

CHAPTER III

Socio-Economic and Administrative Development

AN OVERVIEW

The social, economic and administrative indices provide an overview of the development scenario of a state. This chapter attempts to assess the nature and extent of development in the state of Jammu and Kashmir with reference to these indices. Here the term 'development' is used to denote social and economic indicators which determine the quality of life of the people. Jammu and Kashmir has the characteristics of a backward economic region. The chief characteristics of the state are the predominance of the agricultural sector, low degree of urbanization, inadequately developed infrastructure, widespread illiteracy, high birth rates and low levels of investment. The state ranks among one of the bottom-line states with respect to socio-economic development indicators like literacy rate, infant mortality rate, death rate, birth rate, status of children and women, power consumption, industrial and infrastructure development. Though the number of people below poverty line is only 3.48 per cent (Planning Commission estimate), this does not reflect the progress of the state in terms of main indicators of development because majority of the people have basic requirements like nutritious food, house and cloth.

The per capita annual income of the state was Rs 11,591 in 1989-99 at current prices, which is double that of the per capita annual income of Bihar and half of that of Maharashtra. Nearly 80 per cent of the population of the state lives in the rural areas. Agriculture and allied activities employ 70 per cent of the work force and contribute 60 per cent of the state income. Only a small section of workers is employed in the secondary and tertiary sector. This chapter is divided into three sections. The first section deals with economic development and economic infrastructure; the second with social development and social infrastructure; and the third section deals with administrative development. All the sections are further divided into subsections. The following is a brief profile of the three sections which are subsequently discussed in detail.

SECTION 1

This section examines indicators like agriculture and allied activities, irrigation, industry, labour and employment and infrastructure.

Agriculture

Agriculture and its allied activities are the predominant sector of the economy of Jammu and Kashmir. The land holding pattern is an important predetermining factor of economic and social development. According to the 1995 Agriculture Census, the average land holding is 0.73 hectare. The only state in India with lesser land holding than Jammu and Kashmir is Kerala (0.33 ha). The number of agricultural land holdings went up after land reform, a positive indicator of development. Out of the total geographical area of 2, 22, 236 km² lakh hectare, 40.94 per cent was the gross cropped area including the net sown area and area sown more than once. The net area sown was 30.47 per cent, fallow land accounted for 4.30 per cent and area under forest formed 27.23 per cent. Land not available for cultivation was 29.29 per cent.¹ Allied activities of the agriculture sector like dairy development, fisheries, livestock and sericulture are also dealt with in this sector.

Industry

In spite of a large natural and human resource base, the state lags behind in industrial development. However, due to environmental factors and its geographical location, setting up of large manufacturing industries with a huge capital base is not possible, although many small and medium-scale industries have come up. According to Industrial Statistics of Jammu and Kashmir, 2000-01 there were 42,808 industrial estates in the state in the medium and small-sector with an employment of 1,87,399. The industrial base of Jammu and Kashmir consists mainly of hosiery and basic metal products and wood and food product industries, which contribute a major percentage of total industrial output in the registered manufacturing sector. The industrial backwardness of the state is reflected by the fact that the consumption of electricity is as low as 460 Kwh.

Economic Infrastructure

The economic infrastructure, to a large extent, is the basis on which the economic and social development rests. The power sector, roads and transport and

1. *Source:* Government of J & K, Directorate of Economics and Statistics.

telecommunication come under economic infrastructure. Jammu and Kashmir possesses immense potential for development of the power sector (based on hydel and solar), but the progress of this sector in the state has not been on a scale commensurate with the possibilities. The total installed capacity in 2000-01 was 537.76 MW and total generation in the same year was 580.01 MKwh. Besides, Uri and Salal as NHPC projects have been commissioned and are generating power. Total units sold to consumers in 2000-01 were 3397 MKwh. In terms of per capita consumption of electricity (Kwh) in 1998-99, Jammu and Kashmir stood at 12th position from the bottom at 255 MW. Inadequate infrastructure has hampered the growth of productive sectors in the state. In terms of road length per 1000 sq. km in 1996-97, it is seen that the Jammu and Kashmir figure is the lowest (127/1000 sq km) as compared to Himachal Pradesh (542/1000 sq km) and Assam (872/1000 sq km). The road length for 2000-01 is State PWD 13660 sq. km, other Departments (including BRO) 20,332 sq. km (Digest of Statistics, 2000-2001). The state also has the lowest figure (0.40/1000 sq km) for railways.

SECTION 2

This section deals with all the activities which affect the social life of the people. The social infrastructure comprising facilities for health and education, women and child development and urban development has been discussed in detail.

The social infrastructure of Jammu and Kashmir falls behind most of the developed states in India. Taking education and health as the indicators for social infrastructure, one finds that in 1998-99 there were 10515 primary schools, 3507 middle schools and 1466 high and higher secondary schools, whereas the corresponding numbers in the rest of India were quite high.² This section also discusses the health care, number of hospital and dispensaries per lakh population.

The social indicators here are literacy rate, infant mortality rate, death rate, birth rate, status of children and women and level of poverty and rural development. In terms of literacy, Jammu and Kashmir ranks third from bottom at 54.46 per cent.³ The states with a lower literacy rate than Jammu and Kashmir are Bihar (47.53 per cent) and Jharkand (54.15 per cent). Crude birth rate per 1000 and death rate per 1000 population during 1999-2000 was 13.27 per cent and 3.03 per cent respectively, second highest from the bottom.

2. *Source*: Education Department, Annual Report, Govt. of J & K, 2000-01.

3. *Source*: Govt. of Jammu and Kashmir, Digest of Statistics, 2000-01.

SECTION 3

This section deals with the administrative aspect of development. It attempts to analyze major rural development programmes introduced in the state from time to time. Government and its policies being instrumental in the development of a state, different government policies in respect of poverty eradication and rural development and implementing bodies like the panchayati raj plus the need for good governance have been dealt in detail.

Before delving into the details of each section to develop infrastructure, employment generation and sustained economic development it would be essential to take note of the Prime Minister's announcement for specific development programmes to ensure proper economic development of the state.

Prime Minister's Jammu & Kashmir Package For Employment, Development, Relief and Security

Prime Minister Shri Atal Bihari Vajpayee, at the end of his three-day visit (21st to 23rd May 2002) to Jammu & Kashmir, announced the following comprehensive package of Rs. 6,165 crore covering various aspects of development and security, with a thrust on generation of new employment opportunities for the youth of Jammu & Kashmir and relief for migrants affected by militancy and cross-border shelling.

1. Ministry of Railways

- (a) The 287-km Udhampur-Srinagar-Baramulla rail line will be completed within five years at a cost of **Rs.3, 600 crore**. This railway line is vital for Jammu & Kashmir from the point of view of acceleration of its socio-economic development, promoting national integration and strengthening India's security infrastructure. The work of the railway line is divided into three sections and the tentative fund required is also different as can be seen from the following table.

Section	Funds required in Crores				
	2002-03	2003-04	2004-05	2005-06	2006-07
Udhampur- Katra	20	25	27	0	0
Katra - Qazigund	10	400	850	850	890
Qazigund- Srinagar- Baramulla	200	150	150	150	150
Total	300	655	1097	1000	1040

The work for the first and last section has already been taken up. No work has yet been taken up in the intermediate portion i.e. between Katra and Qazigund. This section is treacherous and will involve heavy tunneling for about 80 km length out of total of 140 km. The bridging in this portion will also be a difficult task. At present a survey is being conducted to work out the details involved in the construction of the section.

The project will be completed and the first train will roll into the Kashmir Valley before August 15, 2007. As a first step, this year's provision is being increased to Rs. 400 crore. Over the next five years, this will require Rs.1500 crores additional fund over previously projected requirement and this additionally will be provided.

- (b) The Jammu Tawi - Jalandhar Line will be doubled within the next five years at a cost of **Rs.386 crore**. It also involves the construction of a number of important bridges. The tentative requirement of funds for the project is expected to be as under:

Year	Fund Required (in crores)
2002-03	19
2003-04	100
2004-05	100
2005-06	110
2006-07	57

Rs. 19.21 crores have been allocated for 2002-03.

2. Border Roads Organisation (Ministry of Defence) and Ministry of Surface Transport

- (a) Nimu Zangal-Padam-Darcha Road (292 kms) linking to Manali-Sarchu Road will be completed over the next four years at a cost of **Rs.195 crore**.
- (b) The above road would be a part of another ambitious project - namely, the all-weather 474-km road to Leh via Manali, including construction of the Rohtang Tunnel. This road, which passes through four high-altitude mountain passes, would be completed before 2010 at a cost of **Rs.1335 crore**.
- (c) In addition, the Prime Minister also announced the Government's decision to advance completion of a major road sector in the state. The construction of the road from Batote to Kistwar - Sinthan Pass - Khanabal, part of which has been declared National Highway 1-B by the Ministry of Surface Transport, would be

speeded up by Border Road Development Board (BRDB). It will now be completed by 2007, as against the earlier deadline of 2013.

3. Ministry of Textiles

Jammu & Kashmir's traditional cottage industries of Wool, Pashmina, Sericulture, Handicrafts, and Carpet Weaving enjoy a great reputation. They also provide employment to a large number of artisans and craftsmen.

The Ministry of Textiles will provide **Rs.70 crore** over five years for further developing this important sector. The programme will also focus on revival of exportable tweed and Kashmir's famous Kani Shawl. The financial requirements for developing the different sectors of the cottage industry is as under:

Technology Mission for Wool	Rs. 12 crore
Development of Pashmina	Rs. 8 crore
Traditional Handicraft Development	Rs. 42.40 crores
Development of Sericulture and Silk Industries	Rs. 10.06 crores
Development of Wool (Tweed) and woolen Design and Development Centre	Rs. 10 crores
Integrated Project for development of Kani Jamarwal Shawls	Rs. 5 crores

4. Ministry of Agriculture

The package contains the following two programmes in agriculture, which sustains the livelihood of many people in the state.

- Technology Mission Horticulture for J & K for **Rs.100 crore** over 5 years which could be coordinated with the Agri-Export Zones for Apples and Walnuts being developed by the Ministry of Commerce. For Apples the sanction is Rs. 82.43 crores and for Walnuts Rs. 36.93 crores.
- Eco Restoration of Degraded Catchments of Chenab, Jhelum & Shivaliks in J&K using participatory watershed approach. A tentative **Rs.100 crore** is the budget for 5 years.

5. Planning Commission

The Border Area Development Programme Fund for J&K will be increased to **Rs.500 crore** over the next five years (Rs.100 crore per year). Half of this amount will be made available directly to District Rural Development Agencies (DRDAs),

with focus on taking up economic / and Infrastructure development programmes in the Border.

6. Ministry of Home Affairs

Two India Reserve Battalions (IRB) will be raised over the next two years - one in 2002-03 and the other in 2003-04 - at a cost of **Rs. 26 crore**,

Rs. 25 crore will be provided over the next five years (Rs. 5 crore per year) for Incentive Schemes for 4000 police personnel who are members of SOG (Special Operations Group).

Rs. 5 crore will be provided over 5 years for better training of and weaponry to the J & K Volunteer Force (elite group of SPOs). The Government has decided to increase the ex gratia payable to the next of kin of SPOs killed in action against terrorists from Rs.1.25 lakhs to Rs.2 lakhs per person.

7. Village Defence Committees (VDCs)

Village Defence Committees (VDCs) have proved to be very useful in supplementing the efforts of the security forces in counter-terrorism and counter-infiltration operations. VDCs will be provided with better weaponry. They will also be given higher allowance on a selective basis.

8. National Defence Fund

(a) **Rs.10 crore** will be provided for provision of new tents and common civic amenities for Border Migrants in J & K. Of this amount, Rs. 5 crore will be released immediately.

(b) **Rs. 8 crore** will be provided for the Police Welfare Fund of J & K Police this year. This will be used for upgrading police hospitals for treatment of police personnel wounded in terrorist attacks; establishment of a Rehabilitation Centre for Widows of police personnel killed by terrorists; Schools for orphans of police personnel killed by terrorists.

9. Enhancement of Assistance to Migrants For Border Migrants

A total of **Rs. 6,165 crore** has been sanctioned against this.

A. For Border Migrants

Ration

Provision of free foodgrains will be increased from 9 kg. per head per month to 11 kg per head per month.

Financial Assistance

- (a) This will be increased from Rs.200 per person per month to Rs.400 per person per month limited to Rs-1600 per family per month
- (b) Old Tents will be replaced with new ones and adequate tents will be provided with assistance from the National Defence Fund, to all eligible migrants.
- (c) Assistance of Rs. 200 per animal per month to each animal-rearing family.

B. For Kashmiri Migrants

For Kashmiri Migrants, the upper limit of financial assistance per family will be increased from Rs.2400 per month to Rs.3000 per family per month, with the same scale per family member per month.

A. Economic Sectors

1. AGRICULTURE

INTRODUCTION

Agriculture is the predominant sector in the economy of Jammu and Kashmir. Directly and indirectly, it supports about 80 per cent of the population besides contributing nearly 60 per cent of the state revenue, which adequately explains the over-dependency of the population on agriculture. The overall economic growth of the state depends largely on the progress of the agricultural sector, the development of which becomes even more important in the context of the very nominal progress it has made in the secondary sectors. With the introduction of planned development in the state during 1951-56, production of foodgrains and fruits has increased considerably. During 1998-99, the state produced 15.50 lakh quintals of foodgrains against 4.53 lakh quintal in 1950-51. Of this, Kashmir region contributed 27.20 per cent, Jammu region 72.14 per cent and Ladakh and Kargil region 0.66 per cent.

Jammu and Kashmir is divided into three agro-climatic zones: Cold arid desert areas of Ladakh, temperate Kashmir Valley and the humid sub-tropical region of Jammu. Each has its own specific geo-climatic condition which determines the cropping pattern and productivity profile. In Jammu province, a small portion of the land lies in the plains along the borders of Punjab while the rest of the area is hilly. As per the Agricultural Census 1994-95, Jammu region dominates both in maize and wheat production. About 67 per cent of the area is under maize and wheat production with the production of 21.25q/ha maize and 15.36 q/ha wheat. This region contributes 79.56 per cent and 95.69 per cent of total production of these two cereals respectively. Even though the yield is not high, the region makes appreciable contribution to the production of groups of cereals classified as 'other cereals and millets'.

The second agro-climatic zone is Kashmir, also known as 'cultivator's paradise'. The region practically depends on irrigation, which is easily available. A large area of level land has alluvial soil. Extensive elevated plateaus of the alluvial or lacustrine material (locally called *Karewas*) also exist in the Kashmir valley. These *Karewas* are productive only in the face of sufficient rainfall or adequate irrigation facilities. Rice is the chief crop of this zone, followed by maize, barley and wheat. According to the Census 1994-95, the Kashmir region accounted for 61 per cent of total cultivable land under rice with the highest yield of 26.13 q/ha as compared to

approximately 15.96 q/ha in the Jammu region. By and large, the soils are well suited for rice cultivation and 90 per cent of the area under rice is irrigated. This region alone contributes more than 74 per cent of total rice produced in the state.

Ladakh zone is endowed with bare rocky mountains and bare gravel slopes. Villages are located near pockets of land with level ground and irrigation facilities, where cultivation is viable. In this region, barley is the major cereal crop followed by summer wheat. Millets and wheat rank second in importance and are grown in the warmer belt of the region.

According to Agriculture Census 1994-95, the gross cultivated area under foodgrain crops is 64.12 per cent of which barley occupies 44.23 per cent and wheat 22.64 per cent. Fruits and vegetables occupy 2.18 and 0.35 per cent respectively.

The physical and climatic conditions act as inhibiting factors in some parts of the state. Further, the extremely small size of holding (average is 0.73 ha) and absence of further scope for extension of cultivation makes it imperative to put agricultural land to optimum use so that the limited land yields the maximum. This could be possible through the judicious application of modern technology adapted to local conditions.

The disadvantage of limited land could be partially overcome through increasing the area under double cropping and by introducing a short-duration *rabi* crop in the valley, which has so far been growing only one crop a year.

It is essential to exploit the potential of irrigation in the state. In the mean time, other schemes consisting of new *khuls*, wells, pumping sets and renovation and repair of *zamindari khuls* should be given due attention.

Apart from this, the state legislation for agriculture has also contributed to the slow growth of agriculture in the state. There are two legislations that restrict the growth of agriculture and horticulture in the state, viz., (a) Conversion Act, which restricts the cultivator from converting irrigated land into orchard, and (b) Kuth Act, which restricts the cultivators from growing wild trees having medicinal value as this hampers the growth of some areas.

Once these aspects are taken care of, a major breakthrough could come through the adaptation of modern technology in the form of high-yielding varieties and large input of fertilizers. A detailed analysis of the existing state of agriculture and its development potential, as well as the implication of the government programme, is described below.

LAND USE PATTERN

The total geographical area of the state is 2, 22, 236 km². Net sown area accounts for maximum area under a particular land use type, followed by forest land put to non- agricultural uses, barren land and permanent pastures and other grazing land in the state (Table III.1). Total forest cover in the state is far below the area prescribed by the 1952 Forest Policy according to which 66 per cent of land should be under forest cover in the hilly region. However, barring Ladakh region, the state has only 50 per cent of its area under forest cover.

Table III.1
Area under different land use

(Values for area are given in 1000 hectare)

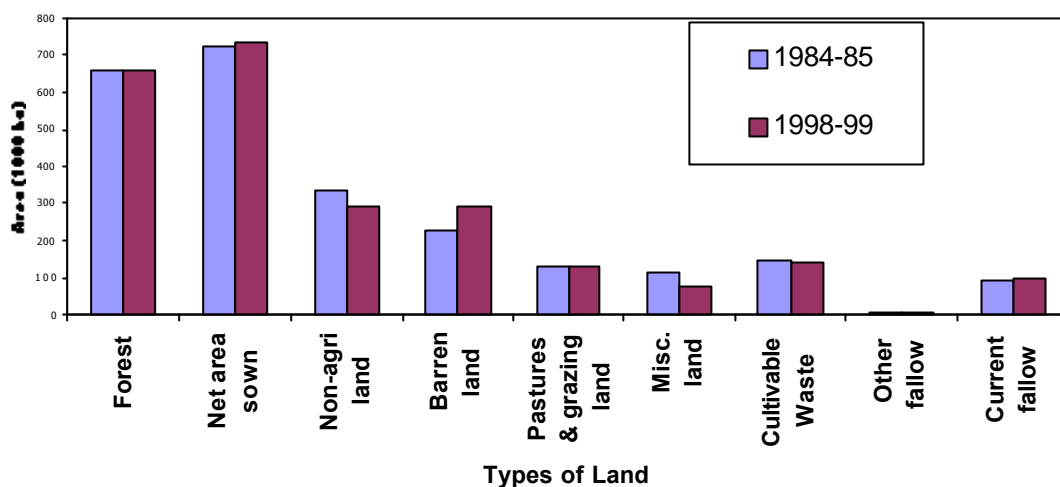
Land use types	Area (1997-98)	Area (1998-99)	Percentage of area (1997-98)	Percentage of area (1998-99)
Forest	658	658	27.19	27.23
Net area sown	722	734	29.53	30.38
Land put to non-agricultural uses	339	291	14.00	12.04
Barren land	227	291	9.37	12.04
Permanent pastures and other grazing grounds	125	126	5.16	5.21
Land under miscellaneous trees and other groves	109	73	4.50	3.02
Cultivable waste	143	139	5.90	5.75
Fallow other than current fallow	8	8	0.33	0.33
Current fallow	91	96	3.75	3.97

Source: Digest of Statistics (1999-2000), Govt. of Jammu and Kashmir

The area under forest cover (27.2 per cent) remained more or less the same during 1997-98 and 1998-99 (Table III.1). Net sown area (30.38 per cent), land put to non-agricultural uses (12.04 per cent), barren land (12.04 per cent), permanent pastures and others grazing grounds (5.21 per cent) accounted for major land use type apart from forested land. While land put to non-agricultural uses declined from 14 per cent to 12.04 per cent during 1997-98 to 1998-99, the cultivable waste declined from 5.90 per cent to 5.75 per cent during the corresponding period. On the other hand, the net sown area, barren land, permanent pastures and other grazing grounds increased by 0.85 per cent, 2.67 per cent and 0.5 per cent, respectively during the same period.

Increase in the net sown area can be attributed to the decline in the area of land put to non-agriculture uses, land under miscellaneous trees and other groves and cultivable waste.

Fig. 1
Land use pattern in Jammu and Kashmir



Source: Digest of Statistics, 1999-2000

The area under forest, net area sown, barren land, permanent pastures and other grazing grounds and current fallow showed a marginal increase during 1984-85 and 1998-99. The area under non-agricultural uses, miscellaneous cultivable waste and other fallow land showed a marginal decline during the same period (Figure 1).

LAND HOLDING

According to the state government data of 1995-96, marginal landholders (having land holdings below 0.05 to 1.00 hectare) comprised 77.97 per cent of the total population. The categorization of land holding is based on area of holding, i.e., small (1.04-2.00 ha), semi medium (2.01-4.00 ha), medium (4.01-10.00 ha) and large (more than 10 ha). The small and middle range farmers comprised 18.77 per cent and 2.63 per cent of the total land holdings, whereas the number of farmers with high landholding is below 1 per cent. The average size of small and marginal land holding shows a declining trend, and the number of bigger landholders is not increasing either. The average landholding size for the state as a whole is 0.76 ha. According to the Agriculture Census of 1985-86, average size of the marginal and small land holdings declined by 8.33 per cent between 1970-71 and 1985-86. There is an inverse relationship between the size categories and the proportion of net sown area, with the exception of the size category of 10 hectare and above. There is a positive relationship between the size category and the land available for cultivation during both the periods.

The average size of land holding is recorded maximum for Leh (1.38 ha) and minimum for Srinagar (0.37 ha). However, the value for total arable land is not the same, as the value recorded is maximum for Jammu (159.27 thousand ha) and minimum for Kargil (12.94 thousand ha). Such a difference in size of land holding of the people and total arable land exists chiefly due to an uneven demographic distribution pattern arising out of physio-climatic conditions. Ladakh district, covering about 70 per cent of the total geographical area of the state, is high plateau devoid of any vegetation, hence has only 2.5 per cent of the state's population living mostly in villages located near the rivers. This is the reason why general density of the population in the state as a whole is low, whereas the concentration of the population in some pockets is quite high.

Table III.2
District-wise Land holding pattern

District	Number of land holders (1000)	Area (1000 ha)	Average land holding size (ha)
Anantnag	166.39	81.34	0.49
Pulwama	103.61	66.28	0.64
Srinagar	87.99	32.39	0.37
Budgam	107.36	57.92	0.54
Baramulla	165.33	95.77	0.58
Kupwara	87.51	48.30	0.55
Leh	12.04	16.59	1.38
Kargil	16.63	12.94	0.78
Jammu	165.20	159.27	0.96
Udhampur	113.56	125.56	1.11
Doda	108.94	91.48	0.84
Kathua	82.94	96.57	1.16
Rajouri	66.39	79.10	1.19
Poonch	51.88	49.02	0.94

Source: Statistical Abstract, 1999-2000, J&K

Fig. 2
District-wise Land Holders and Average land holding

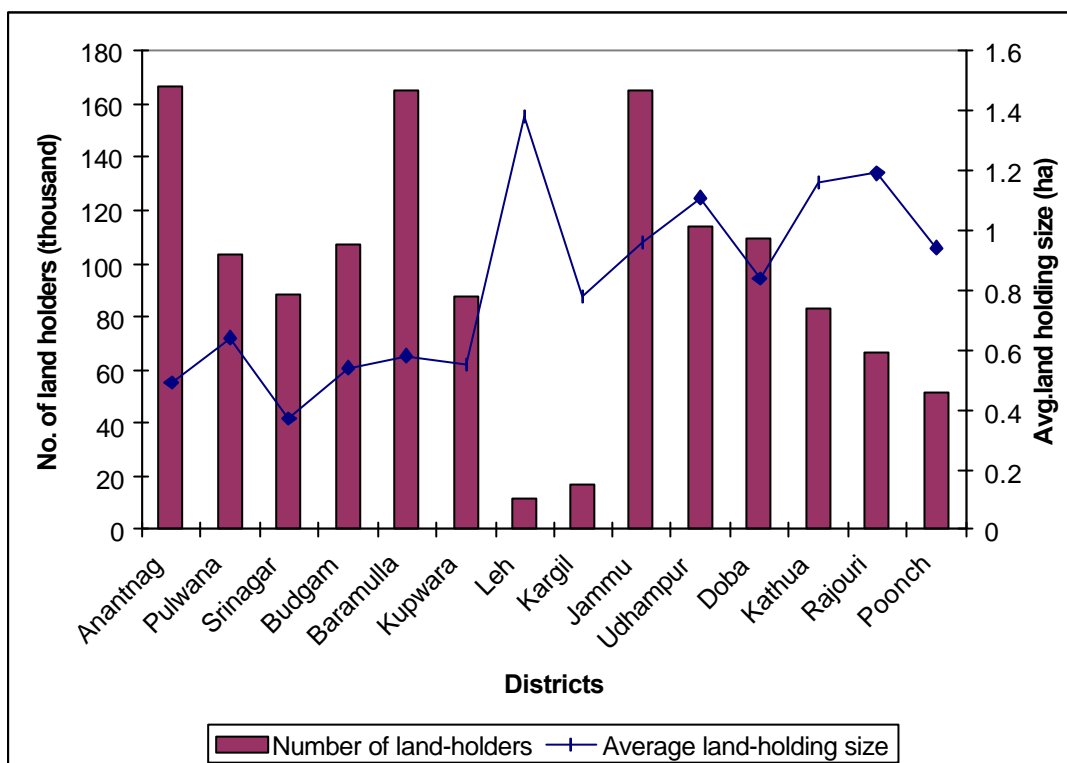


Figure 2 shows that the number of landholders varied between 166.39 thousand in Anantnag and 12.04 thousand in Leh during 1999-2000. The figures also show that in Leh the number of land holding is minimum among all the districts of Jammu and Kashmir, but the average holding is maximum. The same pattern is observed for Kargil, Poonch, Rajouri and Kathua. The aforementioned data shows that the land distribution in the State is quite disproportionate and unequal and that the number of marginal farmers has increased whereas the number of medium and small farmers has decreased. This indicates a considerably reduced concentration of landed property in the state.

CROPPING PATTERN

Owing to variations in climate, soil and nature of irrigation, agricultural operations and the system of cultivation naturally vary from region to region. In the Jammu province, there are usually two crops a year, namely, Rabi in winter and Kharif in summer. The winter crops, consisting chiefly of wheat and barely, are sown between mid September and mid January, depending upon the moisture in the fields. These

are harvested in May-June in the low-lying areas and in July-August at higher altitudes. The summer crops like rice, maize and millet are sown from mid July, according to the geographical location of the place and character of the soil. They are harvested between mid-August and mid-November.

As regards the rotation of crops, maize is often followed by wheat or sometimes by toria or barley and mustard, or by some fodder crop. The fodder crops are sometimes sown with cotton, especially on the irrigated lands. Sugarcane fields are frequently left fallow or a fodder crop is succeeded by two fallows and wheat, or by one fallow and cotton, or sugarcane. Cotton is generally preceded and followed by a fallow. Rice is generally grown on the same field year after year in the spring, the land being left fallow or some fodder crop being grown. Wheat is also sometimes grown on rich-manured fields but its output is generally poor. The rotation of crops is, however, often upset by scanty rainfall.

In Kashmir province, land generally produces one crop a year; therefore it is known as *Ekfasli*. There are, of course, exceptions. The highly cultivated garden lands in the neighbourhood of Srinagar and in some other towns give more than one crop in a year. Ploughing for rice, maize and other autumn crops in the Kashmir province commences in the middle of March. In April and May, seeds of these crops are sown. In June and July, barley and wheat, sown in the previous autumn, are harvested. In July and August, linseeds is harvested. Cotton picking commences in August and September. Maize, rice and other autumn crops are harvested in September and October. In November and December, ploughing for wheat and barely is undertaken. During the winter months, rice and maize as well as other autumn crops are threshed.

In Ladakh, like Kashmir, no customary rotation of crops is followed. However, wheat is not grown on the same land for more than two or three consecutive years, as this process is believed to weaken the soil. Wheat is always followed by gram. If the soil were much improvised, Matar or Sarshaf is sown for a year as the roots and leaves of Matars are believed to strengthen the soil while sarshaf is a crop of very short duration. The rest is allowed to restore the exhausted strength of the soil. In some villages, land called *Dofasli*, gives two crops a year. Trumba, China or kangni give preference to gram.

The time of sowing in the frontier districts differs from area to area. Generally, it commences early in the spring. In the low-lying areas, where the kharif crop maize follows wheat, the former crop is sown anytime from 15 November to 15 January when the soil is not frosty. Maize is sown in July and August. In the villages, where

gram is raised as the Rabi crop instead of wheat, the former is sown immediately after 15 January to give the cultivators sufficient time for growing and harvesting maize in the Kharif.

Table III.3
Area under different crops

Crop	Area in thousand hectare 1984-85	Area in thousand hectares 1998-99	Percentage of total food production 1984-85
Rice	274.99	270.35	30.06
Jawar	-	0.004	1.77
Bajra	17.35	10.70	2.23
Maize	281.57	311.46	29.90
Wheat	225.40	242.66	23.31
Barley	9.12	8.57	1.17
Pulses	47.13	31.88	5.35
Sugarcane	0.68	0.17	0.09
Fruits and Vegetables	54.91	65.49	5.92
Other food crops	0.79	0.459	0.20

Source: Digest of Statistics, 1999-2000, Government of Jammu and Kashmir

Table III.3 shows that among the foodgrains, the main crops are rice (30.06 per cent), maize (29.90 per cent) and wheat (23.31 per cent) accounting for 84 per cent of the total cropped area while the balance 16 per cent is shared by inferior cereals and pulses. The commercial crops of significance grown in the state are apple and oilseeds. The consequence of such a cropping pattern is that the bulk of the cultivators have little to spare for buying other necessities of life. The small quantities of commercial crops grown in the state offer little scope for agro-based industries. The state grows nearly 75 per cent of the country's temperate fruit, mainly apples, but most of the area under fruit cultivation is concentrated in the valley. The upsurge of militancy in the valley has destroyed all the initiative taken by the government to develop these areas. Towards the end of 1990s, the optimism that prevailed before the militancy over the prospects of these area was raised by the positive trends like increase in the production and increase in the export of fruits.

Fig. 3

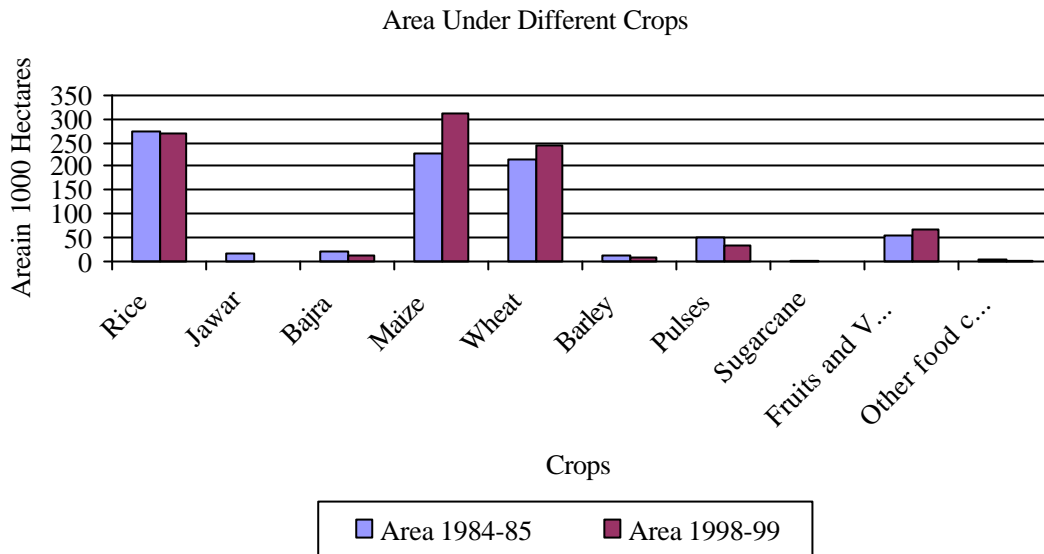


Figure 3 shows that between 1984-85 and 1998-99 there was an increase in the area under crops like maize, wheat and vegetables. There was a marginal decrease in the area under cultivation for pulses, bajra and barley.

PRODUCTIVITY

The region-wise classification of productivity of agricultural land differs throughout the state. In the case of Ladakh, the productivity of the land is on the lower side due to geographical limitation, at the same time the situation in the other region (Kashmir & Jammu) is completely reverse. Here the productivity of the land is on the higher side. So, overall productivity of the state cannot be distinguished within the region. Even the productivity of the crops differs from area to area. Rice cultivation is an important parameter for the crop production in the region. In the Kashmir region, the production of rice is different from the rest of the region. Despite climatic limitations, the agricultural production of one region substitutes for the other region. Another important aspect of the poor agricultural development in the region is that the climatic conditions of the region do not allow round-the-year-cultivation. So, in the case of J&K, despite knowledge and techniques of land-use management available at present, there are limited possibilities of raising agricultural output by increasing the area of cultivation without disturbing the ecological balance. Increase in the agricultural output would, therefore, have to be achieved only through intensification and diversification of agriculture and rational land use.

Table III.4
Productivity of Food crops 1998-99

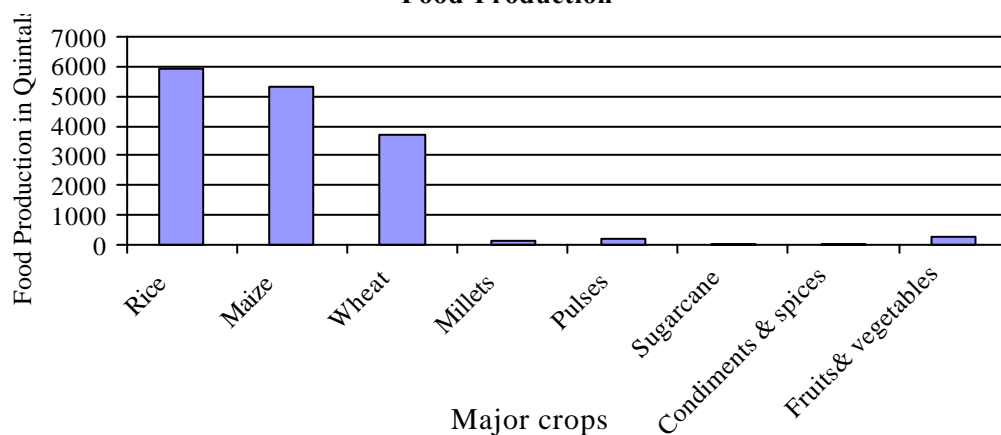
(Quintals/Hectare)

Food crops	Area (000 hectare)	Quantity produced (000qtl)	Productivity
Rice	270.35	5898	21.82
Jowar	0.004	--	--
Bajra	10.70	--	--
Maize	311.46	5324	17.09
Wheat	242.66	3683	15.18
Barley	8.57	--	--
Millets	14.22	162	11.39
Pulses	31.88	186	5.83
Sugarcane	0.17	6.09	35.82
Condiments & spices	2.36	6.00	2.54
Fruits & vegetables	65.49	267.70	4.09
Other food crops	0.459	--	--

Source: Digest of Statistics 1999-2000, Government of Jammu and Kashmir.

Table III.4 shows that the productivity for sugarcane is maximum (35.82 quintal/hectare), followed by rice (21.82 quintal/hectare), maize (17.09 quintal/hectare) and wheat (15.18 quintal/hectare). The productivity of total foodgrain was 12.49 in 1979-80, which increased to 15.22 in 1993-94 and further, increased to 16.18 in 1998-99. Productivity of rice has shown a marginal increase from 18.03 quintal/hectare to 18.57 quintal and up to 21.82 quintal/hectare in 1998-99. Productivity of wheat increased from 10.20 quintal per hectare to 14.19 quintal per hectares and it further increased to 15.18 quintal per hectare in 1998-99. Maize productivity went up from 13.48 quintal per hectare to 18.71 quintal per hectare and further increased to 17.09 quintals per hectare. The productivity of pulses decreased from 5.58 quintal per hectare to 5.51 quintal per hectare, then increased to 5.83 quintal per hectare in 1998-99.

Fig. 4
Food Production



From figure 4 it is clear that the production of three important food crops, namely, rice, maize and wheat, contributes a major portion of the foodgrain in the state. It is also clear from figures 2 and 4 that the production of the crops and area under different crops grows at the same rate. Production of the food crops has shown consistency in the past twenty years. There was hardly any impact on the productivity of the crop during the upsurge of militancy. The data of the period before and after the green revolution shows hardly any change in the production of food crops.

USE OF MODERN AGRICULTURAL TECHNOLOGY

a) Area under High Yielding Variety (HYV) Programmes

The introduction of HYV seeds, use of fertilizers and provision of assured irrigation have given a boost to agricultural growth in the state. The gains show an impressive increase in the yields of important food and non-food crops. While cereal output has shown higher growth, non-cereal crops and allied farm activities have recorded improvements. Higher output of cereal and non-cereal crops has not, however, reduced the state's dependence on food imports. The period 1979-80 to 1998-99 has been chosen to analyse changes in the cropping pattern. The choice of the reference period has been mainly influenced by the availability of the comparable data. The period before 1986-87 shows productivity in the pre-green revolution period, and the remaining period shows important changes in the post-green revolution period. The latter period also shows important changes in the production of major crops. The available data indicates that the post-green revolution era has not shown any marked changes in the agricultural production.

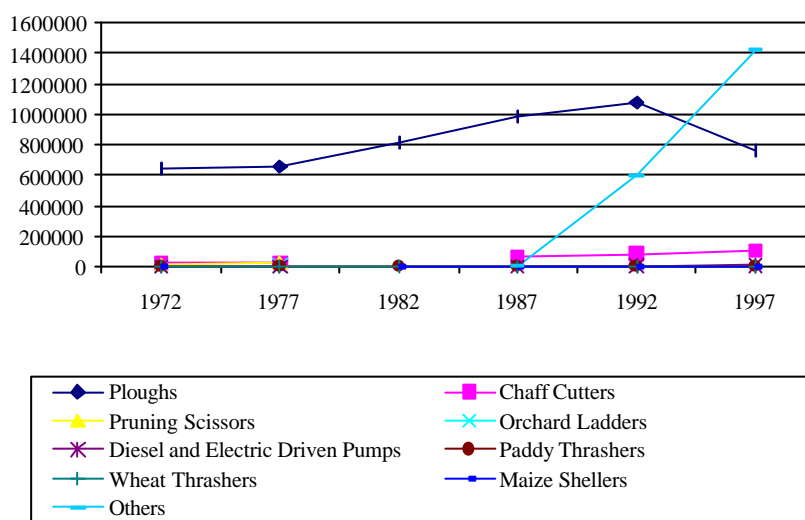
Table III.5
Use of Modern Agricultural Implements in the State

Item	Number of Implements					
	1972	1977	1982	1987	1992	1997
Ploughs	638942	652592	809773	987311	1075454	760457
Chaff Cutters	19418	28961	N.A	65644	83890	103963
Pruning Scissors	12696	23477	NA	NA	NC	NC
Orchard Ladders	1871	4163	NA	NA	NC	NC
Diesel & Electric Driven Pumps	451	881	NA	2894	3678	7915
Paddy Threshers	196	169	104	200	156	664
Wheat Threshers	129	699	1062	2506	987	1061
Maize shellers	32	N.A	159	33	35	149
Others	-	-	-	3020	597665	1417974

Source: Digest of Statistics, 1999-2000, Government of J&K.

The beginning of mechanization in Indian agriculture can be traced to the early 1960s. Since then it has progressed at a rapid pace. But certain important forms of farm mechanization are known to have remained largely concentrated in certain pockets commonly called green revolution areas. The estimates obtained from the NSSO clearly depict the development of mechanized cultivation in terms of ownership of modern machinery like tractors, power tillers and pumpsets. These estimates indicate a rapidly rising trend in the range of modern farm equipment owned, but not necessarily their actual use.

Fig. 5
Use of Agricultural Implements



Source: Digest of Statistics, 1999-2000

Table III.5 and Figure 5 show agricultural implements used in the state during 1972-1997. The figures reveal a tremendous increase in the use of agricultural implements like diesel and electric pumps, ploughs and chaff cutters, and wheat threshers whereas the demand for the paddy threshers has not increased. There were 451 diesel and electric driven pumps in 1972, which increased to 7915 in 1997. The number of ploughs increased from 638942 to 760457 and that of chaff cutters increased from 19418 to 103963 during the same period.

GOVERNMENT INITIATIVE FOR AGRICULTURAL DEVELOPMENT

The agricultural development in the state greatly depends on improving the crop intensity as well as the cropping pattern, both of which are interrelated. The one crop pattern of cultivation, predominant in the valley, is a serious limiting factor to

agricultural growth. The farm output in the valley can be considerably increased if a Rabi crop which could be harvested early enough to allow the transplantation of the next paddy crop, could be introduced.

To determine the suitable crops and to evolve their appropriate varieties, considerable research is needed. The state government has, in all the Five-Year Plans, prioritised the development of agriculture and allied sectors, and taken following initiatives:

1. *Providing seeds to the cultivator:* It is estimated that an area of about 4 lakh hectare was covered with improved seeds of cereals by the end of 9th Plan. Till the 4th Five-Year Plan, the programme had been confined to paddy and maize. However, a major part of the requirements of improved seeds is met through buying from outside the state. Only during the tenure of the 8th and 9th Plans, Jammu and Kashmir started selling seeds to other states. It has now become one of the potential sectors of the state economy. To reduce dependence on other states, certified seed production is envisaged through registered seed growers in seed villages. During 1997-98 a quantity of 6300 quintal was procured and during 1999-2000 a quantity of 14500 quintal of seeds of paddy, wheat, pulses and oilseeds were proposed to be produced and procured from seed village areas. For the Jammu region, an amount of Rs 300 lakh has been proposed during the whole period of 9th Plan. This amount is envisaged to be spent on subsidy on the seeds being procured for distribution among the farmers. During the year 1998-99, an amount of Rs 66.26 lakh was provided as subsidy on different crops.
2. *Increasing uses of fertilizers:* The changes adopted in agriculture were confined to a limited number of farmers, but the major breakthrough in agriculture can come only when a vast number of farmers throughout the state use inputs like fertilizers, seeds and pesticides. Use of fertilizers (inorganic) was introduced in the state during the 1st Five-Year Plan (1951-56). Initially the Department of Agriculture had to undertake a number of extension measures and provide incentives to farmers to make chemical fertilizers popular amongst the farming community but with increased awareness regarding the merits of the same, their use (consumption) has steadily increased over the years, especially of Nitrogen (N) touching an average level of 43 kg. /ha against the highest of 143 kg/ha. in district Ludhiana (Punjab) and the national average of 76 kg. /ha.
3. *Training Support:* *The Government Farmers' Training Centre, Ganderbal provides training to farmers, especially the womenfolk, in various districts of the Kashmir division. The NAEP provides enough opportunities to Agriculture Technocrats/officials for specialized periodic training. During 2001-02 the Department of Agriculture arranged 126 camps for training.*

CHALLENGES FOR THE DEVELOPMENT OF AGRICULTURE

- There is no law on minimum land ceiling for areas used for crop production. The State has not been enforcing a strict ban on use of irrigated land for non-agricultural purposes.
- State cultivation has not taken increasing cropping intensity, average yield by way of optimal use of inputs, and full adoption of recommended production technologies.
- Less credit flow in the beginning of the cropping season for the farming community with a guaranteed minimum price support.
- Lesser emphasis on post-harvest technologies, including handling, storage, transportation, processing and marketing.
- Lack of facility for insurance cover for major crops.

FOREST DEVELOPMENT IN JAMMU AND KASHMIR

Jammu and Kashmir has a total forest cover of 20441 sq. km out of which 11019 sq. km (53.9 %) and 9422 sq. km (46.1%) are dense and open forest respectively. Forests are valuable ecological and economic assets for a hilly state like J&K. The very existence of human and cattle population is dependent on forests. There is a great diversity in the floristic regions of the state.

Table III. 6
Region wise forest area of J&K

(Area in sq.km)

Region	Total area	Forest area	Percentage of forest area to total area
Jammu	26293	12066	45.89
Kashmir	15948	8128	50.96
Ladakh	59146	36	0.06
Total	101387	20230	19.95

Table III.6 shows the region-wise break up of forest area in the state. The overall area under forest cover is lower than the national average. This is due to the fact that the area under forest cover in Ladakh is less than 1 per cent.

IMPORTANT ISSUES FOR FOREST DEVELOPMENT

1. Approximately 48 per cent of the rural population are directly or indirectly dependent on forests. Due to the Forest Conservation Act, no green felling is allowed. Only dry felling is allowed which cannot meet the local need, hence illegal felling is widely prevalent in the area.

2. Due to militancy the forest department does not have effective control on forests.
3. The forest area is not properly demarcated. Due to population growth there is encroachment on the forest area for housing and extending the area under agriculture.
4. Forest records are not properly maintained. The revenue department and the forest department records do not match.
5. Forest fires are prevalent in the Jammu region. Generally in the summer, Chir forests succumb to forest fire. So far the forest department has taken no concrete steps to prevent this.

RECOMMENDATIONS

The state government should plan for higher production and productivity of each major cereal in order to achieve an annual agricultural growth rate of 3 to 4 per cent. In this regard state agricultural department could adopt the following policy:

1. State could shift its agricultural development strategy from food security mode to the value addition mode. The state should grow certain products like high-valued fruits, vegetables and some cash crops, which could give adequate monetary returns to the cultivators. Low productivity and decreasing returns from agriculture are the main reasons for low motivation among cultivators.
2. For optimum utilization of the productive potential of the primary sector, diversification should be the main focus. However, the state should not follow a uniform policy of diversification for all the physiographic regions of the state. Agro-climatic crop planning for each physiographic region should be evolved with the help of experts. This calls for in-depth studies to:
 - Make a realistic assessment of the available resources,
 - Explore cost-effective means of transfer of technologies,
 - Work out forward and backward linkages.
3. A few diversifications have taken place in the Kashmir valley, showing a positive trend in terms of returns. The cultivators in Baramulla have now started cultivating vegetable in the cereal fields, which gives them more return. Still, more initiative is needed in the agricultural diversifications.
4. The agricultural economy of the state is a subsistence economy. The low return from agriculture is one of the reasons for the lesser participation of people in these

activities. The state should formulate a strategy to bridge the gap between the agriculture research institute and the cultivator. Most of the cultivators hardly get any benefit from agriculture. Presently the state government has taken certain initiatives in this direction. The Kissan Behbud (welfare) committee is an interface programme between progressive farmers at the village committee level and agriculture research institute. Yet a lot remains to be done in this area.

5. The state government should provide adequate training to farmers about the use of modern technology in agriculture.
6. One important aspect for the increase in productivity is credit to the farmers. In J&K this facility to the farmer is completely absent. The state should initiate this through the nationalized bank, so that the cultivators get adequate finance on credit for agricultural development.
7. Availability of inputs, e.g., seeds, fertilizers, pesticides, credit, etc., should not only be ensured regularly but their quality extensively checked. There are already some provisions existing in the state but more needs to be done.
8. Subsidy on the inputs should be targeted and selective. The state government should examine a suitable crop insurance scheme. These kinds of initiatives strengthen the confidence of the cultivators.
9. The state government should encourage a mix of supplementing crops in each region. For instance, in the Valley floor and plain areas of Jammu region, the crops which do not either compete with each other or can be grown off season should be the basis of diversification. The *Karewas* of Kashmir and *kandi* areas of Jammu region are best suited for dry farming, horticulture and fodder crops. The side valleys should be earmarked for fodder cultivation and cultivation of medicinal plants. However, these examples are illustrative and demonstrate the need for evolving the micro-region specific diversification strategies. Comprehensive cost of cultivation studies needs to be conducted in each zone.
10. In the Ladakh region, seed production of cauliflower within one season using poly-green house technology has been a successful attempt. Through the same method, this region can produce seeds of cabbage, onion, raddish, *karam saag*, carrot and Swede. This can open up a new vista for the farming community of

Ladakh, not only towards self-sufficiency but also for export of seed outside Ladakh.

11. The farmers of the Ladakh region have successfully experimented the cultivation of vegetables in the poly green houses. Three varieties of tomato namely SL-12, PED and AC-238 and N-13 Nasik red onion have shown a positive result in production. Among other vegetables are brinjal, capsicum, broccoli, green chilli and paprika. This can ensure supply of vegetables to metropolitan cities during off-season and fetch a good price. From Ladakh the only viable mode of transport is airfreight. Hence there is a need for working out an arrangement so that quick transportation of these products can be organized.
12. The Ladakh region has great potential in the field of floriculture as well. In a primary study conducted by SHUAST (K), it was observed that super class flower cuts bearing up to 23 florets can be produced through polyhouse technology in Gladioli. This indicates that floriculture can play a vital role in uplifting the socio-economic status of farmers.
13. The state government should also encourage the production of high-value, low-volume crops like saffron, black zeera and other spices. The Kashmir region is ideally suited for the cultivation of these kind of non-traditional crops. It has been observed that during the past three years the area coverage and production of the spices has been constantly declining.
14. Apiculture is another important area with a lot of potential. In the Kashmir division the fauna and flora required for nectar collection is available in abundance through existing orchards, field crops and wild flora. During the 8th Five-Year Plan the number of bee colonies in the valley was 15,400, which increased to 20,000 during the 9th Five-Year Plan and consequently honey production increased from 180 MTs to 240 MTs. The state government should encourage the people by way of distribution of beehives, bee-colonies and other appliances on subsidized cost with technical guidance.
15. Adaptive research output should be the answer for agricultural development in the state. Research on multiple cropping, improved seeds, crop rotations, water management and dry land farming should take the local factors into consideration and use the results of repetitive trials as the basic input for research studies. The research output of the State and Regional Research Institute of Kashmir and

Jammu has not show any major achievements in the area. It is time to review the objective of this research institute. State government should also provide the infrastructure to the private investor to set up agriculture and biotechnology research institutes.

16. The state produces very limited quantities of a specific variety of garlic in the Jammu division. This garlic is highly prized because of its anti-cholesterol nature and the cultivation of anti-cholesterol must be increased by expanding its area.
17. The climate of the state is ideally suited for production of exotic, high-value vegetable crops like Broccoli and Mushrooms which can be grown profitably in the Jammu division. What is needed is a planned, integrated approach, which takes care of production as well as marketing of these perishable, high-value crops.
18. The state has potential for agro-based industry which needs to be tapped. The food industry has a very high multiplier affect. Besides appropriate cost-effective technology, assured supply of quality inputs and uninterrupted transport facilities are crucial for the development of agro-based industries. In this respect, the development of all weather air, rail and surface transport should be given top priority.
19. The monitoring of the various schemes physically against the target fixed by the department is an essential factor. The state government should involve non-governmental agencies for the evaluation of the schemes and encourage participation of the village community in the monitoring of the scheme.
20. The Sisal Propagation Scheme (SPS) introduced in the 8th Five-Year Plan shall continue in the 10th plan because it is beneficial for the weaker sections of the society. It shall be upgraded and the technology evolved in the past utilized to educate the common masses in rural areas to implement it in the entire districts of Jammu region.
21. Schemes like pasture development, Ladakh soil conservation programme and soil conservation programme on forest lands should continue and spread to vast eroded chunks in new areas so that direct and indirect benefits are received by the common man.

22. The state government should pay attention to short-term soil conservation measures aimed at stabilizing smaller slopes, preventing under-cutting of *nallahs*, and gully control measures in the initial stage of development.
23. The gap between the national average and the existing status of the state forests can be fulfilled by social forest. The state government should take certain initiatives to develop social forestry in the state.
24. The infrastructural facilities have improved during the past decade but more attention is required. The state government should increase the budget allocation for forest development.
25. The state forest department should prepare some project for the entire state and approach funding agencies like the World Bank, Ford Foundation and others for support. Presently only one project, i.e., integrated watershed development programme, in hills is running in the state.
26. People's participation for forest conservation is limited and has not become a people's movement. The village committee needs to be strengthened for National afforestation to be properly implemented.
27. To increase the plantation on the wasteland the state government should promote the participation of voluntary and other agencies.
28. Jammu and Kashmir has a lot of potential for the cultivation of medicinal plants for natural health care. The state government should approach the medicinal plant board to extend their support for the development of medicinal plants. Support and facilities for extraction, storage, value addition and marketing also need to be increased.
29. Opportunities for training, awareness and capacity building of the forest staff and village forest committee need to be increased.
30. Many people are dependent on the Chir forest. These forests need to be resurveyed. For plants which are ready, razing should be allowed.

2. ALLIED SECTORS

FISHERIES

Introduction

Traditionally, fisheries in Jammu and Kashmir were developed and popularized as sport fisheries, primarily as a means of attraction for tourists. During the past few years, there has been a reorientation towards development of fisheries as a major food resource. The diverse agro-climatic conditions of the state are a tremendous potential for the development of both cold and warm water fisheries. This is an important activity allied to agriculture and can strengthen the productive base of the agricultural economy and generate self-employment, an aspect which has not been explored properly and fully till now.

The total number of fisherman population is around 9655. The length of 27781 km of rivers/streams facilitate the farming of more than 40 million tonne of fish. Out of a total 27781 km of area under fisheries the state has only 0.07 lakh hectare under reservoir area. There are 1248 lakes and water bodies and the water is spread into 39921.8 hectare of area. The state has also reported 125 fish species, of which only 11 are commercially important. The total fish output being 188510 quintal in 1998-99, the per capita annual output amounted to one kilogram, i.e., less than three grams per day. (Godbole report, 1998). There is a big gap between demand and supply of fish. Fish is a valuable element of diet of the local people throughout the year, and there is also a demand for fish from the defence personnel and from tourists, especially during the tourist season. By harvesting the potential of fisheries in the state appropriately, considerable impact will be made in terms of fish production, revenue generation and employment creation as well as improving the nutrition level of the common man.

Production of Fish

The fish output is mostly confined to the valley - Baramulla (47 per cent) and Srinagar (36 per cent) districts, accounted for the major share of the state's fish output in 1998-99. Out of the total fish produce, about 80 per cent of the fishing activity takes place in the lakes and the rest from rivers. There are four types of fish available in Jammu and Kashmir, viz., trout, mirror carp, country fish and Jammu fish. The predominant variety is mirror carp forming 61 per cent of the total output. The other three contribute 40 per cent of the total fish production (Table III.7).

Trout fishing holds great potential in terms of increased income rather than output through proper harvesting.

Table III.7
Fish Production in Jammu and Kashmir

Quantity (in Quintal)

Year	Kashmir Province				Jammu Province	
	Trout	Mirror Carp.	Country Fish	Total	Jammu Fish	Total State
1970-71	60	36917	20291	57268	4909	62177
1980-81	79	62712	29914	92705	2713	95418
1985-86	144	67950	32050	100144	5030	105174
1990-91	62	82558	30391	118011	17000	135011
1994-95	125	105800	35500	141425	19575	161000
1995-96	182	106521	37828	144531	20669	165200
1996-97	248	112021	40588	152857	22944	175801
1997-98	454	114360	42588	156982	28318	185300
1998-99	561	115296	42407	158264	30246	188510

Source: Statistical Digest of Jammu and Kashmir, 1999-2000

Due to state government initiatives, the output of fish has increased in the past few years. Fish production, went up from 135011 quintal in 1990-91 to 188510 quintal in 1998-99. In Kashmir and Jammu provinces in 1998-99, it was 158264 and 30246 quintal respectively. The state government claims that J&K has become self-sufficient in the matter of fry and fingerlings of mirror carp.

Infrastructure Facilities for Fisheries Development

There are 18 state-owned trout hatcheries located in the districts of Srinagar, Anantnag, Pulwama, Baramulla, Budgam, Doda, Rajouri and Kargil and these have played an important role in boosting trout culture. The hatcheries have a dual role: one, as an agency for commercial production and two, as an agency for the stocking of the rivers and lakes and distribution of fingerlings to private farms. By developing trout hatcheries as agencies for distribution of fish seed, the state government can increase its income.

Besides, the Department also runs a mahaseer hatchery at Anji and fish farms at Srinagar, Budgam, Anantnag, Pulwama, Baramulla, Kupwara, Jammu, Kathua, Udhampur, Doda, Poonch, Leh, Kargil and Rajouri. This infrastructure gives considerable boost to the fisheries activities in the state.

One of the important items under infrastructure is the fish farm. Under the Infrastructure Development Programme, 22 fish farms have been set up in the state. The State National Fish Seed Farms are located at Kathua, Anji, Muradpore,

Ghomansion, Nowabad (Jammu), Narbal, Trigam, Pandach, Kohru (Kashmir), Shey and Damsana (Ladakh). Some fish farms have the latest technical trout fish farming, viz., Laribal, Kokernag, Beerwah, Mammer (Kashmir), Phalni, Gatha, Shalimar (Jammu) Wakha (Kargil) etc. The state government has also taken steps to develop private fish farms. 811 fish farms among rural masses have been identified, two-thirds of which are in Jammu. Ponds which had been neglected were badly silted. The department is also using fish seed of fast growing species.

Employment Opportunities in the Fishing Sector

The population dependent on fishing is minimal (Table III.8), although the number of labour force engaged in fishing shows a consistently increasing trend, figures nearly doubling from 5446 workers in 1972 to 1997. Fishing is important not only for the state's revenue generation, it also provides employment to the people. By improving the infrastructure and harvesting the new potential area, the state can increase both. Besides, the development of fisheries can also provide employment in the tourism sector and a lot of opportunities can be generated in the marketing and packaging of fish.

Table III.8
Labour force engaged in fishing

Year	Population dependent on fishing	Labour force engaged in fishing
1972	20340	5446
1977	34853	3779
1982	24044	7322
1988	21741	4588
1992	37222	9356
1997	25816	9655

Source: Digest of Statistics, Government of Jammu and Kashmir, 1999-2000

Potential Areas for development

- Ladakh Region has vast water resources with a high potential for fish culture. Very few of these water bodies have been tapped. The steps taken by department of the state need to be accelerated.
- The panchayats in the state have nearly 500 ponds under their control which, due to lack of cooperation between the Department and the panchayats have not been properly utilized for fish production. Improving these ponds can augment fish production.
- The water of Jammu and Kashmir is suited for the fishing of carps-catla, rohu, silver carp and mirror carp. Properly harvesting of the potential in the area can fulfill the local needs.

- Fishing in manmade reservoirs is an important activity in many states and can become one of the important sources of revenue for the state. J&K however, has only one manmade reservoir in Salal. The state needs to give proper attention to this area to increase fish output.

Challenges

- One of the important challenges faced by this sector is the lack of training to fish farmers, only 1183 in J & K being trained annually as against over five lakh in the country. At present, the state has only two Fish Farmers Development Agencies as against a total of 414 in 26 States of India.
- Two, fish marketing faces several problems. Fish is a commodity of highly perishable nature requiring the provision of ice plants, cold storage and refrigerated vehicles. There is only one fish-marketing project in progress and more are required.
- Three, there is inadequate research support for development of paddy-cum-fish culture.
- Four, the fisheries reservoir is not sufficient to fulfill the demand for fish.
- Brown trout, has a specific problem of being fed at the early fry stage. This stage is very crucial, as it does not accept artificial feed. More reservoirs are required.

Policy Recommendations

- (a) The state has extensive inland water bodies, particularly in the valley, which provide excellent habitat for almost any kind of temperate fish. The lakes cover an estimated 0.3 lakh hectare, predominantly in the valley (about 98 per cent of total). River Jhelum flowing, over 162 km in the valley, with its extensive tributaries has enough potential to sustain fish production.
- (b) The Indus river system has carps, catfishes, the exotic rainbow and brown trouts. The trouts of Kashmir are very rich and attract sport fish enthusiasts.
- (c) The state offers a favourable habitat for sport-fish like trout in its cold-water streams, particularly in the Lidder and Sindh valleys.
- (d) Paddy-cum-fish culture is gaining rapid ground in the tropics and subtropics but not in temperate climate. Fish farming as an adjunct to paddy cultivation has a lot of potential either as integrated simultaneous crops or as different crops in the same lands in alternate seasons. Such possibilities with particular reference to compatible fish species should be studied scientifically and a package of technical and management practices evolved for propagation among farmers.

- (e) To improve marketing of fish, particularly the fish harvested in Jammu region, which is closer to the Punjab, the possibility of selling fish in the neighbouring Punjab districts of Gurudaspur, Amritsar, Jalandhar and Ludhiana should be explored and private enterprise encouraged for the marketing of fish.
- (f) Infrastructure support by way of purchase of refrigerated containers or vehicles and working capital, should be extended to private sector.
- (g) To attract fishing enthusiasts from within and outside the country, catch and release sport should be launched and fishing festivals or tournaments organized. In short, fishing should be made part of tourism promotion in the state.

LIVESTOCK SECTOR

Introduction

Agricultural development has been associated mainly with an increase in the production of cereals. In India majority of the people have less than one hectare of land. Due to small holdings, it is not possible to develop infrastructural facilities and these cultivators are unable to meet the basic requirements for their livelihood. Here the development of livestock plays an important role in terms of providing basic necessities. Livestock have formed an integral part of the farm economy. Animals are valued for their draft power, manure, dairy products and meat. In addition, livestock provide income and employment to the weaker sections in the rural areas. In Jammu and Kashmir animal husbandry constitutes a vital activity. From the point of view of the farmer, nearly 0.13 per cent of gross state domestic product (SDP) is contributed by this sector which is an important segment in the over all 33 per cent contribution by the agricultural sector. The state has a precious wealth of livestock in the form of cattle-buffalo, sheep, goats, poultry etc. About 79 per cent of the population in Kashmir is based in rural areas and depends largely on the income generated by the agricultural and animal husbandry sector. Cattle and poultry amongst all livestock are considered the most important tool for the development of rural economy. Animals, besides being the main source of draught force, also provide essential foods like meat, milk, etc, and large quantities of animal by products such as hide, bones, blood, guts and valuable organic manure. The production of *pashmina* shawls, carpets, shawls and blankets of Kashmir earn handsome foreign exchange for the nation. Therefore, the animal industry in the state has vast scope for exploitation and quick economic returns.

Livestock population

The state has different types of livestock the important being cow, buffalo, goat, sheep, rabbit, yak, etc. There is a total of about 91.751 lakh animals livestock population. The estimated cattle population of J&K was recorded as 31.75 lakh (1997 census) constituting about 34.60 per cent of total animal stock in the state. The sheep population comes second, constituting 34 per cent of total animal stock population, followed by the goat population (19.71 per cent of total animal stock). The distribution of livestock differs in different zones. For example, the goat is mainly distributed in Ladakh, Gurez, Karnath and hills of Baramulla. There are different kinds of sheep breeds like Baderwahi, Poonchi, Ramboulleit (Jammu region), Karnahi and Gurezi (Kashmir region), Changhthangi and some local breeds (Ladakh). The Kashmir region has about 55 per cent of sheep population followed by Jammu (about 29 per cent) and Ladakh (about 8 per cent). Yaks are chiefly confined to the Ladakh region.

Table III.9
Total Animal Stock in 1997

(in Lakh)

Types of Animals	Numbers
Sheep	31.695
Goat	18.095
Buffalo	7.878
Horses/ponies	1.505
Yak	0.330
Camel	0.037
Poultry	46.30
Cattle	31.75
Animal stock	91.75

Source: State Animal Husbandry Department

Livestock production

In terms of livestock production there is a gap between demand and supply. Due to the climatic condition there is a great demand for meat and warm clothes in the valley but the breeds of animals, available in the valley are unable to provide these components in sufficient quantities.

Table III.10
Production of Milk, Eggs, Wool, Fish and Mutton

Year	Milk (M.Tonne)	Eggs (Millions)	Wool (M.kg)	Fish (Th.tonnes)	Mutton (Lakh kg)
1990-91	0.56	283	-	-	-
1991-92	0.58	294	3.59	14.05	-
1992-93	0.60	289	3.60	14.30	-
1993-94	0.63	317	3.80	14.50	-
1994-95	0.65	320	4.01	16.10	-
1995-96	-	-	-	NA	-
1996-97	0.90	396	4.9	NA	199.47
1997-98	0.95	423	5.5	NA	219.13

Source: Animal /Sheep Husbandry Dept.

Table III.10 shows that in the past seven years, there has been constant increase in the products and by-products of livestock. However, the output vis-à-vis the number of animals is not sufficient. In other parts of the country, people are using different breeds of animals and getting more returns. In Kashmir, quantity of output from the new breed of cow is much more than the local one but it is advisable for the state government to modernize the sector to meet the domestic and outside demand for the livestock products. At present Jammu and Kashmir is dependent on other states like the Punjab and Himachal Pradesh to supplement their poultry products and milk supply, despite the fact that the state itself has the potential to provide and meet the domestic demand.

Challenges

The most important challenge for the animal and sheep husbandry sector is the problem of fodder in the winter season, particularly for the Valley. In the light of this, there is need to introduce non-conventional feed and fodder resources.

The second biological component influencing animal development and growth is habituating under certain eco-system, for instance, liver fluke disease of domestic animals which is prevalent in marshy humid climatic conditions, e.g., places around Wular Lake in Kashmir Valley. Certain disease foci are permanent. The third challenge is high livestock farming costs. And last, the poor research output available to develop this sector.

Potential for livestock development

Sheep provide valuable manure for improving agricultural productivity. Their skin has high commercial value. The quality of wool of Kashmir sheep varies from the fine to the coarse type.

Goat hair is used for making ropes, coarse blankets and *namdas*. The manure of about 5000 goats, produced in one night, is considered to be sufficient for one hectare of agricultural land as a valuable fertilizer.

Pashmina or *Changra* goat produces softest and warmest animal fibre used for high quality fabric (*Pashmina* wool). This pastoral farming is confined to the highest belt called 'Changthang' area of Ladakh around 4300 meters above sea level. The initiatives taken by the state government to improve productive potential of goats despite lot of scope for the same have so far been inadequate.

Yak meat also has a demand among the local people. Yak hide is used for making leather, hair, ropes, grain bags etc. while its fine undercoat is used for making tents called 'Rebo', shoes and sweaters, and tail hairs are used for making ceremonial fly whisks (chauri).

Jammu and Kashmir also has a great potential for production of rabbit meat, fur and wool. About 15-20 rabbits can easily be raised and managed by a farmer's family without any additional cost. There is also demand for biological research.

Policy Recommendations

- (a) The use of non-conventional feed and fodder resources is one of the important areas for development of livestock in the state. The Agriculture University of Kashmir has done some research work to convert the agricultural waste into cattle feed. What is needed is that the state government should commercialize this research output either through its own or private initiatives.
- (b) Jammu and Kashmir provides a suitable climate for cattle breeding. In other parts of the country, one has to create an artificial climate for cattle breeding and the success rate is also low. In Kashmir this initiative gives an added advantage and the success rate is also high. The state government should take steps to establish cattle breeding centres. It should open frozen semen centres in remote areas to cover all local cattle population.
- (c) The demand for poultry products is constantly increasing. Due to climatic conditions, it has become the part of the regular diet. The state government should encourage the development of poultry through modern technology and take up some short-duration projects along with NGO development.

- (d) Improvement of local sheep by crossbreeding with fine wool breeds (Kashmir Merino, Russian Merino, Starapol, Caucasian Marino, Rambouillet) can improve wool production qualitatively as well as quantitatively.
- (e) Sheep crossbreeding with Polled Dorst (Mutton breed) has remained confined to selected pockets in the Valley such as Hajan block. Corriedale breed has shown good adaptability and performance in the orchard belt of Kashmir, i.e., Shopian area. The government should promote this initiative in other areas of the state as well. It is advisable to develop biotechnology research for enhancing animal productivity.
- (f) The state Sheep Husbandry Department has considerably improved wool production in the state but the increase in mutton production has not been impressive. The state is largely dependent on adjacent states for its ever-growing demand for mutton and steps to increase its production are warranted.
- (g) The Kathua and Jammu districts, which are contiguous to Poonch and Rajouri districts and also to the Punjab where Gujjar population predominates, are ideally suited for dairy development. By forming Gujjar co-operative societies and giving them technical and financial inputs, the milk yield can be improved.
- (h) The state government needs to introduce low-cost village level technology for better use of animal products, processing and marketing.

DAIRY DEVELOPMENT

Introduction

Jammu and Kashmir is ideally suited for dairy development. The state has registered a steady growth in milk production. The State's milk production in 1995-96 was 3.69 lakh metric tonne which stood at 6.66 lakh metric tonne in 2001-02. The per capita milk consumption is 325 ml/day and national average milk consumption is 240 ml/day vis-à-vis the actual requirement of 283 ml/day. In 2000-2001, J & K became a milk surplus state

Cattle profile

Table III.11 shows a constant increase in the number of buffaloes and cattle. The number of buffaloes and cattle per hectare of cultivated area has also increased, while the number of livestock population per 100 people has decreased from 1956.

Table III.11
Profile of cattle and Buffaloes in Jammu and Kashmir

Year	Buffaloes and cattle (Lakh)	Buffaloes and cattle per ha of cultivated area	Livestock population per 100 people
1956	21.32	3	132
1961	22.09	3	115
1972	25.49	3	90
1982	28.88	4	97
1988	33.61	4	104
1992	37.87	5	110
1997	39.63	5	100

Source: Indicator of Economic development J&K, 1998-99

Milk production

Table III.12 shows constant increase in the quantity of milk production from 1974 to 1998. This growth is not at par with other states like the Punjab and Gujarat, which are the pioneers in the field of dairy development. There is need for more emphasis on the dairy development in the state, the Jammu region having lot of potential for dairy farming. What is needed here is the introduction of some new breeds. In the Punjab the number of local breed of cattle is less than in Jammu and Kashmir but in terms of cross-bred milk animals, the Punjab is ahead to J&K because the crossbred cow gives three times more milk than the local breed.

Table III.12
Milk production in J&K

Year	Milk Production in (Lakh tonne)
1974-75	1.85
1980-81	2.40
1984-85	3.53
1987-88	4.28
1989-89	4.50
1989-90	4.86
1995-96	8.70
1996-97	9.92
1997-98	11.79

Source: Indicator of Economic development J&K, 1998-99

The Jammu region has the potential to increase production of milk and also market the surplus milk to other regions of the state. Up to 1999-2000 the demand for milk and milk products in the valley was fulfilled by the Punjab but through proper initiatives and planning state government can sustain self-sufficiency in milk production.

Employment Opportunities

Dairy farming is a household activity largely done by domestic labour. The majority of families have two to three domestic labourers. Very few people have engaged hired labour for dairy development. This shows that in Jammu and Kashmir, dairy development activity is still a subsistence activity but income and employment opportunities can be increased through the modernization of this sector.

Policy Recommendations

Privatising Specific Animal Husbandry Services

Presently, the government's Animal Husbandry Department provides animal husbandry services. However, due to lack of adequate funding, the department has not been able to provide these services effectively. Almost 70 per cent of its expenditure has gone towards veterinary services and animal health while other important activities such as breed and fodder development, and extension and training, have received only small allotments. The solution lies in allowing qualified private parties to provide some of these services. At the same time, some services will have to be provided by the government. Selective privatization of animal husbandry services would be the preferred approach. Services in which public interest is greater than individual interest, e.g., eradication of diseases, programmes for weaker sections, extension and education for weaker sections/areas, would continue to be provided by the government. Where the state government continues its services (for example, in areas where no private investor comes forward), it will do so purely on a cost-recovery basis.

Creating Feed and Fodder Development Programme

In Jammu and Kashmir, feed and fodder which forms 60 per cent of milk production cost is a major constraint to the growth of dairy development. In the Kashmir and Ladakh region there is no fodder available for animals during winter. So the government should spearhead a programme to develop this area.

Building Infrastructure

The development of the dairy sector needs to be based on the provision of

specialized infrastructure such as farm bulk coolers and refrigeration systems as well as basic infrastructure like power and water. Providing a cost-effective and continual supply of power and water to procurement and processing units needs to be top priority. This will reduce costs and improve milk quality considerably. The government will also need to upgrade rural roads leading to milk collection centres (or even, as a first step, from milk collection centres to milk processing units). This will increase the frequency of collection, reduce logistical costs, and improve the quality of the raw milk. Most of the specialized infrastructure required will be built by investors themselves, whether corporations or cooperatives. However, the government can play an important facilitating role. For instance, it could lobby the centre to reduce duties on refrigeration and cold storage equipment. This would reduce the high capital costs that make it unviable to set up this infrastructure today.

Focusing on traditional strong regions

The development effort will initially be focused on Pulwama, Kupwara and Srinagar districts of Kashmir region and Doda district of Jammu region and Ladakh in which dairy activity is established. In these regions the number of cattle, availability of fodder, proximity to large markets and working co-operative structures are fairly well developed. Once this area is developed, the system can be replicated in other parts of Jammu, Kashmir and Ladakh regions.

SERICULTURE

Introduction

India is the second largest producer of silk in the world, after China. It has the unique distinction of producing all four varieties of silk: mulberry, eri, tasar and muga. Mulberry accounts for 92.5 per cent, Eri 5.3 per cent, Tasar 1.7 per cent and Muga 0.5 per cent of the total raw silk production in the country. The rearing of silk worms on mulberry trees for the production of raw silk is known as sericulture. Mulberry silk is produced mainly in Karnataka, West Bengal, Jammu and Kashmir, Assam, the Punjab, Tamil Nadu and Andhra Pradesh.

Sericulture is one of the traditional occupations of Jammu and Kashmir. It is the only traditional univoltine belt in India, capable of producing silk comparable to the fine qualities of raw silk imported in the international market. Kashmir introduced far better silk both in quality and quantity than Italy and Japan 60 years ago. The climate of Kashmir is temperate and congenial for rearing both univoltine and bivoltine silkworm species for cocoon production. These cocoons are far superior to

the multivoltine ones produced in the rest of the country. It is disheartening that the silk industry of J & K, which has seen a glorious past, is on decline. Still a large section of the population is dependent on sericulture. In the year 1999-2000, as many as 25.28 thousand families were engaged in extraction of silk fibre. During the same period, 2.15 thousand villages were engaged in sericulture production. The state has about 1402 thousand mulberry trees, of which 883 thousand are in Jammu division and 519 thousand in Kashmir division. During 1999-2000 about 80 thousand kg of raw silk was produced at the cost of around Rs. 3.5 crore. Still the state is not able to harvest its new potential area and protect its existing trees. Inadequacy of mulberry leaves and damage caused by insects and pests are the major problems in the development and expansion of mulberry trees. The Sericulture Development Department is laying stress on raising dwarf mulberry trees to supplement and replenish the traditional tall mulberry trees.

Area under Mulberry Cultivation

The State has 2,850 hectare of land under mulberry plantation, out of which 1,990 hectare are in the Jammu division and 860 hectare in Kashmir division. The area has been calculated on the basis of 1800 trees per hectare as the plantation is in highly scattered form (Godbole Report).

Table III.13
Number of mulberry trees in Jammu and Kashmir

Years	Mulberry trees (000 nos.)	Seeds Produced (000/OZ)	Seeds Imported (000/OZ)
1980-81	601.00	24.80	10.00
1985-86	724.00	24.75	7.62
1999-00	1402	17.00	27.12

Source: Statistical Abstract, Government of Jammu and Kashmir, 1999-2000

Despite several initiatives taken by the state government, the number of mulberry trees is still very low. During 1980-81, there were 601 thousand trees, which increased up to 1402 thousand in 1999-00 (Table III.13). The number of seeds imported shows a major increase in the past twenty years but the production of the cocoon is not showing the same trend. According to the Godbole Report, the Sericulture Department annually used to provide 14 lakh, one-year-old mulberry saplings for planting either in the farmer's land or in community lands. Since the planters do not give proper attention to the plantation at the establishment stage, the survival rate is very low. This is one of the reasons for the slow growth of mulberry trees in the state. The other reason for the slow growth of mulberry plantation is the

low return from this activity. Due to geographical limitation, the rotation of the cocoon production in Jammu and Kashmir is not possible. It is produced only once in a year (in the month of March in Jammu and May in Kashmir). Whereas in Karnataka the mulberry cultivation and the cocoon production is not a seasonal activity for the cultivators.

Silkworm Rearing

The cocoons produced by hybrids are used for extracting the silk fibre. For preparing the hybrid silkworm eggs, rows of silkworms are raised in separate areas. The cocoons are preserved properly in the egg-producing factories, popularly called silkworm grainages; the moths are allowed to emerge. Due to climatic conditions in Jammu and Kashmir, the rearing of silkworms is practised once a year, during May-June.

Presently the average cocoon production per ounce of silkworm seed is 31 kg in Jammu division and 20 kg in Kashmir division, which is low compared to the national average of about 38 kg, per ounce.

Table III.14
Production of cocoons in Jammu and Kashmir

(1000 quintal)

Year	Production of Cocoons (000 Qtl.)
1980-81	10.36
1985-86	6.42
1990-91	7.00
1995-96	5.81
1996-97	7.67
1997-98	7.83
1998-99	8.29
1999-00	8.25

Source: Statistical Abstract 1999-2000, Government of Jammu and Kashmir.

According to Table III.14 quantity of cocoon production is inconsistent, one of the reasons being the climatic limitation of the state. Low productivity may be attributed to inadequate rearing equipment. As a result, proper growth and development of silkworms does not take place. Through certain initiatives of the state government, the state can overcome from the problem like

- (a) assistance for rearing kits;
- (b) assistance for rearing sheds;
- (c) demonstration of new technologies; and
- (d) replacement of traditional silkworm races with improved varieties.

The state government is negotiating with the Central Silk Board and Universities to get more productive silkworms. During the 10th Plan the state government has proposed to provide proper rearing accommodation, manpower and mulberry leaf to the rearers.

Production of Raw Silk

In Jammu and Kashmir, due to improper disease management, the production of raw silk is not consistent. During the years 1985-86 to 1995-96, production of raw silk showed a gradual declining trend. In 1985-86, the silk production was 33.70 thousand quintal coming down to 9.50 thousand quintal in 1995-96. From 1996-97 onwards it shows an increasing trend. In the year 1996-97 the production of raw silk was 85.10 thousand quintal, which increased to 92.10 thousand quintal during 1998-99 (Table III.15). In terms of value of raw silk produced, the trends has been declining.

Table III.15
Production of Raw Silk in Jammu and Kashmir

Year	Quantity (000 Kg)	Value (Rs 000 lakh)
1980-81	75.85	234.98
1985-86	33.70	291.28
1990-91	20.74	155.35
1995-96	9.50	140.16
1996-97	85.10	1076.00
1997-98	86.13	1205.00
1998-99	92.10	1208.00
1999-00	80.00	960.00

Source: Statistical Abstract, Government of Jammu and Kashmir, 1999-2000

Employment in the Sericulture sector in Jammu and Kashmir

Table III.16 indicates that number of household dependent on sericulture has shown a gradual decline, from 38.50 thousand in 1980-89 to 25.28 thousand in the year 1999-2000. One of the important reasons for this decline is the low return from cocoon production. Due to climatic conditions mulberry cultivation is a subsidiary occupation. Only 20-30 per cent of the produced cocoons were used within the state.

Table III. 16
Number of people dependent on Sericulture

Year	No. of Sericulture Villages (000 nos.)	No. of Sericulture Households (000 nos.)
1980-81	2.70	38.50
1985-86	2.26	32.50
1990-91	2.59	29.19
1995-96	2.36	23.53
1996-97	2.24	25.52
1997-98	2.30	27.00
1998-99	2.307	22.737
1999-00	2.15	25.28

Source: Statistical Abstract, 1999-2000, Government of J&K.

Due to open competition from other countries like China the same product is available at a cheaper price outside the state. Since 1989, the government has not assured a minimum rate to the cultivator, a factor contributing to the restricted participation of the cultivator in mulberry cultivation. By developing this sector, a lot of employment opportunity can be developed in the rural and semi-urban areas. It has greater implications for absorbing family labour which otherwise would have remained unemployed or underemployed. Ramana (1987) is of the opinion that both mulberry cultivation and silkworm rearing employs mainly household labour; the latter providing domestic occupation for ladies even in the upper agricultural class. So, by effective management and proper attention, sericulture development can lead to a substantial increase both in the net return and employment.

Government Initiatives for Sericulture Development

(a) Silkworm seed production

The Ninth Plan period saw an increase in average cocoon productivity from 24 kg per ounce to 33 kg per ounce of silkworm seed. This alone has contributed to about 1.5 lakh kg. The seed-producing units/stations are proposed to be equipped properly and provided with modern facilities so that the quality of silkworm seed is further improved. In Jammu region the traditional silkworm races have been replaced with improved breeds to the extent of 100 per cent. The department is expecting the release of more productive silkworm from Central Silk Board and Universities. During the Tenth Plan, all those rearers who have proper rearing accommodation and with whom man-power and mulberry leaf availability is not a constraint, will be given these varieties.

(b) Production of Mulberry Plants

The department at present annually produces 15 lakh standard mulberry saplings from its nurseries spread over an area of 4317 hectare. During the Tenth Plan, emphasis will be laid to double the out-turn of plants (from about 6000 plants/hectare to 12000 plants/hectare). For increase in plant productivity, the following steps will be taken:

- i) Provision of proper irrigation facilities wherever lacking or insufficient.
- ii) Proper fencing of nurseries.
- iii) Application of inputs and full adoption of package of practices.
- iv) Optimum man-power utilization and management

The yearly turnout of standard plants shall be raised to 20 lakh. By the end of the Tenth Plan, efforts will be made to produce 5-10 lakh plants in private nurseries (Kissan nurseries) for massive field plantation. Attention shall continue to be paid towards popularization of only improved mulberry varieties recommended by different research institutions and universities. Overall production of nutrition leaves in bulk to meet the demand, will be a major area of attention for the department of sericulture.

A scheme to ensure that every family must grow one mulberry plant should be popularized.

Policy Recommendations

- (a) Silkworm seed is the sheet anchor of the sericulture industry. The local seed produced and distributed to rearers in Kashmir gives lower cocoon yield compared to foreign seed. The import and distribution of foreign seed that was stopped in the year 1984 in J & K and re-started in 1995 needs more attention. Therefore, the first step towards boosting silk production is to evolve superior varieties of disease-resistant silkworm races which should suit local conditions. In this context, the research output of Sher-I-Kashmir University of Agriculture Science and Technology is not very encouraging. It is time to review the activity of the university and the state government should provide infrastructure to private investors in this area.
- (b) Profitability from sericulture depends largely on the production of mulberry leaf at an economic cost. Hence, there is an urgent need to improve mulberry leaf both qualitatively and quantitatively. Due to geographical limitations, multi-crop

cultivation of mulberry is not possible. It is suggested that the state government encourage the farmers to plant mulberry trees on the edges of their rice fields and orchards on a large scale. These plants must also be properly maintained for ensuring higher leaf yield.

- (c) The department of sericulture should produce improved varieties of mulberry plants in their farms and then distribute them to the rearers. The social forestry department should be involved in the plantation programme. The department has a large number of workers on daily wages who can be replaced by motivated farmers for planting better varieties of mulberry plants on a large scale. However, these farmers should be given adequate incentives. As a consequence, there will be higher leaf production and rearers can go in for large cocoon production and receive more benefits.
- (d) Cocoons are the end product of a mulberry farm. The rearers should arrange proper equipment for carrying out silkworm rearing scientifically. Wooden trays must be prepared for self-rearing and traditional floor rearing be discarded. The rearers should pay adequate attention to the artificial adjustment of environmental factors like temperature, humidity, light, air and food to create a conducive environment for silkworm rearing.
- (e) Cocoon markets in Kashmir need to be established in such a way that large-scale buyers from outside the state can participate. Wide publicity should be given about the sale of cocoons in these markets before starting the actual sale. Participation of purchasers from outside the state is necessary because silk reeling units in private sector have not yet started functioning in Kashmir. Besides, arrangements should be made by the department of sericulture for taking the cocoons of rearers to the markets at an appropriate time. This will result in higher price for cocoons for rearers of Kashmir.
- (f) Sericulture is an important agro-based industry with considerable potential for income and employment. Therefore, by integrating mulberry cultivation with farm and horticulture activity, it will provide more income and employment to the rural agricultural labour force.
- (g) Marketing of the cocoon has been a neglected area requiring proper attention. Despite certain measures taken by the state government, more steps should be taken. Cocoon auction markets should be started at Jammu, Mandalli, Udampur, Sunderbani, Rajouri, Poonch, Ramban, Banilal, Doda, Anantnag, Srinagar, Kupwara, Pulwama and Baramulla, where private as well as other states could participate in the bidding, besides government. This will help the people to get cash returns at competitive rates and inculcate quality consciousness among the people.
- (h) The upgradation of seed stations also needs the attention of state. The poor silk content needs to be replaced by productive breeds and the technical staff to be imparted training to prepare good quality and disease-resistant silkworm seeds.

- (i) The number of nurseries needs to be increased. In the Tenth Five-Year Plan, the department has proposed that 60 nurseries should be set up in the state, of which 40 should be set up in Kashmir and 20 in the Jammu division. But this target seems on the lower side and needs to be raised.
- (j) Silkworm seed production during the past twenty years shows consistency. (Table III.12). In 1980-81 the silkworm seed produced was 24.80 thousand and during 1999-2000 it was 27.33 thousand, the growth indicating that this sector needs proper attention for improvement.
- (k) In spite of its congenial climate, the average cocoon production per ounce of silkworm seed is 31 kg in Jammu division at present and 20 kg, in the Kashmir division. This is low compared with the national average of about 38 kg, per ounce. The reasons for low productivity are: inadequate rearing equipment and rearing space with the rearers. As a result, proper growth and development of silkworms does not take place. This problem can be overcome by providing assistance for rearing kits, rearing sheds and demonstration of new technologies.

3. IRRIGATION

INTRODUCTION

Irrigation is one of the indicators for measuring the development of agriculture in any state. It affects agricultural productivity directly. In Jammu and Kashmir the total net area irrigated by different sources (canals, tanks, wells and others) was about 2.61 lakh hectare (41.96 per cent) in the year 1950-51 (Table III.18). Table III.17 shows that there is a constant increase in the net irrigated area during fifty years. The area sown more than once is very low. In 1998-99 the area under this category was 3.48 lakh hectare, which is 47.19 per cent of the total area sown.

Table III.17
District-wise Net Area Irrigated from different sources 1999-2000

District	Net Area Irrigated by (1000 ha.)				Total
	Canals	Tanks	Wells	Other Sources	
Anantnag	44.04	1.30	0.02	4.00	49.36
Pulwama	33.34	0.48	0.04	0.10	33.96
Srinagar	16.50	0.11	0.10	0.50	17.21
Budgam	31.59	0.08	-	0.08	31.75
Baramulla	37.21	0.04	0.70	2.19	40.14
Kupwara	14.48	0.55	-	0.21	15.24
Leh	8.48	-	-	-	8.48
Kargil	9.32	-	-	-	9.32
Jammu	51.72	0.01	0.026	2.10	54.09
Udhampur	4.15	-	-	1.02	5.17
Doda	6.46	-	-	0.78	7.24
Kathua	15.86	-	0.25	5.75	21.86
Rajouri	2.08	-	-	3.39	5.47
Poonch	3.12	-	-	0.68	3.80
J & K	278.35	2.57	1.37	20.80	303.09

Source: Digest of Statistics, 2000-01, Government of Jammu and Kashmir

The state can be divided into 3 hydro-geological units, namely, (i) outer plains of Jammu & Kathua districts, (ii) Kashmir Valley, and (iii) Ladakh region. Brief description of all the units is as under.

The outer plain unit is located at the foothills of Shiwalik Hills. The altitude varies between 260 and 440 metres above mean sea level. Innumerable streams are crossing the area. These streams are locally called *khads* and are laid by boulders and have water only in the rainy season. These plains are further divided into Bhabar and Tarai region. Because of deeper water level conditions, the Bhabar region has ground water only in under-water level condition, whereas in the Tarai region it occurs both in under-water level and confined conditions.

Jammu area receives surface irrigation facilities from the following canal systems:

1. The Ranbir canal system
2. Partap canal system
3. The Kashmir canal system
4. The High canal system
5. The Ravi-Tawi irrigation system.

About 90 per cent of the above-surface irrigation facilities are available to the Tarai area and only 10 per cent to the Bhabar area. There is considerable scope for extending irrigation facilities through tubewells in the Bhabar area, which has not so far been covered by surface irrigation.

The second hydro-geological unit is the Kashmir valley, located at an elevation of 1600-1900 metres above mean sea level with its trend in NW-SE direction. The Pir Panjal range along south and southwest and Great Himalayan range of the north and northeast encircle this valley. It seems that inland independent ground water region of the valley is plain. A Karewas level land is a conspicuous feature of the valley. There are several hard rock ridges, which abut into the valley plain from the flanks and are responsible for marking almost separate hydro-geological sub basins. Low-lying areas, especially those around the surface water bodies are marshy. The Dal, the Wular and the Mansbal lakes occupy about 300 sq.km of the valley portion. The lakes act as balancing reservoir for storing flood water and save downstream areas from watercourse. The valley fills of Jhelum River and the upper Karewas form the main hydro-geological units of the valley. The upper Karewas have distinctive boulder beds from potential aquifers whereas lower Karewas are argillaceous in nature and wells have to be carefully designed for tapping these formations. Sand occurring in lower Karewas takes up a lot of time during development. The high-area level lands, which have not been covered so far by surface irrigation, are irrigated only by tubewells.

The third one is the Ladakh region. The sediments of Leh plain consist of morainic material overlain by varied living and silts of lacustrine. The entire zone receives irrigated water for cultivation from the Indus and its tributaries as well as Nallah, Drass, Suru, Kangi and Wakha. In this region the construction of tubewells is possible on the thickness of rocks.

Area Irrigated from different sources

Out of 2,22,236 sq.km of total area of the state about 3000 sq.km area of outer plain of Jammu & Kathua districts and 5,000 sq.km area of Kashmir Valley covering parts of districts of Srinagar, Pulwama, Badgam, Anantnag, Baramulla and Kupwara has been considered for the purpose of the ground water resource estimation by the Central Ground Water Board (CGWB). The ground water estimates are available at the district level, whereas the same has not been segregated at the block level. It has been established by the CGWB that the entire out plain area of Jammu region and the valley portion of Kashmir region fall in the white category. The present stage of ground water development is 1.33 per cent.

Canal irrigation constitutes the largest single source of irrigation, accounting for 93.75 per cent. Tanks, wells and other miscellaneous sources contribute the rest (Table III.18). Some estimates indicate that the gross irrigated area is 4.27 lakh hectare of the gross cultivated area of 11.02 lakh hectare. As such the percentage of gross irrigated area was about 40.94 per cent for the state as a whole. However, the situation in various regions is different from the state average. In the Jammu region the gross irrigated area is 75.14 thousand hectare, mostly irrigated by canals like Ranbir canals and Ravi lift irrigation system covering about 21.06 per cent area only. This assumes significance in view of the fact that Jammu region has the largest gross cropped area of the state.

Table III.18
Trend in Net Area Irrigated from different sources

Years	Net Area Irrigated (1000 ha)				Total
	Canals	Tanks	Wells	Other Sources	
1950-51	244.00	3.00	3.00	11.00	261.00
1960-61	256.00	-	5.00	13.00	274.00
1968-69	252.00	-	1.00	11.00	264.00
1980-81	285.00	2.00	4.00	13.00	304.00
1990-91	278.58	1.98	1.33	16.20	298.09
1995-96	284.86	2.57	1.42	17.73	306.58
1996-97	284.25	2.57	1.42	25.02	313.26
1997-98	284.31	2.52	1.30	20.64	308.77
1998-99	283.81	2.60	1.32	21.42	309.15
1999-00	278.35	2.57	1.37	20.80	303.09

Source: Digest of Statistics, 2000-01, Government of Jammu and Kashmir.

In Kashmir, gravity canals mostly provide the region with irrigation. Canals like Martnod, Dedi, Nandi, Maw, Zainapora, Wopzan and Zoor and lift stations like Lethpora, Padgampora, Marwal, Quill and Rajpora are the main sources of irrigation for southwest and southeast of Kashmir. Canals like Lar, Power, Ded, Zaingeer, Lalquell, Babul and Aehji and lift stations like Sumbal, Rajiabad cater to the

irrigation needs of northeast and northwest Kashmir. Gross cropped area is 255.14 thousand hectare constituting 63.11 per cent. In Anantnag district of Kashmir region, most of the land has irrigation facilities followed by Baramulla and Pulwama.

In Leh and Kargil districts, the entire cropped area is irrigated from the Indus and its tributaries and Nallah, Drass, Suru, Kangi and Wakha and wherever possible, also through gravitational canals, as field crop production is not possible without assured irrigation in the limited cropping season of this arid region. The total area under irrigation in this region is about 18.76 thousand hectare, constituting 82.60 per cent of the total cultivable area. Recently, Igo-phey canal has been commissioned for irrigation in Leh and Kurbathang canal in Kargil. A few more canals are under construction in the region.

Irrigated Area under different Crops

Table III.19 shows that rice and maize cultivation get maximum share of available water sources. The Kashmir region gets maximum irrigation facility for rice cultivation despite the fact that the rice produced in this region is not sufficient. Wheat, after rice, is the second important crop which receives a big share of irrigation facility in the Jammu region, but in the Kashmir region it has been neglected, not because there is no water for wheat cultivation in Srinagar division, but due to different food habits. The Kashmir region is giving more attention to rice cultivation and the Jammu division to wheat.

Table-III.19
District-wise Irrigated area under different crops 1999-2000 (1000 ha)

District	Rice	Maize	Wheat	Barley	Other cereals pulses & millets	Other food crops	Other Food Non crops	Total area under crops irrigated
Ananatnag	0.40	0.03	Neg	-	Neg	Neg	Neg	0.43
Pulwama	0.25	0.04	Neg	-	Neg	-	Neg	0.29
Srinagar	0.12	0.02	Neg	-	Neg	-	Neg	0.14
Budgam	0.27	0.02	Neg	-	Neg	-	Neg	0.29
Baramulla	0.28	0.10	Neg	-	Neg	-	Neg	0.38
Kupwara	0.10	0.05	-	-	Neg	-	-	0.15
Leh	-	-	0.03	Neg	Neg	Neg	-	0.03
Kargil	-	-	0.02	Neg	Neg	-	-	0.02
Jammu	0.44	0.44	0.42	Neg	-	-	-	0.86
Udhampur	0.05	0.05	Neg	-	-	-	-	0.05
Doda	0.04	0.04	Neg	Neg	Neg	-	-	0.06
Kathua	0.23	0.23	0.12	Neg	-	-	-	0.35
Rajouri	0.05	0.05	0.02	Neg	-	-	-	0.07
Poonch	0.04	0.04	0.01	Neg	Neg	-	-	0.05
Total	2.27	0.28	0.62	Neg	Neg	Neg	Neg	3.17

Neg: Negligible

Source: Digest of Statistics, 2000-01, Government of Jammu and Kashmir.

Potential Areas

The state offers good scope for exploitation of ground water. The ground water development is 1.33 per cent of total available water resources. The MI structure like STWs, dug wells, PI sets or river lets are feasible. There is a potential for the installation of 7,000 STWs in the state.

Drawbacks

The potential for installation of STWs and other MI structures in the state has not been utilized to its fullest extent. Since the Minimum Needs Programme (MNP) has been stopped by the state government, the farmers are not interested to go in for STWs/other MI structures. The block-level ground water elements are not available in the state. Besides, there is no agency which can guide the farmers in the promotion of MI works. The ground water deficit area like Kandi has vast scope for drip and sprinkler irrigation. These systems, once introduced in these areas can increase the production and productivity.

Problems/Constraints in the Development of Ground Water

The state has a lot of ground water potential in selected areas but the same has not been exploited due to the following reasons:

1. Lack of information on the availability of the resource at block level on area-specific basis.
2. Lack of coordination between the different state agency involved in ground water activities.
3. Lack of technical staff in banks for formulation of ground water as well as surface water-based schemes.
4. Non-availability of block-wise ground water evaluation data.
5. Only subsidy-oriented programmes are preferred by the borrowers.
6. Fragmented land holdings and lack of non-farm development
7. Dominance of traditional crops in the existing cropping pattern.

Policy Recommendations

In order to exploit ground water potential in the state, the following measures are suggested:

- (a) The state government should work out ground water potential at block-level as per National Bank requirements.

- (b) Delineate area suitable for the development of ground water.
- (c) Recommend area-specific suitable design of MI structures and Unit Cost.
- (d) Provide technical support to the banks in the formulation of MI Schemes and innovative schemes like drip and sprinkler irrigation.

4. INDUSTRY

Industries play a vital role in the development of an economy. Unfortunately, J&K has not been able to attract investments in industries and remained as an industrially backward state. The state does not have a strong industrial base, because geographical location of the state is such that the setting up of large industries with a large capital base is not feasible, besides adverse environmental consequences. Nevertheless, many small and medium-scale industries have come up basically in the traditional sectors along with some new areas like food processing, agro-based units and metallic and non metallic products.

Table: III.20
Number of registered industrial units and employment

Year	Number	Employment
1995	35641	154621
1996	36829	159509
1997	38135	164989
1998	39542	171660
1999	40729	177603
2000	42042	183297
2001	42808	187399

Source: Industrial Statistics, J&K, 2000-2001.

It can be seen from Table III.20 that with government's support in the form of loans and incentives to set up industrial units, their number has increased from 35641 in 1995 to 42808 in March 2001. At the same time, employment has increased from 154621 persons in March 1995 to 187399 in March 2001 (the data pertains to units that have got themselves formally registered).

Annexe-4 gives product-wise details of the industrial units along with employment and output. The registered number of hosiery and basic metal products manufacturing units has shown an increase year after year from 1995-96 to 1999-00. However, the trend changed during 2000-01 when only 91 units in case of hosiery and 69 units of basic metal products were registered. Units producing wood products have, however, shown a decreasing trend with the registration of 105 units in 1999-2000 and only 26 units in 2000-01.

The year 2000-01 experienced a decline in the number of industrial units set up in the state, with only 766 units getting registered in 2000-01 as compared to 1313 units in 1999-00. Employment generation also declined during the same period. In 1999-2000 5694 persons were additionally employed, while only 4102 persons were

absorbed in 2000-01. Annual production showed a decline from Rs. 30805.04 lakh in 1995-96 to Rs. 24293.01 lakh in 1999-00 and further to Rs. 21787.34 lakh in 2000-01. It is also important to note that the annual production declined to Rs. 13213.87 lakh, in 1997-98 in spite of the increase in the number of units registered during that year. The year 2000-01 witnessed an overall decline in the number of units set up, employment generated and the production.

Table III.21
Loans advanced by banks and other financial institutions

(Rs. in Lakh)

	Cases Recommended		Cases Sanctioned		Cases Disbursed	
	No.	Amount	No.	Amount	No.	Amount
1995-96	1785	5460.37	622	1523.60	546	1352.35
1996-97	1717	6275.74	285	861.86	226	745.24
1997-98	2040	6960.06	445	1859.88	239	1233.38
1998-99	1790	8252.87	419	1748.80	295	1073.32
1999-00	1334	7257.06	374	1507.00	284	755.27
2000-01	1469	8061.23	418	2095.34	332	976.61

Source: Industrial Statistics, J&K, 2000-2001.

Table: III.22
Loans disbursed by banks and other financial institutions

(Rs. in lakh)

Year	State Financial Corporation	Jammu & Kashmir Bank	Other banks and financial institutions	Total loans advanced by banks & other financial institutions
1995-96	0.00	1177.70	174.65	1352.35
1996-97	0.00	508.01	237.23	745.24
1997-98	18.00	960.12	255.26	1233.38
1998-99	130.38	282.31	660.63	1073.32
1999-2000	162.43	462.22	130.62	755.27
2000-01	418.81	426.20	131.60	976.61

Source: Industrial Statistics, J&K, 2000-2001.

Table III.21 shows the financial support to industries set up in the state. Against 1785 cases recommended for loans in 1995-96, only 622 cases were sanctioned and only 546 units were granted to the tune of Rs. 1352.35 lakh. This number came down to 1469 cases recommended for loan in 2000-01, of which 418 units were sanctioned loans and only 332 were only granted amounting to Rs. 976.61 lakh. During 1995-96 and 1996-97, dependence on J & K Bank for financial support was immense, while no loan was sanctioned or provided by the State's premier

development financing institution, viz., State Financial Corporation (SFC) (Table III.22). However, the SFC has emerged to play a greater role in providing financial support during 1999-2000 and 2000-01 as an amount of Rs. 418.81 lakh was disbursed as loans in 2000-01.

It is important to note that the sanctions and disbursements by the SFC reached an all-time high in 1991-92. Lack of proper appraisal of the viability of the projects and the credit worthiness of the applicants resulted in careless lending (Committee on Economic Reforms, August 1998). Due to such practices and difficulty in recovery along with law-and-order problems in the state, SFC defaulted in its commitments to SIDBI and Industrial Development Bank of India (IDBI) and subsequently IDBI stopped matching contributions towards subscription of share capital. That is why SIDBI and IDBI stopped refinance from 1992-93 till 1995-96. In 1997-98, however, SFC sanctioned a loan of Rs. 18.00 lakh to one industrial unit only and gradually increased the cases disbursed to 10 in 1998-99 with a total of Rs. 130.38 lakh as loan amount.

Role of Promotional Agencies

Jammu and Kashmir State Industrial Development Corporation Limited (SIDCO)

Jammu and Kashmir State Industrial Development Corporation Limited (SIDCO) is the nodal agency for promotion and development of medium and large-scale industries in the state. The corporation has been entrusted with various assignments for the development of industries in the state. It is responsible for the development of infrastructural facilities of small, medium and large scale industrial projects, identification of technically feasible and financially viable projects for the state, conducting seminars/ workshops/industrial exhibitions within and outside the state for the promotion of industries, and assisting quick clearance of the envisaged projects by various regulatory authorities. SIDCO has also been acting as a nodal agency for the Ministry of Food Processing Industries, Government of India and operating as the virtual office of Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce, in the state. It has also been assigned the responsibility of providing grant of financial assistance to industrial projects having investment up to Rs. 450 lakh and participation in the equity of selected joint or assisted projects.

SIDCO has developed a number of industrial estates in Jammu and Kashmir. The corporation has been able to generate employment opportunity for 8,000 persons and

expects to create an additional opportunity for 10,000 persons, with an additional investment of Rs. 2000 crore in the pipeline.

J&K Small Scale Industries Development Corporation Limited (SICOP)

SICOP was established in 1975 as a wholly owned company of the Government of J&K. It has been entrusted with a variety of roles for the development of small-scale industries (SSI) in the state. The corporation, along with SIDCO and Directorate of Industries and Commerce (DIC), has been responsible for developing industrial infrastructure in the state. SICOP is managing six industrial estates located at Gangyal, Birpur and Kathua in Jammu Division and Zainakote, Zakura and the Sports Goods Complex, Bejbehara in Kashmir Division. In addition, SICOP is also managing an Industrial Infrastructure Development Centre (IIDC) at Battal Ballian in Udhampur (Jammu Division). Around 535 units have come up in these estates (A Handbook of Industrial Statistics, J&K, 2000-01). The corporation has established a network of raw-material depots in all districts of the state for the procurement and distribution of raw materials to small industrial units. It also functions as the consignment agent of Indian Petrochemicals Ltd. (IPCL) at Jammu, Srinagar and Leh and handling agent of Steel Authority of India Ltd. (SAIL) at Pampore (Kashmir) and the consignment as well as its handling agents at Leh. Besides, it also provides marketing support by selling the end products of the industries to the government. The state government, to this effect, had reserved fifteen items for exclusive purchase by the government departments from SSI through SICOP in 1997. A total of 944 units are registered with the corporation under this activity. It also provides testing and quality inspection facilities for SSI units through testing centres.

Small Industries Service Institute (SISI)

Small Industries Service Institute (SISI) was set up to provide technical support services to small scale industries in the country. Along with various developmental efforts, SISI has been conducting entrepreneurial development programmes as well as promotional programmes to promote SSIs in the country. SISI and its branches have common facility workshops in various trades attached to it.

SISI, Jammu has been providing techno-managerial, economic and marketing services to prospective and existing entrepreneurs in the state. The entrepreneurs are guided in product identification and diversification, selection of machinery and their procurement. It has also undertaken the preparation of project reports like: Industrial Profile of J&K state, State Profile on Agro-based industries, Technical Reports on the prospect of glass and ceramic industry in J&K, etc.

Besides, SISI provides consultancy services to prospective entrepreneurs and conducts training courses/seminars. During 2000-01, technical, managerial as well as marketing assistance was provided to 1866 prospective entrepreneurs. The institute conducted four entrepreneurial development programmes where 122 entrepreneurs including 20 women were trained.

Directorate of Industries and Commerce (DIC)

The Directorate of Industries and Commerce performs various functions to promote industrialization in the state. The directorate is the implementing agency for various policies and programmes meant for the development of industries. It provides incentives (under the package of incentives announced by the government both state and central) and marketing assistance to existing as well as new industrial units in the state, organises and participates in exhibition and fairs, seminars, workshops and awareness campaigns to promote industrial development in the state. DIC facilitates interface between industrial associations and agencies engaged in industrial development and financial institutions and banks. The directorate has also developed industrial estates with facilities to set up industrial units. Along with promotional functions, DIC maintains statistical information regarding industrial development in the state.

There were 32 industrial estates with 692 units in the state under Directorate of Industries and Commerce's (DIC) control in March 2001 (Table III.23). Under the control of SICOP there were 7 estates with 535 industrial units and 11 estates with 320 units under SIDCO's control. However, the number of functional units is much less than the total number of units. A total of only 581 units were functional out of 1547 units set up in the estates.

Table III.23
Industrial Estates in the State

(numbers)

Industrial Estates	No. of Estates	No. of Units	
		Functional	Non Functional
Estates under D.I.C	32	425	267
Estates under SIDCO	11	217	103
Estates under SICOP	7	324	211

Source: Industrial Statistics, J&K, 2000-2001.

With the objective of promoting small-scale industries, industrial estates have been set up in the state. These estates were meant to provide conditions favourable to enhance the efficiency of the units, economical use of the resources available, and

create backward and forward linkages. Industrial estates, however, have failed to fulfill the objective of promotion of small-scale industries. One such study shows that units outside the estates have performed better than the units inside.* Further, the industrial estates have been developed without appropriate planning and economic study. There is also a need to improve the infrastructural facilities provided to these estates in the form of a road network, power supply, etc.

To provide gainful employment to rural artisans of the state, the J&K Khadi and Village Industries Board was established in 1962. The Board provides financial and technical assistance for setting up of small-scale industries under various schemes to achieve this objective.

Financial assistance is provided as per the approved pattern of the All-India Khadi and Village Industries Commission to individual units as well as to cooperative societies. Up to now the Board has financed 1214 cooperative societies and 28364 individual units, generating employment for 72309 people. In 1997-98 'Special Employment Programme' was taken up by the Board in the districts of Jammu and Anantnag to provide job opportunities to 10,000 people in each district. Under this scheme, 65 per cent of the cost of setting up an industrial unit comes as bank finance, 25 percent as margin money released by the Board and 10 per cent as beneficiary contribution. This scheme has been extended to all districts of the state under the name of 'Rural Employment Generation Programme' in the year 1998-99. By the end of March 2001, 1215 units had received financial assistance from the Board with the generation of employment for 5,000 people (Draft 10th Plan Document, J&K, 2002).

PUBLIC SECTOR UNDERTAKINGS

J&K Minerals Ltd. was the first state-owned enterprise set up in the year 1960 with the objective of exploiting mineral resources and establishing mineral-based industries in the state. Next, the J&K Industries Limited (JKI) was incorporated in 1963. Though Public Sector Undertakings (PSUs) were set up in the state, keeping in view the objective of industrial development for which private investment was not available; they have of late, lost their importance in terms of contribution to the State Domestic Product (SDP). On the one hand these units have to compete with the private sector in procuring raw material and on the other, over-staffing, political interference in the day-to-day functioning of the corporation, mis-management, poor

* Mushtaq 2002, Efficacy of Industrial Estates in J & K, *The Business Review, The Journal of Kashmir University*, Vol.8, No. 1 & 2, 2002).

marketing strategy, law-and-order problems in the state have resulted in the poor economic performance of the PSUs. It is further claimed that all the PSUs in the state are viable, though running into loss. An example is the watch-case manufacturing company set up by SIDCO, which, virtually producing nothing, only pays salaries to its employees.

There are 20 PSUs in the state, namely:

1. J&K Handicrafts (S&E) Corporation Ltd.
2. J&K Minerals Ltd.
3. J&K Handloom, Handicrafts, Raw Material Supplies Organisation
4. J&K Himalayan Wool Combers Ltd.
5. J&K State Industrial Development Corporation Ltd.
6. J&K Cements Ltd.
7. J&K Handloom Development Corporation Ltd.
8. J&K Small Scale Industries Development Corporation Ltd.
9. J&K Industries Ltd.
10. J&K Women Development Corporation Ltd.
11. J&K Scheduled Caste, Scheduled Tribe and Other Backward Classes Development Corporation.
12. J&K Tourism Development Corporation Ltd.
13. J&K Cable Car Corporation Ltd.
14. J&K Forest Corporation Ltd.
15. J&K State Financial Corporation Ltd.
16. J&K Horticulture Production, Marketing and Processing Corporation Ltd.
17. J&K State Road Transport Corporation Ltd.
18. J&K Project Construction Corporation Ltd.
19. J&K Agro Industries Development Corporation Ltd.
20. J&K Power Development Corporation Ltd.

Almost all the PSUs in the state are running into loss with the exception of J&K Project Construction Corporation Ltd., J&K Tourism Development Corporation, J&K Cable Car Corporation Ltd., J&K Forest Corporation Ltd. and J&K Cements Ltd, which are earning revenues only to meet their day-to-day expenses.* The state government has recently shut two corporations, namely, J&K Himalayan Wool Combers Ltd. and its subsidiary J&K Handloom, Handicrafts, Raw Material Supplies

* *Source:*Department of Public Sector Undertakings, Govt. of J&K, Jammu.

Organization, after declaring them sick. The employees have been paid money the under Voluntary Retirement Scheme (VRS) designed especially for these two companies and sanctioned by the state government.

Seven PSUs are being provided budgetary support by the state government to enable them to meet their wage bills as well as carry out day-to-day activities. The state government has signed a MoU with the Government of India to gradually phase out the budgetary support. Since 1998-99 there has been an annual reduction of 10 per cent in the support provided to these corporations.

The state government had formed an apex committee under the chairmanship of the Chief Secretary to decide on the strategy to revive/ restructure the loss-making corporations. The issue of restructuring was also discussed with the Ministry of Finance, Government of India, where it was decided that financial institutions like IDBI would provide funds for VRS required to downsize the concerned corporations along with some capital investment to rejuvenate them. However, the financial institutions did not come forward to fund VRS, though they were ready to invest in the restructured company. A restructuring fund has been created in the state under the name of Renewal and Restructuring Reserve Fund to finance the Golden Handshake Scheme (or the VRS) for the purpose of voluntary retirement of the employees working in PSUs which are not financially viable. The fund has a corpus of Rs. 10 crore contributed from the Plan funds of the state along with matching contributions from the non-Plan. Sales proceeds from disposal of fixed as well as current assets of the PSUs also contribute to the fund.

The state government has also explored the possibility of privatization but the experience with such sales has not been encouraging since the private owners could not run the units had to close down the business. Second, only a few corporations in the state are involved in manufacturing, most of them being service providers like SIDCO, SICOP, SFC etc., providing infrastructure and raw material to the industrial units in the state. Privatisation of these corporations would not be in the best interest of the industries in general and development of small-scale industries in particular.

Disinvestment is another option being explored by government. The state has initiated the process by disinvesting in a few units owned by J&K Industries Ltd.

The state, however, does not have any active policy towards restructuring/ revival of the loss-making PSUs. The J&K Government had appointed a committee on Economic Reforms which submitted its recommendations in 1998. Accordingly, various departments were asked to come up with the proposal to restructure/ revive

the PSUs under their respective departments. Though some of the PSUs have hired consultants and prepared such proposals, the concerned finance department has not received any such proposal.

INDUSTRIAL SICKNESS

Although the number of SSIs in the state has gone up, there are cases of sickness of units, some of them being nonfunctional and missing. Industrial Census of SSI in J&K (1998) showed that out of 36,510 units surveyed, 15,145 units (41.48 per cent) were functional 4,840 units (13.26 per cent) were closed whereas 306 units (0.84 per cent) were sick and 16,219 units or 44.42 per cent were untraceable (Table III.24). Most of these untraceable units are those that are registered to take advantage of the incentives given to the SSI. Some others left the state due to disturbances.

Table: III.24
**Classification of units as functional/sick/closed/
untraceable according to Census 1998**

Type of Industrial Units	Total	Percentage
Units Surveyed	36510	--
Functional Units	15145	41.48
Sick Units	306	0.84
Closed Units	4840	13.26
Untraceable Units	16219	44.42

Source: Industrial Statistics, J&K, 2000-2001.

The Entrepreneur Development Institute (EDI), Ahmedabad, conducted a survey in 1996-97 to determine the reasons for the sickness of the industrial units in J&K. The results showed that 32.71 per cent of the units became sick due to financial crunch, 30.55 per cent due to law-and-order and other problems, 19.40 per cent due to marketing problems, 9.24 per cent due to raw material unavailability and 8.10 per cent due to migration.

POTENTIAL FOR DEVELOPMENT OF MINERAL-BASED INDUSTRIES

Coal found in the state is of the semi-anthracite quality and about 10 per cent of the production is in the form of steam coal. Generally the coal is of high heat value with ash content of 20-30 per cent and calorific value of 6,000 K.cal/kg to 7,800 K.cal/kg. At the same time, extraction is uneconomical due to thin seams and high cost of mining. Coal is used in the state in brick kilns, cement plants, manufacture of battery covers and other industrial units. Presently coal is extracted from Metka, Moghla and Baryal/Kotla coal mines falling in Rajouri and Udhampur districts.

Gypsum deposits occur in Assar, Kanga, Parlanka in Jammu region and in Buniyar in Kashmir valley. J&K Minerals Ltd. is presently extracting gypsum from Assar. Gypsum is mined on a limited scale by manual operation after blasting gypsum rocks. It extracts about 25,000 metric tonne of gypsum annually. The gypsum so mined is of 97 per cent purity and is in the form of lumps. The consumers of gypsum in the state are mainly the small-scale industries and cement plants, manufacturers of plaster of paris including Wuyan Cement Factory and J&K Cements Ltd. Attempts are being made to increase the production of gypsum as well as to explore markets outside the state. The draft 10th Plan also proposes to explore gypsum from the mines located in Parlanka, in district Doda. There are estimates that huge reserves are available in that area.

Sapphire occurs in Paddar area in Doda district. The sapphire extracted is deep blue in colour and known for its purity and transparency and considered to be of better quality than that from Sri Lanka. However, the techniques used to extract it are unscientific and primitive. Though there is potential for developing this mineral, international expertise should be used to extract it and investments should come in strictly from the private sector.

Limestone is used in the state mostly in the cement industry. However, the state has to import almost 30 per cent of its total cement requirement. The chemical industry is another large user of limestone, but due to environmental concerns, not many large chemical industries have been set up in the state.

Bauxite found in the Salal area has a high content of silica. The technology developed so far uses bauxite with a low silica content. So this variety cannot be used to manufacture aluminium sheets. However, if new technology is developed, the bauxite found in J&K can be put to good use.

Marble reserves are located in Kupwara district but because they fall in the border area, mining has been stopped for the past few years.

Challenges: Most of the mineral deposits are located in border areas and in difficult terrain. This increases their cost of transportation to the site of production. Second, the only means of transportation is by road since railways are not well developed in the state. Therefore the state cannot compete with other states like Rajasthan which with a well laid-out network of railways covering almost all the mining sites.

The fragile ecology of the state also inhibits setting up of large industries based on minerals. The social costs involved, in the form of environmental degradation,

pollution, soil erosion, would be much higher than the benefits which would accrue to the people.

INCENTIVES FOR INDUSTRIAL DEVELOPMENT

The state government announced the New Industrial Policy in 1998, operative till 2003, with a package of incentives to attract investments in J & K.

According to the New Industrial Policy 1998, the state government proposed to follow an open door policy for investors from within the state, other parts of the country as well as from abroad. To achieve rapid industrialisation in the state, the government adopted the strategy of developing industrial infrastructure. The policy includes allotment of land on lease for a period of 90 years in the industrial estates. Capital Investment subsidy (CIS) of 30 per cent subject to a maximum limit of Rs. 30 lakh to be given on capital investments. In priority areas, the upper limit has been increased to Rs. 45 lakh. Hundred percent subsidy on project feasibility report as well as on testing equipment for maintaining quality standards and on purchase of captive DG sets up to one MW is also provided. Apex Projects Clearance Committee (APCC), a high power clearance committee has been set up for expeditious clearance of the projects under the chairmanship of Chief Secretary of the state. The committee serves as a single-window clearance system for the projects which can be accommodated within the sanctioned policy and prestigious units. The government has identified certain thrust areas for giving priority in the matter of industrial growth. The projects in these areas would receive priority in land allotment, sanction of power and other clearances from the high powered committee as well as other incentives. The thrust areas are: electronics including computronics and software, food processing including agro-based industries, floriculture, handicrafts, leather processing and leather goods, sports goods, forest-based industries, processing of aromatic plants and herbs, pharmaceuticals based on herbs, bulk drugs, silk reeling, weaving, processing, printing and made-ups, items of textile goods including spinning, weaving, processing, printing hosiery and made-ups, cutting and polishing of stones, gems and jewellery, precision engineering and other identified areas.

The central government has also announced a package of incentives for setting up industries in the state. The package includes:

- Income tax holiday for a period of 5 years.
- 90 per cent transport subsidy provided from the railhead to factory site on raw material and finished goods.

- ❑ Special incentive for food-processing industries.
- ❑ Central excise exemption scheme wherein the goods specified in the First Schedule and the Second Schedule to the Central Excise Tariff Act, 1985(1of 1986) from so much of the duty of excise or additional duty as the case may be, leviable thereon under any of the said Acts.
- ❑ Central capital investment subsidy scheme where subsidy of 15 per cent of the investment in plant and machinery subject to a maximum ceiling of Rs.30 lakh is admissible to the units to be set up in the identified locations.
- ❑ Central interest subsidy scheme where the subsidy of 3 per cent is payable to the industrial units on the working capital loans for a period of ten years from the date of commencement of production.
- ❑ Comprehensive insurance scheme where insurance premium paid by the eligible units is reimbursable through a revolving fund maintained by the nodal insurance company, National Insurance Company.
- ❑ The centre would also bear the entire expenditure on growth centre subject to a ceiling of Rs. 15 crore.
- ❑ In case of Integrated Industrial Development Centres, the funding pattern would change from 2:2 between Government of India and SIDBI to 4:1and Government of India would fund the grants.
- ❑ A one-time grant of Rs.50 crore would also be provided to the J&K Development Finance Corporation by the central government to fund techno-economic studies for the industries and infrastructure best suited to this region.
- ❑ The package would be extended to all new units except branded beverages, alcoholic drinks, tobacco and tobacco-based products.

Along with various incentives offered under the New Industrial Policy, the government has taken other initiatives to boost investments in the state as follows:

1. A Software Technology Park (STP) was set up in Rangreth, Srinagar in January 2001 with central assistance. The STP has facilities of high-speed data communication, central computing/conferencing, linkage to the units located outside the complex to integrate them with the international gateway through Local Area Network (LAN), etc.
2. To promote food processing industries, a food park is being set up at Khanmoh, Srinagar. The project has been taken up with a central assistance of Rs. 400 lakh.

3. The state government, with assistance from the central government, is in the process of setting up a Common Facility Centre (CFC) at Bagh-Ali-Mardhan Khan, Srinagar. In CFC, facilities for carpet washing and drying, walnut wood seasoning and paper pulp-making plant would be provided to the craftsmen/artisans. The Government of India has also approved the setting up of a common facilities centre for processing wool and woollen products. CFC for handlooms would also be setup with the contributions by state as well as centre.
4. The development of a growth centre near Samba and Lassipora, the textile city in Kathua, the Export Promotion Industrial Park at Kartholi and one near Srinagar, the Industrial Infrastructure Development Centre at Batal Balian near Udhampur and Srinagar, are some of the other initiatives taken by the state for industrial promotion.
5. A scheme was introduced in 1998 under the New Industrial Policy for the revival of sick units. However, the unit had to be financially viable to avail of the assistance provided under this scheme. This required hiring of consultants to prepare viability report for the units. Potentially viable units would get margin money and subsidy on interest to the financial institutions like SIDBI from whom the unit holders would be asked to avail fresh working capital loans on soft terms.

However, the problem with this scheme was that almost all the sick units managed to get viability reports, thus making the revival of potentially viable but sick unit difficult. A new scheme for revival has been introduced now. The condition of viability has been scrapped. The unit has to negotiate with the financial unit on its own, settling the terms of assistance. The state government's role would be limited to providing interest subsidy to the borrowers, with the central government/state government bearing the total interest less by 1 per cent.

RECOMMENDATIONS

1. Industrial estates should be developed keeping in mind economic considerations like raw material availability, geographical location, proximity to the market, etc.
2. Common Facilities Centres should be provided to the industrial units set up in the estates. The government should also encourage setting up of homogeneous units in an estate so that they can use the common facilities provided there.

3. There should be some monitoring mechanism in place to check the performance of the small-scale units, which could detect early signs of a unit becoming sick.
4. To check untraceable units, incentives to set up units should not be given indiscriminately.
5. More educational and training centres should be set up to provide advanced training to craftsmen.
6. The small-scale unit holders need to be provided marketing assistance. The private sector should be encouraged to take a lead in this area.
7. To encourage investments in the state, government should play a lead role to build up the confidence of the private investors.
8. Better infrastructure with uninterrupted power supply, connectivity, etc., should be provided to the units to improve their efficiency.
9. Separate strategies should be adopted to promote industries in Jammu and Kashmir keeping in mind the climate, accessibility, raw material availability, human resources and consumption pattern.
10. High-value, low-volume items, service sector and information-enabled services should be promoted in the Kashmir valley. In Jammu, the advantage of rail connections should be explored by introducing industries which handle bulk materials.
11. In view of the mounting financial losses of the PSUs, the state government's scarce funds and reluctance of the financial institutions to provide the funds required to restructure the corporations, a restructuring fund could be created by the central government with specific targets set for each state to downsize/restructure the financially non-viable corporation in a phased manner.
12. There is a need to look at the practical problems involved in setting up industries based on minerals. The state is poor in infrastructure like power, essential for setting up heavy industries. The state government cannot be entirely relied upon to

invest in these industries. There is also a need to carry out a social and economic cost-benefit analysis before investing in such ventures in view of the limited government financial resources. The state's special concessions to entrepreneurs for setting up mineral based industries should be time bound and based on actual investments brought in and employment generated.

5. LABOUR AND EMPLOYMENT

J&K has been facing the problem of unemployment for long. The population of the state increased from 59.87 lakh in 1981 to 100.70 lakh in 2001. The number of workers also registered an increase of 39 per cent during the same period. According to 2001 census, the number of total workers stands at 36.89 lakh of which the main workers constitute 25.36 lakh and the number of marginal workers constitutes 11.52 lakh. The share of main and marginal workers in the total work force has remained nearly constant during the last two census years. Further classification of workers during 2001, shows that 43.36 per cent of the total workers are cultivators, 6.74 per cent are agricultural labourers and the remaining 49.9 per cent are workers engaged in other activities including household industries. Female workers contributed 28.4 per cent of the total work force, the share of female marginal workers being 66.84 per cent of the total female workers (Census, Government of India, 1981& 2001).

Work opportunities, however, have not kept pace with the increasing population. The problem of unemployment gains more importance because of increasing unemployment of the educated in the state. Almost 70 per cent of the population is directly or indirectly dependent on agriculture and allied activities which continue to be a subsistence sector. In the absence of industrial growth and negligible scope for absorption in the private sector, many have been rendered unemployed and have joined the ranks of job seekers.

The main source of data on job seekers is the live registers of employment exchanges of the state. Since registration is not compulsory, all unemployed do not get themselves registered. Second, some of those registered may not actually be unemployed but may be in search of better employment opportunities.

Table: III.25
Registrations and Placements made by Employment Exchanges

(in '000s)

Year	No. of employment Exchanges	Registrations made	Placements made	Strength on the live registers as on last day of the year
1980	10	28.66	2.52	51.28
1990	17	56.58	0.61	112.43
1991	17	56.80	0.75	146.25
1995	17	31.98	0.21	146.52
1998	17	23.41	0.15	164.06
1999	17	29.28	0.03	162.53
2000	17	34.80	0.05	167.23

Source: Digest of Statistics, 2000-2001, J&K.

The total number of job-seekers or unemployed, as per lives registers of the employment exchange during 1991, stood at 146.25 thousand, increasing to 167.23 thousand in 2000. During 1991 56.58 thousand registrations were made while employment could only be provided to 0.75 thousand unemployed, i.e., 1.2 per cent of those registered. Table III.25 shows that registrations made each year have been falling since 1991, decreasing to 34.8 thousand in 2000. Against this, jobs could be provided only to 50 people, i.e., 0.14 per cent of those registered.

The total job seekers, however, form only 1.66 per cent of the total population of the state. Since registration is not compulsory in the state, the actual percentage of the unemployed might be much higher than this number. Moreover, low percentage of placements might also have discouraged the unemployed youth from registering themselves.

Table III.26
Qualification-wise number of persons on live register

Category	1990	Percentage	1999	Percentage	2000	Percentage
Illiterates	29211	25.98	23385	14.39	21301	12.74
Below Matric	22106	19.66	29454	18.12	31128	18.61
Matric & Above Schooling	29997	26.68	56890	35	61507	36.78
Graduates	10156	9.03	19200	11.81	21823	13.05
Post Graduates	1979	1.76	7474	4.6	8275	4.95
Medicine Degree	-	-	-	-	-	-
Engineering	529	0.47	4605	2.83	4772	2.85
Diploma Engineering	770	0.68	6422	3.95	4639	2.77
I.T.I trained	3042	2.70	7346	4.52	4619	2.76
Skilled (Other than I.T.I)	14636	13.02	7752	4.77	9174	5.48
Total	112426	100	162528	100	167238	100

Source: Digest of Statistics 2000-2001, J&K.

Unemployment in 2000 increased by 48.75 per cent from the level in 1990. Table III.26 shows that while the absolute number of unemployed has increased, it is mostly in the number of educated youth. The number of illiterates seeking employment has actually declined from 29211 in 1990 to 21301 in 2000. However, matriculates and those with secondary and higher secondary schooling, seeking jobs have increased from 29997 in 1990 to 61507 in 2000. Likewise, those with

graduation and above qualifications searching employment have also registered an increase as this category increased from 27.66 per cent of the total unemployed in 1990, to 31.86 per cent in 2000.

It is important to note that the percentage of youth passing out of colleges without technical and vocational education has increased. This group would ultimately look to government for providing employment in the absence of jobs in the private sector in the state.

The increase in the number of students passing out of schools and colleges each year contributes to the pressure on the labour market. The number of graduates passing out in 2000 registered an increase of 36.3 per cent as against those in 1990 (Digest of Statistics, J&K, 2000-01). With matriculation and above degrees in their hands, these persons will add to the pressure on the employment situation in the state, further exacerbating the problem of educated unemployment and under employment.

A number of factors has contributed to the mounting problem of unemployment in the state. High population growth for J&K, growing at the decadal rate of 28.91 per cent between 1981-91 and at 30.46 during 1991-2001, against the population growth for the country as a whole was 23.56 per cent during 1981-91 and decreased to 21.43 per cent during 1991-2001. Employment generation, however, has not kept pace with the increasing population. Industrial development did not take place in the state to absorb the large pool of educated youth. The number of registered industrial units in March 2001 stood at 42808 with an employment of 1.9 lakh. Most of the industries set up in the state are in the small-scale sector with just a few medium and large scale industries. Lack of growth of medium or large-scale industries with forward and backward linkages has limited the scope for large-scale absorption of the unemployed. Poor infrastructure has kept private investors from outside the state away from investing in the state. Lack of entrepreneurship among the educated local youth for setting up their own business or trade has made them almost completely dependent on the government for jobs. The education system in the state has also contributed to the increasing problem of educated unemployment. With free education up to university level, students are encouraged to enroll for higher studies without considering the demands of the job market. Law-and-order problems in the state during early and the mid 1990s have slowed the pace of economic development affecting the creation of employment opportunities adversely.

GOVERNMENT INITIATIVE

The state government announced a job package of 26,000 jobs in 1997-98 to tackle the increasing unemployment causing much financial pressure on the state (Godbole Report, 1998). Now, however, there is a virtual freeze on state government employment, as government jobs have reached saturation point. The government has introduced certain self-employment schemes to encourage youth to set up their own enterprises. Various departments of the state implement these schemes emphasizing creation of income-generating assets for which the beneficiary can avail bank loan as well as subsidy. Special packages for career development and private placement of educated youth of J&K are: Jammu & Kashmir Self-Employment Scheme being implemented by the Department of Employment, Prime Minister's Rozgar Yojana (PMRY) implemented by District Industries Centres, Swarna Jayanti Shahri Rozgar Yojana (SJSRY) implemented by the Urban Development Agency, and Swarna Jayanti Gram Swarozgar Yojana (SGSY) implemented by Rural Development Agency.

In addition, to encourage private investors to invest in the state, the government has announced a package of incentives under its New Industrial Policy of 1998. Through this initiative, the government aims to attract industries in the state and create new employment opportunities for the local youth.

RECOMMENDATIONS FOR EMPLOYMENT GENERATION

- 1 Tourism has been a major source of income and employment for the local people in the state. However, this sector has been the main casualty due to militancy. By reviving the tourism industry, the state can re-establish those rendered unemployed; the government should develop a strategy to promote J&K as a tourist destination for domestic as well as foreign tourists.
- 2 Horticulture is another potential sector for income as well as employment generation. Presently, some 20 lakh people are employed in this sector. Developing this sector will not only increase direct employment but also increase employment in related activities such as servicing of inputs, packaging, transportation of fruits, etc
- 3 There is a tremendous scope for setting up agro-based industries in the state since the raw material required is locally available. This will also provide additional employment for the local youth in packaging, marketing and transportation of the products.

- 4 Developing sericulture can generate employment opportunities in the state. This sector has the potential of absorbing the entire family and becomes an important source of employment for female workers who would otherwise remain unemployed or under employed. Therefore, there is an urgent need to develop this sector through improved silkworm rearing, mulberry cultivation, etc.
- 5 Handloom and handicrafts is one of the traditional sectors of the state employing more than three lakh people. Emphasis on improving designs, colour combinations and marketing can generate additional income and employment.
- 6 There is a tremendous demand for dairy, poultry and fishery products. By developing this sector the state government can provide employment to the unemployed youth.
- 7 The state has a huge unexplored hydel potential. Harnessing this potential by constructing power projects can provide opportunities for both technical as well as non-technical jobs.
- 8 There is a need to develop local ventures that require skills to absorb those with matriculation and below degree, especially in the rural areas. The ITIs and polytechnics can impart training to this group.
- 9 Industry promotion in the state is essential to tackle the problem of education unemployment. The government should provide basic infrastructure to the investors and take a lead role in building up investors' confidence.
- 10 Proper career counselling should be given to students so that they make career choices according to the market needs and not because of easy admission to certain university courses.
- 11 Youth should also be encouraged to take up jobs even outside the state where investments are being made. The state needs to be better connected to the rest of the country through roads and railways so that there is more physical mobility.
- 12 Unemployment among young women is very high in the Ladakh region, accounting for 80 per cent of the unemployed youth. Males gets employment in military,

paramilitary and tourism industry, but the absorption of young women in these fields is practically nil. By providing appropriate training, women can be absorbed in hospitals as nurses, paramedical officers, laboratory assistants, etc. They can also be absorbed in schools and colleges and other jobs after suitable training.

- 13 Biotechnology (BT) and Information Technology (IT) are the new emerging knowledge-based industries which have high employment potential. Increased application of IT and BT in other sectors like horticulture, floriculture, agriculture, animal husbandry, etc. can enhance employment and income generation.

6. INFRASTRUCTURE

Power

INTRODUCTION

Growth in the consumption of energy is related to the growth of the economy, modernization, urbanization and improvement in the quality of life of the people.

India ranked sixth in the world in terms of total consumption of commercial energy during 1999. The country's consumption was only 12.5 per cent of that of USA, the world's highest consumer of energy and 37 per cent of China's, world's most populous country (CMIE, Energy, 2001). However, the energy consumption in India does not reflect the actual demand due to supply shortages.

For the year 1999-00, power consumption for the country as a whole was 319993 MKwH whereas the consumption for Jammu & Kashmir was 2915 MKwH, sharing 0.9 per cent of the total consumption for the country as a whole.

The state has a huge hydel potential estimated at 20,000 MW. of which less than 10 per cent has been exploited so far. Among the primary sources of commercial energy, Jammu & Kashmir has proven reserves of coal and lignite. The production of non-coking coal in 1999-2000 was 28 thousand tonne and lignite reserves in the state were 128 million tonne (CMIE, Energy, 2001).

Hydel energy is the cheapest source of energy available to the state, though thermal energy is also consumed in large proportions. The installed capacity in thermal plants as on 31 March 2000 was 184 MW. Thermal plants are basically used as standbys to back the hydel plants whose generation capabilities fall during winter season due to low river discharge. On the other hand, coal and lignite provide a high-cost option, because of difficult mining conditions in the case of low fuel value coal and lignite of high ash content.

Renewable energy, especially solar energy also has a vast potential in meeting the increasing demand for energy in the state. Solar energy can be an important source for Ladakh due to its sunny and dry climatic conditions.

The power sector in Jammu & Kashmir, however, is one of the most underdeveloped sectors in the state. It has not only been unable to keep pace with the growing demand but its supply to ultimate consumers has also been poor. In addition to large

unexplored potential, inadequate transmission and distribution network, huge transmission and distribution (T&D) losses, low power tariff, power thefts as well as long gestation period of the power projects have contributed to the dismal situation of the sector.

GENERATING CAPACITY

The installed capacity in the state as on March 1998 was 374.13 MW, with 190.19 MW in hydel plants and 183.94 MW in thermal plants. The 9th Five-Year Plan (1997-2002) was targeted to commission 14 ongoing hydroelectric projects with a total capacity of 144.46 MWs. These projects included small/mini hydel projects with up to 3 MW capacity as well as big projects like USHP-II (105MW). The generating capacity of the hydel plants increased to 232.7 MW in 2001 with no addition to capacity in thermal plants (Table III.27) During 1997-98 and 1998-99 there was no addition to the capacity whereas 35 MW was added during 1999-2000 and 8 MW during 2000-01 to the hydel capacity. The hydel capacity further increased to 300.15 MW by June 2002 (Table III.28). The hydro-thermal mix for the state was 51:49 in 1997-98 and the ratio increased to 56:44 in 2000-01.

Table III.27
Electricity availability in Jammu & Kashmir

Year	Installed Capacity (MW)			Generation (MKwH)		
	Hydel	Thermal	Total	Hydel	Thermal	Total
1997-98	190.19	183.94	374.13	892.00	59.00	951.00
1998-99*	189.00	183.90	372.90	662.00	6.00	668.00
1999-00	225.2	183.90	409.10	602.00	0.00	602.00
2000-01	232.70	183.90	416.60	551.00	5.00	556.00

* The figures for Installed capacity for 1998-99, 1999-2000 & 2000-2001 are provisional figures. Sources:(i) Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001.

(ii) Power Development Corporation, J&K, June 2002.

The entitlement for the state from Salal and Uri power projects is 34.39 per cent and 33.96 per cent respectively. This includes 12 per cent free power which the state is entitled to get as royalty from the projects set up under the central sector in the state.

GENERATION

Against this, the generation of power from the hydel projects was 892 MKwH and 59.00 MKwH from thermal projects in 1997-98 summing to 951 MKwH. Generation from hydel plants, however, fell to 551 MKwH in 2000-01 with only 5 MKwH of generation from thermal plants (Table III.27).

Table III.28
Existing Hydel Power Projects in J&K

Name of the Project	River Basin	Configuration	Installed Capacity (MW)
State sector			
Lower Jhelum	Jhelum	3x 35	105.00
Upper Sindh –I	Jhelum	2x11.3	22.60
Upper Sindh –II	Jhelum	3x35	105.00
Ganderbal	Jhelum	2x3+2x4.5	15.00
Karnah	Jhelum	2x1	2.00
Chenani-I	Chenab	5x4.66	23.30
Chenani-II	Chenab	2x1	2.00
Chenani-III	Chenab	3x2.5	7.00
Rajouri	Chenab	2x0.35	0.70
Sewa-III	Ravi	3x3	9.00
Ikbal Bridge	Indus	3x1.25	3.75
Hunder	Indus	2x0.20	0.40
Sumoor	Indus	2x0.05	0.10
Bazgoo	Indus	2x0.15	0.30
Stakna	Indus	2x2	4.00
<i>Sub- Total</i>			<i>300.15</i>
Central Sector			
Salal HEP	Chenab	6x115	690.00
Uri – I	Jhelum	4x120	480.00
<i>Sub-Total</i>			<i>1170.00</i>
Grand Total			1470.15

Source: Power Development Department, J&K, June 2002.

CONSUMPTION

Consumption of power increased from 2577.9 MKwH in 1997-98 to 3397.0 MKwH during 2000-01 recording an increase of 31.7 per cent. The domestic sector has been the biggest consumer followed by agriculture and industry. Domestic consumption showed an increase of 65 per cent during the same period, followed by an increase of 13.84 per cent in agriculture and 59.39 per cent in industrial consumption. The state is dependent on external sources to fill the wide gap between the demand and supply of power. The supply of power is measured by its own generation. Gross generation of power in the state is only 8.6 per cent of the total energy available as the latter includes the power purchase from central and other sources. Since the supply of power is usually not metered, consumption figures are only estimates and not actual consumption by the consumer.

Table: III.29
Electricity consumption in Jammu & Kashmir

(Million KwH)

Year	Total Consumption	Domestic	Commercial	Aariculture	Industrv	Railwav Traction	Outside the State	All other Consumers
1997-98	2577.9	652.70	125.5	439.2	313.7	0.0	0.0	1046.8
1998-99	2873.7	830.0	160.9	500.0	452.4	0.0	0.0	930.4
1999-00	2915	830	190	500	460	0.0	0.0	935
2000-01(AP)	3397.0	1077	250	500	500	0.0	0.0	1070

Sources: 1) Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001. 2) Power Development Corporation, J&K, June 2002.

Table: III.30
Net generation and total energy availability for the state

(Million Kwh)

Year	Net generation	Energy received	Energy received from central sector	Others	Energy availability
1997-98	942	3967	3918	49	4909
1998-99	706(P)	4723	4679	45	5429
1999-00	650(RE)	4851(RE)	4800	51	5501
2000-01	990(AP)	5449(AP)	5379	70	6439

Sources: 1) Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001. 2) Power Development Corporation, J&K, June 2002.

TRANSMISSION & DISTRIBUTION (T&D) NETWORK

According to the Sixteenth Power Survey conducted by the Central Electricity Authority (CEA), the demand for power is projected to increase from 6796 MUs in 2001-02 to 7214 MUs in 2002-03 and 9099 MUs by 2006-07. Peak demand is expected to grow to 1923 MUs by the end of the 10th Five Year Plan. To meet the future demand as projected, matching infrastructure is required. The state however, has a weak T&D system, inadequate both in coverage and supply.

The infrastructure requirement projected by CEA is given below.

Table III.31
Capacity of Sub-stations required at various voltage levels

(MVA)

Voltage Levels	2002-03	2006-07	2011-12
200/132 KV	2287	2884	3844
132/33 KV	2516	3173	4229
33/11 KV	2768	3490	4652
11/0.4 KV	3045	3839	5117

Source: Power Development Department, J&K, June 2002.

The present status of infrastructure vis-à-vis the requirement is as mentioned below:
Sub Stations available on 03/2002:

	<i>(MVA)</i>
200/132 KV	1680.00
132/33 KV	1787.28
33/11 KV	2015.40
11/0.4 KV	2507.49

Table: III.32
Status of transmission and distribution network in 2000-01

Voltage	Circuit kms	No. of sub-stations
220 KV	531	5
132 KV	1090	28
66 KV	223	13
33KV	2630	226
11KV	19905	17540
LT	46195	-

Source: Power Development Department, J&K, June 2002.

The HT-LT system is not well balanced in the state, being as high as 1.89 as against the ideal HT to LT ratio of one. The large LT network has also resulted in high T&D losses and poor voltages. Non-technical losses are also high on LT system.

TRANSMISSION AND DISTRIBUTION LOSSES

T&D losses in the state were as high as 47.5 per cent in 1997-98. The state, however, has been able to check the losses though they remain high at 46.5 per cent (2000-01). These losses include transformation losses as well as unaccountable consumption, of which latter accounts for more than half of the losses. The absence of metering of consumption due to non-installation or the non-functioning of the meters accentuates the problem. Power theft and pilferage exert additional pressure, forcing the state to purchase more from outside sources.

Table: III.33
Total energy availability and T&D losses

(MKwH)

Year	Net Generation	Purchases	Energy Available	Consumption	T&D losses	Percentage Losses
1997-98	942	3967	4909	2577.9	2330	47.5
1998-99	706	4723	5429	2873.7	2556	47.1
1999-00	650	4851	5501	2915	2586	47.0
2000-01	990	5449	6439	3397	2953	46.5

Source: Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001.

Although, the State Electricity Regulatory Commission Act has been enacted in the state, the commission is yet to be constituted. Once that happens, there would be rationalization of tariff and settlement of dispute between the power suppliers and consumers. The state government has also signed a Memorandum of Understanding with the Ministry of Power, Government of India, under Accelerated Power Development and Reforms Programme (APDRP) to provide good quality and uninterrupted power supply through various steps. These include de-segregation of transmission and distribution to attain commercial viability in the power sector, invitation of private participation in distribution, undertaking of energy audit at each level to reduce energy losses by 2003, installation of meters by 2003 in urban areas and by 2004 in rural areas, computerization of billing in urban areas by 2003 and rural areas by 2004 and making distribution operations to break even by March 2006.

Table: III.34
Rate of purchase and sale of power

(Paise/ Kwh)

Year	Rate of Purchase	Average Tariff
1997-98	130.7	34.35
1998-99	139.9	66.67
1999-00(RE)	144.5	156.36
2000-01(AP)	150.1	194.16

Source: 1) Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001.

2) Power Development Corporation, J&K, June 2002.

Table III.34 shows the gap between the average rate of purchase from various sources and the average tariff for sale of power, with rate of purchase being higher than the rate of selling, resulting in huge losses. Table III.35 indicates consumer-wise average tariff in J&K. Whereas most of the sectors enjoyed the highly subsidized rates of tariff, agriculture paid the minimum tariff. Low tariffs have also encouraged wastage.

Tariffs were revised in November 1997 after nine years and further revised in three steps effective from November 1998, April 1999 and April 2000. The third phase, however, has not been implemented so far.

Table III.35
Consumer-wise average tariff in the state

(Paise/Kwh)

Category	1997-98	1998-99	1999-00(RE)	2000-01(AP)
Domestic	31.50	48.00	85.00	125.00
Commercial	57.90	86.00	160.00	230.00
Agriculture	12.50	50.00	220.00	250.00
Industry	46.00	70.00	135.00	2000.00

Sources: 1) Annual Report on the working of SEBs & Electricity Departments, Planning Commission, GOI, 2001.

2) Power Development Corporation, J&K, June 2002.

RURAL ELECTRIFICATION

By the end of 8th Five-Year Plan (1996-97), there were 232 unelectrified villages of the total of 6477 inhabited villages in the state. Reasons cited for slow electrification were: that the leftover villages were mostly remote, sparsely populated and inaccessible and did not fulfill the viability norms under Rural Electrification Corporation (REC) loan Assistance (8th Five Year Plan Document).

During the Ninth Plan, the state was to achieve a target of electrification of 150 villages. However, this target could not be achieved and only 39 villages were

electrified during the Ninth Plan period and the remaining 193 unelectrified villages have been set as a target for the Tenth Five-Year Plan (Draft 10th Plan Document). The number of rural electrification schemes has increased from 137 at the beginning of Ninth Plan to 189 at the beginning of Tenth Plan. Of the 6,477 inhabited villages in the state, 6,295 stand electrified as on October 2002, of which 4,411 villages have been electrified with REC loan funds.

Due to declining interest of the State Electricity Board in raising interest-bearing loans from the REC for Village Electrification Programme, village electrification was made a part of the Prime Minister's Gramodya Yojna (PMGY) from the year 2001-02. The funds for this programme now flow to the state in the form of central assistance. Allocation under PMGY to Jammu and Kashmir was to the tune of Rs. 19.60 crore in 2001-02. During that year, 15 un-electrified villages, 256 hamlets and 84 tribal and Dalit *bastis* have been electrified.

STRATEGY FOR FUTURE DEVELOPMENT

Micro Hydro Projects

Though hydel power has a large potential in the state, most of the unexploited potential is located in difficult/inaccessible areas. In such areas, the role that small and medium hydro projects can play in meeting the local power requirements by tapping water streams and rivers of small discharge cannot be overlooked. Moreover, the development of this source of power would also avoid the necessity for using other expensive fuels for which the state has to depend on external sources. This would not only increase the availability of power to meet the increasing demand of the consumers but also reduce the cost of generating power.

The Ministry of Non-conventional Energy Sources has identified 106 sites up to 3 MW capacity with a total capacity of 145.52 MW and 78 sites with an aggregate capacity of 728.75 MW for projects in the range of 3-15 MW capacity in Jammu and Kashmir. By the end of the year 1999-2000, a total of 17 projects (up to 3 MW capacity) had been set up with a total installed capacity of 8.37 MW, whereas 10 projects with an aggregate capacity of 13.31 MW were under construction. The large untapped potential of the state needs to be identified through detailed survey and investigation.

Renewable Energy

Renewable energy can also play an important role in meeting the increasing demand

for energy in the state. Solar energy can be an important source, especially for Ladakh which presently gets electricity either through its hydel projects or through diesel sets. Ladakh is not connected to the grid and the villages in the region usually depend on diesel sets. The hydel power plants remain closed for months together during winters due to freezing of water and in summers due to high siltation. In addition, the topographical conditions are such that villages are scattered over long distances. Due to this, a central generating and evacuating system with large T & D network does not seem to be feasible. The power solution for the region lies in the dual strategy of concentrated generating system for pockets where population is concentrated and decentralised system for less populated areas.

Inadequate and erratic supply of electricity through the existing hydel projects and diesel sets, absence of conventional fuels like coal and lignite along with the environmental hazards of using energy based on these resources make the option of solar energy attractive. More than 300 days in a year are sunny and dry, increasing demand for energy provides both the need as well as opportunity to use renewable sources of solar energy. It has the added advantage of widespread use, non-polluting nature and inexhaustible supply over other fuels.

In the case of diesel sets, the fuel has to be transported from the plains. Due to the region's remoteness and inaccessibility, the cost of transportation and operation and maintenance as well as the cost of generation per unit (which is around Rs.10 to Rs.12) is very high. Solar energy can be put to use for various purposes like home and street lighting, cooking, water and space heating, water pumping, etc.

Solar Photovoltaic Technology

Solar photovoltaic (SPV) technology enables direct conversion of sunlight into electricity without any moving parts and without causing pollution. The SPV device has, of late, emerged as useful in providing energy for lighting purpose and operation of various gadgets like hospital equipment and solar water pumping for agriculture and related uses. SPV is being used in the state for domestic light, street lights and solar lanterns.

The Ministry of Non-Conventional Energy Sources, Government of India, has been providing subsidy to the users to promote the use of SPV. The state has also set targets to electrify the remaining unelectrified villages by non-conventional energy mode. A 40 KW solar power plant has been installed in Ladakh and 500 households are being provided electricity through this plant. It has been a success, having reduced the consumption of diesel to provide power.

Geo-thermal Energy

Puga valley in Ladakh has a high potential for geo-thermal energy. The Geological Survey of India has done a preliminary survey of the valley by drilling at various spots. Its results are awaited. However, it is estimated that around 40 MW of power can be obtained from this source and exploitation of the same can further ease the power situation in the region.

Developing renewable energy project needs technical expertise plus a lot of financial and administrative support by way of getting clearances at various stages and awareness generation about the advantages of using renewable energy. This is where the government is expected to play a larger role with or without the help of private participants.

CHALLENGES AND OPPORTUNITIES

The peak power demand is expected to rise from 1437 MW in 2001-02 to 1923 MW in 2006-07. Presently, the peak demand is around 1525 MW against which a supply of 500-600 MW is only available.

Another problem facing power generation is the low discharge of the rivers during winters. Since all hydel projects in the state are run-of-the-river type with no storage, the generation reduces to 25-30 per cent of the installed capacity. The state has to rely on purchases from other states plants to meet its demand. Despite large purchases from the central plants and other states, it is unable to meet its peak demand and has to curtail power supply for long hours in summers as well as winters. The state's low generation as well as lack of purchasing power is often cited as the reasons for curtailment.

To augment power generation, there is need to harness the hydel potential to make the state self-sufficient and add to the National Grid. Once this is achieved, the state can resort to power trading during winters when the discharge of water is low and the generation falls i.e., purchasing power from the surplus state during winters and selling during summers when generation is high. This would bring down the curtailment for power consumption in the state and overdraw from the grid.

For this, development of four projects - Sawalkote 600 MW, Baglihar-II 450 MW, Parnai 37.5 MW and New Ganderbal 93MW - has been prioritized in the state sector. There are other projects which are nearing completion and will be commissioned in two- three year's time.

Table:III.36
Upcoming Hydel Projects in J&K

Name of the Projects	Installed Capacity (MW)	Expected date of commissioning
<i>State Sector</i>		
Baglihar	450.00	2004-05
Pahalgam	4.50	2002-03
Matchil	0.35	2002-03
Haftal	1.00	2002-03
Sanjak	1.26	2002-03
Marpachoo	0.75	2002-03
Igo-Mercellong	3.00	2003-04
Bhandarwah	1.50	2002-03
Dumkhar	2.25	2004-05
Sub- Total	464.61	
<i>Central Sector</i>		
Dul Hasti	390.00	2003-04
Grand Total	854.61	

Source: Power Development Corporation, J&K, June 2002.

In addition to the aforementioned projects, the seven projects mentioned in Table III.37 have been transferred to National Hydro-Electric Power Corporation (NHPC) for execution in the central sector under Build-Own-Operate-Transfer (BOOT) system. As per the Memorandum of Understanding (MoU) signed between the central and the state government these projects are to be fully completed by 2010. The state will get 12 per cent free power on the completion of these projects as royalty and a share of un-allocated quota to the extent of 15 per cent.

Table III.37
Projects transferred to NHPC under BOOT system

Name of the project	Installed Capacity (MW)
Kishenganga HEP	330
Uri-II	280
Burser	1020
Pakal Dul	1000
Sewa-II	120
Nimo-Bazgo	30
Chutak	18
Total	2798

Source: Power Development Corporation, J&K, June 2002.

The CEA has not considered Kishenganga viable even after considering the benefits from all downstream projects. The Ministry of Power has been approached to take up the matter with the CEA to either review or abandon the project as unviable. Additional investigation required for upgradation of Detailed Project Report (DPR) formulated by Government of J&K has been taken up in the case of Uri-II, Sewa-

II and Pakal Dul. Major works are expected to start in August 2004 in the case of Uri-II, July 2003 in the case of Sewa-II and January 2005 in case of Pakal Dul. Major work on Burser is expected to start in January 2005. The Stage –I cost estimation for Nimo- Bazgo has been cleared by CEA in April 2002 and Stage-I investigation taken up. Field activities (Stage-I) are in progress for preparation of a feasibility report to enable assessment of the commercial viability of Chutak.

Paucity of funds is another reason for slow addition to the generating capacity of the state. There has been constant delay in completion of the projects, where targets set for one Plan have spilled over to the next. For this reason the state experienced no or negligible addition to the generating capacity during 8th and 9th Plan periods. Law-and-order problems have also contributed to the delays.

Power sector outlay & share of power sector outlay in total outlay

(Rs. in crore)

	Power Sector	All Sectors	%
Eighth Plan	1175.2	4000.00	29.38
Ninth Plan	2387.00	9500.00	25.13

Of the total Plan outlay of Rs. 4000 crore during the 8th Plan, the power sector's share was 29.38 per cent. The allocation was comparable to the other states. During the 9th Plan, however, the allocation increased in absolute terms, share of the sector out of the total outlay decreased to 25.13 per cent. This, in spite of the fact that the state needs large investments to develop its hydel potential.

Premier power financial institutions of the country have recently been approached by the state for the completion of the ongoing schemes. Whereas USHP-II, Chenani-III & Sewa-III have been completed with the help of loans from the Power Finance Corporation (PFC), the Rural Electrification Corporation (REC) has been approached for assistance to complete some other on going projects.

In the absence of sufficient funds, increasing demand for power and huge unexplored potential, the private sector is expected to play an important role. It is also important to undertake reforms/measures to make investments attractive. The state, however, has to ensure that the private investors do not face undue administrative hurdles, further increasing the gestation period. For this the state has proposed to provide the following incentives:

1. Fully investigated schemes for development by the private investors;
2. Clearances from different agencies for development of the scheme; and
3. Arranging the land required for the project.

Tariff rationalization and other distribution reforms would also encourage private participation in the distribution sector. The Private sector's presence would improve the overall performance of the sector through proper metering and billing of the power sales, energy audits, and reduction and ultimately elimination of power thefts, etc.

Given the fact that the state has to depend mostly on purchases to meet its demand and the wide gap between the rate of purchase and sale of power, plus the fact that the cost of energy from all future plants being set up under the state, central and private sectors would be higher, it is critical that the state takes steps to reduce T&D losses (technical and non-technical), operational expenditure and ensures proper metering, meter reading, billing of services and revenue collection.

Roads

Road development in Jammu & Kashmir is important, given the terrain of the state and limited development of alternate means of transportation. A well-developed network of roads is necessary not only for the economic development of the state but for its social, political and cultural development. It is required to exploit the rich natural wealth of the state, to develop indigenous industries, to explore new markets for its products and to promote tourism. To this effect the state government has been laying targets in each Five-Year Plan to build new roads, maintain and upgrade already existing roads, construct bridges and culverts and connect villages with a network of roads.

EXISTING ROAD NETWORK

In Jammu & Kashmir, roads are maintained by the Public Works Department (PWD), Border Roads Organization (BRO) and various state government departments, which maintain roads for their departmental purposes. Almost all of these roads, however, are open to the public.

There were 13539 km of roads in the state as on March 2000 (provisional). Of the total, 11,260 km were surfaced and 2279 km were un-surfaced (Table-III.38). This figure excludes the length of National Highways and other roads not maintained by the state P.W.D. The BRO has taken up the maintenance of National Highways in the state. The total road length maintained by BRO as on March 2000 was 3715 km of which 2954 km were surfaced and 761 km unsurfaced roads (Digest of Statistics, J&K, 1999-2000).

Other departments in the state, viz., the Forest department, Irrigation and Flood Control and C.D & N.E.S. department, maintain a total of 16090 km of roads (Digest of Statistics, Govt. of J&K, 1999-2000). Surfaced roads accounted for 1964 km whereas 14126 km were un-surfaced.

Table: III.38
Roads in different Districts of Jammu & Kashmir

(as on 31.3.2000)

Districts	Road Length (km)			Road Length/100 sq Km of area			Road Length/Lakh of population		
	Sur-faced	Un-surfaced	Total	Sur-faced	Un-surfaced	Total	Sur-faced	Un-surfaced	Total
Anantag	1223	105	1328	30.7	2.64	33.33	104.53	8.97	113.50
Pulwama	875	3	878	62.6	0.21	62.80	138.38	0.47	138.85
Srinagar	1386	39	1425	62.21	1.75	63.96	111.91	3.15	115.06
Budgam	1109	13	1122	80.9	0.95	81.84	186.77	2.19	188.96
Baramulla	1447	106	1553	31.54	2.31	33.85	124.02	9.08	133.11
Kupwara	710	112	822	29.84	4.71	34.55	110.93	17.50	128.43
Leh	416	748	1164	0.92	1.66	2.58	353.63	635.85	989.48
Kargil	400	276	676	2.85	1.97	4.82	347.14	239.53	586.67
Jammu	1592	137	1729	51.40	4.42	55.83	101.28	8.71	109.99
Udhampur	530	189	719	11.65	4.15	15.80	71.72	25.58	97.30
Doda	392	221	613	3.35	1.89	5.24	56.77	32.01	88.78
Kathua	670	112	782	25.27	4.22	29.5	123.11	20.58	143.69
Rajouri	348	163	511	13.23	6.2	19.43	72.71	34.06	106.77
Poonch	162	55	217	9.68	3.28	12.96	43.60	14.80	58.40
Total	11260	2279	13539	5.07	1.02	6.09	111.82	22.63	134.45

Source: Digest of Statistics, J&K, 2000-01.

P.W.D, Kashmir, June 2002.

P.W.D., Jammu, June 2002.

Table: III. 39
Existing Roads in Jammu & Kashmir

District	Black Top	Metallic	Shingled	Fair Weather	Jeepable	Total
Anantag	596	249	378	41	64	1328
Pulwama	455	378	42	3	0	878
Srinagar	1002	316	68	19	20	1425
Budgam	436	296	377	13	0	1122
Baramulla	576	568	303	89	17	1553
Kupwara	258	315	137	91	21	823
Leh(R)	183	42	191	709	39	1164
Kargil (R)	120	192	88	240	36	676
Jammu	1507	32.5	53	127.5	10	1729
Udhampur	373	95	62	189	0	719
Doda	162	190	40	217	4	613
Kathua	545	61	64	110	2	782
Rajouri	164	47	137	163	0	511
Poonch	104	7	51	53	2	217

Source: R&B, Kashmir, June 2002.

R&B, Jammu, June 2002.

Digest of Statistics, J&K, 2000-2001.

Road length per 100 sq km of area, calculated in Table III.38 for the state gives the value of 6.09 km. The Table also shows that Budgam district has the highest road density of 81.84 km. Breaking it further into surfaced and unsurfaced roads shows

that the district has 80.9 km of surfaced roads and 0.95 km of unsurfaced roads per 100 sq km of the area. In sharp contrast to this are the districts of Leh, Kargil and Doda with 2.58, 4.82 and 5.24 km of roads per 100 sq km of area. This can be explained partly by the fact that Leh is the largest district in terms of area in the state followed by Kargil and Doda and partly due to the problems faced in road development on account of difficult terrain of the districts, nature of soil along with a short working season.

However, road length per lakh of population gives a better picture. The value for the state is 134.45, with Leh and Kargil showing values as high as 989.48 and 586.67 respectively. This is chiefly because of the sparse and scattered population especially in Leh and Kargil. Districts like Doda, Poonch in Jammu Division show a very low value of 88.78 and 58.40 respectively. On the whole, districts in Jammu division lag behind the districts in Kashmir Valley as far as road infrastructure is concerned. Difficult terrain as well as severe law-and-order problems have contributed to connectivity.

REGIONAL DEVELOPMENT OF ROADS

Kashmir valley had a total of 7128 km of road network as on March 2000, with 4571 km in Jammu and 1840 km in Ladakh region. From the Ninth Plan onwards, the thrust of the Roads and Bridges (R&B) department has been on the construction of bridges and culverts and public assets damaged during militancy, connecting all unconnected villages to nearest roads and completion of schemes which have spilled over from the 8th Five-Year Plan.

ADDITIONAL CENTRAL ASSISTANCE

During the period of militancy, a large number of major and minor bridges were gutted or damaged. In 1996, 157 major and 244 minor bridges were identified for reconstruction. Of this number, 109 major bridges and 128 minor bridges were taken up for construction. The total cost of the reconstruction of the bridges taken up was assessed in 1996 at Rs.196.00 crore; it has now increased to Rs.500.00 crores. Against this, the state has already spent an amount of Rs. 172.48 crore; 76 major as well as 106 minor bridges have been completed so far. The remaining 33 major bridges and 22 minor bridges are under construction. The state, however, received only a one-time allocation of Rs.20 crore under additional central assistance in 1997-98 from the government of India for reconstruction of damaged bridges.

NABARD PROJECTS

In the wake of the state government's inability to provide the financial resources required to develop and maintain rural infrastructure, loans were raised from NABARD as a major supplement to the state plan. The NABARD assistance received by the R&B department under Rural Infrastructure Development Fund (RIDF) is meant for upgradation of roads in rural areas. In all 380 projects in Kashmir Valley were sent to NABARD for funding. Of these only 284 have been sanctioned. The total number of schemes in Phase –I were 157 and 127 in Phase-II, coming to 2629.10 km of road length at the cost of Rs 3455.22 crore. The break-up of these schemes under various trenches of RIDF is:

RIDF IV	-	26 schemes	
RIDF V	-	87 schemes	} Phase I
RIDF VI	-	44 schemes	
RIDF VII	-	127 schemes	} Phase II

Status of the schemes:

Till June 2002, a total of 21 projects under RIDF-IV had been physically completed. The remaining 92 projects under RIDF-IV and V are expected to be completed by March 2003. NABARD loan received till March 2002 was to the tune of Rs.95.42 crore and 728.4 km of black topped and 1848 km of metallic roads have been added. For the current year, Rs. 46.55 crore has been earmarked.

Implementation of the NABARD projects in Jammu started in the year 1998-99. The break-up of schemes under various trenches is:

RIDF IV	-	30 schemes sanctioned
RIDF V	-	39 schemes sanctioned
RIDF VI		112 schemes sanctioned
Total	-	181

A total of 181 schemes had been sanctioned till March 2002, at the loan cost of 152.16 crore. The state's contribution was to the tune of Rs. 16.91 crore. The total cost of the schemes was therefore Rs.169.07 crore. For the year 2002-03, a total of 70 schemes have been sanctioned under RIDF VII and RIDF VIII, as given below:

	No. of Schemes	Loan Component (in Rs. crore)
RIDF VII	34	34.72
RIDF VIII	36	43.29

In addition to the loan, 10 per cent will be contributed by the state. Of the 181 schemes sanctioned for the upgradation and improvement of roads, 20 schemes had been completed till March 2002. Ten schemes have been completed under RIDF IV, 5 each under RIDF V and RIDF VI.

This year, NABARD loan for upgradation and improvement of rural roads has been sanctioned to Ladakh as well. The projects taken up under NABARD scheme have to be completed within a period of three years.

CENTRAL ROAD FUND

Besides NABARD funding, the state gets funds under the Central Road Fund (CRF), from the Central Government, to take up small schemes, which were nearing completion but could not be completed due to lack of funds. This is a 100% Centrally Sponsored Scheme (CSS). The state government was to identify projects nearing completion so that they could be completed in time and benefits reach the public within short span of 1-2 years.

Initially, during the year 2001-02, a total of 3 projects were sanctioned in the Kashmir valley at the total cost of Rs. 15.56 crore along with 7 additional projects.

Table III.40
Schemes under CRF programme (2001-02)

Sl.No.	Scheme	Cost (Rs in Crore)	Status in June, 2002
1	Construction of Nowpora bridge	18.23	Completed
2	Widening of Srinagar – Barmulla road from Batamallo Bridge to Qamerwali	11.27	Work in progress
3	Improvement of Srinagar Harwan road	2.47	„
4	Construction of dual carriage Hazratbal crossing to Zakura	3.45	„
5	Construction of dual carriage from Nageen Club to Hazratbal	3.12	„
6	Saidkadal to Ashaibagh	3.69	„
7	Rainawari Hospital to Saidkadal	3.32	„
8	Khonkhan to Rinawri	3.63	„
9	Dalgate to Khonkhan	3.54	„
10	Habak crossing to Zakura	2.18	„

Source: R&B Dept., Kashmir, June 2002.

In Jammu Division, the Ministry of Road Transport and Highways, Government of India had sanctioned fifteen schemes at the cost of Rs. 39.87 crore up to March 2002. The R&B department, Jammu division, had initially sent 90 projects to the

Ministry of which only fifteen were sanctioned. So far only Rs. 6.63 crore has been received and one scheme completed.

ROADS OF ECONOMIC IMPORTANCE

During 2001-02, a few roads were identified as roads of economic importance on the criteria that they should lead to rise in the socio-economic condition of the region. This was to include roads for the promotion of tourism, horticulture, etc. These schemes were to be funded jointly by the centre and the state on a 50:50 basis.

In Kashmir Valley, four projects have been taken up at an estimated cost of Rs. 6.18 crore. The state's contribution is Rs 3 crore and an equal amount will be contributed by the centre. In Jammu Division, nine schemes have been identified under this head at an estimated cost of Rs. 12.50 crore. However, the Ministry of Road Transport and Highways, Government of India, has given consent for only three schemes. No funds whatsoever had been released till June 2002.

CHALLENGES AND OPPORTUNITIES

1. According to the norms laid down by the Ministry of Road Transport and Highways, funds required for maintenance of roads and bridges are very high as compared to the funds actually received under the Plan allocation. In Leh (Ladakh), however, this cost has to be taken out of the non-Plan allocation or the district plan since allocation under state plan is very small.
2. The state government has proposed a project to connect Pampore Lassijan to Rambagh via Padshaibagh by construction of four bridges at the cost of Rs. 274 crore. This will provide an alternative route to those who have to go to the south of the valley, given the growing and burgeoning intensity of traffic in the valley. The project has been discussed with the Central Government for funding but it has not been cleared till date. The state government, however, is keen to see it through.
3. The National Highway, NH-1 is the only road connecting the valley to Jammu and the rest of the country. This approximately 300 km long road remains closed for long periods of the year due to bad weather and is also vulnerable to landslides. The state government intends to build an alternate road to the existing National Highway. The proposed Highway would be shorter in length by about 80-90 km than the existing National Highway-1. It would also have 40-50 tunnels

at various spots to make it free from vulnerabilities. The project cost is likely to be Rs. 200 crore. The government of J&K had engaged an Austrian consultancy firm to prepare the project feasibility report for which HUDCO has sanctioned Rs. 2.30 crore to the State government.

It is suggested that the Centre should explore the feasibility of the project proposal rather than the state government, given the fact that the state with its limited financial resources would not be in a position to build this road.

4. Over the years traffic on the roads in the state has increased manifold especially on the National Highway, making it almost imperative to upgrade it. The stretch from Banihal to Srinagar needs to be upgraded from two lanes to four lanes.
5. Tawi Bridge III, which is a sanctioned scheme under Central Road Fund, could not be completed in time due to the slow release of funds by the Centre. The state government, under the scheme, was to fund the construction of the sub-structure, which is complete but the slow funding from the centre for constructing the super-structure has delayed the completion of the bridge.
6. Ladakh faces a problem of high cost of construction since all the building material has to be brought from the plains at high transportation cost. Since distances between villages are considerable, providing connectivity to all the villages becomes very expensive. Per capita road length therefore, does not hold much meaning. There is also discontent among the officials that the region does not get much allocation under the state plan and much of the expenses have to be borne out of district plan, which again is not a big amount.
7. Due to locational disadvantage, developmental works have to be suspended in the region for 5-6 months a year. Providing year-long access to the region becomes important in this context. The construction of a road from Tsomoriri to Spiti in Himachal Pradesh via Parangla Pass, a stretch of about 60 km, can provide connectivity to the region almost throughout the year. This route would provide many advantages. For instance, it would have only one pass on which a tunnel could be made to ensure connectivity. Moreover, the Manali-Leh road is no alternative since it opens only after the Leh-Srinagar road opens and closes before the latter due to heavy snowfall.

Transport

ROAD TRANSPORT

Road transport is the only means of transport for the people of the state in the absence of railways. The developmental work in the state has up to now focused on developing road network to meet the increasing traffic pressure. During 1989-2000 the road network increased by 1¼ times, while the traffic on the roads has increased by more than 2 ½ times (Digest of Statistics, J&K, 1999-00). Besides, there are other operational and commercial problems faced by the transport sector like frequent landslips, narrow roads, short working season of about 6-7 months, etc.

STATE ROAD TRANSPORT CORPORATION

The J&K State Road Transport Corporation (JKSRTC) came into existence in September 1976 on the conversion of the J&K Government Transport Undertaking. Like most of the 64 state transport corporations, JKSRTC is a loss-making public sector undertaking. Its losses reached Rs. 310 crore in the year 1998-99, according to the annual accounts report tabled in the state Legislative Assembly (*Kashmir Times*, 17 March, 2002). The audit report identified that books of accounts were not maintained in accordance with the principles of commercial accounting system and there were abnormal delays in recoveries, adjustment of balance, under advances, deposits, and purchases.

Table III. 41
Fleet held and operative and revenues earned

Year	Fleet Held (Number)	Fleet Operative (Number)	Percentage utilization	Volume of Operation (lakh Km)	Total Revenue (Lakh Rs.)
1997-98	1347	687	51	272.61	3148.55
1998-99	1287	731	56	273.97	3457.82
1999-00	1239	807	65	313.95	4460.44
2000-01	1258	839	63	326.27	4414.77

Source: State Road Transport Corporation, J&K, June 2002.

The reasons cited for the losses are:

1. De-nationalisation of roads: The National Highway from Leh to Srinagar and up to Lakhanpur in Jammu used to be a nationalized route, restricted to the operation of SRTC vehicles only. For the past few years, private operators have been issued permits for plying on this route because of which SRTC is losing revenue.

2. The private fleet on roads within the cities has increased immensely as compared to the SRTC fleet. The private-SRTC fleet ratio is 80:20. However, private operators have moved out of the un-economical routes, leaving the job of providing connectivity to such areas to SRTC because of social and other obligations.
3. The state government fixes fares charged by SRTC whereas private operators can charge lower rates to attract more passengers.
4. Various departments of the government, along with the Armed Forces, have large dues in favour of JKSRTC, recovery of which is very slow.
5. Though all state government departments should engage SRTC vehicles for official purpose, they generally hire private vehicles, leading to low revenues for SRTC.
6. Turmoil in the state has also hit the revenues of the corporation by reducing the inflow of tourists to the state. Almost 114 vehicles of SRTC have been damaged during militancy.

In addition, Plan allocation does not reach the corporation in full or in time. Against an allocation of Rs. 4.5 crore, only Rs 3.37 crore was released in 2000-01. Likewise, in 2001-02, Rs 0.45 crore against an allocation of Rs 4.03 crore was released.

Table III.42
Plan Allocation to SRTC

(Rs.in lakh)

Year	Approved	Released
1999-2000	500.00	500.00
2000-01	450.00	337.50
2001-02	403.00	45.00

Source: State Road Transport Corporation, J&K, June 2002.

According to the norms of the corporation, the life of a vehicle is ten years. This means that on an average, roughly 10 per cent of the fleet should be replaced every year. The corporation, however, has not been able to do so resulting in low efficiency. Increasing running cost of the vehicles and increasing salary component have also contributed to the losses. Whereas the operating cost has increased four-five times in the past few years, revenues have only doubled. This widening gap between the two has resulted in accumulation of losses.

The state government has engaged the Central Institute of Road Transport, Pune, for

working out a plan to restructure or revive the corporation. Since providing transport services to the people is a social obligation of the government, privatisation is not the best possible solution. It is important to note that public transport is the only means of transport to remote villages where private operators do not ply due to uneconomical returns. The government should therefore perceive SRTC as a social obligation and not merely as a profit making corporation. The corporation's fleet should be limited to only those routes where private operators are not forthcoming. The state government should also ensure that the private operators follow their respective routes without causing inconvenience to the commuters.

Table III. 43
Cost and revenue earned per km

(In Rupees)

	1997-98	1998-99	1999-00	2000-01
Average Operating Revenue, EPKM ¹	10.72	12.08	12.96	12.75
Cost per Km., CPKM ²	25.52	28.59	27.73	27.65

Source: Annual Accounts, JKSRTC, 2002

Notes: 1. EPKM= Earning per km.

2. CPKM= Cost per km.

RAILWAYS

The rail-road mix of transport in the state is very low. Jammu city is the railhead for the state. Kashmir Valley and Ladakh are totally dependent on road transport. This has both economic and environmental implications. Industrial growth in the country, as well as elsewhere in the world, in the past, has taken place in areas with a well-laid rail network. J&K has lagged behind in attracting industries because of high fuel costs involved in bringing in the raw material and taking finished goods to the markets, which has adversely affected the pace of economic activity in the state.

Though under construction for many years now, the Jammu-Udhampur railway line is expected to be completed by the end of 2003. The Udhampur-Katra and Qazigund-Baramulla sections of Udhampur-Baramulla rail project are expected to become operational by 2005. This project needs to be given high priority, as taking of railway line into the valley will open up new avenues and opportunities for economic development and social transformation. Not only will it improve the connectivity of the state to the rest of the country, but provide opportunities of employment and income generation to the local youth, while also enabling easy movement of raw material and finished products from the state.

AIR TRANSPORT

Jammu and Kashmir is connected to Delhi, Chandigarh and the rest of the country through air transport as well. There are three civil airports in the state – Jammu, Srinagar and Leh. Within the state there are three lines: Jammu-Srinagar, Srinagar-Leh and Jammu-Leh. Table III.44 gives the details of the aircraft and traffic movement at the three airports of the state during 1998-99. Share of each airport out of total airports of the country is also given.

Table: III.44
**Aircraft movement, Passenger and Cargo traffic
in the State Airports:1998-99**

(in numbers)

Airport	Domestic Aircraft Movement	Percentage Share	Domestic Passenger Traffic	Percentage Share	Domestic Cargo Traffic	Percentage Share
Jammu	3542	1.09	243079	1.01	650	0.29
Srinagar	2362	0.73	195427	0.81	745	0.33
Leh	1070	0.33	90415	0.38	367	0.16
Total	325392	100	24072631	100	224490	100

Source: Airports Authority of India website, 2002.

Of the total domestic aircraft movement in the country, the state accounts for only two per cent. The passenger traffic in the state's domestic airports is also approximately two per cent of the total passenger traffic in the domestic airports of the country.

The state sparsely populated and scattered as it is, needs more airports and better air connectivity. Kargil airfields have been ready for quite sometime but are not yet operational. Putting Kargil on the air map will open up the region to tourism and lead to economic development of the area. Air frequency to Leh also needs improvement, particularly during summer which is the tourist season for Ladakh. Remote places like Gurez, Kupwara, Poonch, Rajouri and Kishtwar need to be connected by air. If small airfields, which can enable smaller planes to land, are developed at these places, it would indeed give a big impetus to the development of these inaccessible areas. A beginning could perhaps be made by taking up the development of two airfields.

RECOMMENDATIONS

There were 13540 km of roads in the state as on March 2000 apart from national highways with 3715 km of road length maintained by the state. Other departments

in the state, the Forest department, Irrigation and Flood Control and C.D & N.E.S. department, maintain a total of 16090 km of roads.

Difficult terrain as well as severe law-and-order problems have contributed to poor connectivity. There are inter-district variations in respect of connectivity of roads. In terms of road length per 100 sq. km of area, Budgam district has the highest road density of 81.84 km in contrast to the districts of Leh, Kargil and Doda with 2.58 km, 4.82 km and 5.24 km respectively. On the whole, districts in Jammu division lag behind the districts in Kashmir Valley as far as road infrastructure is concerned. For the development of roads, Central Road Fund, Additional Central Assistance and loans raised from NABARD have been utilized.

Traffic on the roads has increased by more than 2½ times as against a 1¼ times increase in the road network during 1989-2000. In addition to the traffic growth, there are other operational and commercial problems faced by the transport sector like frequent landslips, narrow roads and short working season of about 6-7 months. The rail-road mix of transport in the state is very low. As Jammu city is the railhead for the state, Kashmir Valley and Ladakh are totally dependent on road transport. The state, with three civil airports at Jammu, Srinagar and Leh, is connected to the rest of the country through air transport too.

Telecommunication

INTRODUCTION

Telecommunications is a significant part of the infrastructure of the economy. In spite of a large telecom network, in absolute terms India suffers from low penetration. Given its large unserved population, there is tremendous potential for growth in this sector. To tap this potential, the telecom sector in India has been witnessing a continuous process of reforms since 1991. The New Telecom Policy (NTP) announced in 1999, modified the NTP 1994, to take into account far-reaching technological global developments in the telecom sector.

The performance of telecommunications is judged by indicators like demand and supply measures, quality of service provided, economic and financial performance, capital investment, tariffs, etc. Demand for telecommunication is measured by the sum of telephone mainlines and the number of registered applicants for new connections. However, the list of registered applicants does not reflect the real current pending demand. Extremely short supply may discourage potential applicants from applying for telephone connections (World Development Indicators, The World Bank, 1999). However, in some cases, a waiting list may overstate demand because applicants may register themselves several times to improve their chances.

Telecom penetration in India is very low as compared to other developing countries of the world. The number of telephone mainlines per 1000 persons was only 19 in 1997 for India as compared to developing countries like China with 56 and Brazil with 107 mainlines per 1000 people (World Development Indicators, The World Bank, 1999).

The tele-density, i.e., connections per hundred people, for India as a whole, was 3.04 in 2001. The New Telecom Policy (1999), however, aims at achieving a tele-density of 7 by the year 2002 and 15 by 2010. Where as tele-density in the urban areas was 8.47, rural connectivity showed an even dismal picture with 0.12 connections per 100 persons (Table III.45). The situation is no different in the state of Jammu & Kashmir with a tele-density of 1.65 per hundred persons, with tele-density in rural areas being as low as 0.12.

Table III.45
Tele-density in Jammu & Kashmir

(as on 31.3.2001)

State/Country	Urban	Rural	Total
Jammu & Kashmir	6.33	0.12	1.65
India	8.47	0.85	3.04

Source: Website of Department of Telecommunication, GOI.

In the absence of private operators, Bharat Sanchar Nigam Limited (BSNL) is the only basic telephone services providing body in the state. The J&K Telecom Circle has 5 Secondary Switching Areas (SSA), namely Jammu, Srinagar, Udhampur, Rajouri and Leh. Taking together all the SSAs, there were 314 exchanges of various capacities in J&K as on November 2000, which increased to 349 in June 2002.

Table III. 46
Telephone Exchanges: Current Status

	11/2001	6/2002
Telephone Exchanges	314	349
Equipped Capacity	277352	317520
Working Connections	198357	231777
Waiting List	48119	42266

Source: Website of Department of Telecommunication, GOI.

Jammu's telecom district comprises Jammu and Kathua revenue districts. These had an equipped capacity of 1,23,564 lines and 106 electronic exchanges as on 30/11/2001. Of the 106 exchanges, 43 have STD facility. Rajouri SSA comprises the two revenue districts of Rajouri and Poonch. During March 2002, additional C-DOT exchanges were installed in the telecom district. The area is also being provided with Optical Fibre Cable Network (*The Kashmir Times*, 3 April, 2002). Udhampur SSA comprises the two revenue districts of Udhampur and Doda. Leh SSA comprises Leh and Kargil revenue districts, and had an equipped capacity of 10,384 lines and 6,833 working connections as on 30/11/2001. It had 32 electronic exchanges of which 28 have been provided with STD facility. The Kashmir SSA comprises six revenue districts of the state, namely, Srinagar, Anantnag, Pulwama, Badgam, Baramulla and Kupwara. There were 70 electronic exchanges in the Kashmir SSA as on 30/11/2001, with 34 exchanges been provided with STD facility.

Table III.47
Telephone Exchanges: Targets set for 2001-02 & 2002-03

(Numbers)

	2001-02	2002-03
Direct Exchange Lines	80000	44000
Exchange Capacity	69790	52888
Village Public Telephones	2754	2692

Source: Website of Department of Telecommunications, GoI, August 2002.

RURAL CONNECTIVITY

Of the total 6764 villages in the state, 4022 had been provided with telephone connections by April 2001. However, the Village Public Telephones (VPT) increased to 4053 by November 2001 and further to 4070 villages by June 2002. The pace of village connectivity had been slow against the targets set. However, an additional 2692 villages are targeted to be provided connections during 2002-03.

Table III. 48
Status of Village Public Telephones

(As on 01/04/2001)

	Total Number of Villages	Villages with VPTs
J & K	6764	4022
India	607491	408922

Source: Website of Department of Telecommunications, GoI, 2001.

CELLULAR SERVICES

Though BSNL had been provided the licence for providing cellular mobile telephone services in the state, at present these services are not allowed in the state due to security reasons. The centre has however, decided to lift the ban on cellular as well as Wireless-in-Local-Loop (WLL) services in J&K. This is a welcome move since the terrain in the region is such that providing telephone connections to remote villages by laying landlines becomes very difficult. Also, the business community had been asking for this facility for a long time in the wake of poor development of other means of connectivity in the state.