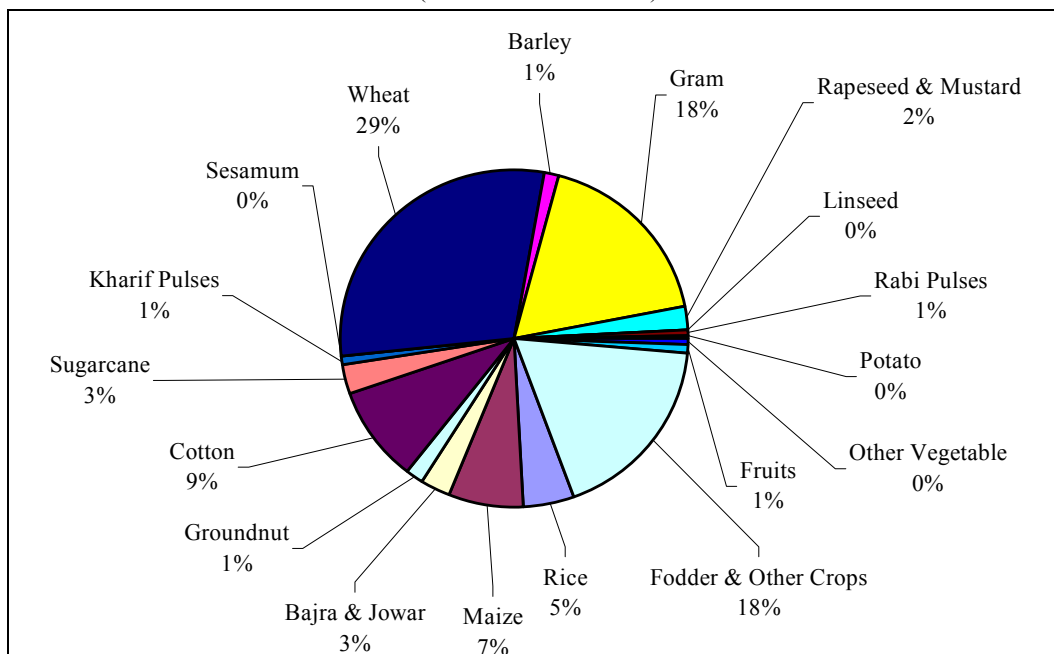
Crop	1950-51	1955-56	1960-61	1965-66	1970-71	1975-76	1980-81	1985-86	1990-91	1995-96	2000-01
Rice	120	149	227	292	390	565	1183	1714	2015	2184	2612
Maize	252	260	327	389	555	577	382	260	188	171	164
Bajra & Jowar	247	141	140	160	212	187	70	33	12	8	6
Groundnut	38	53	67	135	174	168	83	45	11	8	4
Cotton	225	430	446	459	397	580	648	559	701	742	473
Sugarcane	91	96	133	169	128	114	71	78	101	136	121
Kharif Pulses	97	80	32	20	38.5	40	61	102	72	68	42
Sesamum	24	21	8	10	15	23	17	14	18	24	19
Wheat	1137	1292	1400	1550	2299	2449	2812	3112	3273	3221	3408
Barley	100	98	66	67	57	120	65	50	37	44	32
Gram	851	1002	838	602	358	381	258	108	60	20	8
Rapeseed & Mustard	62	39	106	84	103	122	146	150	69	102	55
Linseed	4	4	4	4	3	2	2	1	1	1	0
Rabi Pulses	13	13	33	22	17	26	22	15	14	5	5
Potato	6	7	9	14	17	26	40	43	23	39	64
Other Vegetable	NA	NA	23	NA	23	NA	24	32	31	38	46
Fruits	NA	NA	42	NA	50	NA	29	47	69	84	34
Fodder & Other Crops	NA	NA	859	NA	866	NA	959	716	827	864	657

Source - Johl Committee Report, Page No. - 21

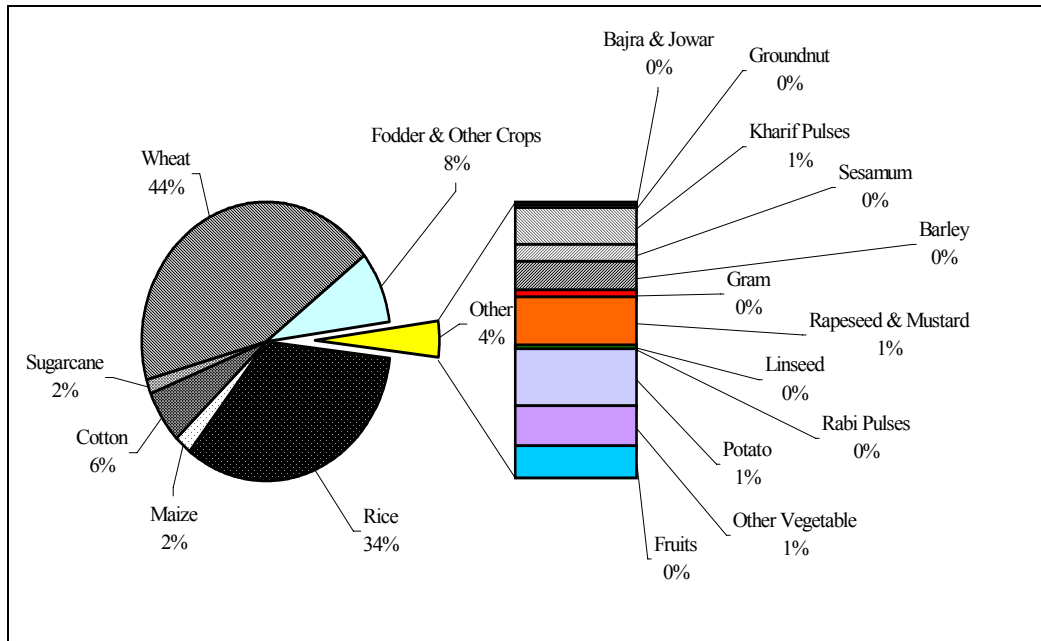
Punjab
CROPPING PATTERN - 1950 - 51
 (Area Sown in '000 Ha)



Punjab
CROPPING PATTERN - 1960 - 61
 (Area Sown in '000 Ha)



Punjab
CROPPING PATTERN - 2000 - 01
 Area Sown in '000 Ha
 (Less than 1% is shown as 'other')



Punjab
AREA PRODUCTION AND YIELD OF WHEAT & RICE

Year	Wheat			Rice		
	Area (M Hec)	Production (M Met. Tons)	Yield (kg/Hec)	Area (M Hec)	Production (M Met. Tons)	Yield (kg/Hec)
1950-51	1.137	1.024	901	0.120	0.107	892
1951-52	1.172	1.209	1032	0.120	0.151	1263
1952-53	1.121	1.228	1095	0.131	0.207	1580
1953-54	1.163	1.240	1066	0.136	0.200	1471
1954-55	1.236	1.337	1082	0.144	0.203	1414
1955-56	1.292	1.136	879	0.149	0.107	718
1956-57	1.344	1.354	1008	0.155	0.243	1562
1957-58	1.329	1.327	999	0.174	0.252	1444
1958-59	1.479	1.589	1075	0.200	0.295	1470
1959-60	1.431	1.499	1047	0.218	0.365	1671
1960-61	1.400	1.742	1244	0.227	0.229	1009
1961-62	1.436	1.766	1230	0.228	0.230	1009
1962-63	1.516	1.761	1162	0.247	0.261	1057
1963-64	1.511	1.895	1254	0.257	0.275	1070
1964-65	1.579	2.367	1499	0.287	0.351	1223
1965-66	1.550	1.916	1236	0.292	0.292	1000
1966-67	1.608	2.451	1524	0.285	0.338	1185
1967-68	1.790	3.335	1863	0.314	0.415	1322
1968-69	2.063	4.491	2177	0.345	0.470	1364
1969-70	2.166	4.865	2245	0.359	0.535	1490
1970-71	2.299	5.145	2238	0.390	0.688	1765
1971-72	2.336	5.618	2406	0.450	0.920	2045
1972-73	2.404	5.368	2233	0.476	0.955	2007
1973-74	2.338	5.181	2216	0.499	1.140	2287
1974-75	2.207	5.286	2395	0.569	1.179	2071
1975-76	2.439	5.788	2373	0.567	1.447	2553
1976-77	2.630	6.392	2432	0.680	1.776	2611
1977-78	2.617	6.642	2538	0.858	2.497	2910
1978-79	2.739	7.439	2716	1.052	3.090	2937
1979-80	2.813	7.868	2797	1.172	3.052	2604
1980-81	2.812	7.677	2730	1.183	3.233	2733
1981-82	2.914	8.544	2932	1.269	3.750	2955
1982-83	3.052	9.168	3004	1.322	4.156	3144
1983-84	3.124	9.422	3015	1.481	4.536	3063
1984-85	3.094	10.176	3289	1.644	5.052	3073
1985-86	3.112	10.988	3531	1.714	5.485	3200
1986-87	3.185	9.447	2966	1.786	5.949	3331
1987-88	3.131	11.084	3540	1.720	5.442	3164
1988-89	3.158	11.580	3667	1.778	4.925	2770
1989-90	3.247	11.666	3593	1.908	6.697	3510
1990-91	3.273	12.159	3715	2.016	6.510	3229
1991-92	3.237	12.309	3803	2.071	6.745	3257
1992-93	3.283	12.397	3776	2.072	7.028	3392
1993-94	3.335	13.377	4011	2.179	7.642	3507
1994-95	3.311	13.539	4089	2.265	7.658	3381
1995-96	3.223	12.518	3884	2.161	6.768	3132
1996-97	3.230	13.679	4235	2.160	7.338	3397
1997-98	3.301	12.751	3853	2.278	7.893	3465
1998-99	3.337	14.456	4332	2.519	7.940	3152
1999-00	3.388	15.910	4696	2.604	8.716	3347
2000-01	3.408	15.551	4563	2.612	9.157	3506
2001-02	3.422	15.509	4532	2.489	8.824	3545

Source: Various Statistical Abstracts of Punjab, Government of Punjab Website
<http://punjabgovt.nic.in/agriculture/AGRICULT.HTM>, Accessed on Sep 13, 2003,
<http://punjabgovt.nic.in/agriculture/agricult.htm>, Accessed on Jan 10, 2004.
http://www.punjabgovt.net/about_agri2.asp, Accessed on Jan 10, 2004.
<http://www.punjab.gov.in/webii/General/Abstract/PDF/157-223.pdf>, Accessed on Oct 7, 2004.

Note: Data between 1951-52 to 54-55 and 1956-57 to 59-60 are not comparable

Punjab
AREA PRODUCTION AND YIELD OF FOODGRAINS

Year	Total Cereals			Total Pulses			Total Foodgrains		
	Area (M Ha)	Production (M M Tons)	Yield (kg/Ha)	Area (M Ha)	Production (M M Tons)	Yield (kg/Ha)	Area (M Ha)	Production (M M Tons)	Yield (kg/Ha)
1950-51	1.834	1.423	776	0.940	0.546	581	2.774	1.969	710
1951-52	1.914	1.773	926	0.798	0.535	671	2.712	2.308	851
1952-53	1.877	1.991	1061	0.863	0.589	683	2.740	2.581	942
1953-54	1.963	2.061	1050	1.001	0.832	831	2.964	2.894	976
1954-55	1.962	1.998	1019	1.112	0.827	743	3.074	2.825	919
1955-56	1.930	1.558	807	1.072	0.687	641	3.002	2.245	748
1956-57	2.085	2.204	1057	1.154	0.833	722	3.239	3.037	938
1957-58	2.073	2.139	1032	1.040	0.710	682	3.113	2.848	915
1958-59	2.290	2.354	1028	1.159	1.036	894	3.448	3.390	983
1959-60	2.216	2.420	1092	1.168	0.828	709	3.384	3.248	960
1960-61	2.149	2.452	1141	0.893	0.707	791	3.042	3.159	1038
1961-62	2.205	2.587	1174	0.904	0.725	802	3.109	3.313	1066
1962-63	2.327	2.450	1053	0.873	0.608	697	3.200	3.058	956
1963-64	2.281	2.757	1208	0.814	0.472	580	3.095	3.229	1043
1964-65	2.471	3.340	1352	0.791	0.687	868	3.262	4.027	1234
1965-66	2.454	3.000	1222	0.643	0.389	605	3.097	3.389	1094
1966-67	2.631	3.643	1385	0.682	0.528	774	3.313	4.171	1259
1967-68	2.944	4.883	1659	0.587	0.479	815	3.531	5.362	1519
1968-69	3.184	5.949	1869	0.400	0.257	643	3.583	6.206	1732
1969-70	3.347	6.505	1943	0.423	0.412	975	3.770	6.917	1835
1970-71	3.513	6.997	1992	0.414	0.308	759	3.927	7.305	1860
1971-72	3.530	7.623	2159	0.375	0.301	803	3.905	7.924	2029
1972-73	3.633	7.399	2037	0.372	0.291	781	4.005	7.690	1920
1973-74	3.666	7.326	1998	0.419	0.347	827	4.085	7.673	1878
1974-75	3.626	7.703	2124	0.321	0.241	749	3.947	7.944	2012
1975-76	3.890	8.425	2166	0.427	0.396	928	4.317	8.821	2043
1976-77	4.065	9.005	2215	0.386	0.330	855	4.450	9.335	2097
1977-78	4.074	10.004	2456	0.390	0.340	870	4.464	10.344	2317
1978-79	4.344	11.363	2616	0.396	0.308	777	4.740	11.671	2462
1979-80	4.473	11.717	2620	0.267	0.174	650	4.740	11.890	2509
1980-81	4.513	11.717	2597	0.341	0.204	597	4.854	11.921	2456
1981-82	4.673	13.157	2816	0.320	0.159	496	4.992	13.316	2667
1982-83	4.807	14.050	2923	0.202	0.120	595	5.009	14.170	2829
1983-84	5.006	14.649	2926	0.192	0.131	682	5.199	14.780	2843
1984-85	5.151	15.948	3096	0.198	0.146	740	5.348	16.094	3009
1985-86	5.169	17.023	3293	0.219	0.198	905	5.388	17.221	3196
1986-87	5.295	16.032	3028	0.222	0.176	794	5.517	16.209	2938
1987-88	5.137	16.994	3308	0.152	0.093	610	5.289	17.087	3231
1988-89	5.250	16.937	3226	0.164	0.180	1093	5.414	17.117	3161
1989-90	5.413	18.867	3486	0.133	0.095	710	5.546	18.961	3419
1990-91	5.524	19.112	3460	0.149	0.110	739	5.673	19.222	3388
1991-92	5.540	19.548	3528	0.103	0.080	782	5.643	19.628	3478
1992-93	5.597	19.982	3570	0.104	0.076	729	5.701	20.058	3518
1993-94	5.759	21.495	3732	0.102	0.081	795	5.861	21.576	3681
1994-95	5.802	21.667	3735	0.100	0.087	873	5.901	21.754	3686
1995-96	5.604	19.722	3520	0.103	0.084	818	5.706	19.806	3471
1996-97	5.593	21.481	3841	0.098	0.081	824	5.691	21.562	3789
1997-98	5.789	21.105	3646	0.162	0.107	660	5.951	21.212	3565
1998-99	6.046	22.853	3780	0.074	0.047	635	6.120	22.900	3741
1999-00	6.191	25.166	4065	0.061	0.041	665	6.252	25.197	4029
2000-01	6.222	25.279	4063	0.055	0.039	709	6.277	25.318	4033
2001-02	6.106	24.867	4073	0.049	0.031	633	6.155	24.898	4045

Source Various Statistical Abstracts of Punjab and Government of Punjab Websites
<http://punjabgovt.nic.in/agriculture/agricult.htm>, Accessed on Sep 13, 2003,
<http://punjabgovt.nic.in/agriculture/agricult.htm>, Accessed on Jan 10, 2004.
http://www.punjabgovt.net/about_agri2.asp, Accessed on Jan 10, 2004.
<http://www.punjab.gov.in/webii/General/Abstract/PDF/157-223.pdf>, Accessed on Oct 7, 2004.

Note Data between 1951-52 to 54-55 and 1956-57 to 59-60 are not comparable.

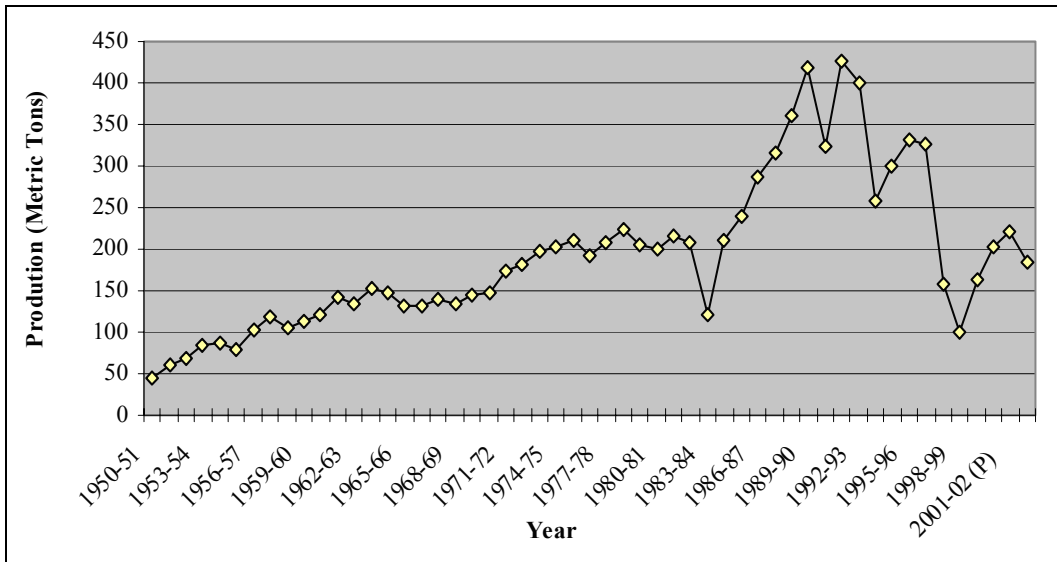
Punjab
AREA, PRODUCTION AND YIELD OF COTTON

Year	American			Desi			Total		
	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)
1950-51	79.00	19.74	250.00	146.00	25.96	178.00	225.00	45.70	203.11
1951-52	79.76	19.56	245.22	199.19	41.61	208.87	278.95	61.16	219.26
1952-53	102.02	27.56	270.12	176.52	40.01	226.63	278.54	67.56	242.56
1953-54	168.02	50.50	300.54	136.84	33.25	242.97	304.86	83.74	274.70
1954-55	280.57	64.36	229.41	118.62	23.11	194.85	399.19	87.48	219.14
1955-56	287.00	58.85	205.00	143.00	19.02	133.00	430.00	77.87	181.09
1956-57	327.94	78.23	238.56	132.79	23.65	178.08	460.73	101.88	221.13
1957-58	304.05	76.28	250.87	183.00	41.43	226.38	487.04	117.70	241.67
1958-59	270.04	61.52	227.81	221.05	44.63	201.89	491.09	106.15	216.14
1959-60	263.97	67.92	257.30	183.81	46.41	252.47	447.77	114.33	255.32
1960-61	245.00	65.79	269.00	202.00	54.51	270.00	447.00	120.30	269.13
1961-62	212.00	63.57	300.00	270.00	77.28	286.00	482.00	140.85	292.22
1962-63	211.00	61.04	289.00	260.00	72.87	280.00	471.00	133.91	284.31
1963-64	258.00	84.43	327.00	254.00	69.01	272.00	512.00	153.44	299.69
1964-65	254.00	81.89	322.00	235.00	64.55	275.00	489.00	146.44	299.47
1965-66	222.00	68.97	311.00	237.00	62.65	264.00	459.00	131.62	286.75
1966-67	199.00	66.86	335.00	236.00	65.33	277.00	435.00	132.19	303.89
1967-68	227.00	84.15	371.00	192.00	55.90	291.00	419.00	140.05	334.25
1968-69	229.00	84.05	369.00	163.00	51.41	316.00	392.00	135.46	345.56
1969-70	220.00	83.74	381.00	188.00	60.26	321.00	408.00	144.00	352.94
1970-71	212.00	84.78	399.00	185.00	62.53	338.00	397.00	147.31	371.06
1971-72	246.00	98.84	407.00	229.00	73.90	326.00	475.00	172.74	363.66
1972-73	235.00	94.36	407.00	271.00	86.16	322.00	506.00	180.52	356.76
1973-74	301.00	129.36	430.00	222.00	67.36	303.00	523.00	196.72	376.14
1974-75	342.00	142.20	416.00	205.00	61.56	301.00	547.00	203.76	372.50
1975-76	363.00	146.92	404.00	217.00	63.19	292.00	580.00	210.11	362.26
1976-77	375.00	142.21	379.00	180.00	50.83	282.00	555.00	193.04	347.82
1977-78	440.00	164.27	374.00	169.00	44.88	263.00	609.00	209.15	343.43
1978-79	470.00	181.87	387.00	161.00	42.33	264.00	631.00	224.20	355.31
1979-80	460.00	163.99	357.00	170.00	40.88	241.00	630.00	204.87	325.19
1980-81	502.00	164.73	329.00	147.00	35.53	241.00	649.00	200.26	308.57
1981-82	546.00	182.40	334.00	140.00	34.34	246.00	686.00	216.74	315.95
1982-83	582.00	181.90	313.00	142.00	25.16	177.00	724.00	207.06	285.99
1983-84	556.00	107.44	193.00	94.00	12.75	136.00	650.00	120.19	184.91
1984-85	409.00	193.12	471.00	63.00	17.89	287.00	472.00	211.01	447.06
1985-86	471.00	213.85	452.00	88.00	25.46	288.00	559.00	239.31	428.10
1986-87	496.00	264.37	533.00	71.00	23.15	326.00	567.00	287.52	507.09
1987-88	565.00	300.05	531.00	56.00	16.66	298.00	621.00	316.71	510.00
1988-89	701.00	345.31	492.00	57.00	15.13	266.00	758.00	360.44	475.51
1989-90	669.00	394.87	591.00	64.00	22.26	354.00	733.00	417.13	569.07
1990-91	637.00	306.40	481.00	64.00	18.24	285.00	701.00	324.64	463.11
1991-92	615.00	391.14	636.00	104.00	34.74	334.00	719.00	425.88	592.32
1992-93	635.00	375.06	591.00	66.00	24.08	369.00	701.00	399.14	569.39
1993-94	536.00	246.50	460.00	41.00	10.88	267.00	577.00	257.38	446.00
1994-95	538.00	281.93	521.00	60.00	19.50	325.00	598.00	300.22	502.00
1995-96	649.00	300.49	463.00	93.00	27.16	292.00	750.00	331.50	442.00
1996-97	626.00	291.27	467.00	90.00	26.17	300.00	742.00	327.25	441.00
1997-98	626.00	133.52	213.00	98.00	25.61	264.00	724.00	159.13	219.79
1998-99	456.00	81.62	179.00	106.00	19.61	185.00	562.00	101.23	180.12
1999-00	381.00	128.16	337.00	96.00	33.79	352.00	477.00	161.95	339.52
2000-01 (P)	358.00	156.68	437.00	115.00	46.83	408.00	473.00	203.51	430.25
2001-02 (P)	507.00	193.70	382.00	100.00	28.55	285.00	607.00	222.25	366.14

Source Various Statistical Abstracts of Punjab, Government of Punjab websites
<http://punjabgovt.nic.in/agriculture/agricult.htm>, Accessed on 13 Sep 2003s
<http://www.punjab.gov.in/webii/General/Abstract/PDF/157-223.pdf>, Accessed on Oct. 7, 2004

Comment Production and Yield are in terms of cleaned cotton.
 Data between 1950-51 to 1954-55 and 1956-57 to 1959-60 are not comparable with data for rest of the years.

Punjab
PRODUCTION OF TOTAL COTTON
 (Metric Tons)



Punjab
CONSUMPTION OF FERTILIZERS
 (000 Tons)

Year	N	P	K	Total
1960-61	5		0	5
1965-66	43	3	0	46
1966-67	46	4	1	51
1967-68	83	12	4	99
1968-69	135	27	10	172
1969-70	147	21	6	174
1970-71	175	31	7	213
1971-72	225	53	12	290
1972-73	240	66	19	325
1973-74	218	68	21	307
1974-75	189	42	13	244
1975-76	232	53	10	295
1976-77	259	93	21	373
1977-78	331	105	29	465
1978-79	419	155	29	603
1979-80	477	179	30	686
1980-81	526	207	29	762
1981-82	562	217	34	813
1982-83	626	230	36	892
1983-84	706	253	32	991
1984-85	759	267	22	1048
1985-86	787	287	24	1098
1986-87	803	290	23	1116
1987-88	791	297	24	1112
1988-89	796	301	20	1117
1989-90	818	315	12	1145
1990-91	877	330	15	1221
1991-92	930	314	18	1262
1992-93	934	254	11	1199
1993-94				
1994-95				
1995-96				
1996-97				
1997-98				
1998-99	1081	275	19	1375
99-2000	1086	335	26	1447
2000-01	1008	282	23	1313
2001-02	1070	307	30	1407
2002-03	1111	299	31	1441

Source Various Statistical Abstracts of Punjab

Punjab
ANNUAL RAINFALL BY DISTRICTS (MM)

Districts	1970	1980	1990	1997	1998	1999	2000	Average for 5 years (1998-2002)
Gurdaspur	926.3	1155.0	1214.9	1038.3	662.6	810.6	830.1	793.0
Amritsar	594.6	869.8	650.8	813.2	554.8	327.1	207.9	316.1
Kapurthala	554.9	683.0	780.5	973.5	492.0	464.5	542.0	457.3
Jalandhar	171.4	873.9	1195.7	596.7	469.6	315.7	364.2	369.0
Nawan Shehar	@@	@@	@@	1932.6	936.7	705.1	699.4	742.7
Hoshiarpur	999.3	906.1	1075.6	916.3	1004.6	641.0	658.0	649.6
Rupnagar	983.4	759.0	1092.4	967.0	641.8	675.2	793.4	709.3
Ludhiana	756.7	38.0	523.9	607.8	589.3	504.4	437.2	582.6
Firozpur	232.3	956.2	421.6	405.3	127.9	95.6	130.3	100.3
Faridkot	*	511.4	567.8	350.4	151.0	262.7	256.5	243.8
Muktsar	@@	@@	@@	883.1	520.1	508.5	358.0	421.0
Moga	@@	@@	@@	551.6	259.0	234.5	175.0	229.6
Bathinda	499.2	355.9	342.1	274.9	173.6	42.5	136.1	160.0
Mansa	**	**	**	146.3	132.9	72.2	77.1	151.7
Sangrur	521.9	521.4	527.2	540.7	377.2	228.8	202.0	233.5
Patiala	555.6	835.7	662.7	819.8	779.0	470.1	641.2	647.7
Fatehgarh Sahib	**	**	**	253.2	244.9	285.0	155.0	319.0
Punjab	672.3	739.1	754.6	710.0	477.5	390.8	391.9	419.2
Comment	*Data included in Firozpur and Bathinda districts							
	** District Mansa and Fatehgarh Sahib were created in April 1992, hence data of these districts is included in Bathinda and Patiala respectively.							
	@@ Districts Muktsar, Moga and Nawanshehar were created in 1996, Data of Muktsar & Moga included in Faridkot and that of Nawanshehar in districts Jalandhar							
Source	Various Statistical Abstracts of Punjab 2004							

HARYANA AT A GLANCE

General	
Geographical Area (000 Ha)	4421
Divisions	4
Districts	17
Tehsils	61
Cities	
Towns (1991)	94
Villages	6955
Inhabited Villages	6781
Population	
Population	21,082,989
Males	11,327,658
Females	9,755,331
Sex Ratio	861 F/1000 M
Sex Ratio (0 – 6 Years)	820 F/1000 M
Rural Population (1991)	12409000
Percentage to Total (1991)	75.37 %
Urban Population (1991)	4055000
Percentage to Total (1991)	24.62 %
Density	477
Literate And Educated Persons	12225036
Literacy Rate	86.59 %
Scheduled Castes (1991)	3251000
Percentage (1991)	19.75 %
Climate	
Average Rainfall	564.5
Agriculture	
Total Cultivable Area	3865
Net Area Sown (000 Ha)	3700
Net Area Sown as % to Total Geo. Area	83.69 %
Gross Area Sown (000 Ha)	6450
Cropping Intensity [(GSA/NSA)x100]	174.32
Production of Crops (000 MT)	
Total cereals	12252
Total pulses	84
Total foodgrains	12336
Total Cotton	176.46
Total oilseeds	709
Irrigation	
Net area irrigated by (000 Ha)	
Govt. Canals	1433
Wells/Tube wells	1395
Others	14
Total (Net Irrigation)	2842
Net Area Irrigated as % to Net Area Sown	76.81 %
Gross area irrigated (000 Ha)	5041
No. of Tube wells and Pumping sets (Lakhs)	6.04
Forest	
Area under forests (000 Ha) (1994-95)	159
Electricity	
Consumption of Electric Power (Million KWH) (1994-95)	7824.3
Unit sold per capita (KWH) (1994-95)	446
Roads	
Metalled Roads Per 100 SqKM	54.8
Villages Connected with Pucca Roads (1994-95)	6677
Gross Domestic Product (Crore Rupees)	34,800.4

Haryana
AREA, PRODUCTION AND YIELD OF WHEAT AND RICE

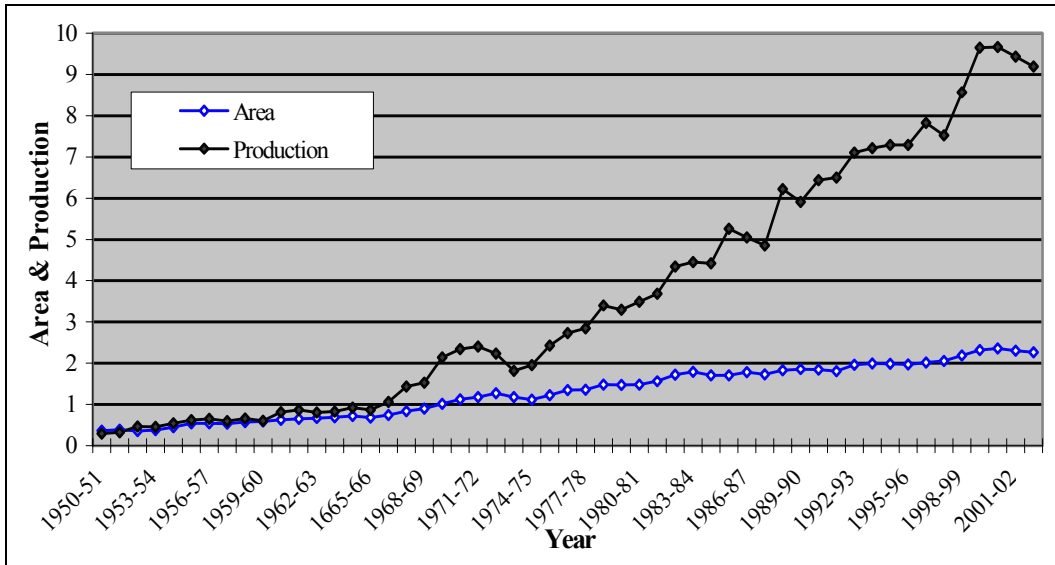
Year	Wheat			Rice		
	Area (M Ha)	Production (M MT)	Yield (Kg/Ha)	Area (M Ha)	Production (M MT)	Yield (Kg/Ha)
1950-51	0.362	0.294	812	0.075	0.043	573
1951-52	0.382	0.321	840	0.063	0.066	1046
1952-53	0.361	0.468	1297	0.067	0.093	1391
1953-54	0.378	0.451	1193	0.077	0.121	1572
1954-55	0.443	0.545	1228	0.072	0.111	1537
1955-56	0.543	0.619	1140	0.078	0.060	769
1956-57	0.547	0.649	1188	0.098	0.125	1270
1957-58	0.538	0.602	1121	0.101	0.163	1606
1958-59	0.573	0.662	1156	0.116	0.189	1632
1959-60	0.589	0.611	1037	0.130	0.225	1722
1960-61	0.628	0.814	1296	0.155	0.175	1129
1961-62	0.648	0.870	1343	0.163	0.203	1245
1962-63	0.670	0.804	1200	0.165	0.154	933
1963-64	0.689	0.834	1210	0.158	0.220	1392
1964-65	0.723	0.922	1275	0.185	0.266	1438
1965-66	0.678	0.869	1282	0.192	0.205	1063
1966-67	0.743	1.059	1425	0.192	0.223	1161
1967-68	0.841	1.438	1710	0.217	0.287	1323
1968-69	0.898	1.529	1703	0.229	0.272	1188
1969-70	1.017	2.147	2110	0.241	0.372	1545
1970-71	1.129	2.342	2074	0.269	0.460	1709
1971-72	1.177	2.402	2041	0.291	0.536	1842
1972-73	1.271	2.231	1756	0.291	0.462	1585
1973-74	1.177	1.811	1539	0.292	0.540	1851
1974-75	1.117	1.954	1749	0.275	0.393	1427
1975-76	1.226	2.428	1980	0.304	0.625	2059
1976-77	1.349	2.735	2027	0.330	0.815	2473
1977-78	1.360	2.845	2092	0.371	0.965	2601
1978-79	1.482	3.398	2294	0.459	1.228	2678
1979-80	1.477	3.295	2231	0.509	0.941	1848
1980-81	1.479	3.490	2360	0.484	1.259	2602
1981-82	1.562	3.686	2357	0.505	1.252	2481
1982-83	1.723	4.347	2524	0.490	1.276	2607
1983-84	1.793	4.458	2499	0.561	1.332	2485
1984-85	1.705	4.421	2593	0.557	1.363	2447
1985-86	1.701	5.260	3094	0.584	1.633	2797
1986-87	1.782	5.057	2836	0.628	1.543	2457
1987-88	1.731	4.861	2808	0.464	1.077	2321
1988-89	1.827	6.225	3407	0.602	1.443	2397
1989-90	1.857	5.907	3181	0.642	1.750	2730
1990-91	1.850	6.436	3479	0.661	1.834	2775
1991-92	1.806	6.496	3597	0.637	1.803	2831
1992-93	1.963	7.108	3621	0.707	1.880	2659
1993-94	1.994	7.217	3619	0.755	2.061	2730
1994-95	1.985	7.297	3676	0.796	2.230	2802
1995-96	1.972	7.291	3697	0.830	1.847	2225
1996-97	2.017	7.826	3880	0.831	2.463	2964
1997-98	2.057	7.528	3660	0.914	2.556	2800
1998-99	2.188	8.568	3916	1.086	2.432	2239
1999-00	2.317	9.650	4165	1.083	2.583	2385
2000-01	2.355	9.669	4106	1.054	2.695	2557
2001-02	2.300	9.437	4103	1.028	2.726	2652

Source: Various Statistical Abstracts of Haryana and Government of Haryana website

http://agriharyana.nic.in/cropwisearea_area.htm, http://agriharyana.nic.in/cropwisearea_production.htm and http://agriharyana.nic.in/cropwisearea_yield.htm. D/L on Jan 9, 2004

Comment : Data between 1950-51 to 1954-55 and 1956-57 to 1959-60 are not comparable with data for rest of the years.

Haryana
WHEAT : AREA SOWN & PRODUCTION
 (Million Hectares, Million Metric Tons)



Haryana
AREA, PRODUCTION AND YIELD OF FOODGRAINS

Year	Total Cereals			Total Pulses			Total Foodgrains		
	Area (M Ha)	Production (M MT)	Yield (Kg/Ha)	Area (M Ha)	Production (M MT)	Yield (Kg/Ha)	Area (M Ha)	Production (M MT)	Yield (Kg/Ha)
1950-51	1.807	0.827	458	0.945	0.420	444.4	2.752	1.247	453
1951-52	1.740	0.599	345	0.427	0.182	425.4	2.167	0.781	361
1952-53	1.834	1.172	639	0.666	0.502	753.4	2.500	1.675	670
1953-54	1.896	1.235	652	0.765	0.650	849.7	2.660	1.885	709
1954-55	1.723	1.058	614	1.406	0.912	648.4	3.129	1.969	629
1955-56	1.987	1.219	613	1.565	1.045	667.7	3.552	2.264	637
1956-57	1.866	1.208	647	1.446	1.136	785.5	3.312	2.344	708
1957-58	1.916	1.291	674	1.459	1.056	723.5	3.376	2.347	695
1958-59	1.966	1.274	648	1.588	1.458	918.0	3.554	2.732	769
1959-60	1.936	1.339	692	1.488	0.893	600.3	3.425	2.232	652
1960-61	2.115	1.450	686	1.606	1.303	811.3	3.721	2.755	740
1961-62	2.086	1.562	749	1.460	1.018	697.3	3.546	2.580	728
1962-63	2.081	1.418	681	1.512	0.938	620.4	3.480	2.356	677
1963-64	2.018	1.542	764	1.462	0.691	472.6	3.564	2.233	627
1964-65	2.184	1.720	788	1.380	0.995	721.0	3.480	2.715	780
1965-66	2.108	1.576	748	0.915	0.408	445.9	3.023	1.985	657
1966-67	2.370	2.029	856	1.150	0.563	489.6	3.520	2.592	736
1967-68	2.655	2.690	1013	1.296	1.316	1015	3.951	3.970	1005
1968-69	2.463	2.315	940	0.655	0.449	685	3.118	2.764	886
1969-70	2.678	3.411	1274	1.189	1.215	1022	3.867	4.626	1196
1970-71	2.709	3.939	1454	1.159	0.832	717.9	3.868	4.771	1234
1971-72	2.750	3.861	1404	1.205	0.682	565.9	3.955	4.543	1149
1972-73	2.911	3.488	1198	1.056	0.585	553.8	3.968	4.073	1027
1973-74	2.884	3.353	1163	1.082	0.483	446.3	3.966	3.836	967
1974-75	2.824	2.965	1050	0.781	0.374	478.9	3.605	3.339	926
1975-76	3.017	4.088	1355	1.194	0.952	797.4	4.211	5.040	1197
1976-77	3.040	4.384	1442	1.108	0.876	790.3	4.148	5.260	1268
1977-78	2.988	4.335	1451	1.217	1.005	825.9	4.205	5.340	1270
1978-79	3.140	5.245	1671	1.134	1.084	956.4	4.273	6.333	1482
1979-80	3.097	4.696	1517	0.601	0.348	578.5	3.697	5.037	1362
1980-81	3.168	5.533	1747	0.795	0.503	632.2	3.963	6.036	1523
1981-82	3.232	5.692	1761	1.116	0.347	310.9	4.348	6.039	1389
1982-83	3.251	6.334	1949	0.561	0.315	560.7	3.812	6.649	1744
1983-84	3.475	6.526	1878	0.720	0.363	503.6	4.195	6.889	1642
1984-85	3.296	6.481	1966	0.692	0.367	530.1	3.989	6.848	1717
1985-86	3.197	7.460	2333	0.846	0.687	811.3	4.043	8.147	2015
1986-87	3.461	7.161	2069	0.679	0.467	687.7	4.140	7.628	1843
1987-88	2.920	6.199	2123	0.265	0.112	423.7	3.186	6.311	1981
1988-89	3.483	8.836	2537	0.728	0.674	924.8	4.212	9.510	2258
1989-90	3.335	8.279	2482	0.604	0.430	711.0	3.939	8.709	2211
1990-91	3.337	9.017	2702	0.742	0.542	730.1	4.079	9.559	2343
1991-92	3.188	8.805	2762	0.389	0.273	701.9	3.577	9.078	2538
1992-93	3.510	9.955	2836	0.462	0.326	706.6	3.972	10.281	2589
1993-94	3.416	9.774	2862	0.478	0.469	981.0	3.893	10.243	2631
1994-95	3.537	10.456	2956	0.475	0.516	1086.3	4.012	10.972	2735
1995-96	3.571	9.721	2722	0.450	0.451	1002.0	4.021	10.172	2530
1996-97	3.609	11.102	3076	0.417	0.345	827.3	4.026	11.447	2843
1997-98	3.755	10.956	2918	0.433	0.376	869.4	4.187	11.332	2706
1998-99	4.073	11.782	2893	0.409	0.323	789.7	4.482	12.105	2701
1999-00	4.154	12.987	3126	0.136	0.078	573.5	4.290	13.065	3045
2000-01	4.185	13.195	3153	0.155	0.099	638.7	4.340	13.294	3063
2001-02	4.065	13.150	3235	0.189	0.149	788.4	4.254	13.299	3126
2002-03	3.848	12.252	3184	0.128	0.084	656.3	3.976	12.336	3103

Source: Various Statistical Abstracts of Haryana and Government of Haryana website

http://agriharyana.nic.in/cropwisearea_area.htm,

http://agriharyana.nic.in/cropwisearea_production.htm and http://agriharyana.nic.in/cropwisearea_yield.htm. D/L on Jan 9, 2004

Comment: Data between 1950-51 to 1954-55 and 1956-57 to 1959-60 are not comparable with data for rest of the years.

Haryana
NET AREA SOWN AND GROSS AREA SOWN
 (Million Hectares)

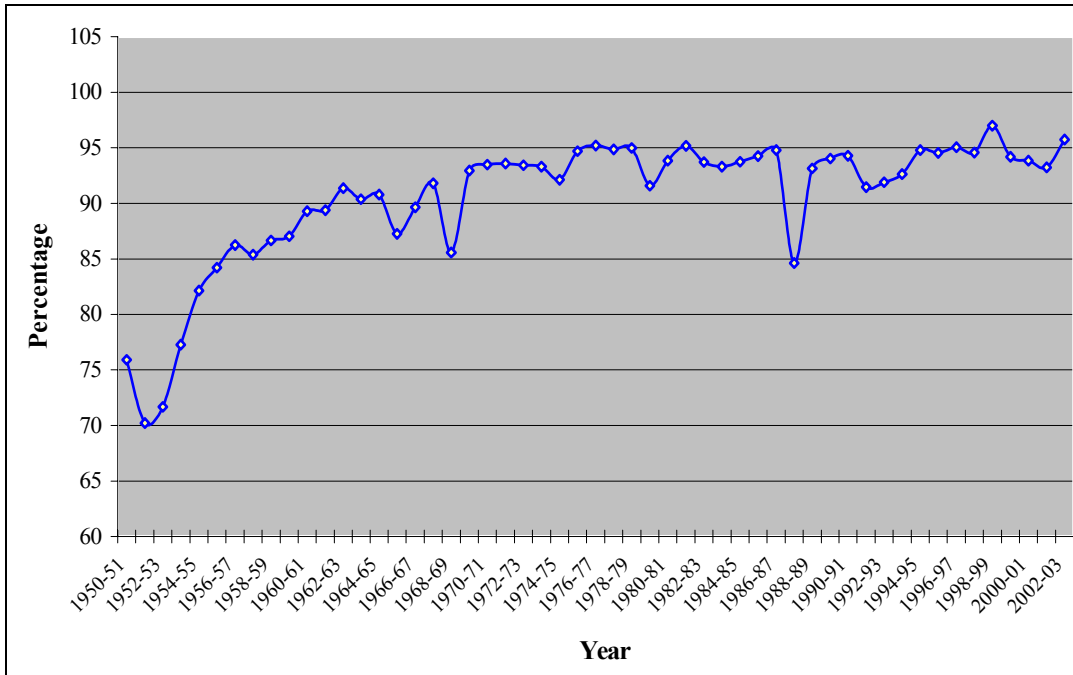
Year	Cultivable	Net Sown	Gross Sown	NS as % to Total Cultivable	Cropping Intensity
1950-51	3.930	2.983	3.334	75.9	111.8
1951-52	3.779	2.653	2.979	70.2	112.3
1952-53	3.802	2.725	3.129	71.7	114.8
1953-54	3.780	2.921	3.369	77.3	115.4
1954-55	3.775	3.100	3.923	82.1	126.6
1955-56	3.919	3.300	4.504	84.2	136.5
1956-57	3.765	3.247	4.258	86.2	131.2
1957-58	3.758	3.209	4.271	85.4	133.1
1958-59	3.750	3.249	4.461	86.7	137.3
1959-60	3.781	3.291	4.311	87.0	131.0
1960-61	3.809	3.401	4.584	89.3	134.8
1961-62	3.829	3.422	4.500	89.4	131.5
1962-63	3.799	3.471	4.614	91.4	132.9
1963-64	3.842	3.472	4.471	90.4	128.8
1964-65	3.835	3.481	4.577	90.8	131.5
1965-66	3.824	3.337	4.070	87.3	122.0
1966-67	3.819	3.423	4.599	89.6	134.4
1967-68	3.828	3.514	5.150	91.8	146.6
1968-69	3.825	3.273	4.053	85.6	123.8
1969-70	3.817	3.548	4.941	93.0	139.3
1970-71	3.813	3.565	4.957	93.5	139.0
1971-72	3.812	3.567	5.048	93.6	141.5
1972-73	3.805	3.555	5.188	93.4	145.9
1973-74	3.822	3.566	5.150	93.3	144.4
1974-75	3.820	3.519	4.842	92.1	137.6
1975-76	3.827	3.624	5.451	94.7	150.4
1976-77	3.829	3.646	5.282	95.2	144.9
1977-78	3.843	3.645	5.435	94.8	149.1
1978-79	3.843	3.650	5.522	95.0	151.3
1979-80	3.884	3.557	4.862	91.6	136.7
1980-81	3.839	3.602	5.462	93.8	151.6
1981-82	3.846	3.660	5.826	95.2	159.2
1982-83	3.842	3.600	5.306	93.7	147.4
1983-84	3.859	3.600	5.688	93.3	158.0
1984-85	3.857	3.616	5.512	93.8	152.4
1985-86	3.833	3.613	5.601	94.3	155.0
1986-87	3.821	3.622	5.662	94.8	156.3
1987-88	3.821	3.233	4.686	84.6	144.9
1988-89	3.827	3.564	6.012	93.1	168.7
1989-90	3.821	3.593	5.661	94.0	157.6
1990-91	3.792	3.575	5.919	94.3	165.6
1991-92	3.836	3.508	5.570	91.4	158.8
1992-93	3.800	3.492	5.853	91.9	167.6
1993-94	3.793	3.513	5.815	92.6	165.5
1994-95	3.753	3.558	5.985	94.8	168.2
1995-96	3.793	3.586	5.974	94.5	166.6
1996-97	3.803	3.615	6.075	95.1	168.0
1997-98	3.886	3.675	6.143	94.6	167.2
1998-99	3.807	3.692	6.214	97.0	168.3
1999-00	3.771	3.552	6.029	94.2	169.7
2000-01	3.758	3.526	6.115	93.8	173.4
2001-02	3.825	3.566	6.318	93.2	177.2
2002-03	3.865	3.700	6.450	95.7	174.3

Source: Various Statistical Abstracts of Haryana and GoH website

<http://agriharyana.nic.in/agricultureatglance.htm>, Accessed on Aug. 22, 2004.

Comment Data Between 1950-51 and 1959-60 are not comparable with rest of the years.

Haryana
NET AREA SOWN AS % OF CULTIVABLE AREA



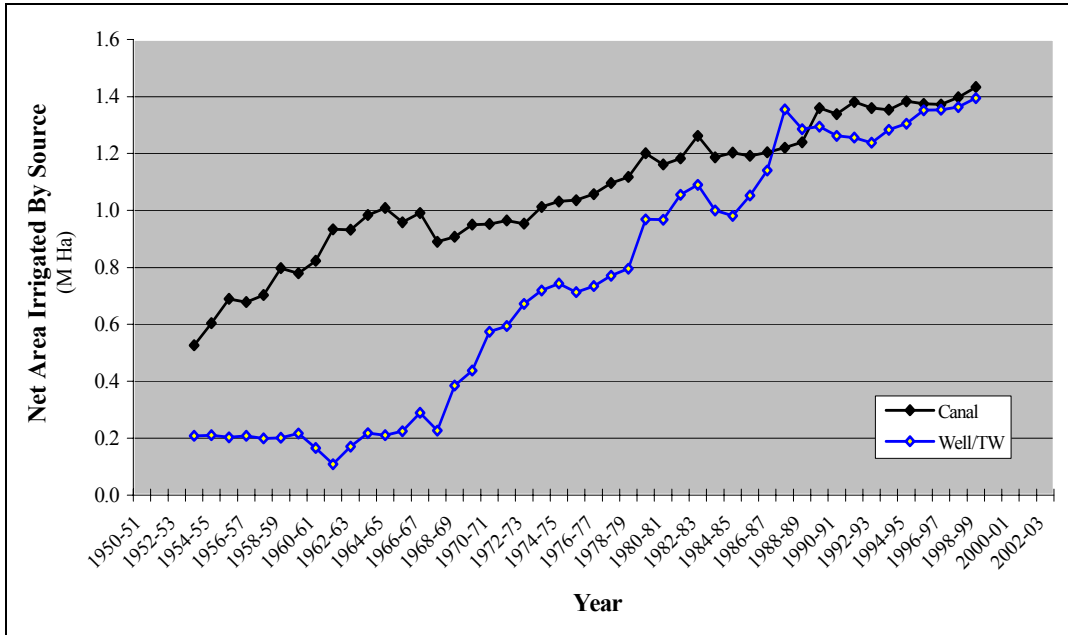
Haryana
NET AREA IRRIGATED AND GROSS AREA IRRIGATED
(Million Hectares)

Year	Net Area Irrigated by Source			Gross Area Irrigated	NAI as % to Net Area Sown	GAI as % to Gross Area sown
	Canal	Well/TW	Total (Net Irri)			
1950-51				0.66		30.0
1951-52				0.79		33.6
1952-53				0.80		32.0
1953-54	0.526	0.208	0.744	0.82	25.5	29.7
1954-55	0.604	0.211	0.825	0.96	26.6	25.5
1955-56	0.689	0.203	0.903	0.99	27.4	22.2
1956-57	0.677	0.208	0.894	0.97	27.5	23.5
1957-58	0.702	0.200	0.911	1.00	28.4	23.4
1958-59	0.797	0.201	0.890	1.05	27.4	22.4
1959-60	0.779	0.217	1.019	1.10		23.2
1960-61	0.823	0.166	1.007	1.21	29.6	26.3
1961-62	0.933	0.109	1.046	1.26	30.6	28.0
1962-63	0.932	0.170	1.109	1.36	32.0	29.5
1963-64	0.983	0.218	1.208	1.43	34.8	32.0
1964-65	1.009	0.211	1.225	1.43	35.2	31.1
1965-66	0.959	0.224	1.225	1.49	36.7	36.6
1966-67	0.991	0.289	1.293	1.74	37.8	37.7
1967-68	0.889	0.227	1.132	1.78	32.2	34.6
1968-69	0.907	0.385	1.312	1.86	40.1	46.0
1969-70	0.950	0.437	1.408	2.16	39.7	43.7
1970-71	0.952	0.574	1.532	2.23	43.0	45.0
1971-72	0.965	0.594	1.565	2.33	43.9	46.1
1972-73	0.953	0.672	1.632	2.48	45.9	47.7
1973-74	1.012	0.719	1.736	2.58	48.7	50.2
1974-75	1.031	0.743	1.779	2.60	50.6	53.6
1975-76	1.036	0.713	1.754	2.73	48.4	50.1
1976-77	1.057	0.734	1.798	2.70	49.3	51.1
1977-78	1.096	0.771	1.873	2.78	51.4	51.1
1978-79	1.117	0.795	1.917	2.98	52.5	53.9
1979-80	1.200	0.969	2.174	3.13	61.1	64.4
1980-81	1.161	0.967	2.134	3.31	59.2	60.6
1981-82	1.183	1.055	2.248	3.46	61.4	59.3
1982-83	1.262	1.090	2.356	3.56	65.4	67.1
1983-84	1.186	1.000	2.190	3.60	60.8	63.2
1984-85	1.203	0.981	2.189	3.50	60.5	63.6
1985-86	1.192	1.052	2.248	3.68	62.2	65.7
1986-87	1.204	1.140	2.348	3.91	64.8	69.1
1987-88	1.220	1.355	2.579	3.88	79.8	82.9
1988-89	1.239	1.286	2.532	4.07	71.0	67.8
1989-90	1.359	1.294	2.657	4.25	73.9	75.1
1990-91	1.338	1.262	2.600	4.24	72.7	71.6
1991-92	1.381	1.256	2.666	4.34	76.0	77.9
1992-93	1.359	1.238	2.628	4.47	75.3	76.4
1993-94	1.353	1.283	2.663	4.52	75.8	77.6
1994-95	1.383	1.304	2.719	4.60	76.4	76.8
1995-96	1.375	1.352	2.760	4.67	77.0	78.2
1996-97	1.372	1.353	2.766	4.79	76.5	78.8
1997-98	1.397	1.363	2.792	4.83	76.0	78.6
1998-99	1.433	1.395	2.842	5.04	77.0	81.1
1999-00			2.888		81.3	
2000-01			2.958		83.9	
2001-02			2.938		82.4	

Source: Various Statistical Abstracts of Haryana Government of Haryana website <http://agriharyana.nic.in/agricultureatglance.htm>, Accessed on Dec. 30, 2003

Comment: Data between 1950-51 and 1959-60 are not comparable with rest of the years.
"Other" source not listed but included in total Net Irrigated Area.

Haryana
NET AREA IRRIGATED BY SOURCE
 (Million Hectares)

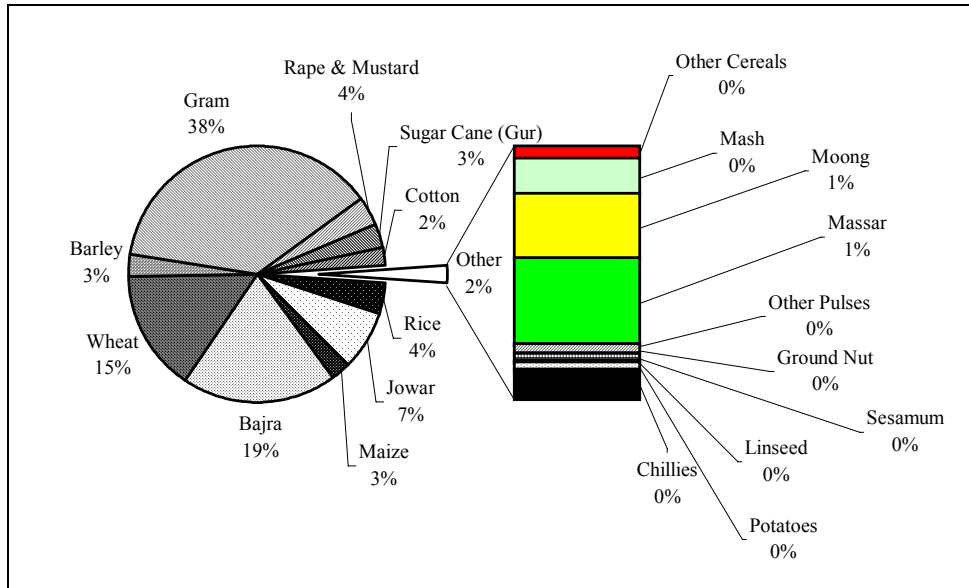


Haryana
DECADAL CROPPING PATTERN
(Area Sown 000 Ha)

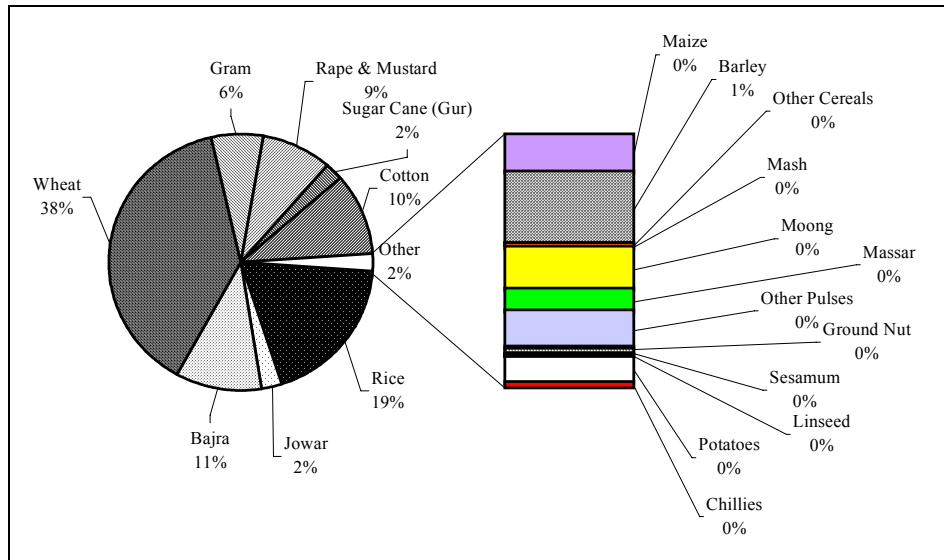
	Rice	Jowar	Maize	Bajra	Wheat	Barley	Gram	Rape & Mustard	Sugar Cane (Gur)	Cotton	Other Cereals	Mash	Moong	Massar	Other Pulses	Ground Nut	Sesamum	Linseed	Potatoes	Chillies
50-51	75	286	33	927	362	111	886	108	56	54	13	17.4	22.9	19.0	0.00	1.60	2.40	0.60	1.22	0.00
60-61	155	308	106	801	628	112	1543	152	130	93	5	12	21.8	29.3	0.00	3.10	2.40	0.80	2.27	9.60
66-67	192	270	87	893	743	182	1062	198	150	183	3	7.9	13.6	35.1	31.00	11.10	1.70	0.60	3.70	6.22
67-68	217	293	115	885	841	302	1160	246	121	241	2	11.5	38.3	41.3	45.00	14.50	1.70	0.60	3.30	13.95
70-71	269	207	114	880	1129	109	1063	130	156	193	0.9	8.9	22.5	26.8	37.50	10.40	1.80	0.50	4.60	9.59
80-81	484	136	71	871	1479	125	723	300	113	316	1.8	12.5	4.1	27.4	28.90	6.20	3.70	0.40	11.40	10.60
90-91	661	130	35	609	1850	51	649	474	148	490	2.7	3.4	10.7	18.3	60.30	2.60	6.10	0.10	10.50	5.00
98-99	1086	130	20	613	2188	36	357	498	128	583	0	2	21	11.0	18.00	1.00	3.00	0.00	14.00	2.00
00-01	1054	109	15	608	2355	44	125		143	555										
2002-03	906	113	16	515	2268	30	55		190	519										

Source: Various Statistical Abstracts of Haryana.
Government of Haryana website - http://agriharyana.nic.in/cropwisearea_area.htm, Accessed on Jan 9, 2004

Haryana
CROPPING PATTERN 1960-61
 (Less than 1% is shown as 'other')



Haryana
CROPPING PATTERN 1998-99
 (Less than 1% is shown as 'other')



Haryana
AREA PRODUCTION AND YIELD OF COTTON

Year	American			Desi			Total		
	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)	Area (000 Ha)	Production (000 MT)	Yield (Kg/Ha)
1950-51	2.00	0.36	180	52.00	9.50	183	54.00	9.86	183
1951-52	13.36	2.84	213	39.27	6.93	177	52.63	9.78	186
1952-53	21.86	5.87	268	25.91	3.91	151	47.77	9.78	205
1953-54	30.36	8.00	263	27.53	6.22	226	57.89	14.22	246
1954-55	55.47	15.11	272	29.15	6.40	220	84.62	21.51	254
1955-56	62.00	12.15	196	32.00	4.68	146	94.00	16.83	179
1956-57	91.09	23.65	260	28.34	5.87	207	119.43	29.51	247
1957-58	99.19	20.45	206	37.25	6.93	186	136.44	27.38	201
1958-59	80.57	16.00	199	36.03	6.40	178	116.60	22.40	192
1959-60	60.73	16.36	269	29.15	6.22	213	89.88	22.58	251
1960-61	54.00	13.80	257	39.00	8.85	227	93.00	22.65	244
1961-62	50.00	13.52	270	58.00	11.96	206	108.00	25.48	236
1962-63	56.00	14.11	252	62.00	18.04	291	118.00	32.15	272
1963-64	100.00	31.87	318	77.00	21.68	282	177.00	53.55	303
1964-65	101.00	31.54	312	74.00	20.00	270	175.00	51.54	295
1965-66	113.00	30.59	271	83.00	21.88	264	196.00	52.47	268
1966-67	81.00	24.18	300	102.00	27.59	289	183.00	51.77	283
1967-68	138.00	39.15	283	103.00	28.15	274	241.00	67.30	279
1968-69	125.00	38.74	310	87.00	21.96	253	212.00	60.70	286
1969-70	91.20	30.96	343	103.20	30.17	290	194.40	61.13	314
1970-71	88.60	32.04	359	104.80	31.50	299	193.40	63.54	329
1971-72	112.30	39.96	354	129.40	39.06	303	241.70	79.02	327
1972-73	116.10	36.90	321	141.60	39.24	276	257.70	76.14	295
1973-74	108.10	46.80	433	143.30	32.58	227	251.40	79.38	316
1974-75	130.00	43.18	332	116.70	33.49	286	246.70	76.67	311
1975-76	108.30	36.38	340	146.70	42.67	290	255.00	79.05	310
1976-77	115.40	42.16	366	128.20	39.10	305	243.60	81.26	334
1977-78	155.60	50.32	327	110.00	28.39	258	265.60	78.71	296
1978-79	176.80	76.50	435	108.30	25.67	233	285.10	102.17	358
1979-80	196.00	70.04	357	117.40	29.75	250	313.40	99.79	318
1980-81	211.60	81.60	387	104.60	27.71	264	316.20	109.31	346
1981-82	230.20	88.57	387	99.30	27.88	278	329.50	116.45	353
1982-83	276.50	107.78	391	120.90	35.02	289	397.40	142.80	359
1983-84	284.20	73.27	259	121.10	23.12	191	405.30	96.39	238
1984-85	220.20	85.00	388	74.40	18.36	247	294.60	103.36	351
1985-86	262.30	105.74	402	81.80	20.91	255	344.10	126.65	368
1986-87	303.50	131.75	433	77.20	21.76	286	380.70	153.51	403
1987-88	349.40	102.00	293	67.00	15.30	221	416.40	117.30	282
1988-89	361.50	126.99	351	71.60	16.83	237	433.10	143.82	332
1989-90	404.80	184.11	456	66.80	18.36	277	471.60	202.47	429
1990-91	421.60	177.14	421	69.00	19.21	278	490.60	196.35	400
1991-92	439.40	203.49	464	66.40	24.48	371	505.80	227.97	451
1992-93	469.90	217.77	463	62.80	22.10	352	532.70	239.87	450
1993-94	488.00	169.83	348	74.90	21.25	283	562.90	191.08	339
1994-95							556.00	233.07	419
1995-96	490.30	167.62	342	161.50	50.66	313	651.80	218.28	335
1996-97							653.00	256.19	392
1997-98	455.70	141.61	310	176.00	46.58	265	631.70	188.19	298
1998-99	387.00	109.82	284	196.00	38.76	198	583.00	148.58	255
1999-00							544.00	221.68	408
2000-01							555.00	235.11	424
2001-02							630.00	122.74	195
2002-03							519.00	176.46	340

Source: Various Statistical Abstracts of Haryana and Government of Haryana website
http://agriharyana.nic.in/cropwisearea_area.htm, http://agriharyana.nic.in/cropwisearea_production.htm and
http://agriharyana.nic.in/cropwisearea_yield.htm. D/L on Jan 9, 2004

Comment: Production and Yield are in terms of cleaned cotton.
 Data between 1951-52 to 54-55 and 1956-57 to 59-60 are not comparable with rest of the years.

Haryana
CONSUMPTION OF FERTILIZERS
 (Thousand Tons)

Year	N	P	K	Total
1963-64	7.8	0.3	0.0	8.2
1964-65	13.8	0.5	0.0	14.3
1965-66	13.2	0.4	0.0	13.6
1966-67	12.6	0.6	0.1	13.3
1967-68	30.2	1.7	0.5	32.5
1968-69	40.3	5.5	1.2	47.0
1969-70	47.0	5.1	1.8	53.9
1970-71	61.0	6.9	2.2	70.1
1971-72	73.4	6.3	2.4	82.1
1972-73	83.1	8.2	2.6	93.9
1973-74	94.1	16.5	4.5	115.0
1974-75	66.1	7.1	2.3	75.5
1975-76	86.3	8.3	2.3	96.9
1976-77	115.5	15.7	6.0	137.1
1977-78	150.2	28.7	9.3	188.1
1978-79	161.9	31.8	10.3	204.1
1979-80	174.5	30.2	10.7	215.4
1980-81	187.4	31.3	12.1	230.8
1981-82	208.7	32.0	10.8	251.6
1982-83	216.2	37.3	9.7	263.2
1983-84	259.5	53.0	13.7	326.3
1984-85	272.7	56.2	7.6	336.6
1985-86	296.4	69.6	6.2	372.2
1986-87	327.0	82.0	5.8	414.8
1987-88	300.7	88.3	4.9	393.9
1988-89	383.6	119.6	5.9	509.2
1989-90	402.6	129.1	3.8	535.5
1990-91	443.2	138.0	5.0	586.3
1991-92	470.4	161.6	5.1	637.2
1992-93	464.7	141.4	2.5	608.6
1993-94	522.9	148.4	0.4	671.7
1994-95	559.1	150.5	2.6	712.3
1995-96	587.0	133.6	3.2	723.8
1996-97	619.2	139.2	3.1	761.5
1997-98	649.9	181.8	3.8	835.5
1998-99	662.7	171.8	4.0	838.4
1999-00	670.4	226.2	5.2	901.8

Source: Various Statistical Abstracts of Haryana

Haryana
DETAILS OF DARK, GREY AND WHITE BLOCKS
 (On the basis of Ground Water Assessment As on April 1st, 1997)

Sr. No.	District	Number of blocks		
		Dark (Dev. > 85%)	Grey (Dev. 65-85%)	White (Dev. < 65%)
1	Ambala	2	1	-
2	Bhiwani	3	1	4
3	Faridabad	1	2	2
4	Gurgaon	5	1	3
5	Fatehabad	2		3
6	Hisar	-	2	5
7	Jind	2	-	5
8	Kurushetra	4	-	-
9	Kaithal	2	-	3
10	Karnal	6	-	-
11	Mahendragarh	5	-	-
12	Panchkula	1	1	2
13	Panipat	3	1	
14	Rewari	5		
15	Rohtak	-	-	5
16	Jhajjar	2	2	1
17	Sirsa	1	1	5
18	Sonepat	1	3	3
19	Yamuna Nagar	2	2	1
	Total	47	17	42

Source: Government of Haryana website: http://agriharyana.nic.in/gwc_dark.htm
 Accessed on Jan 9, 2004

Haryana
DISTRICTWISE WATERLOGGED AREAS (JUNE 2002)

District	Geographical Area (000 Ha)	Hilly area (000 Ha)	Area in Sq. KM under various depth range (mtrs.) June' 02			
			Fully Waterlogged (0 - 1.5)	Waterlogged (1.5 - 3)	Potential Waterlogged (3 - 10)	Safe area (>10)
Ambala	1596	3	22	210	1153	208
Bhiwani	4871	47	14	317	1562	2931
Faridabad	2105	88	-	45	1401	571
Fatehabad	2491	-	3	127	873	1488
Gurgaon	2750	177	12	101	1011	1449
Hisar	3860	-	68	243	2694	855
Jind	2736	-	4	134	1698	900
Jhajjar	1868	-	53	227	1493	95
Kurukshetra	1682	-	-	-	7	1675
Kaithal	2284	-	-	18	995	1271
Karnal	2471	-	-	-	1340	1131
Mahendragarh	1939	46	-	-	29	1864
Panchkula	789	353	-	-	215	221
Panipat	1250	-	-	-	741	509
Rewari	1559	23	-	-	335	1201
Rohtak	1668	-	21	311	1317	19
Sonepat	2261	-	23	187	1557	494
Sirsa	4276	-	17	165	1984	2110
Yamunanagar	1756	153	-	22	1128	453
Total	44212	890	237	2107	21933	19445

Source Government of Haryana website - http://agriharyana.nic.in/gwc_loggedarea.htm
Accessed on Jan. 9, 2004.

Note: This is the pre monsoon period when area under waterlogging is at its lowest.

Haryana
DISTRICTWISE AVERAGE DEPTH OF WATER
 During June 1974 and June 2002 (Mtrs)

District	Jun-74	Jun-02	Historical Fluctuation June 74 June, 02	Seasonal Fluctuation June 2002 Oct 2002
Ambala	5.79	7.23	-1.44	0.75
Bhiwani	21.24	16.5	4.74	-0.48
Faridabad	5.79	8.24	-2.45	0.46
Fatehabad	10.48	10.04	0.44	0.06
Gurgaon	6.04	13.18	-7.14	0.07
Hisar	15.47	7.14	8.33	-0.14
Jind	11.97	7.96	4.01	-0.37
Jhajjar	6.32	5.79	0.53	0.28
Kurukshetra	10.21	19.35	-9.14	-1.28
Kaithal	6.28	10.45	-4.17	-1.43
Karnal	5.72	9.52	-4.2	0.05
Mahendragarh	16.11	25.73	-9.62	-7.36
Panchkula	7.58	13.04	-5.46	0.78
Panipat	4.56	11.27	-6.71	-0.41
Rewari	11.75	16.28	-4.53	-0.19
Rohtak	6.64	4.84	1.8	-0.02
Sonepat	4.68	6.87	-2.19	0.29
Sirsa	17.88	10.33	7.55	-0.28
Yamunanagar	6.26	8.75	-2.49	1.11
Total	9.51	11.21	-1.7	-0.42

Source: Government of Haryana website http://agriharyana.nic.in/gwc_fluctuations.htm
 Accessed on Jan 9, 2004

Haryana
ANNUAL RAINFALL BY DISTRICTS
(in cms)

District	1980	1985	1990	1995	1997	1998
Ambala	96.7	109.9	156.1	165.9	93	152.2
Panchkula	-	-	-	-	135	149.6
Yamunanagar	-	-	145.6	148	116.3	147.3
Kurukshetra	60	52.9	55.9	102.4	80.4	137.6
Kaithal	-	-	90.8	77.7	67.5	70.6
Karnal	83.5	44.2	88.5	74.3	59.3	74.5
Panipat	-	-	53.7	87.4	76.5	65.1
Sonipat	101.4	60.1	69.4	91.5	68.3	60.2
Rohtak	46.9	59.3	55.1	84.9	54.9	59.2
Jhajjar	-	-	-	-	19.3	52.8
Faridabad	52.8	59.3	63.9	59.9	59.8	62.9
Gurgaon	54.1	78.3	56.6	73.2	63	63.5
Rewari	-	-	54.1	95.3	66.3	64.9
Mahendragarh	54.6	39.3	55.6	86	67.1	40.7
Bhiwani	30.1	36.6	49.7	66	48.3	38.6
Jind	31.8	56.2	47.9	99.6	72.5	83.5
Hisar	29.3	35.2	41.7	47.3	49	37.4
Fatehabad	-	-	-	-	46.4	68.6
Sirsa	21.3	62.8	46.2	37.1	44.9	31
Haryana	662.5	694.1	1130.8	1396.5	1287.8	1460.2

Source Envis Node For Water Resource Management website
http://www.water-mgmt.com/en/database_haryana3.htm, Accessed on Feb 2nd, 2004

Ganga Nagar & Hanumangarh Districts (Rajasthan)

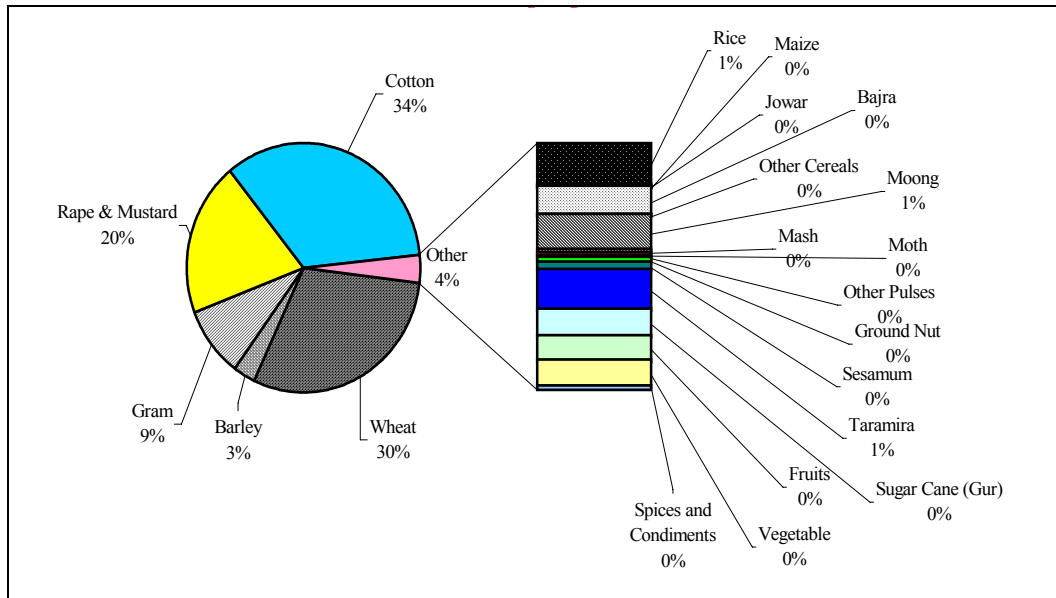
CROPPING PATTERN (2001-02)

Area Sown (Hectares)

	Rice	Jowar	Maize	Bajra	Wheat	Barley	Other Cereals	Gram	Moong	Mash	Moth	Other Pulses	Rape & Mustard	Ground Nut	Sesamum	Taramira	Cotton	Sugar Cane (Gur)	Fruits	Vegetable	Spices and Condiments
G'nagar	4588	196	71	2965	218401	21765	0	65766	3765	346	279	226	145463	527	728	4254	247275	2843	2582	2766	221
H'garh	33537	9	2	51854	202958	15801	0	77358	1529	155	17576	103	45286	79	2668	1550	165145	64	255	876	97

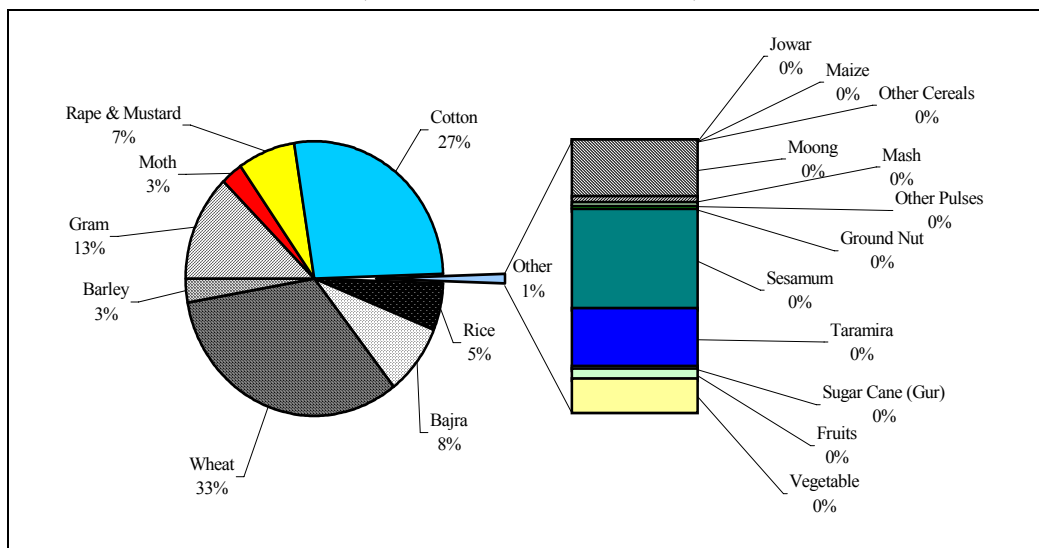
Source SA of Rajasthan 2001-02

Ganga Nagar
CROPPING PATTERN 2000-01
 (Less than 1% is shown as 'other')



Source : SA of Rajasthan 2001-02

Hanumangarh
CROPPING PATTERN 2000-01
 (Less than 1% is shown as 'other')



Source : SA of Rajasthan 2001-02

MAP - 1

INDUS BASIN RIVERS



LEGEND



International Boundary



State Boundary



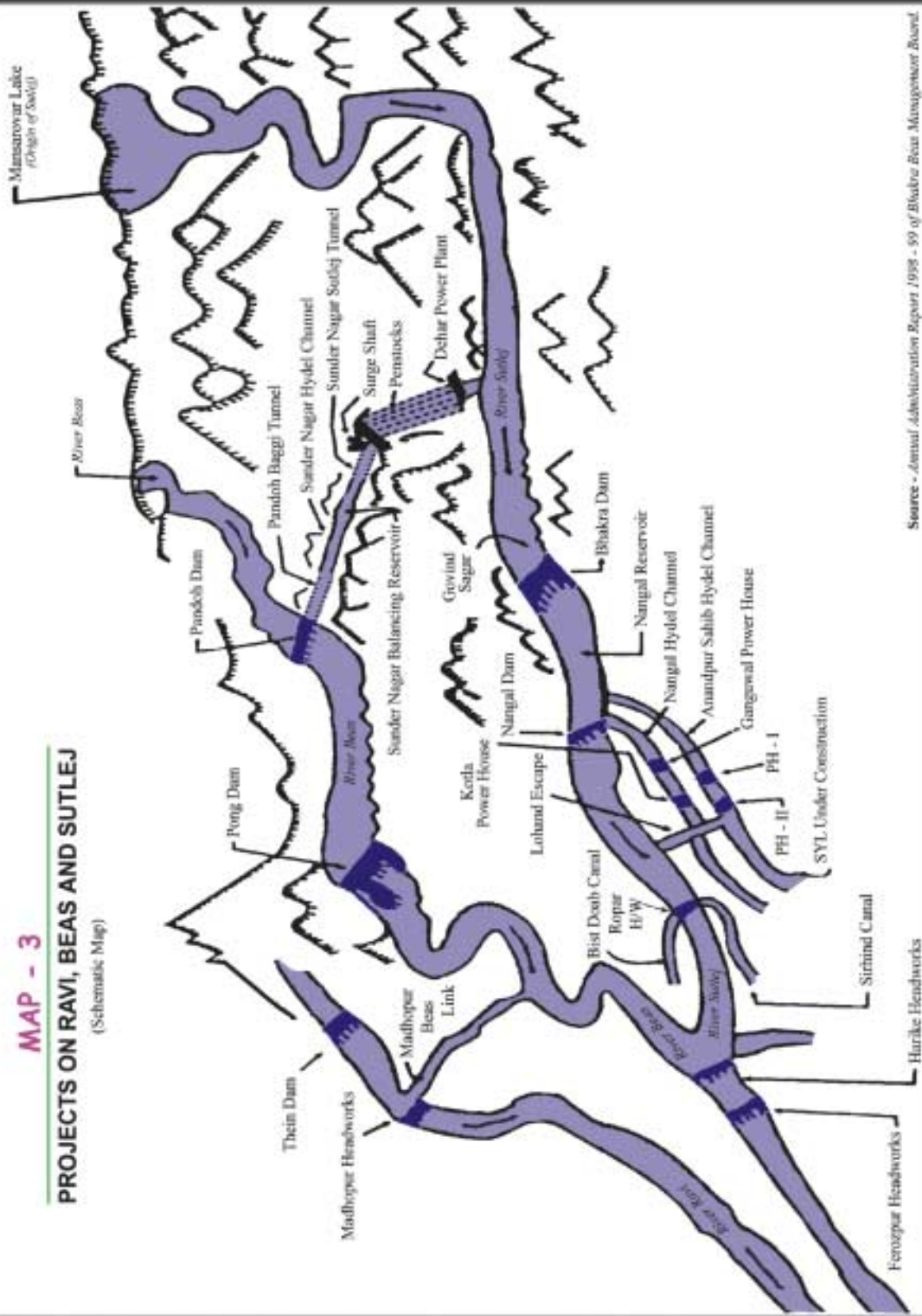
Rivers

Maps are meant to be indicative only.

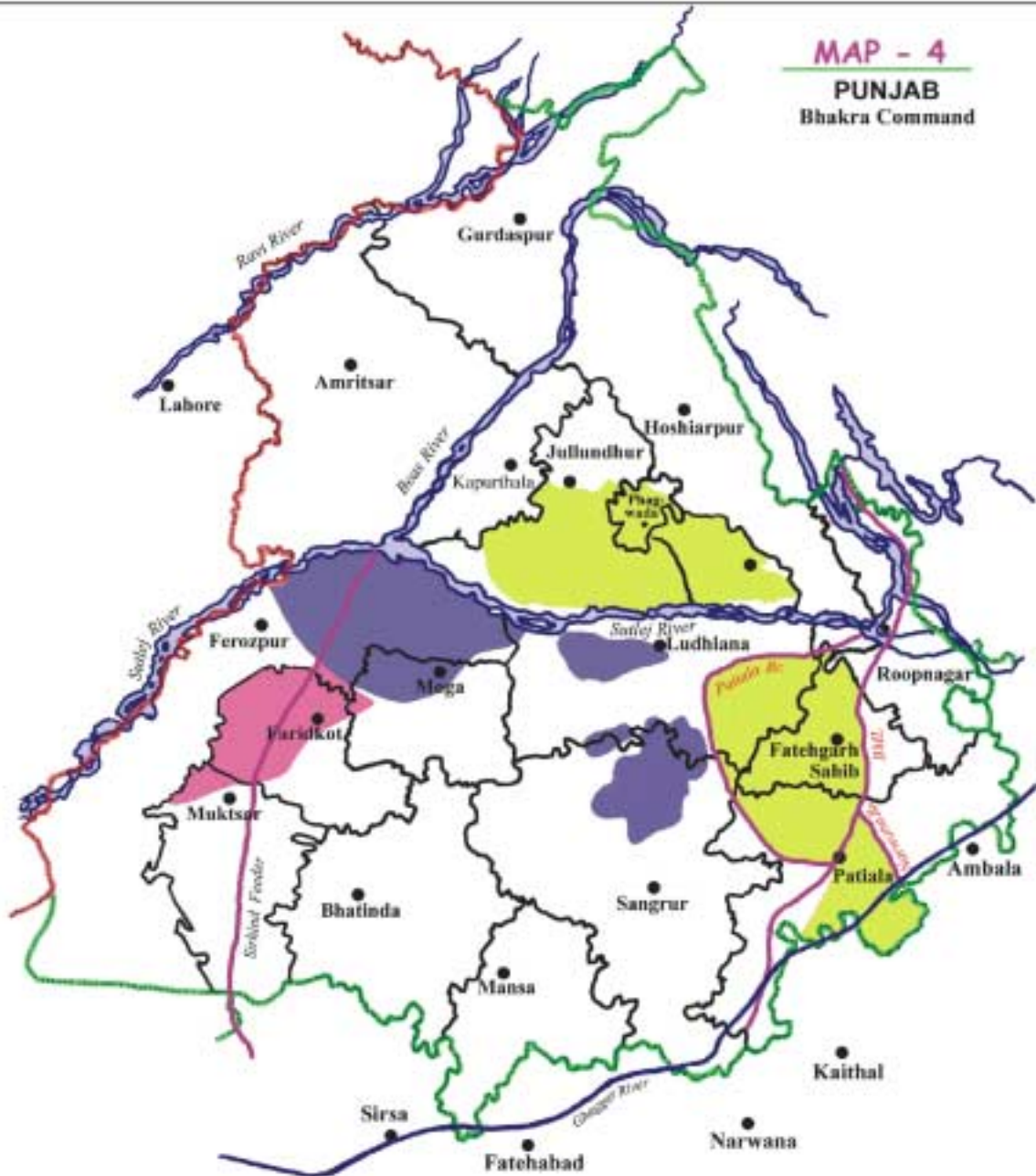
MAP - 3

PROJECTS ON RAVI, BEAS AND SUTLEJ




(Schematic Map)








MAP - 4
PUNJAB
 Bhakra Command



LEGEND

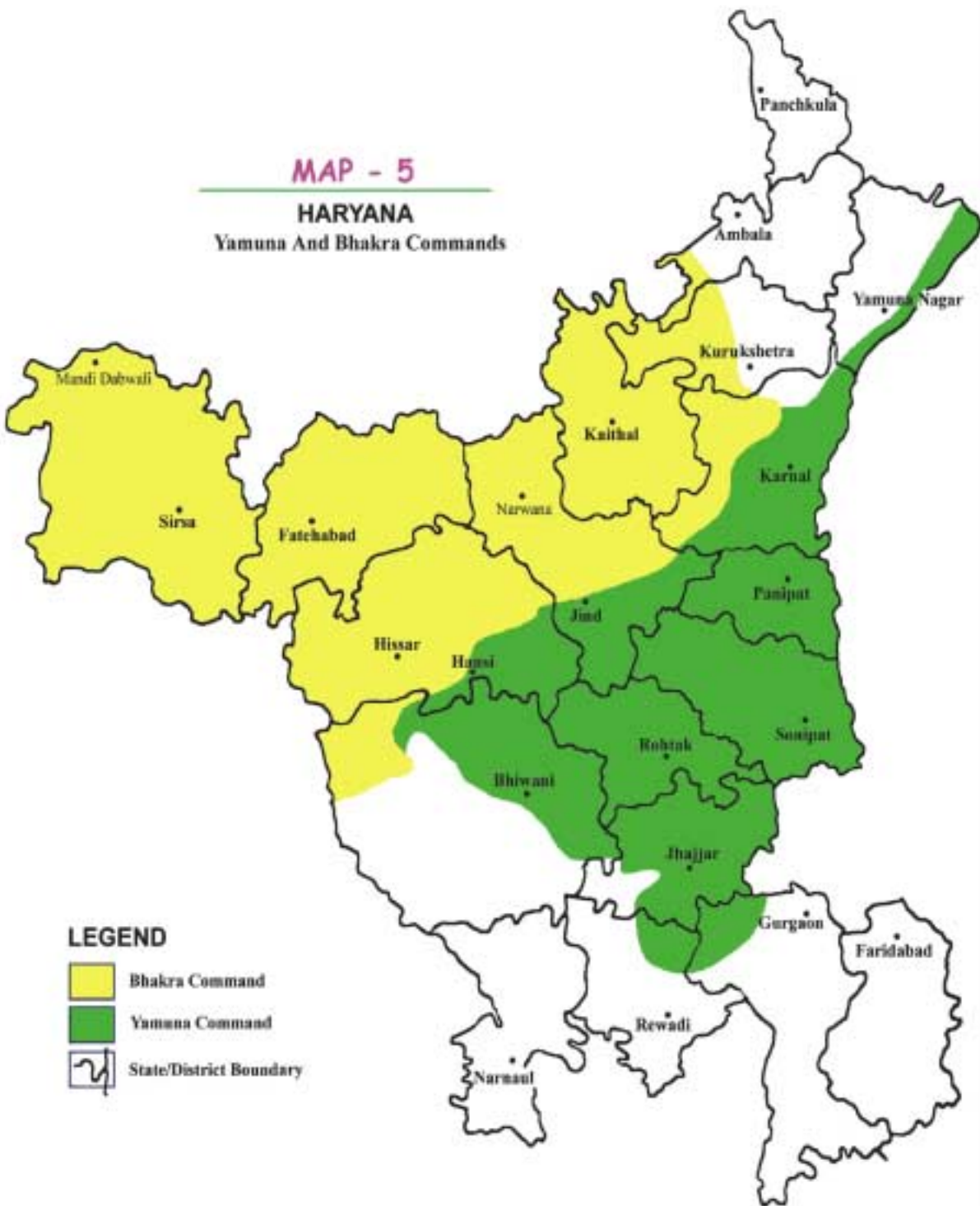
-  Restricted Perennial Irrigation (Zone -1)
-  Non Perennial Irrigation (Zone -2)
-  Perennial Irrigation (Zone -3)

-  International Boundary
-  State Boundary
-  District Boundary
-  Rivers
-  Canals

Maps are meant to be indicative only

MAP - 5

HARYANA
Yamuna And Bhakra Commands



LEGEND

-  Bhakra Command
-  Yamuna Command
-  State/District Boundary

MAP - 6

RAJASTHAN
Bhakra Command



LEGEND

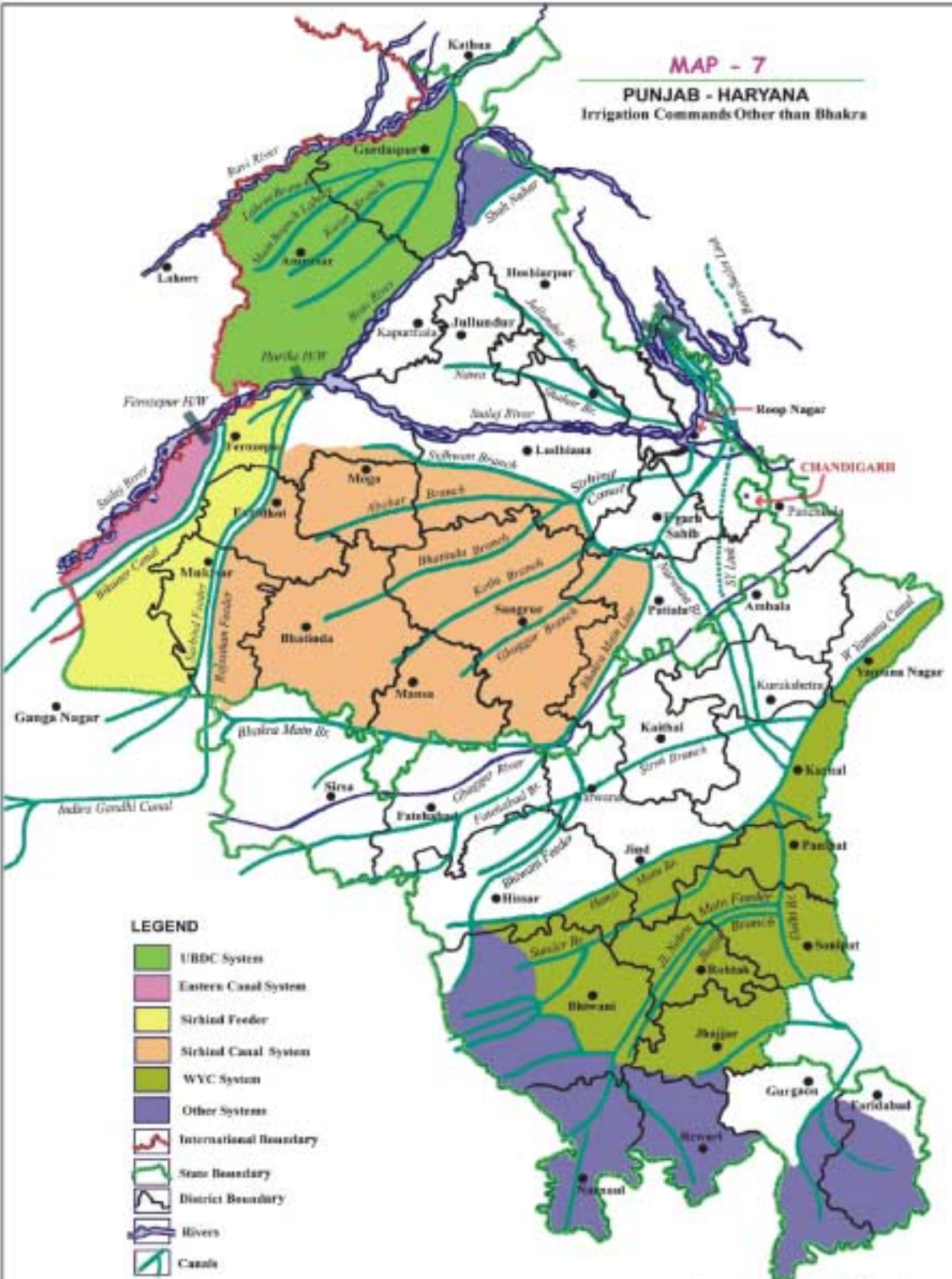
-  Bhakra Command
-  Canals
-  International Boundary

-  District/State Boundary

Maps are meant to be indicative only.

MAP - 7

PUNJAB - HARYANA
Irrigation Commands Other than Bhakra



LEGEND

- UBDC System
- Eastern Canal System
- Sirhind Feeder
- Sirhind Canal System
- WYC System
- Other Systems
- International Boundary
- State Boundary
- District Boundary
- Rivers
- Canals

Maps are meant to be indicative only

MAP - 8

PUNJAB AND HARYANA POLITICAL

PUNJAB



HARYANA





Land affected by waterlogging and salinisation near village Lamba Khedi, Taluka Narwana, District Jind, Haryana. The damage to the crop can be seen as only part of the sown crop has come up. Salt encrustation can be seen in the background.



Land affected by waterlogging at village Lohgad, Dist. Sirsa, Haryana.



Land with heavy salt encrustation on the top, At Directorate Farm, attached to Hissar Agricultural University, Hissar, Haryana.



Failed crop on waterlogged land near Lohgad, Dist. Sirsa, Haryana



A drain *nallah* to control waterlogging, just outside Malout town, district Muktsar, Punjab. The *nallah* is choked with overgrowth of hyacinth. In places, the *nallah* is also used for disposal of sewage, effluents etc.



Seesam trees which have blackened and died due to the waterlogging problem.



Dampness along the wall at a house in Malout town, District Muktsar, Punjab leading to peeling off of the paint and plaster. Waterlogging has impacted about 70% of the houses in this town, and houses require repair at regular intervals.



A stretch of the National Highway No. 10 between Mandi Dabwali, Haryana and Malout, Dist Muktasar, Punjab. The road is being raised and repaired as it has suffered extensive damage due to waterlogging.



Chilli crop on land that previously used to grow paddy. In Punjab, attempts to diversify crops is becoming very difficult as other crops are difficult to raise on lands where paddy is grown.

STUDY TEAM

This Report has been authored by *Shripad Dharmadhikary*, who has also been the lead researcher and coordinator of the study. The research team consisted of *Swathi Sheshadri* and *Rehmat* (both for part of duration of the study).

Swathi Sheshadri completed her Master of Arts in Social Work (MSW) in May 1999 from the Tata Institute of Social Sciences (TISS), Mumbai with specialisation in Medical and Psychiatric Social Work. She has also completed her Master of Commerce (M.Com) from Sydenham College of Commerce and Economics, Mumbai in August 1997. Before joining Manthan she worked with various organisations in the field of finance and community and mental health. She was with Manthan from its inception in October 2001 till June 2003. In Manthan, apart from the Bhakra study, she was also involved in monitoring water privatisation issues, especially the General Agreement on Trade in Services (GATS). She is currently with the National Youth Foundation in Bangalore.

Rehmat is from a small village Chikhald, District Dhar, Madhya Pradesh, on the banks of the Narmada. His village, home and land are affected by submergence due the Sardar Sarovar project. He is a graduate (B.Sc.) and worked as a full time activist with the Narmada Bachao Andolan for 12 years. Subsequently trained in planning, designing and constructing water harvesting projects, he worked on such projects in a number of places before joining Manthan. He was with Manthan from July 2003 till Dec. 2003, and has joined again from Jan. 2005. He has been involved with the Bhakra study both, formally, when he has been a part of Manthan, and informally when he has not been a part of the Manthan team. Apart from the Bhakra study, he is involved with the issues of water privatisation and continues to work on implementation of rural water harvesting projects.

Shripad Dharmadhikary completed his graduation in 1985 with a Bachelor of Technology (B.Tech) degree from the Indian Institute of Technology (IIT) Bombay. He worked for a couple of years with industry, and then for a year with a research institute studying development policy issues. He was a full time activist of the Narmada Bachao Andolan for 12 years, before setting up the Manthan Adhyayan Kendra in 2001. Manthan is a centre set up to research, monitor and analyse water and energy issues. He is the coordinator of the centre.

Nilesh Sanotia and **Manish Vyas**, both with Manthan, helped with inputting, managing and cross checking the data. **Himanshu Upadhaya**, on a month's deputation from SANDRP, contributed with some important research input. **Mukesh Jat**, who was with Manthan also assisted with parts of the study.

UNRAVELLING



B H A K R A

is the report of a study of the Bhakra Nangal project carried out by Manthan Adhyayan Kendra. This study was carried out over three years from December 2001 to December 2004.

The Bhakra Nangal project has become a legend in India. It is accorded overwhelming, at times the sole credit for rescuing India from hunger and famine, for making India self-sufficient in foodgrains production, for making Punjab and Haryana highly prosperous and surplus states.

Forty years after it was completed, the project continues to be used as one of the main arguments in justifying new large dam projects in the country. Indeed, "What would be the situation without the Bhakra project?" is a question that it used less as a question than as an answer, as an argument, as a justification.

However, there have been few studies of the precise role played by the project. This study examines the reality behind these perceptions related to the Bhakra project. The study attempts to look at the broad developmental impacts of the project, in particular its impact and contribution to food security in the country.

