VISUAL IMPAIRMENT

Chapter 1

Historical Perspective

The visually handicapped have passed through various stages: of being treated as rejects of the society to being recognized as talented persons who were no inferior to their sighted counterparts. From their status of being more akin to objects than living beings in antiquity, the visually handicapped have passed through the phases of getting social protection during the Judaic and Christian periods in the West, more for consideration of body than soul (Kirtley, 1975).

International Efforts for the Education of the Blind

Prior to the 80s blind people were mainly self-taught, often being given appropriate assistance. France was the cradle of new attitudes towards the blind and started the first school for blind children. The philosophical groundwork was laid by Diderot, an enlightened philosopher and physician to King Louis XV. In 1749, he published 'Letter on the Blind for the Use of Those Who See'.

The next giant step was taken in Paris in 1784 by Valentin Hauy when he established the Institution des Jeunes Aveugles (Institution for Blind Youth). Admiration for their competence, not pity for their blindness, was what Hauy hoped to engender for his students. In spite of political upheavals in France and in the life of his school, Hauy's contribution was a lasting one. He founded the first school for blind children, which was to become a model. He emphasized reading and fostered the development of embossed print. Believing in the vocational potential of blind people, he introduced vocational training in his school.

Education of the blind children received a further boost by 1834 with the successful adaptation and development of the embossed dot code by Louis Braille, a Frenchman, himself blind. Until this time, blind people did not have an efficient system of reading and writing. Therefore the code which bears Braille's name, still taught around the world, ushered in an era of easier communication among the blind themselves opening the doors for the acquisition of information and knowledge through the sense of touch.

Hauy's success led to the establishment of similar institutions in Europe, including the first school for the blind in Liverpool, England, in 1791. Almost half a century after the founding of Hauy's institution, the first school for the blind children was opened in the United States. Three private schools were then founded almost simultaneously. They are presently known as Perkins School for the Blind (1829), the New York Institute for the Blind (1831), and Overhrook School for the Blind (1833).

Organized Efforts for the Education of the Blind in Pre- and Post-Independent India

The residential model was rapidly replicated,

not only in the USA but also beyond the shores of Europe and North America. The missionaries arrived in Asia and other parts of the world before the turn of the 19th Century, to offer education and rehabilitation services to blind people. In India, Miss Annie Sharp, a Christian missionary from England, founded the first school for the blind in Amritsar in 1887. There were just four schools for the blind at the turn of the Century. But the efforts in this direction by the voluntary organizations and the Christian missionaries continued. By 1944, when the report on blindness in India was submitted, there were 32 schools in undivided India. Most of these schools were being managed by private agencies, with grants from some state governments.

Significant landmarks in the history of education of the visually handicapped in India have been:

1. State level decision to establish a Braille press to produce books in Braille in 1923. This could not be implemented due to non-existence of a uniform Braille code for Indian languages.
2. Setting up of a Committee in 1941 by the then Govt. of India to develop a uniform Braille code for Indian languages.
3. Submission of the Report on Blindness in India (1944) which is the basis of most of the services for the blind today.
4. Setting up of a Cell in the Ministry of Education in 1946 to promote education, training and rehabilitation of the blind.
5. Development and acceptance of "Bharthi Braille", a common Braille code for Indian languages finalized in November 1950, replacing the earlier codes in the light of certain recommendations made by UNESCO.
6. Setting up of the first Braille press at Dehradun in 1951.
7. Establishment of National Association for the Blind in 1952 marking the beginning of concerted voluntary action in the field.
8. Setting up of first Vocational Training Centre for the Adult Blind Women in 1957 at Dehradun.
9. Establishment of the first School for the Blind by the Central Govt. in January 1959 at Rajpur, Dehradun (now located in the campus of NIVH, Dehradun).
10. Institution of the first Light Engineering course in 1961 at Dehradun.
11. Establishment of the first National Library for the Blind by the Central Government in 1962.
12. Govt. of India brought all its activities for the education, training and rehabilitation of the blind under one umbrella for better coordination in 1967 called National Centre for the Blind, Dehradun.
13. A review of the Government initiative in 1973-75 to gauge the impact of its schemes for the welfare of the blind led to the decision to set up one apex level Institute in each disability area by the then Ministry of Social Welfare (presently the Ministry of Social Justice & Empowerment).
14. Establishment of the National Institute for the Visually Handicapped (NIVH) on 2nd July 1979.

Chapter 2

Incidence and Prevalence of Visual Impairment

Incidence means the number of persons born with visual impairment or who acquired impairment per 1,00,000 population during 365 days prior to survey. Prevalence means the number of persons born with visual impairment or became visually impaired per 1,00,000 population in the country till the date of survey. The data available by NSSO and/or Census gives the prevalence and not the incidence.

Prevalence of Visual Impairment in India According to NSSO (2002)

NSSO defined visual disability as loss or lack of ability to execute tasks requiring adequate visual acuity. For the survey, visually disabled included *(a)* those who did not have any light perception – both eyes taken together, and *(b)* those who had light perception but could not correctly count fingers of hand (with spectacles/contact lenses if he/she used spectacles/contact lenses) from a distance of 3 metres (or 10 feet) in good day light with both eyes open. Night blindness was not considered as visual disability.

Across the country, 45,571 rural and 24,731 urban households were surveyed in rural and urban areas, respectively from 4,637 villages and 3,354 urban blocks. The number of disabled persons enumerated was 49,300 in rural and 26,679 in urban India. According to the survey estimates, the number of disabled persons in the country was 18.49 million during July to December, 2002, and they formed about 1.8 per cent of the total estimated population.[1]

Prevalence and Incidence of Visual Disability – A Comparison

A comparative analysis of visual impairment in different rounds of NSSO is given in Table 1.

The prevalence and incidence of visually disabled persons per 1,00,000 persons is given in Table 1 for rural and urban areas. For the country as a whole, the prevalence of visual disability has decreased marginally between 1981 and 1991, and substantially between 1991 and 2002 (Table 2). This is true of incidence rates too. With better health care facilities over time, ailments such as diarrhoea, cataract, glaucoma, etc., might have been prevented to a large extent during the recent years. It may also be noted that a large proportion of people are using spectacles to improve their vision. Further, visual disability is judged depending upon whether one is using spectacles or not.

[1] The total estimated population for 1st October, 2002, is obtained by applying decennial (exponential) growth rate of population for 1991 – 2001 on *Census 2001 Population*.

Table 1: Prevalence and Incidence of Visually Disabled Persons per 1,00,000 Persons Obtained from NSSO 36th, 47th and 58th Rounds

All-India Sector	*36th round (July – December, 1981)*			*47th round (July – December, 1991)*			*58th round (July – December, 2002)*		
	Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Prevalence rate				
Rural	444	670	553	471	548	525	276	326	296
Urban	294	425	356	263	346	302	163	228	194
					Incidence rate				
Rural	32	45	38	22	28	25	10	16	13
Urban	23	38	30	15	25	20	7	10	9

Source: NSSO Report, 2002.

Table 2: NSSO Report – Prevalence

Year	*Rural*	*Urban*	*Total*
1981	–	–	34,70,000
1991	33,35,000	6,70,000	40,05,000
2002	22,57,500	5,69,200	28,26,700

Table 3: Age Group and Visual Impairment

(Number of disabled persons per 100,000 persons)

Age Group	*Rural*		*Urban*	
	Blindness	*Low Vision*	*Blindness*	*Low Vision*
0 – 4	32	5	30	5
5 – 9	48	12	73	16
10-14	52	22	82	10
15 – 19	56	21	44	13
20 – 24	65	23	56	18
25 – 29	68	17	43	20
30 – 34	77	16	30	19
35 – 39	75	32	53	20
40 – 44	128	43	79	30
45 – 49	183	65	105	39
50 – 54	266	124	182	98
55 – 59	431	234	283	122
60 & above	1733	747	1087	459
ALL	**210**	**86**	**140**	**54**

Source: NSSO Report, 2002.

Table 4: Age at the Onset of Visual Disability

(Per 1000 distribution of persons 60 years and above with blindness or low vision by age at onset of disability)

Category Across the Country	*Disability since birth*	*Age at onset (years)*										
		0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 44	45 - 59	60 & *Above*	*Total*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
						Blindness						
Rural male	21	5	8	7	4	2	2	10	45	196	699	1000
Rural female	17	8	10	8	4	6	8	5	26	238	673	1000
Rural persons	19	7	9	7	4	4	5	7	34	220	684	1000
Urban male	18	6	6	10	5	4	1	19	23	301	606	1000
Urban female	9	12	5	9	14	0	1	7	21	288	633	1000
Urban persons	13	9	5	10	10	2	1	12	22	294	621	1000
All male	21	5	7	7	4	2	2	12	41	214	683	1000
All female	15	8	9	8	6	5	7	5	25	246	666	1000
All persons	18	7	8	8	5	4	5	8	32	233	673	1000
						Low vision						
Rural male	13	2	6	4	3	2	0	2	6	234	729	1000
Rural female	2	8	5	3	0	1	2	0	12	259	708	1000
Rural persons	7	6	5	3	1	2	1	1	9	248	717	1000
Urban male	12	0	1	4	0	0	1	0	15	231	727	1000
Urban female	2	2	0	3	0	7	0	0	25	254	709	1000
Urban persons	5	1	0	3	0	4	1	0	21	245	716	1000
All male	13	2	5	4	3	2	0	2	7	233	729	1000
All female	2	7	4	3	0	2	1	0	14	258	708	1000
All persons	6	5	4	3	1	2	1	1	11	248	717	1000

It is observed from the above tables that the prevalence rate is highest in the age group, 60 years and above for both blindness and low vision. The trend for higher incidence rate for both conditions in rural and urban areas is similar, i.e., 1733 and 1087 for blindness and 747 and 459 for low vision.

The lowest prevalence is observed in the age group of 0 to 4 years with 32 and 30 cases of blindness and 5 cases each of low vision among the rural and urban inhabitants. While, there is a steady rise of blindness with an increase in age, it is not so for low vision. However, in the age group of 55 to 59, there is a marked increase in the prevalence of both blindness and low vision in both rural and urban areas.

Some people are born with the impairment and some acquire it in course of time. For those who acquired impairment after birth, information relating to age at onset of the impairment was collected. To study the pattern of age at onset, the cohort of persons of age 60 years and above who acquired visual impairment, have been considered

here and the distribution over age at onset as given in Table 3 for rural and urban sectors in the country. The results are given separately for the blind and for those with low vision.

It appears that visual impairment is an old age problem. About 68 to 72 per cent acquired visual impairment at the age of 60 years and above. The onset of visual impairment seems to start progressing between the ages of 35 and 44 years. In the remaining age-groups (at onset) from 0-4 years, the percentages were found to be quite low – 1 per cent or less. It is worth noting that both in the rural and urban sectors, the percentages tend to be higher in the first three age-groups (0-4, 5-9 & 10-14 years) than those in the next four age-groups. The results suggest that apart from old age, visual impairment tends to manifest during the early years of life, 1 to 2 per cent being visually impaired at birth. The distribution appears to be identical both for the blind and persons with low vision, for rural and urban, and for male and female (Table 4).

Census 2001

The population of blind persons in rural and urban areas according to Census 2001 is given State-wise in Table 5.

Table 5: State-wise Population of Blind Persons (Per Thousand) in Rural and Urban Areas

States/ Union Territories	*Residence*	*Disability in seeing*		
		Person	*Male*	*Female*
Jammu & Kashmir	**Total**	**208713**	**116034**	**92679**
Jammu & Kashmir	Rural	152494	83563	68931
Jammu & Kashmir	Urban	56219	32471	23748
Himachal Pradesh	**Total**	**64122**	**34819**	**29303**
Himachal Pradesh	Rural	58132	31163	26969
Himachal Pradesh	Urban	5990	3656	2334
Punjab	**Total**	**170853**	**93153**	**77700**
Punjab	Rural	112597	60743	51854
Punjab	Urban	58256	32410	25846
Chandigarh	**Total**	**8422**	**5041**	**3381**
Chandigarh	Rural	953	620	333
Chandigarh	Urban	7469	4421	3048
Uttaranchal	**Total**	**85668**	**46434**	**39234**
Uttaranchal	Rural	66804	35336	31468
Uttaranchal	Urban	18864	11098	7766
Haryana	**Total**	**201358**	**111545**	**89813**
Haryana	Rural	148286	81300	66986
Haryana	Urban	53072	30245	22827
Delhi	**Total**	**120712**	**71342**	**49370**
Delhi	Rural	4925	2867	2058
Delhi	Urban	115787	68475	47312
Rajasthan	**Total**	**753962**	**430589**	**323373**
Rajasthan	Rural	591450	336419	255031
Rajasthan	Urban	162512	94170	68342
Uttar Pradesh	**Total**	**1852071**	**1042383**	**809688**
Uttar Pradesh	Rural	1445145	808866	636279
Uttar Pradesh	Urban	406926	233517	173409
Bihar	**Total**	**1005605**	**556688**	**448917**
Bihar	Rural	903016	498654	404362
Bihar	Urban	102589	58034	44555
Sikkim	**Total**	**10790**	**6100**	**4690**
Sikkim	Rural	9454	5319	4135
Sikkim	Urban	1336	781	555
Arunachal Pradesh	**Total**	**23079**	**16283**	**6796**
Arunachal Pradesh	Rural	18329	12630	5699
Arunachal Pradesh	Urban	4750	3653	1097
Nagaland	**Total**	**9968**	**5627**	**4341**
Nagaland	Rural	8209	4544	3665
Nagaland	Urban	1759	1083	676
Manipur	**Total**	**11713**	**6264**	**5449**
Manipur	Rural	8733	4696	4037
Manipur	Urban	2980	1568	1412
Mizoram	**Total**	**6257**	**3506**	**2751**
Mizoram	Rural	3770	2089	1681
Mizoram	Urban	2487	1417	1070
Tripura	**Total**	**27505**	**15629**	**11876**

States/ Union Territories	Residence	Disability in seeing		
		Person	Male	Female
Tripura	Rural	22559	12824	9735
Tripura	Urban	4946	2805	2141
Meghalaya	**Total**	**13381**	**7170**	**6211**
Meghalaya	Rural	9643	5114	4529
Meghalaya	Urban	3738	2056	1682
Assam	**Total**	**282056**	**154136**	**127920**
Assam	Rural	244103	132655	111448
Assam	Urban	37953	21481	16472
West Bengal	**Total**	**862073**	**468935**	**393138**
West Bengal	Rural	610221	329861	280360
West Bengal	Urban	251852	139074	112778
Jharkhand	**Total**	**186216**	**104147**	**82069**
Jharkhand	Rural	142109	78292	63817
Jharkhand	Urban	44107	25855	18252
Orissa	**Total**	**514104**	**274151**	**239953**
Orissa	Rural	435405	230381	205024
Orissa	Urban	78699	43770	34929
Chhattisgarh	**Total**	**160131**	**84047**	**76084**
Chhattisgarh	Rural	129417	67167	62250
Chhattisgarh	Urban	30714	16880	13834
Madhya Pradesh	**Total**	**636214**	**346567**	**289647**
Madhya Pradesh	Rural	478225	259729	218496
Madhya Pradesh	Urban	157989	86838	71151
Gujarat	**Total**	**494624**	**273694**	**220930**
Gujarat	Rural	337141	184883	152258
Gujarat	Urban	157483	88811	68672
Daman & Diu	**Total**	**1898**	**1069**	**829**
Daman & Diu	Rural	1161	730	431
Daman & Diu	Urban	737	339	398
Dadra & Nagar Haveli	**Total**	**2346**	**1353**	**993**
Dadra & Nagar Haveli	Rural	1860	1054	806
Dadra & Nagar Haveli	Urban	486	299	187
Maharashtra	**Total**	**580930**	**320466**	**260464**
Maharashtra	Rural	375886	201617	174269
Maharashtra	Urban	205044	118849	86195
Andhra Pradesh	**Total**	**581587**	**318730**	**262857**
Andhra Pradesh	Rural	435239	235461	199778
Andhra Pradesh	Urban	146348	83269	63079
Karnataka	**Total**	**440875**	**241439**	**199436**
Karnataka	Rural	304701	164907	139794
Karnataka	Urban	136174	76532	59642
Goa	**Total**	**4393**	**2316**	**2077**
Goa	Rural	2251	1157	1094
Goa	Urban	2142	1159	983
Lakshadweep	**Total**	**603**	**295**	**308**
Lakshadweep	Rural	369	183	186
Lakshadweep	Urban	234	112	122
Kerala	**Total**	**334622**	**167352**	**167270**
Kerala	Rural	251284	124846	126438
Kerala	Urban	83338	42506	40832
Tamil Nadu	**Total**	**964063**	**397227**	**566836**
Tamil Nadu	Rural	553331	219696	333635
Tamil Nadu	Urban	410732	177531	233201
Pondicherry	**Total**	**10646**	**5900**	**4746**
Pondicherry	Rural	3898	2037	1861
Pondicherry	Urban	6748	3863	2885
Andaman & Nicobar Islands	**Total**	**3321**	**1907**	**1414**
Andaman & Nicobar Islands	Rural	2283	1314	969
Andaman & Nicobar Islands	Urban	1038	593	445
INDIA	**Total**	**10634881**	**5732338**	**4902543**
INDIA	**Rural**	**7873383**	**4222717**	**3650666**
INDIA	**Urban**	**2761498**	**1509621**	**1251877**

Source: Census, 2001.

As per the Census Report 2001, the highest number of persons with blindness were reported from the State of Uttar Pradesh (18.52 lakhs) followed by Bihar (10 lakhs) and Tamil Nadu (9.64 lakhs) whereas leaving apart the Union Territories, Goa reported smallest number of blindness cases (44 thousand).

Chapter 3

Causes and Prevention of Visual Impairment

Causes of Visual Disability

The NSSO report provides figures of blind persons and persons with low vision per thousand in terms of causes of blindness and low vision as reported by the respondents. These are presented in Tables 1, 2 & 3.

Table 1: Per 1000 Distribution of Persons with Low Vision by Cause of Low Vision for Each Sex and Sector–All-India

All-India Cause of Low Vision	*Rural*			*Urban*			*Rural+Urban*		
	Male	*Female*	*Person*	*Male*	*Female*	*Person*	*Male*	*Female*	*Person*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Sore eyes first month life	1	0	1	0	2	1	1	0	1
2. Sore eyes after one month	5	0	2	3	5	4	5	1	3
3. Severe diarrhoea before age six	8	2	5	5	9	7	8	3	5
4. Cataract	272	287	280	293	405	358	276	309	294
5. Glaucoma	36	29	32	41	38	40	36	31	33
6. Corneal opacity	59	39	48	22	8	14	53	33	42
7. Other eye diseases	121	100	109	221	122	163	137	104	119
8. Small pox	14	7	10	12	7	9	14	7	10
9. Burns	2	4	3	3	3	3	2	4	3
10. Injury other than burns	64	28	44	92	34	58	69	29	47
11. Medical/ surgical intervention	21	13	17	23	31	28	22	16	19
12. Old age	236	342	295	156	228	198	223	321	278
13. Other reasons	38	31	34	65	43	52	42	33	37
14. Not known	111	108	110	58	59	59	102	99	101
TOTAL⋆	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

⋆ 'Total' includes not recorded cases of 'cause of low vision'.

Table 2: Distribution of Blind Persons Per 1000 by Cause of Blindness Sex-wise and Sector-wise–All India

Cause of	*Rural*			*Urban*			*Rural+Urban*		
Blindness	*Male*	*Female*	*Person*	*Male*	*Female*	*Person*	*Male*	*Female*	*Person*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Sore eyes during first month life	5	2	3	2	1	1	4	2	3
2. Sore eyes after one month	8	4	6	10	7	8	8	5	6
3. Severe diarrhoea before age six	9	5	7	5	11	8	8	6	7
4. Cataract	187	233	212	214	183	196	192	223	209
5. Glaucoma	54	51	52	64	93	80	56	59	58
6. Corneal opacity	26	17	21	24	54	40	25	24	25
7. Other eye diseases	186	157	170	171	158	164	183	157	169
8. Small pox	53	42	47	43	31	36	51	40	45
9. Burns	4	4	4	4	0	2	4	3	3
10. Injury other than burns	50	28	38	73	26	47	54	28	39
11. Medical/ surgical intervention	21	23	22	48	49	49	26	28	27
12. Old age	212	281	250	158	234	200	202	272	241
13. Other reasons	91	54	70	89	62	74	90	55	71
14. Not known	85	94	90	93	86	89	87	92	90
TOTAL⋆	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

⋆ 'Total' includes not recorded cases of 'cause of blindness'.

Table 3: Cause-wise Distribution of Persons with Low Vision Per 1000 Use of Low Vision Sex-wise and Sector-wise–All India

Cause of	*Rural*			*Urban*			*Rural+Urban*		
Low vision	*Male*	*Female*	*Person*	*Male*	*Female*	*Person*	*Male*	*Female*	*Person*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Sore eyes first month life	1	0	1	0	2	1	1	0	1
2. Sore eyes after one month	5	0	2	3	5	4	5	1	3
3. Severe diarrhoea before age six	8	2	5	5	9	7	8	3	5
4. Cataract	272	287	280	293	405	358	276	309	294
5. Glaucoma	36	29	32	41	38	40	36	31	33
6. Corneal opacity	59	39	48	22	8	14	53	33	42
7. Other eye diseases	121	100	109	221	122	163	137	104	119
8. Small pox	14	7	10	12	7	9	14	7	10
9. Burns	2	4	3	3	3	3	2	4	3
10. Injury other than burns	64	28	44	92	34	58	69	29	47
11. Medical/ surgical intervention	21	13	17	23	31	28	22	16	19
12. Old age	236	342	295	156	228	198	223	321	278
13. Other reasons	38	31	34	65	43	52	42	33	37
14. Not known	111	108	110	58	59	59	102	99	101
TOTAL⋆	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

⋆ 'Total' includes not recorded cases of 'cause of low vision'.

Information on probable cause/s of visual disability as known to the informant was collected in respect of only those who had acquired the visual disability. The distribution of such persons by probable cause of visual disability is given in tables above for rural and urban areas. The cause was unknown to about 9 per cent of the affected. About 24 per cent reported 'old age' as the cause. Apart from 'old age', with 21 percent reporting, 'cataract' was one of the main cause. It may be noted that cataract develops with advancing age, being relatively higher in the old age. 'Other eye diseases' caused blindness in about 17 per cent cases. These facts suggest that blindness is essentially a problem of old age. Although there is a marginal gender and rural–urban distribution difference, the pattern remains same.

The pattern of distribution remains same for persons with low vision as that for the blind. About 10 per cent did not know the probable cause of their low vision and about 57 per cent reported it was due to 'old age' or 'cataract'. The other major causes for low vision were found to be 'other eye diseases' (12 per cent), 'injury other than burns' (5 per cent), 'corneal opacity' (4 per cent), etc.

Prevention

A vast majority of the blind live in developing countries, where infections, malnutrition and lack of eye care contribute to a high proportion of blindness, particularly among the rural inhabitants. Thus these countries have blindness rates that are 10 to 40 times greater than those of industrialized countries, where blindness is due mainly to degenerative and metabolic disorders related to ageing.

A major portion of blindness in developing countries is avoidable or curable. Blindness due to infectious or nutritional origin can easily be prevented. A simple surgery can restore vision in case of loss due to cataract. Endemic trachoma and associated infections affect millions of people in the poorer rural communities of developing countries and can be controlled through hygienic measures such as face-washing, the application of antibiotic ointments in children and corrective lid surgery in adults.

Malnutrition leading to severe Vitamin A deficiency can cause permanent blindness by damaging the cornea. This is particularly true of malnourished children who are affected by superimposed diseases such as measles, diarrhoea and acute respiratory infections that can aggravate their Vitamin A deficient status.

Cataract, or opacity of the crystalline lens of the eye, occurs, worldwide more frequently with advancing age and may affect more than 90 per cent of those over 60 years of age. Cataract constitutes the major cause of easily curable blindness in most regions.

Blindness due to ocular trauma can be controlled by preventive efforts at the community level and through appropriate timely treatment.

Another major cause of blindness – glaucoma is a group of diseases generally characterized by elevated internal pressure of the eye and resulting in visual impairment. Its control depends on case-detection and treatment with eye drops or surgery.

The lack of eye health services in underserved communities in developing countries is responsible for high incidence of blindness. Early treatment of infectious and eye disease due to poor nutrition is essential to prevent visual loss. Such treatment can often be delivered effectively by auxiliary health personnel.

The blind are a severe burden to society in the sense that the cost of productivity loss, cost of rehabilitation and education of the blind is very

high and progressive. Effective deployment of resources for the prevention of blindness will save both on monetary expenditure and human suffering, the cost of preventing blindness being only a small fraction of the expense of rehabilitation. According to WHO, unless rapid and systematic action is taken, the number of blind worldwide is likely to double by the year 2020.

Primary Health Care Approach to Prevention of Blindness

There are three distinct, yet related, components in the primary health care approach for prevention of blindness. They are:

(i) Social and community developmental programs that promote health through changes in behaviour and the environment which may reduce or eliminate factors contributing to ocular disease. Provision of adequate, safe water supplies, growing and consuming food rich in provitamin A, construction and maintenance of pit-latrines are some such programs.

(ii) Strengthening community cooperation to promote, within the family, the recognition and appropriate care of individuals at risk for diseases. The community activities could include adequate feeding and oral rehydration of children with severe measles or diarrhea. Immunization is also important. Community awareness of eye care can be promoted by local committees.

(iii) Delivery of eye care to individuals with disorders for treatment and referral of infectious corneal ulcers by the village-level workers or cataract surgery performed by teams in mobile or at stationary facilities.

Only the last of the above requires direct interaction between a sick individual and medical personnel.

Of the three components, community and social development may be the hardest to achieve, but will eventually have the greatest impact. World-wide, blindness caused by infections and malnutrition have practically disappeared following moderate socio-economic advances, despite the absence of specific disease control activities.

Primary Eye Care

Primary eye care comprises of a simple but comprehensive set of promotive, preventive and curative measures that can be carried out by suitably trained primary health workers, specialized auxiliary personnel or other interested people. The primary eye care worker should carry out promotive and preventive activities, focusing on education and community participation aimed at prevention of sight loss.

The clinical activities involved in primary eye care consist of simple means of treating three major eye symptoms presented by patients: inflamed ("red") eyes, loss of vision and pain in the eye. At the primary level, the health worker can manage these problems by definitive treatment, through referral alone or immediately after treatment.

The most important aspect of primary eye care is the training of health workers to recognize anomalous eye conditions and to take appropriate action.

Secondary Eye Care

Primary eye care must be supported by reinforcing training and through referral services at the secondary level. Eye care facilities at the secondary level should provide for the management of common blinding conditions,

such as, cataract, trichiasis and entropion (in turned eyelids), ocular trauma, primary angle closure glaucoma and corneal and intraocular infections.

Secondary eye care activities are generally carried out in dispensaries, or hospitals at the district or state/provincial level, by staff such as ophthalmic assistants, general practitioners trained in eye care or fully qualified ophthalmologists.

Tertiary Eye Care

Facilities for sophisticated eye care are often available at mega hospitals and medical college hospitals or similar institutions. Eye care delivered at this level usually covers a variety of diagnostic and therapeutic services; availability is often limited to urban population.

Technical support for primary and secondary eye care and carrying out research related to delivery of eye care come under tertiary eye care apart from other activities.

Mobile Eye Services

For taking the eye care services to the doorstep of the needy, mobile services have proved to be useful especially in those areas where facilities for primary and secondary eye care services are not available. However, mobile camps and such other services should be of temporary nature and should eventually be replaced by a suitable permanent infrastructure for care of the eyes.

Prevention of Conditions Causing Blindness

Conjunctivitis and Lid Infections

Patient suffering from acute conjunctivitis, that is, redness of globe and purulent discharge without any loss of vision, should be referred following little relief after application of antibiotic drops or ointment for three days.

Ophthalmia neonatorum is conjunctivitis common among the newborn with symptoms of red eye with lid swelling and discharge in the first few days after birth, often caused by a maternal infection. Treatment should be carried out immediately and it is necessary to continue it for two weeks or more until conjunctivitis disappears. The eyes should be cleansed frequently to keep them free from discharge.

Malnutrition Causing Blindness

Blindness due to malnutrition can occur at any age. Vitamin A deficiency usually occurs in children under six years of age with malnutrition which may result in the following conditions:

1. Night blindness.
2. Foamy spots on the white of the eyeball on either side of the cornea (Bitot's spots).
3. Dry eye in which the cornea appears to be roughened and dull and does not have a moist appearance (xerophthalmia).
4. Corneal ulcers may occur in a severely malnourished child, particularly after measles. Complaint of pain may be absent, but a black spot may appear on the surface of the cornea.

All children with corneal ulcers should receive Vitamin A supplement whether or not a deficiency is suspected. The symptoms are red, painful eyes, usually with some diminished vision, often causing blindness of the affected eye. These potentially causal conditions require urgent and expert attention.

Prevention of malnutrition causing blindness takes two forms: increasing Vitamin A intake and reducing the infections that contribute to its occurrence, such as measles, frequent diarrhoea and respiratory infections. The most direct,

effective and sustainable solution is to ensure consumption of food rich in Vitamin A and other essential nutrients and proteins.

Mothers should be encouraged to breast-feed exclusively (without giving additional water) until babies reach 4-6 months of age, since breast milk generally is adequate for this period and is safe and protective. Vitamin A rich food include carrot, mango, papaya, dark green leafy vegetables like cabbage, eggs, fish and meat. Prolonged overcooking destroys the vitamins therefore, it should be avoided.

Burns

Chemical burns should be treated through immediate and prolonged washing of eyes with water, with the eyelids held wide open. Thermal as well as chemical burns should be treated with antibiotic ointment before referral.

Cataract

Cataract is defined as opacity of the lens of the eye. Patients with cataract have a gradual loss of vision without any pain. In advanced cases, the pupil appears to be chalky-white or greenish-gray in colour. These patients should be referred as soon as possible to the nearest eye hospital for surgery.

Loss of vision from cataract is a major cause of blindness in developing countries that can be treated successfully with existing technology. Since, prevalence of cataract rises markedly with age, blindness from cataract in developing countries is expected to increase with increased longevity.

About 85 per cent of cataracts are classified as senile, the causes of which are unknown. There are many known causes of cataract, but these account for a relatively small percentage, i.e., about 15 per cent of the total number of cases. The present understanding of the biochemical and structural events leading to the formation of senile cataract is quite incomplete.

Although not a major cause of vision loss in absolute terms, congenital cataract is of particular concern, because it affects infants and young children and therefore, if left untreated, causes lifelong blindness. The treatment should start preferably before the age of six years. However, the surgery should be avoided until the age of 18 years.

Glaucoma

Glaucoma, popularly known as *Kala Motia* or *Neela Motia* is an important cause of blindness, both in developing and in developed countries accounting for approximately 15 per cent of all cases of blindness.

According to some Indian studies, more than 150 million Indians over the age of 40 years are in the vulnerable age-group and it is likely that more than three million either have glaucoma or are potential patients.

Glaucoma includes four distinct entities, i.e., congenital or infantile glaucoma, primary open-angle glaucoma, primary angle-closure glaucoma and secondary glaucoma, with the common but not obligatory feature of intraocular pressure high enough to impair the functioning of the optic nerve and cause visual field loss ultimately leading to blindness.

Primary open-angle glaucoma and primary angle-closure glaucoma account for a majority with glaucoma-related blindness. Of the two, primary open-angle glaucoma is more common and also more difficult to diagnose and treat. It usually affects both the eyes and its prevalence increases rapidly after the age of 40 years.

The black population has a rate of glaucoma four to eight times higher than that of Caucasian populations. Thus race is an important risk factor. Kinship with a patient of primary-angle glaucoma is also a risk factor others being high blood pressure, diabetes and myopia.

Of the Infantile glaucoma is a rare disorder. Sixty per cent cases are diagnosed by the age of six months. Secondary glaucomas are caused by ocular diseases. Prevention or treatment of the underlying disease is the preventive measure.

Diabetic Retinopathy

Diabetic retinopathy is the leading cause of blindness in adults. Loss of vision cannot be regained. Laser treatment works best towards prevention, early diagnosis being crucial.

Childhood Blindness

Major causes of childhood blindness in developing countries, such as, Vitamin A deficiency, measles, harmful traditional eye practices, and corneal infections are preventable congenital cataract and congenital glaucoma together represent 10-20 per cent of childhood blindness in most parts of the world.

National Program for the Control of Blindness (NPCB)—Present Status

The National Programme for the Control of Blindness was launched in the year 1976 as a 100 per cent Centrally sponsored scheme, the goal being reduction of the prevalence of blindness to 0.8 per cent by 2007.

Budget

With the closure of the World Bank Project, the program is being sustained with indigenous support. In the Tenth Plan, Rs. 445 crores has been allocated.

The objectives of the programme are:-

- To reduce the backlog of blindness through identification and treatment of the blind.
- To develop eye care facilities in every district.
- To develop human resources for providing Eye Care Services.
- To improve quality of service delivery.
- To secure participation of the voluntary organizations in eye care.

Achievements

The major activities and achievements of this program include performance of cataract surgery, eye screening of school age population, collection and utilization of donated eyes, training of ophthalmic surgeons and increasing community awareness. Tables 4 to 5 highlight these activities.

Table 4: Cataract Surgeries Performed

Year	*Target*	*Achievement*	*Percent Surgery with IOL (Intra Ocular Lense)*
2002-03	4000000	3857133	77
2003-04	4000000	4197609	83
2004-05	4240000	4491154	88
2005-06	4513000	4879612	90
2006-07	4500000	1656239	75★

★Provisional.

Source: NPCB Report, 2005-06.

Table 5: School Eye Screening Program

Year	*Teachers trained*	*School children screened*	*Children detected with refractive errors*	*Poor children provided free glasses*
2002-03	35,267	97,36,805	5,06,663	98,697
2003-04	88,317	1,92,60,984	5,52,963	1,84,305
2004-05	97,310	2,68,62,932	5,72,691	2,83,070
2005-06	1,24,981	2,94,73,371	7,26,803	3,50,048
2006-07	30,944	30,42,533	88,611	43,999⋆

⋆Provisional.

Source: NPCB Report, 2005-06.

Collection and Utilization of Eyes Donated

Currently, almost twenty thousand eyes donated are collected per annum. Hospital retrieval programme is the main strategy which envisages motivating relatives of terminally ill patients, accident victims and others with grave diseases to donate eyes. Annual eye donation fortnight is organized from 25th August to 8th September to promote eye donation/eye banking. Gujarat, Tamilnadu, Maharashtra and Andhra Pradesh are the leading States in this activity.

Table 6: Collection of Eyes Donated

Year	*Total No. of Eyes Collected*
2003-04	23,741
2004-05	23,553
2005-06	28,007
2006-07	1,0371⋆

⋆ Provisional.

Source: NPCB Report, 2005-06.

Table 7: Training of Ophthalmic Surgeons

Year	*Nos.*
2002-2003	176
2003-2004	229
2004-2005	350
2005-2006	250
2006-2007	125
TOTAL	**1130**

Source: NPCB Report, 2005-06.

Development of Infrastructure through Establishment of Centers and Providing Manpower and Instruments

a.	Regional Institutes of Ophthalmology	16
b.	Upgraded Medical Colleges	105
c.	Paramedical Ophthalmic Assistants Training Centers	39
d.	Eye Banks	166
e.	District Hospitals equipped	550
f.	District Blindness Control Society	590
g.	Central Mobile Units Integrated with RIOs	80
h.	District Mobile Units at Medical Colleges	344
i.	Primary Health Centers upgraded to District Hospitals.	5,692
j.	Para Medical Ophthalmic Assistants Posted	5,692

Support to Voluntary Organizations

Voluntary organizations play an important role in implementing various activities under the programme. District Blindness Control Societies (DBCS) have been established throughout the country under the Chairmanship of the District Collector/Deputy Commissioner. So far 575 DBCSs have been established. Under the scheme of non-recurring grant, a maximum of Rs. 25 lakhs was granted for expansion/upgradation of Eye Care Units for tribal and backward rural areas. So far, 54 NGOs have been assisted under this scheme

since 1996-97. 24 eye banks in the voluntary sector have been assisted to promote collection of eyes donated.

Targets for the Tenth Plan

- To increase the cataract surgery rate to 450 operations; per one lakh population.
- Improvement in the outcome of cataract surgery through IOL implantation in more than 80 per cent by 2007.
- Development of 50 Pediatric Ophthalmology Units.
- Facilities for early diagnosis and treatment of glaucoma and diabetic retinopathy.
- Setting up 2000 Vision Centers in rural areas.
- Development of 25 fully functional eye bank networks.
- Developing human resources and institutional capacity for eye care through training eye surgeons and other personnel at various levels, supply of ophthalmic equipment and grant-in-aid to the NGOs.

Participation of RCI in Identification and Prevention of Blindness

RCI launched a scheme of providing orientation to medical personnel manning the primary health centers (PHCs). The curriculum and manuals were developed. Financial assistance was provided to 76 Government and Non-Government organizations to conduct orientation programs for these personnel across the country. A total of 1,250 batches for Medical Officers were sponsored by the RCI in which 18,657 medical doctors in-charge/posted in PHCs were trained from July 1999 to March 2004. In all, 634 Master Trainers, trained in 70 batches were involved.

Chapter 4

Early Identification and Intervention

Early eye-examination is of utmost importance. All eye surgeons have been exposed to the frustration of an adult when informed that nothing can be done to improve vision in the lazy (amblyopic) eye. This can be prevented to a great extent if it can be detected around the age of 3 – 4 years.

It has been observed that 24 per cent have refractive errors and many of these errors are present at birth and go un-noticed for a long time. It is so more often when there is an imbalance of errors between the two eyes.

Signs to Watch Out for Early Detection (As Adopted by UNICEF)

General symptoms that may occur from birth

- Squints or blinks when looking at something.
- The eyes are crossed.
- Favors one eye more than the other when looking at an object.
- One or both of the eyes turn in or out.
- The pupils are hazy.
- Eyes are tearing excessively, they are red, or the eye-lids are encrusted with matter.
- Turns or tilts head abnormally.
- Has frequent or persistent sties.

General Symptoms that may occur from 0-3 Months

- Child does not follow an object in his visual field.
- Child does not play with his hands.

General Symptoms that may occur from 3-6 Months

- Child does not reach for toys in his visual field.
- Child does not make eye contact when being fed or cuddled.
- Child does not visually inspect objects in his hand.

General Symptoms that may occur from 6-9 Months

- Child's motor skills such as rolling over, sitting or crawling. do not develop.
- Child does not appear to discriminate between similar objects or people.
- Child does not pick up small objects successfully.

General Symptoms that may occur from 9-12 Months

- Child shuts or covers one eye when focusing.
- Child holds playthings very close to eyes.
- Child bumps into large objects when crawling.
- Child rubs his eyes excessively.
- Child does not attempt to grasp spoon or cup when being fed.
- Child does not appear to notice interesting or bright coloured objects that are at short distance.

- Child does not imitate simple motor play such as waving bye-bye.

General Symptoms that may occur from 1-2 Years

- Walking is delayed.
- Bumps into large objects.
- Child not interested in playing.
- Child not interested in picture books.
- Child holds books or objects very close or far from the eyes to see them.
- Child appears to be afraid to walk or move in strange environment.
- Child clumsy and awkward for his age.
- Child does not bother about colourful objects
- Child pays more attention to sounds.

General Symptoms that may occur from 2-5 Years

- Stumbles over small objects.
- Bumps into large objects, is clumsy and awkward.
- Not interested in games involving catching, throwing, bouncing or tagging.
- Not interested in tasks that require sustained visual concentration.
- Not interested in books.
- Complains of: headaches, nausea, dizziness, burning or itching of eyes, blurring of vision.
- Cannot see distant things clearly.
- Places head close to the tasks he is doing.
- Does not notice colour differences.

General Symptoms that may occur from School Age

Teacher or parent may observe in the child

- Body is rigid while looking at distant or near objects.
- Short attention span and daydreams.
- Places head close to book or desk when colouring, reading or writing.
- Uses unusual or fisted pencil grasp, frequently breaking pencil.
- Has a spidery, excessively sloppy, or very hard to read hand writing.
- Closes or covers one eye.
- Dislikes tasks requiring sustained visual concentration; feels nervous, irritable, restless or unusually fatigued after maintaining visual concentration.
- Loses place while reading and uses the finger or marker to guide the eyes.
- Difficulty in remembering what is read.
- Skips words and re-reads.
- Difficulty remembering, identifying, and reproducing basic geometric forms.
- Difficulty in sequential concepts.
- Poor eye-hand coordination and unusual awkwardness including difficulty with stairs, throwing and catching ball, buttoning and unbuttoning and tying.
- Gets easily frustrated, withdrawn and has difficulty in getting along with children.

Measures for Promoting Early Identification for Referral

Early identification is necessary for two reasons. Firstly, it can help a child to achieve his full potentials. Secondly, it would help to minimize the disability. It is therefore essential that the following measures are taken:

- Awareness generation at grass root level.
- Attend to reproductive and child health care.

- Implementation of immunization programs.
- Proper guidance and counseling to parents and community workers and the person himself.
- Publicizing resource material on visually impairment, its impact, its prevention and related issues.
- Training the key persons in the community, etc.

Intervention

Non-implementation of timely rehabilitation measures leads to disabilities and any disability leads to handicap, if no timely exposures are taken. Prevention of disabilities in early childhood can arrest secondary complications due to impairment. Implementation of appropriate intervention such as, education, awareness, medical/surgical and therapeutic intervention, the adverse effects of disabling conditions can be minimized to a large extent.

Objectives of early childhood intervention programs are:

- To detect blindness and prevent further disabling condition early in life.
- To reduce the impact of visual impairment.
- To accelerate the rate of development in the child.
- To facilitate acquisition of new behavior pstterns and skills by the child.
- To enhance skills for independent functioning of the child.
- To give support to the families of these children to cope with the challenges.

Different approaches for the intervention services for the visually impaired children during early childhood stage:

- Sensory Motor Integration Techniques.
- Be-activity Box Stimulation.
- Special training through the sense organs.
- Physiotherapy for reflex inhibition, sensory motor integration, mobility and orientation, etc.
- Neuro-developmental therapy.
- Psycho-social interventions.
- Medical intervention.
- Multidisciplinary intervention, etc.

Services for Parents/Care Takers

- Guidance and Counseling.
- Psycho-social intervention to cope with the challenges.
- Parent-Family Education.
- Appropriate training to parents on blindness and its management.

Many of the above services are available in the country in organizations such as Blind Relief Association, New Delhi; NAB, New Delhi; National Association for the Blind (NAB), Mumbai; Blind People's Association (BPA), Ahmedabad; All India Confederation of the Blind (AICB), New Delhi; IHRDC, Coimbatore; Blind Boys Academy, Ramkrishan Ashram, Narendrapur, West Bengal; Ramana Maharishi Academy, Bangalore; National Institute for the Visually Handicapped, Dehradun and its Regional Centre at Chennai; Sharp Memorial School for the Blind, Rajpur, Dehradun, etc.

Chapter 5

Education of Persons with Visual Impairment

The term 'rehabilitation' here refers to a process aimed at enabling persons with visual impairment to reach and maintain their optimal physical, sensory, intellectual, psychological and/or functional social levels, so that, they could change their lives to a higher degree of empowerment and independence (World Blind Union Position Paper on *Rehabilitation of Blind and Partially Sighted Persons*, 2000).

Education is one of the strong means to achieve optimum rehabilitation. A brief account of the present status of education for the visually impaired in the country follows.

Vocational Training Programs

There were only 32 institutions for the blind in India before partition. It was, generally, believed that most blind people were gifted with musical ability. Many of them learnt music and were career music teachers in the community. There were very few opportunities for vocational training or other forms of economic rehabilitation. A few traditional crafts such as re-caning, weaving, doormat making formed the subject matter of vocational services for the visually impaired. Today, a wide range of vocational courses are available for the blind, some striking examples being training in light engineering, providing computer-aided services, stenography, physiotherapy, acquiring middle-level managerial skills, along with training in a range of conventional occupations.

Financial Assistamce

The state governments gave little or no financial assistance to schools for the blind. Consequently, these schools had to depend to a very large extent on voluntary contributions. This was also, perhaps, the reason why the main impetus for work for the blind came from the voluntary sector rather than from the State which entered the fray only after Independence. In 1961, the Government of India initiated its Scheme of Assistance to Voluntary Organizations for the Handicapped with the provision of rupees one lakh only. Other schemes followed: Scheme of Assistance for Integrated Education (1974), Scheme of Assistance to Disabled Persons (1981), Special Employment Exchanges (1954), Vocational Rehabilitation Centres for the Handicapped (1964) and finally the Scheme for the establishment of Composite Regional Centres. The number of institutions for the blind in the country is now about 350.

National Institute for the Visually Handicapped

There was no national organization of or for the blind in the country in the pre-independence days. Several smaller organizations working at the State or local levels did exist. However, the establishment of the National Institute for the Visually Handicapped at Dehradun was a welcome step. The Institute continues to be the largest single manufacturer of equipment needed for the

education of the blind. The facility at the Institute is being updated and manufacturing procedures have been streamlined. Equipment is also being distributed through the Institute's regional outlets at Chennai, Kolkata, Secundrabad, etc.

Common Braille Code

There was almost complete absence of a common Braille Code for Indian languages. About 10 different Codes were being used by schools in different parts of the country. There was no Braille printing facility, nor a unit for the production of basic assistive devices. In November 1950, Bharati Braille came to be accepted as the National Code. Thereafter, the Central Braille Press and the Workshop for the Manufacture of Braille Appliances – the first ever such unit in the country came to be established in Dehradun.

The number of Braille printing presses has been going up steadily in the country. Many of these printing houses are now producing books in Braille with the help of very high-speed computerized Braille embossers. Equipments like Perkins Braille Writers are also available in the country at substantially reduced costs.

Government of India/Ministries

Starting on a modest note, there has been a continuing and rapid expansion of facilities and services for the blind since Independence. The Ministry of Education, Government of India, established a unit for the welfare of the handicapped in April 1947 in Delhi in accordance with the recommendations contained in the 1944 '*Report on Blindness*'. Although the unit was intended primarily for the blind, the Ministry of Education subsequently decided to take up work for all categories of disabled persons. Thus, some of the initiatives of the Government of India pertaining to other categories of disabilities owe their origin to the momentum provided by the *Report on Blindness in India* (1944).

The first program undertaken by the Ministry of Education was to offer scholarships to the blind students in the levels of secondary schools and colleges.

In 1954, the Government of India established the Central Social Welfare Board which gave small grants to certain institutions and persons with disabilities including the blind.

Education of the blind children receives special attention under the scheme of Integrated Education as also in Sarva Shiksha Abhiyan (SSA). A large number of NGOs are today conducting outreach and community-based rehabilitation services at their doorsteps to the blind and other disabled individuals in rural areas. The National Handicapped Finance & Development Corporation (NHFDC) seeks to promote self-employment through soft loans at reduced rates of interest.

The above, post-independence period developments are only illustrative of the concerted endeavours being made by the Government and the voluntary sector for the empowerment of blind persons. Yet, the magnitude of the task remains daunting. This is despite the fact that the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 stipulates that the appropriate Governments and the local authorities must "ensure that every child with a disability has access to free education in an appropriate environment till he attains the age of 18 years".

Table 1 provides information about blind children studying in regular schools under the scheme of Integrated Education for the Disabled Children in the country.

Table 1: Students with Visual Impairment (State Level), 2004-05

Enrolment Blind	*Classes*								*Total*	
	I	II	III	IV	V	VI	VII	VIII	I - V	VI- VIII
Boys	19443	15402	17059	17951	18270	16037	23122	11811	88125	50970
Girls	13644	12305	13661	14383	13478	12950	18253	11431	67471	42634
Total students with disabilities										
Boys	117259	100002	106852	101239	92055	68407	79511	47271	517407	195189
Girls	77554	69343	74801	70559	61145	47048	55631	36002	353402	138681
Total enrolment										
Boys	5241002	2713060	2191561	1045725	400359	8371596	7459637	4552696	61591707	20383929
Girls	3859472	1688119	1172433	9928012	9101360	7010329	6227217	3642383	55749396	16879929
Percentage of disability to total students with disabilities										
Percentage of Blind	16.98	16.36	16.91	18.82	20.72	25.11	30.62	27.91	17.87	28.04
Percentage of disability to total enrolment										
Percentage of Blind	0.11	0.11	0.13	0.15	0.16	0.19	0.30	0.28	0.13	0.25

Source: NIEPA, DIET Data, 2004-05.

It can be noticed from Table 13 that there were 2,49,200 blind students out of 12,04,679 total children with disabilities enrolled in regular schools. Further, out of the total blind students enrolled, there were 1,56,1,55,596 studying in Classes I to V whereas the rest were in Classes VI to VIII. Of the total, 20.68 per cent children with disabilities were in schools. In addition to these visually impaired children, another 19,000 children were receiving some form of education in the government and non-government special schools (unpublished M.Ed dissertation, 2005.) Thus, a total of 2,69,000 (approx.) children with visual impairment are enrolled in schools.

Sarva Shiksha Abhiyan

The Scheme of Sarva Shiksha Abhiyan (SSA) evolved from the recommendations of the State Education Ministers' Conference held in October 1998 to pursue universal elementary education in a mission mode. The scheme of Sarva Shiksha Abhiyan was launched by the Government of India in 2001 with the expenditure shared between the Central Government and the State Governments in the proportion of 85:15 during the Ninth Plan, at 75:25 during the Tenth Plan, and at 50:50 thereafter.

Inclusive Education of Children with Special Needs (CWSN)

SSA aims to ensure that every Child With Special Needs (CWSN), irrespective of the kind, category and degree of disability, is provided education in an appropriate environment and envisages adoption of zero rejection policy so that no child is left out of the education system. SSA's

thrust is on providing integrated and inclusive education to all children with special needs in general schools, as far as possible - with adoption of suitable alternative approaches in special cases. SSA framework mentions that a child with special needs should be taught in an environment which is best suited to his/her learning needs. It also envisages a specific grant @ Rs. l200/- per CWSN per year to meet "the special learning needs" of CWSN.

In 2004-05, 18.53 lakh Children with Special Needs were identified in the age group 6-14 years.

In the year 2005-06, the Project Approval Board allocated an amount of Rs.186.79 crores for a total of 20.14 lakh CWSN identified. Convergence has been established with the Ministry of Social Justice and Empowerment to provide aids and appliances to CWSN under SSA. Steps are being taken to make all new and the existing school buildings barrier-free.

Vocational Training and Employment Opportunities

Employment is the most important factor in mainstreaming the persons with disabilities. Therefore, a provision has been made in the PWD Act for 3 per cent reservation in Government jobs for persons with disabilities at all levels.

National Centre for Promotion of Employment for Disabled Persons (NCPEDP) conducted a sample survey of various companies and reported that the employment of persons with disabilities constitutes 0.35 per cent of all people employed (Mehra, 2000). The employment of disabled persons was reported to be 0.49 per cent in the public sector, 0.23 per cent in private sector, and 0.05 in the multi-national companies. It was also reported that the major chunk of the jobs went to the persons with locomotor disability with minimal or negligible impairment. Malhotra (2000) reported that 5.13 per cent companies employed persons with mental retardation. It may be inferred from the various studies that prejudicial attitude still prevails when it comes to the employment of persons with disabilities, specially, in case of the visually impaired.

The latest NSSO data regarding the status of employment among the disabled persons is given in Table 2.

Table 2: Number of Persons by Visual Activity Status and Disability Category per 1000 of age 5 years and above

Type of Disability	*Rural + Urban*		
	Employed	*Unemployed*	*Out of labour force*
Mental Retardation	56	0	943
Mental Illness	126	1	873
Blindness	91	2	907
Low Vision	188	3	809
Hearing Impairment	343	4	653
Speech Impairment	263	7	730
Locomotor Impairment	282	10	708
All disabled	257	7	735

Source: Table 13, NSSO Report No. 485, December, 2003, p. A – 158 to A – 229.

The data given in Table 2 shows that among all categories of disability, the hearing impaired account for the highest number employed per 1000 persons followed by persons with locomotor impairment, speech impairment, persons with low vision, persons with mental illness, persons with blindness, the least employed being persons with mental retardation. Overall, it was reported that out of every 1000 persons with disabilities aged 5 years and above, 257 persons were employed, 7 were unemployed and 735 persons with disabilities were out of the labor force. 91 persons with visual impairment were reported to be employed, 2 were unemployed while as many as 907 persons were out of the labor force.

The NSSO report further elaborates that out of the 91 blind persons employed, 42 were self-employed in agriculture, 15 were self-employed in non-agrarian sector, 10 were regular employees, and 24 were casual labourers. Among the 907 blind persons who were out of labor force, 40 attended educational institutions, 77 performed domestic chores, 12 were beggars. Those in categories other than the above numbered 777.

As regards persons with low vision, out of every 1000 persons 188 were employed, 83 were self-employed in agriculture, 32 persons were employed in non-agrarian, 9 were regular employees whereas 64 were casual labourers. Among the 809 the low vision persons out of the labor force, 41 attended educational institutions, 157 performed domestic duties, 7 were beggars.

It may be concluded that the visually-impaired got fewer jobs compared to those with other disabilities.

The Census Report 2001 gives the employment status of persons with visual impairment in Table 3.

Table 3: Distribution of the Visually Handicapped by Sex and Economic Status

India	*Workers*					*Non-workers*
	Total	*CL*	*AL*	*HHI*	*Others*	
Persons	4,247,162	1,382,587	1,099,717	184,759	1,580,099	6,387,719
Male	3,082,844	1,020,102	643,450	106,015	1,313,277	2,649,494
Female	1,164,318	362,485	456,267	78,744	266,822	3,738,225

Source: Census Report for the Disabled, 2001.

Table 15 shows that with regard to persons with visual impairment, as many as 42.5 lakhs were engaged in various occupations; about 64 lakh disabled people were not employed. Among those employed, 72.58 per cent were male and 27.41 per cent were female The employment rate of persons with visual impairment was 19.38 per cent among the disabled in the country.

To ascertain the link between disability and poverty in the country, Mohapatra (2004) collected data from 426 disabled persons belonging to locomotor, visual, hearing and mental disabilities. Among the respondents, 40 per cent males and only 8.4 per cent females were employed. While 53 per cent of locomotor disabled persons could find jobs, only 26 per cent of hearing disabled could manage

one. Only 17 and 14 per cent mentally disabled and visually disabled persons respectively could get jobs. Percentage of unemployment increased from 59 to 73 with an increase in the degree of disability implying that higher the severity of disability, more difficult it is to get work. Of those employed, 38 per cent earned their livelihood from casual labour, 34 per cent of them were self-employed.

The Ministry of Social Justice & Empowerment, Government of India, in pursuance of the provisions of Section 32 of the Persons with Disabilities Act, 1995 constituted an Expert Committee for identifying the jobs for persons with disabilities in both government offices and public sector undertakings. The notification was issued in May 2001 where jobs for the persons with orthopeadic, hearing and visual impairment were listed for A, B, C, and D Group employees. For visually handicapped, there were 216 types of jobs identified for A and B Groups, 179 for Group C and 22 for Group D levels. This exercise was undertaken to fill up 3 per cent reserved posts for persons with disabilities in the government and the public sector undertakings.

Technology for the Visually Impaired

Impairment relates to the functional limitation of a sensory organ. If we see disability in this perspective then it only means that we need to use a little more or a little different technology to compensate for the limitation imposed, compared to the average, normal person.

To understand the relationship between technology and disability, we must understand that impairment is the limitation of the capacities and capabilities of the sensory organ whereas disability is the functional limitation consequent to impairment.

This clearly implies that a person with blindness can do most of the things that a visually normal person can, but with the help of appropriate technologies and tools and perhaps using modified ways and means.

However, the technology and tools may not reach the needy persons at appropriate time/place. Some reasons for this are given below:

Availability: Right kind of tools, especially those that are meant for persons with disability are not available in the general market. Lack of proper distribution system is also to be blamed for the lack of availability.

Affordability: Cost of technology or tools are often prohibitive. For example, the screen reading software is the basic technology to be used by persons with blindness or low vision to work on the computer. This software costs more than the computer hardware.

Awareness: The potential beneficiaries often are not even aware of what is available for their benefit.

Language: Currently, the latest and the most effective technology available in developed countries are not available in Indian languages. For example, a scanner can be used by blind persons to read printed books. This technology which is in use for English language for the past 20 years, is not available for any Indian language till date. For this reason, most of these tools are useful to that small percentage of English-knowing blind persons.

In the past decade, introduction of technology such as Screen Reading Software, Text Reading Machines, Talking mobile phone, Drawing Boards, Geometric Kit, Cassette Recorder or a Digital Recorder, etc., have played a big role in changing the meaning of blindness or low vision. Steps are also being taken to overcome the

challenges that are mentioned above. Many efforts are being made to introduce Indian language screen reading applications. The information society in general is making efforts to bridge the digital divide. It is definitely possible for a person with blindness or low vision to be totally independent for all their reading and writing needs.

Some of the revolutionary technologies that have already made a difference in the lives of persons with blindness are as follows:

> Since computers have affected the lives of one and all, they are being used in every walk of life. One of the salient features of the PC is that it stores information in digital format. This information can be expressed or conveyed in many different ways. Same piece of information can be viewed on screen in different sizes or could be spoken out by the PC itself. One who cannot see, can hear a piece of information and the same information could be seen on the screen by a person who cannot hear. Therefore, information technology has come as a revolution for providing functional capabilities for persons with sensory impairment.

To illustrate, capabilities that this tool offers to persons with blindness are as follows:

1. Read and write in the format commonly used.
2. Use voice and text communication tools such as e-mail, web chat, internet telephony and instant chatting.
3. Use the Internet for all the purposes that it offers such as reading newspapers and magazines, Internet banking, online shopping, etc.
4. Gain access to dictionaries, encyclopaedia, telephone directories, etc.

Information Technology

What the information technology has made accessible to persons with blindness are as under:

1. *Screen Reading Software and Text-to-Speech Engine (TTS)*

Appropriate speech output from a computer enables persons with blindness to use a computer. This speech output comprises of two components:

(a) Screen Reading Software: The screen reading software is a computer programme that picks up the relevant information from the screen and sends the information to text-to-speech engine or speech synthesizer or a Refreshable Braille Display. This software determines what would be spoken by the computer.

There are innumerable screen layouts and user interfaces of computer applications. To be able to determine what would be the appropriate text to be spoken in each of those screens is an unending task. Screen readers need regular upgradation as new programs and applications are introduced in the market from time-to-time. A single key of the keyboard does different things in different softwares on a computer. For example, in a word processing environment, right arrow goes to next character whereas in the menu bar right arrow takes the focus to the next menu item. The speech output required in these two situations differs entirely. In the first situation only one character needs to be spoken whereas in the second situation complete item of focus needs to be spoken. Therefore, the screen reader sends the speech output in relation to the key pressed and the situation where the key is pressed.

It is not possible for any company making screen reader to design appropriate speech output for every application. Therefore, most of the screen reading software provides tools to customize the

speech output of the screen reading software so that the users themselves can configure the screen reading software to make it compatible with any application that they have to use.

A text-to-speech engine is the software which converts any text string into a spoken word. A screen-reading software determines what will be spoken and the text-to-speech engine determine how that text would be pronounced. The quality of speech output and the various voices depend entirely on the text-to-speech engine.

(b) Text-to Speech-Engine: Apart from being used as a speaking device for the screen reading software, the TTS is used in various other applications such as computerized telephonic inquiry systems, computerized announcement systems.To be able to design a speech output system for any particular language, it is essential to have a text-to-speech engine for that particular language. Screen reading software can then be designed or adapted to give appropriate speech output to blind persons in that particular language. Screen reading software and a text-to-speech engine are entirely two different application programs, which, working in tandem, provide accessibility to computers for persons with blindness. Jaws for windows from Freedom Scientific USA, Window Eyes from GW-Micro USA, Hal from Dolphin UK, Look Out by Premier Programming USA, etc., are all examples of screen reading softwares that use text-to-speech engines such as Eloquence by Eloquent Technology, Microsoft speech from Microsoft, Flex Talk from ATNT, Deck Talk Access from Digital Equipments, etc., to provide speech output. The cost of screen reading softwares ranges from 150 US dollars to 1,200 US dollars.

2. Screen Magnification Software

This software is designed to enable persons with low vision who can read large print to operate a computer. The condition of low vision varies widely. Therefore the screen magnification software offers magnification from 2 to 20 times and come in varying styles such as full screen magnification, magnifying lense simulation, vertical or horizontal split window magnification, etc. This magnification is different from increasing the font size. Increasing the font size would change the formatting of a document and would not provide magnification for items such as menus, etc. Screen magnification software, on the other hand, magnifies only the display of the document on the monitor and the original formatting of the document is preserved.

Magnification soft wares provide magnification to any and every part of the screen and not just to the text of the document. These softwares have enhanced capabilities for using different color contrast. A few of the screen magnification softwares also use speech output to help a person with low vision to lessen the strain. With the use of the screen magnification software persons with low vision use the same devices of the input such as the mouse and a keyboard used by a sighted person which allows the easy integration of the persons with low vision in the mainstream computer education or work environment.

Operating systems such as Windows are now supplied with in-built screen magnification software which has a limited capability. Magic by Freedom Scientific USA, Zoom Text by Ai-Square USA, Lunar by Dolphin UK are some of the examples of screen magnification softwares designed specially for persons with low vision. Screen magnification softwares cost between 80 and 600 US dollars.

3. OCR and Scanners

An OCR and a Scanner turns a computer

into a reading machine for those with low vision and the blind This equipment helps them to gain access to the hard copy of the text. The scanner sends the image of the printed-paper to the computer where the OCR software processes the image and converts it into a digital text which can be read using the text-to-speech engine or through a Refreshable Braille Display. Within a few seconds of starting to scan a paper, the computer starts reading it. This system can read only the print, but not the handwritten text.

The OCR softwares also have a limitation of not being able to recognize the text correctly if the printing is not of an excellent quality. There are a few OCR softwares designed specially for the blind. These are more user-friendly in processing tables, images, columns, etc. They are supplied with built-in text-to-speech engines, thereby eliminating the use of screen- reading software for reading purposes.

These special OCRs are much more expensive than the general purpose OCRs. Kurzweil 1000 by Kurzweil Education Systems USA, Open Book by Freedom Scientific USA, Complete Reading System by Premier Programming USA are a few examples of special OCR softwares made for the blind. Omni Page Professional, Text Bridge and Fine Reader are the examples of general-purpose OCR softwares which can be used by blind persons with the help of screen reading softwares. The cost of OCRs ranges from 150 to 1000 US dollars.

4. Refreshable Braille Display

A Refreshable Braille Display is a hardware device, an alternate output device for a text-to-speech engine. The Refreshable Braille Display gives one line of Braille information which is sent out by the screen reading software. This line of Braille keeps changing as new information is sent by the screen reader to the Braille display. There are various models of Braille display which can provide 20, 40 or 80 cells of Braille at a time.

There is a greater chance of adaptability of Braille output for different languages since the basic Braille cells remain the same for every language.

The very high cost of Braille display comes in the way of its use in developing countries. Alva Delphi Multimedia & Alva Satellite by Alva Access Group, Braille Stars by Pulse Data Human Ware, Braille Ellex by Paper Meyer Company Germany Power Braille by Freedom Scientific, Vario by Braum Germany are a few examples of Refreshable Braille Displays. The various models of Braille display of 40/80 cells cost between 4,500 and 11,000 US dollars.

5. Note-takers

Braille note-takers are essentially hand-held devices that use either a Braille or QWERTY keyboard for input and voice and/or refreshable Braille for output. These devices have built-in packages for word-processing, spread sheets, address book, clock, calendar, e-mail, internet browsing, etc. These devices have long battery backups that enable its use without power input for a whole day. Lightweight and highly portable, they can be connected to desktop or laptop computers so that files may be backed up.

Some note-takers can be connected to external disk drives (for an additional cost) to permit storing files on floppy disks. Many of these note-takers can be attached to a modem for handling e-mails and web browsing. They can also be attached to Braille embossers/printers.

Note-takers are extremely useful devices for students of integrated education and in work environment. Aria by Robotron Australia, Braille

Desk 2000 by Artic Technologies; Braille Lite Millennium, P ACmate, Type n' Speak, Type Lite, Braille n' Speak by Freedom Scientific; Braille Note & Voice Note by Pulse Data HumanWare; Braille Elba by Papenmejer Germany; TransType 2000 by Artic Technologies are a few examples. Cost of these note-takers range between 1,200 and 5,000 US dollars.

6. Voice Diary

Voice Diary, a small hand held device, has multiple applications: appointments, calendar, clock, calculator, address book and note-taker. Data in a voice diary is stored in the form of recorded audio. This device uses speech recognition to search for the names and appointments. These can be searched by speaking the names into the voice diary. Voice Diary by Voice Diary Ltd., Israel and Voice Make by Parrot France are available models of voice diaries costing in the range of 70 to 250 US dollars.

Chapter 6

Human Resource Development to Provide Rehabilitation Services to the Visually Impaired

Professional training for generating manpower in rehabilitation in the country was adhoc, unstructured, disorganized and unplanned. In view of this, the Rehabilitation Council of India (RCI) Act was passed by the Parliament in 1992. In 1993, when RCI Act came into effect, the number of training courses and number of training institutes stood at 22 and 25 respectively. Today, after only 13 years of its existence, as a regulatory body, the number of institutions recognized by the RCI for offering courses at Certificate, Diploma, Bachelors, Masters, M.Phil, etc., has reached 280 covering all disability areas.

Out of the 114 short and long term courses developed so far, 56 courses of one-year duration or more are operational in the country, turning out more than 5,000 rehabilitation professionals annually in regular courses and 5,000 more complete the B.Ed. Special Education course of 18 months duration through Distance Learning in a year. Some of these trained professionals are in demand not only within the country but also outside in the developed countries.

Though the disability movement in India got the real impetus in 1981, the International Year for the Disabled Persons, some special schools run by Christian missionaries and service organizations were in existence since the late 19th century. It was believed that children with disabilities could not be educated alongside normal children.

Special schools were first established by Christian missionaries. Subsequently, the work was taken over by the NGOs. By the end of the previous century, about half a dozen special schools for the blind and the deaf had been established by the Christian missionaries. The progress was checkered and slow. By 1947, undivided India had 32 schools for the blind, 30 for the deaf and only 3 for the mentally retarded. The number of NGOs catering to the needs of persons with different disabilities has now risen to over 3,000 in the country.

Education of the disabled, popularly known as "Special Education", was introduced. A team of professionals required to provide total rehabilitation to persons with disabilities may include Special Education Teachers, Rehabilitation Psychologists, Clinical Psychologists, Rehabilitation Social Workers, Physiatrists, Psychiatrists, Neurologists, Pediatriciasn, ENT Specialists, Audiologist and Speech-Language Pathologists, Physiotherapists, Occupational Therapists, Prosthetists and Orthotists, Rehabilitation Counselors, Care Givers, Rehabilitation Nurses, Rehabilitation Recreationists, et al. Since the role of parents is vital, their training is equally important.

The magnitude of the problem of rehabilitation in India is of such proportion that a very large number of rehabilitation professionals are required to meet the needs of the disabled in the country. Most of the rehabilitation services are still confined to big cities where largely the affluent

class is being served. In rural India, even the basic facilities are non-existent. Not only is the lack of infrastructure a stumbling block to reach the services to the rural areas, but non-availability of trained professionals or lack of motivation on their part to serve in rural areas is another hurdle.

In order to formulate training needs and policies, the requirement of trained professionals must be projected as accurately as possible. Though no scientific study has been conducted in the country, to assess the requisite human resource for providing rehabilitation services, the RCI in its *Manpower Development Report* (1996) highlighted the targets of various rehabilitation professionals in Ninth and Tenth Plan periods which are given Table 1.

Table 1: Targets of Various Rehabilitation Professionals in Ninth and Tenth Plans

Sl. No.	*Category of Personnel*	*Numbers to be trained in the Ninth Plan*	*Numbers to be trained in the Tenth Plan*
1.	Teachers of HI children	15000	30000
2.	Teachers of MR children	19500	39000
3.	Teachers of VI children	7500	15000
4.	Teachers of CP children	1000	2000
5.	Teachers of Multiple disabled children	1000	2000
6.	PT / OT	2000	4000
7.	P & O Engineers	1000	2000
8.	Speech Pathologists/Audiologists/ Ear Mould Technicians	3200	6400
9.	Rehabilitation Engineers	500	1000
10.	Clinical Psychologists	100	200
11.	Rehabilitation Psychologists	2000	4000
12.	Vocational Instructors	2, 50,000	5,00,000
13.	Medical Psychiatric Social Workers	1000	2000
14.	CBR Workers	50,000	100,000
15.	MRWs	500	1000
16.	Physiatrists	1000	2000
17.	Master Trainers	500	1000
18.	Pre-school Teachers	1000	2000
19.	Low Vision Teachers	1000	2000
	TOTAL	**3, 62,300**	**7, 24,600**

These figures were projected to cover less than 10 per cent of the total population of persons with disabilities. Therefore, if 100 per cent of the population of the persons with disabilities were to be taken into consideration, it would have been ten times the figures projected above.

Since this exercise was not based on any empirical study, the estimates are not realistic. In view of this, RCI approached the Institute of Applied Manpower Research, New Delhi, a professional Institute under the Planning Commission specializing in undertaking such studies to develop a methodology for estimating the HRD needs to provide rehabilitation services in the country and to arrive at more realistic estimates. Even if very conservative estimates are taken into consideration, there exists a huge gap between the demand and supply of trained professionals.

Other Efforts in Promoting HRD Programs in the Country

NCERT's Initiative in Special Education Teacher Preparation

In 1983, the National Council of Educational Research & Training (NCERT) included education of children with special needs under its teacher education program. The first National Workshop on Special Education was organized by NCERT in March 1983. Though not currently operational, the NCERT had also initiated multi-category special education teacher preparation courses through its Regional Colleges

UGC's Scheme for Special Education Teacher Preparation

In 1985, the UGC encouraged university departments and colleges of education in the country to start teacher preparation programs in education of children with special needs for which 100 per cent financial assistance was provided. The UGC operates TEPSE (Teacher Preparation in Special Education) scheme wherein assistance is given to Universities and Colleges of Education to start B.Ed. or M.Ed. Special Education programs.

Present Status of HRD in the Field of Visual Impairment

RCI Recognized Training Institutes/Universities & Training Programs

RCI has been entrusted with the statutory authority to regulate and monitor training courses in Rehabilitation and Special Education at all levels in all disability areas in the country in all professional categories except the fields of Physiotherapy, Occupational Therapy, Nursing, Medical Science, etc. In all, there are 56 courses operational at 280 institutions in the country across various disabilities. Courses approved by the RCI specifically in the field of Visual Impairment are given in Table 2.

Table 2: Training Programmes

	Years
Diploma Level Course	
Diploma in Special Education	2
Degree Level Course	
B.A., B.Ed. (Visual Impairment)	4
Bachelor in Mobility Science	1
B.Ed. (VI)	1
Master Degree Level Programs	
M.Ed (Special Education) – Visual Impairment	1

Table 3: State-wise List of Institutions Offering Courses in the Field of Visual Impairment

Andhra Pradesh	
1. Training Centre for Teachers of Visually Handicapped, Secunderabad	DSE (VI)

2.	Dept. of Special Education, Andhra University, Vishakhapatnam	1) M.Ed.(VI) 2) B.Ed. (VI)

Bihar

3.	Training Centre for the Teachers of the Blind, Patna	DSE (VI)

Delhi

4.	Jamia Millia Islamia, New Delhi	B.Ed (VI)
5.	Durgabai Deshmukh College of Special Education, Blind Relief Association, New Delhi	1) DSE (VI) 2) B.Ed.(VI)

Gujarat

6.	Training College for Teachers of the Deaf & Blind, Ahmedabad	DSE (VI)
7.	Shri K.K. School & Home for the Blind, Bhavnagar	DSE (VI)
8.	Andhjan Shikshan Mandal, Ghoddod Road, Surat	B.Ed. (VI)
9.	Blind People's Association, Ahmedabad	B.Ed. (VI)

Haryana

10.	Department of Special Education, Kurukshetra University, Kurukshetra	1) B.Ed.(VI) 2) M.Ed.(VI)

Karnataka

11.	Shree Ramana Maharishi Academy for the Blind, Bangalore	D.S.E.(VI)
12.	Helen Keller Govt. Teacher Training Centre for the Visually Handicapped Children, Mysore	D.S.E.(VI)

Kerala

13.	Kerala Federation of the Blind, Thiruvananthapuram	DSE (VI)

Madhya Pradesh

14.	Mahesh Dristihein Kalyan Sangh, Indore	DSE (VI)

Maharashtra

15.	National Association for the Welfare of the Physically Handicapped, Amravati	DSE (VI)
16.	The Poona School & Home for the Blind Teachers Training Centre, Poona	DSE (VI)
17.	Deptt. of Special Education, S.N.D.T. Women's University, Mumbai	DSE (VI)
18.	National Association for the Blind, Mumbai	DSE (VI)

Meghalaya

19.	Montfort Centre for Education, Tura	DSE (VI)

Orissa

20.	Training Centre for Teachers of the Visually Handicapped, Bhubaneshwar	DSE (VI)

Punjab

21.	Teacher Training Centre for the Visually Handicapped, Ludhiana	DSE (VI)

Rajasthan

22.	L.K. C. Jagdamba Andh Vidyalaya Samiti, Hanumangarh Road, Sriganga Nagar	DSE (VI)

Tamilnadu

23.	Sri Ramakrishna Mission Vidyalaya, College of Education, Coimbatore	1) M.Ed. (VI) 2) B.Ed. (VI)
24.	International Human Resource Development Centre for the Disabled (IHRDC), Coimbatore	1) M.Ed. (VI) On credit basis 2) B.Ed. (VI) On credit basis
25.	Regional Training Centre, C/o Govt. Hr. Sec. School for the Blind, Chennai	DSE (VI)
26.	Institute of Home Science & Higher Education for Women, Avinashlingam Deemed University, Coimbatore	1) M.Ed. (VI) 2) B.Ed. (VI)
27.	N.K.T. National College of Education for Women, Chennai	B.Ed. (VI)
28.	National Institute for the Visually Handicapped, Regional Centre, Chennai	B.Ed. (VI)
29.	The YMCA College of Physical Education, Chennai	Bachelor in Mobility Science

Uttar Pradesh

30.	Faculty of Education, Banaras Hindu University, Varanasi	1) B.Ed. (VI) 2) M.Ed. (VI)
31.	Israji Devi Shikshan Sansthan, Allahabad	DSE (VI)

32.	Jagadguru Rambhadracharya Handicapped University, Chitrakoot	1) M.Ed. (VI) 2) B.Ed. (VI)
33.	Govt. Inter College for the Blind, Lucknow	DSE (VI)
	Uttranchal	
34.	National Institute for the Visually Handicapped, Dehradun	B.A.- B.Ed. (VI)
	West Bengal	
35.	Training Institute for the Teachers of the Visually Handicapped, Ramkrishna Mission Blind Boys Academy, Calcutta	B.Ed. (VI)
36.	Vivekananda Mission, District Medinipur	DSE (VI)
37.	Ramakrishna Vivekananda Mission, Barrackpore, North 24 Parganas	DSE (VI)

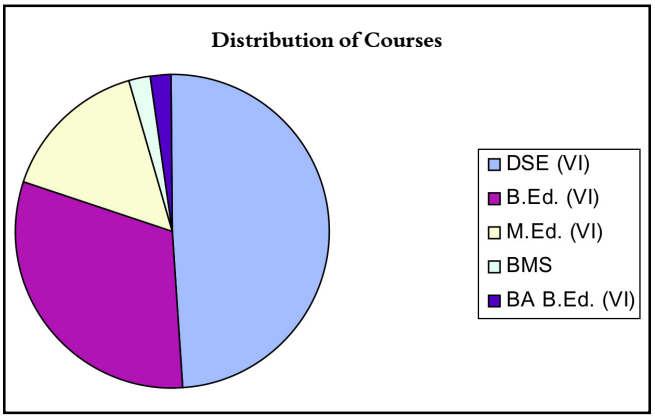
A perusal of the above tables show though there are totally five types of courses operational at 37 institutions in the field of visual impairment, Other courses such as M.Phil and Certificate courses in Clinical Psychology, M.Phil & PG Diploma courses in Rehabilitation Psychology, Diploma courses in CBR and MRW, Bachelor and Diploma courses in Rehabilitation Therapy, PGDDRM, and PG Diploma in Early Intervention give sufficient coverage to visual impairment besides other disabilities.

Table 4: The distribution of batches for different courses in the field of visual impairment

Sl. No.	*Course*	*No. of Batches*
1.	DSE (VI)	22
2.	B.Ed. (VI)	14
3.	M.Ed. (VI)	7
4.	Bachelor in Mobility Science	1
5.	B.A.-B.Ed. (VI)	1

Many of the institutions listed above are not only running more than one course in the field of visual impairment, but also courses in other disability areas at different levels.

The National Institute for the Visually Handicapped (NIVH), Dehradun and its Regional Centres are contributing significantly to human resource development programs at all levels in addition to other activities such as research, outreach services, orientation programs, CBR service documentation and publications.



An important aspect of human resource development in rehabilitation is the significant contribution, about 80 per cent, by the Non-Governmental Organizations without significant funding from the Government.

Lately, universities with the support of UGC have introduced Special Education programs to prepare teachers for children with special needs which has gained momentum in the last decade. At present, India is in a position to prepare teachers for other countries too.

Future Perspectives

Apart from teacher training, parent training program, sensitization programs for Panchayat, Block and District level functionaries need to be taken on mass scale with the government.

To enhance human resource development for rehabilitation purposes, the most important step

would be to conduct need assessment studies before launching a training course. This is necessary for identifying types of rehabilitation personnel required, their placement, role, job analysis, determination of minimum salary, number of such personnel required, etc.

Based on this information, the course content of the curriculum, its duration, etc., can be decided, avoiding wastage of the most productive years of the youth undergoing the training.

Impact studies and research needs to be conducted to gauge the usefulness of ongoing programs by involving various stake holders such as clients, family members, employers, professionals, faculty members, etc. Based on the feedback, the deficiencies in the curriculum, course content could be overcome. Studies on comparative analysis of training programs available in India and in the developed countries need to be conducted for adopting relevant content areas suitable to meet local needs.

To improve the training programs qualitatively, resources need to be provided to the training institutions to improve their infrastructure, recruit qualified faculty members and professionals (Therapists, Medical professionals, technicians, et al., to undertake research studies, organize and participate in seminars and conferences at local, national and international levels, and develop resource material for training purposes.

Professional development programs are very important for improving the quality of service to persons with disabilities. Refresher and orientation programs need to be compulsorily and regularly attended by the practicing rehabilitation professionals. Continuing Rehabilitation Education (CRE) programs supported by RCI, aimed at updating knowledge and skills of the professionals have been linked with the renewal of registration of the professionals.

Special Education demands a variety of skills and innovations. Teachers should update their knowledge with the latest developments.

It may be concluded that the quality of lives of persons with disabilities is directly proportional to development and availability of human resources.

Chapter 7

Parent Involvement and Community Mobilization

Family is the first unit of the society. Mother is the first teacher to her child. Initial development of behavior such as sitting, walking, eating, asking for things needed begins at home. This learning depends on the perception and the attitudes of parents towards their child.

The parents' behavior affects development of a sense of security in a child which in turn affects later learning. The visually impaired child's perception of parental behavior is important as it determines acceptance first in the family, the neighborhood, in the school and in the community at large.

In a developing country like India, education of children with visual impairment is provided through education in special school, integrated education and also through inclusive education. Where integrated/inclusive education strategies are adopted, children remain with their families and they are a part of all the social, educational, cultural and economic activities of the community.

In such programs, the local resources have to be used optimally to provide maximum benefit for the visually impaired. Available human resources should be utilized properly for the all-round development of visually-impaired children. It is therefore necessary to sensitize the family members and the members of the community so that they may promote education of the visually impaired children and youth.

The primary goal of habilitation and rehabilitation of children and adults with visual impairment can be achieved only when the community participation is ensured at all levels of educational development, viz., physical, educational, functional, emotional, cognitive, social and societal level.

Governmental and non-governmental organizations conduct a number of programmes aimed at sensitizing the parents and the community members towards problems faced by the visually impaired children and youth. They also create awareness about how the needs of these persons can be met. For example, the National Association for the Blind, in India, promotes itinerant model of integrated education in the rural communities in a big way. Visually impaired children stay in their homes and efforts are made towards integrating them in the social, educational and cultural activities of the community. For this purpose, need-based programmes are essential to educate these members about the roles they are expected to play in fostering healthy development of these children.

The Family and the Community Participation

The family and the community have specific roles to play in the upbringing of the visually impaired children. Parents of a visually impaired child are responsible for meeting the basic needs of the child such as learning daily living skills - sitting, walking, dressing, eating, etc. A child learns to speak and move within the house and in the

neighbourhood. Parents are also required to give the psychological back up apart from giving food, shelter, clothing and social security. They can perform their duties better when they are sensitized to the needs of children with visual impairment. What the children learn in schools has to be reinforced by the family members if those skills have to be perfected by the child. The parents are in need of information, knowledge and skills to manage a visually impaired child and through specific strategies this objective can be achieved successfully.

Similarly, the school teachers are responsible for involving the visually impaired children in curricular, co-curricular and extra-curricular activities of the school. The general teacher should have the knowledge of curricular adaptation techniques while teaching. He should also know the techniques of involving a visually impaired child in co-curricular activities. There is need to address the training needs of general teachers in managing children with visual impairment in their schools.

Peers and siblings of the visually impaired can assist in a number of ways provided they are sensitized. In short, proper community participation vis-a-vis effective use of human resources in the academic development of these children would go a long way in mainstreaming the visually impaired.

Strategies to Make Use of Community Human Resources

Various strategies were evolved in the past for mainstreaming children and youth with visual impairment in their respective communities. Many of the strategies evolved by different organizations are discussed below.

Organizing Integrated Camps

The objectives of the camps to promote community participation are as under:

- To interface the visually impaired and their fellow sighted classmates to promote interaction through literary/ cultural activities and through games.
- To enable the sighted cohorts to have the knowledge and skills required to assist their visually impaired counterparts in curricular, co-curricular and plus curricular activities in and out of school, in the community.

To attain these objectives, it should be a regular feature in an organization of and/or for the blind that they conduct such camps, preferably residential of 5 to 10 days' duration at frequent intervals. Parents and siblings and a group of seeing children chosen by participating blind children should be invited to these camps. Such camps organized by the National Association for the Blind have been fruitful.

Both blind and the sighted should be made to participate together in the daily living activities, reading and writing, games, etc. Some basic skills pertaining to plus curriculum as also the ways and means of helping each other, need to be introduced for the benefit of the normal children. It would lead to confidence building, personality development and mutual respect. Project implementation agencies must ensure community participation.

Social Animators Training Camps

The objectives may include:

- To identify village level volunteers who are interested in assisting blind children and their families.

- To motivate and train such volunteers on matters of education of children with visual impairment.
- To prepare local level community volunteers to help them to act as facilitators of education aimed at mainstreaming blind children in the community.

Social Animators Training Camps need to be organized to identify, motivate and train community members so that their involvement can be ensured in the system of Integrated Education. Any educated person such as parents of the visually impaired children, retired teachers, anganwadi workers, housewives, college students or others who is willing to come forward to assist children with visual impairment in their education and social integration could be trained for about 2-3 weeks covering all aspects of integrated education. Information on needs of visually impaired children, concept and philosophy of integrated education, basic skills pertaining to Braille, Orientation and Mobility, Daily Living Skills, use of arithmetic devices such as Abacus and Taylor Frame, preparation of instructional materials like worksheets, flash cards and diagrams, concessions and facilities available from various government and non-government sources should form parts of these training programmes. Follow up is undertaken to know the progress and further assistance could be given to them according to the individual needs. Information on concessions and facilities available from governmental and non-governmental agencies helps the local facilitators to help the families to avail all the possible assistance by the families from various sources. Further, they can act as local facilitators to the disabled children and their families to ensure that the families have access to such provisions in the community. Thus, greater awareness is brought in the community to the needs of children with visual impairments and their families.

Parents Meeting

Orientation/meeting of parents needs to be organized on a periodical basis. Parents have specific responsibilities irrespective of their socio-economic background, etc. Matters pertaining to health and hygiene, love and affection, daily living skills are parental responsibilities.

To ensure their cooperation, to share the knowledge and skills, institution working for blind persons must organize regular parent meetings. The agenda would vary as per the needs and the context. Other family members and neighbors could also be encouraged to participate in such meetings to take up advocacy issues and developmental initiatives. Through such orientation programs, many educated parents can and have become para-professionals in the field of integrated education.

Head Master/Class Teachers Meetings

Head Masters and regular teachers of the school are directly responsible for providing opportunities to participate in various curricular and co-curricular activities for all children with blindness along with their seeing counterparts. They need to have regular updates on latest technology and information on facilitating learning of a blind child in a classroom. Adaptation/ modification of teaching/learning materials, curricular adaptations, concept development in blind children, evaluation procedures, enabling blind children to participate in games and cultural activities are some of the areas of interest in these meetings.

Social Sensitization and Awareness Building

Apart from the village level workers, there

are others like the education officer, school inspectors, local government authorities such as Child Development Project Officers, Block Development Officers (BDOs), Transport Officials, Health Officials, local non-governmental organizations like service clubs and others are to be sensitized to the specific needs of visually impaired children. Social sensitization programs need to be organized to bring together officials of various departments and the stakeholders to discuss about the needs of the visually impaired and to help them realize the role of each department in facilitating education of the disabled children. This kind of awareness and sensitization of the government department officials, service clubs and the community in general is vital for the growth and sustainability of all programmes aimed at facilitating the education, training and the rehabilitation of the visually impaired children and youth. This activity, in turn, promotes advocacy.

It is crucial, therefore, to involve members of the community as partners in education. The members must be trained to acquaint themselves with the needs, strengths and limitations of children with visual impairment. Their help should be sought in meeting the social, educational, economic and personal needs of children with visual impairment. Better response may be forthcoming when their involvement is sought at different levels of program implementation.

Project implementing agencies must ensure community participation as detailed above.

Schemes, Facilities, Concessions and Allowances

In this section, facilities, concessions and allowances available exclusively to persons with visual impairment under Government schemes and rules has been briefly highlighted.

Travel Concessions

(a) By Train

The blind travelling by train alone or with an escort, can avail concessions on production of a certificate issued by:

(a) Head of recognized institutions working for the blind.

(b) Medical Suprintendent of a Govt. hospital.

(c) MLAs and MPs.

(d) City Magistrates.

The traveller is required to carry the original certificate at the time of travel.

Element of Concession

Class	*First*	*Second Sleeper*	*Season*	*Ticket*
Percentage of concession	75	75	75	50

(b) By Air

The Indian Airlines Corporation allows 50 percent concessional fare to blind persons on single journey or single fare round trip journey on all domestic flights on production of a certificate from a medical practitioner.

(c) By Road

Concessions in road travel to blind persons have been granted which varies state-wise. For example Delhi Transport Corporation (DTC) allows 100 per cent concessions to blind persons by its buses within NCR areas. UP Govt. allows similar concessions on the basic fare for inter and intra city travel.

Communication

(a) Postage

Transmission of blind literature packets, both inland and foreign, is free by surface route. Payment of Registration fee, fee for acknowledgement, and fee for the attested copy of the receipt are also exempt from paymemt.

Air mail charges are applicable if sent by air.

Contents and Conditions of Posting: Papers, any kind, periodicals and books printed in Braille or other special type for the use of the blind may be transmitted by post as 'Blind Literature' packets provided that they are posted in accordance with the following conditions:

(i) Plates bearing the characters of writing, sound records for the use of the blind, and discs, films, tapes and wires on which spoken message for the blind have been recorded, when sent by, or addressed to, an officially recognised institution for the blind, shall also be treated as 'Blind Literature'.

(ii) The packets shall consist only of articles specially impressed as described above for the use of the blind, and shall not contain any communication either in writing or printed in ordinary type, except the title and table of contents of the book or periodical and any key to instructions for the use of special type, or any enclosure except a level for the return of the packet.

(iii) The packet shall bear on the outside the inscription 'Literature for the Blind' and the written or printed name and address of the sender.

(iv) The packet shall be posted without a cover, or in cover open at both ends, which can easily be removed for the purpose of examination.

(v) No 'Blind Literature' packet may weigh more than 7 kg.

(vi) 'Blind Literature' packets are subject to the same limits of dimensions as printed papers.

Penalty for Breach of Condition: Should any of the conditions mentioned above be infringed, the packet (unless it is admissible as an ordinary packet) will be charged on delivery with letter or parcel postage, whichever may be less.

Rule 304, 305 and 306 in regard to definition of 'Blind Literature' Conditions and Exemption from Postal fees in respect of Foreign postage are the same as prescribed in Rule 129 and 130 in regard to Inland Postage. However, the penalty for breach of conditions in respect of foreign postage is specified under Rule 307—Penalty for Breach of Conditions:

'Blind Literature' packets which contain any note or document having the character of actual and personal correspondence, or which are not made up in such a manner as to admit of easy examination of the contents, or which contain postage stamps, form of pre-payment whether obliterated or not or paper representing any value, or which infringe any of the foregoing conditions will not be forwarded, but will be returned to the sender and will be charged on delivery with letter or parcel postage at the internal postage rate whichever is applicable. If the sender wishes to report the article after complying with the necessary conditions, he may do so. It is permissible in such cases to use the original wrapper, but the use of a fresh wrapper is preferable and is recommended.

(b) Telecommuncation

Concessional Telephone Connection to Blind Persons: Telephone facility to blind persons on concession and priority basis is provided on the following terms. The terms are: 50 percent of the normal rental and 50 percent of the annual advance rental and bi-monthly rental as applicable to a private subscriber. This facility is available in Non-OYT(S) category only.

(c) Preference in Allotment of STD/PCO to Handicapped Persons: Educated (VIII or Middle School Pass for rural areas and at least matriculation or high school for urban areas). Unemployed persons are eligible for allotment of STD/PCO.

Customs Concessions

Individuals

The Central Government exempts goods specified below, when imported into India by a handicapped or disabled person for his personal use, from the whole of the duty of customs and the additional duty subject to the condition that the importer produces to the Assistant Collector of Customs, at the time of importation, a certificate from the Civil Surgeon of the District, Medical Officer or the Administrative Medical Officer or the Director of Health Services of the concerned State or a Specialist in the concerned speciality attached to a Govt. Hospital or a recognised medical college to the effect that the importer suffers from the particular handicap or disability and that the imported goods in respect of which the exemption is claimed are essential to overcome the said handicap or disabilty.

1. Braille writers and Braille writing equipment.
2. Hand writing equipment, Braille Frames, Slates, Writing Guides, Braille Erasers, Script Writing Guides.
3. Canes, electronic aids like the Sonic Guide.
4. Optical, Environmental Sensors.
5. Arithmetic Aids like the Taylor Frame (Arithmetic and Algebra Types) Cubarythm, Speaking or Braille Calculator.
6. Geometrical Aids like Combined Graph and Mathematical Demonstration Board, Braille Protractors, Scales Compasses and Spar Wheels.
7. Electronic measuring equipment, such as micrometers, compass, gauges, blocks levels, and yard sticks.
8. Drafting drawing aids, tactile displays.
9. Specially adapted clocks and watches.

Institutions

As per notification C.S.R. No. 550 (E) dated 10.11.1978 issued by the Department of Revenue, Ministry of Finance, Government of India, amended from time to time, the Institutions (including Registered Co-operative Societies) for the Blind are permitted to import equipment and apparatus as below, being bonafide gifts to, as purchased out of donations received in foreign exchange by such insititutions from *(i)* the whole of the duty of customs leviable thereon under the first Schedule to the Customs Tariff Act, 1975 (51 of 1975); *(ii)* the whole of the auxiliary duty of customs leviable under sub-section (I) section 35 of the Finance Act; and *(iii)* the whole of the additional duty leviable thereon under section 3 of said Customs Tariff Act at the time of importation of such goods into India:

(a) All tangible appliances for the blind.

(b) Vocational aids for the blind.

(c) Articles including instruments, apparatus, appliances, machinery and

spares or component parts of accessories thereof required by such institution for the purpose of giving training or imparting instructions to the blind.

Exemption for Braille Paper

Ministry of Finance (Department of Revenue) vide their Notification dated 1st March, 1981, has exempted Braille Paper, falling under item No. 17 of the First Schedule to the Central Excise and Salt Act, 1994 (1 of 1994) from the whole of the duty of excise leviable thereon subject to the condition that such paper is supplied direct to a school for the blind or to a braille press against an indent placed by the National Institute for the Visually Handicapped, Dehradun.

Import of Audio Cassettes

Ministry of Finance (Department of Revenue) vide their Notification No. 379/86-Customs (F-14-839/86 C) dated 3rd July, 1986, has exempted audio cassettes, falling within Chapter 85 of the First Schedule to the Customs Tariff Act, 1975 (51 of 1975) newspapers or magazines for the blind when consigned by an organisation and imported into India by an organisation:

1. The whole of the duty of customs leviable thereon, which is specified in the said First Schedule.
2. The whole of the additional duty leviable thereon under Section 3 of the said Customs Tariff Act subject to the conditions that:
   (a) The audio cassettes so imported shall be re-exported within one year from the date on which these are imported into India or a such extended period as the Assistant Collector of Customs may allow;
   (b) the importer executes an undertaking binding himself to pay an amount equal to the duty leviable on the audio cassettes at the time of import to the Assistant Collector of Customs in the event of failure to re-export the said audio cassettes whithin the period specified or, as the case may be, such extended period as may be allowed; and
   (c) the importer produces the audio cassettes before the proper officer for identification before re-export.

Conveyance Allowance

The Central Government visually impaired employees who are on regular establishment (including work charged staff) will be paid double the amount as conveyance allowance which is admissible to a non-disabled employee subject to the conditions that the allowance will be admissible on the recommendation of the Head of Opthalmological Department of a Government Civil Hospital.

Children's Educational Allowance

Reimbursement of tuition fee in respect of physically disabled and mentally retarded children of the Central Government employee has been enhanced to Rs.100 p.m. (from Class I to XII) in comparison with general category where it restricts to Rs. 40 p.m. The disabled children will however, get other assistance under this scheme as per rates prescribed for other children.

Income Tax Concessions

Relief for the Disabled

Section 80 DD provides for a deduction in respect of the expenditure incurred by an individual

or HUF resident in India on the medical treatment (including nursing) training and rehabilitation, etc., of disabled dependents. For officiating the increased cost of such maintenance, the limit of the deduction has been raised to Rs. 75,000.

Those employees having 40 per cent of disability or more but less than 75 per cent disability will get a rebate of Rs. 50,000.

Award of Dealerships/Agencies by Oil Companies

Award of Retail Outlet, 2/3 Wheeler Outlet, Kerosene-LDO Dealerships and LPG Distributorships

Ministry of Petroleum & Natural Gas has reserved 7½ percent of all types of dealership agencies of the public sector oil companies for Physically Handicapped/Government personnel (other than Defence personnel) disabled on duty/ widows of Government personnel (other than Defence personnel who die in the course of duty).

Eligibility Criteria: Blind Indian Nationals, between 21 and 30 years, matriculation or equivalent. Blind are not eligible for LPG distributorship.

Income: Income including that of the candidate, his/her spouse, dependent children put together should not exceed more than Rs. 50,000 p.a. In case of dependent candidates, his/her parents' income would also be taken into consideration.

Application Form: Standard formats can be obtained from divisional /regional area office of the concerned oil companies.

Reservation of Jobs and Other Facilities

Three Percent Reservations in Grade 'C' & 'D' Posts: For effective implementation of the reservation, it has been advised to maintain a roster of vacancies arising in Grade 'C' & Grade 'D' posts from year to year.

(i) Definitions of the Blind for the Purpose of Reservation: The blind are those who suffer from either of the following conditions:

(a) Total absence of sight.

(b) Visual acuity not exceeding 6/60 or 20/200 (Snellen) in the better eye with correcting lenses.

(c) Limitation of the field of vision subtending an angle of 20 degree or worse.

(ii) Posting of Handicapped Candidates: As far as possible posting may be given near to their native place within the region subject to administrative constraints.

(iii) Appointment of Visually Impaired Persons as Caner in Government Department: Recaning of chairs in Government Offices should be done by blind persons as far as possible. With justifcaion, a full time post may be created in consultation with the Finance Department.

(iv) Instruction to Appointing Authority for Intimating Vacancies Reserved for Handicap: As per the existing instruction of the Government, all vacancies in Grade 'C' & 'D' are to be notified to the Employment Exchange and filled through the agency unless filled through UPSC/SSC. All the appointees should send their request to Employment Exchange/Special Employment Exchange/nearest Vocational Rehabilitation Centre for the physically

handicapped for nominating suitable persons.

(v) Grant of Age Concession to PH Persons: As per the Government order, age concession of 10 years is permissible incase of handicapped persons for recruitment to posts filled through the SSC and through Employment Exchange in Grade 'C' & Grade 'D' posts.

(vi) Consideration for Confirmation in Job for Blind Persons: Ministry/Department should ensure, especially in which blind persons are employed that confirmation is made without delay and at appropriate time.

(vii) Reservation for PH Persons in Posts Filled by Promotion: Handicapped persons may be promoted to Grade 'C' from 'D' and within Grade 'C' against the identified post if they are capable of being filled/ held by the appropriate category of PH.

(viii) Exemptions from Payment of Examinations Fee: PH persons recruited to Grade 'B' and Grade 'C' posts advertised by the UPSC and SSC will be exempted from the payment of applications and examination fee as prescribed by UPSC/ SSC.

Scheme of Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances

The main objective of the Scheme is to assist the needy, disabled persons in procuring durable, sophisticated and scientifically manufactured, modern, standard aids and appliances that can promote their physical, social and psychological rehabilitation, by reducing the effects of disabilities and enhance their economic potential. The aids and appliances supplied under the Scheme must be ISI marked.

The Scheme will be implemented through the Implementing Agencies which will be provided with financial assistance for purchase, fabrication and distribution of such standard aids and appliances that are in conformity with the objective of the Scheme. The agencies will take care of/make suitable arrangements for fitting and post-fitting care of the aids and appliances distributed under ADIP Scheme. The scope of the Scheme has been further enlarged to include use of mass media, exhibitions, workshops, etc., for exchange of information and promoting awareness and distribution and use of aids/appliances.

Eligibility of the Beneficiaries

A person with disabilities fulfilling following conditions would be eligible for assistance under ADIP Scheme through the authorized agencies:

The beneficiary should be an Indian citizen, irrespective of age, who is employed/self-employed or getting pension and whose income from all sources does not exceed Rs. 10,000 p.m., certified by a Registered Medical Practitioner.

In case of dependents, the income of parents/ guardians should not exceed Rs. 10,000 per month.

Persons who have not received assistance from the Government, local bodies and Non-Official Organizations during the last three years for the same purpose also eligible. However, for children below 12 years of age this limit would be one year.

Type of Aids/ Appliances to be Provided

The following aids and appliances and any other aids notified later are allowed for persons with visual impairment under the scheme.

i. *Learning equipment:* Arithmetic frames, abacus, geometry kits, etc. Giant Braille dots system for slow-learning blind children. Dictaphone and other variable speed recording system. CD player/Tape recorders for blind students X standard onwards.

ii. *Science learning equipment:* Talking balances, talking thermometers, measuring equipment like tape measures, micrometers, etc.

iii. *Braille writing equipment:* Braillers, Braille shorthand machines, typewriters for blind students from X class. Talking calculators, raised maps and globes for learning geography.

iv. *Communication equipment for the deaf-blind:* Braille attachments for telephone for deaf-blind persons.

v. *Low vision aids:* Hand-held stand, lighted and unlighted magnifiers, speech synthesizers or Braille attachments for computers.

vi. Special mobility aids for visually disabled people with muscular dystrophy or cerebral palsy, like adapted walkers.

vii. Software for visually handicapped persons costing above Rs. 6,000 may be procured and provided in exceptional cases with prior approval of Ministry of Social Justice and Empowerment on case to case basis, subsidy remaining Rs. 6,000. For all other devices ceiling is Rs. 6,000 .

Quantum of Assistance to Disabled

Aids/appliances costing Rs. 6,000 or below, are covered under the Scheme. However, for the disabled with visual, mental, speech & hearing or multiple handicaps, the limit should be Rs. 8,000 during their studentship beyond IX standard. The limits are applicable to each individual aid whether one or more is required. The amount of assistance will be as follows:

Total Income	*Amount of Assistance*
(i) Upto Rs.6,500 per month	i. Full cost of aid/ appliance
(ii) Rs.6,501 to Rs.10,000 per month	ii. 50% of the cost of aid/ appliance

Further, traveling cost is limited to bus fare in ordinary class or railway by second class sleeper subject to a limit of Rs. 250 per beneficiary and to an attendant, irrespective of the number of visits to the center based on a certificate from a doctor or a rehabilitation professional.

Boarding and lodging expenses admissible is Rs. 30 per day, up to a maximum of 15 days subject to an income limit of Rs. 6,500 p.m.

Scheme of Integrated Education for the Disabled Children

Handicapped children are sought to be integrated in the normal school system. Hundred per cent assistance is provided to the States/UTs for education of the children suffering from certain mild handicaps in common schools with the help of requisite aids, incentives and specially trained teachers. Allowances and facilities under this scheme include:

Per annum: Books and stationery allowance of Rs. 400 and uniform allowance of Rs. 50.

Per month: Reader allowance of Rs. 50 after class V.

For a period of five years: Actual cost of equipment subject to a maximum of Rs. 2,000 per student.

Boarding/Lodging: Disabled children enrolled

in institution residing in hostels may also be paid boarding and lodging charges as admissible under the State Govt. rules/ schemes. In the absence of State Scheme of Scholarships to hostel inmates, the disabled children, may be paid actual boarding and lodging charges subject to a maximum of Rs. 200 p.m. provided their parents' income does not exceed Rs. 3,000 p.m.

Scheme of Scholarship to the Disabled Persons

A Central scheme namely 'Scheme of Scholarship to Disabled Persons' from Class IX onwards has been transferred to the State/U.T. government for smoother functioning of the program where the facilities/grants are uniformly available in each State/U.T. The details are:

Scheme of Scholarship to Disabled Persons (From Class IX Onwards)

(a) Scholarship Allowance

Type of course	*Rate per month*	*Rate per month (Hostel)*	*Reader's allowance for hostellers per month*
IX, X, Pre-University Course and I.A/I.Sc.	Rs.85	Rs.140	Rs.50
B.A./B.Tech./M.B.B.S./LL.B/B.Ed.	Rs.170	Rs.240	Rs.100
Diploma in Professional and engineering studies, etc./ in-plant training	Rs.170	Rs.240	Rs.100
M.A./M.Sc./M.Com./LL.M/M.Ed., etc.	Rs.170	Rs.240	Rs.100

The scholarship under the scheme is limited to a maximum period of six years after Class XII. No scholarship after postgraduation.

(b) Other Allowances

A reader's allowance shall be paid if certified by the head of the institution/establishment.

(c) Tenure of Scholarship

The scholarship, limited to a period of six years after Class XII, will be renewable yearly for a particular stage of study depending on promotion to the next class.

(d) Mode of Applying

Application should be made to the State Deptt. of Social Welfare in the prescribed form through the head of the institution where the candidate is admitted as student/apprentice/ trainee.

Scheme of National Scholarship for Persons with Disabilities

Objectives are to provide financial assistance to disabled students for pursuing higher and technical education and to procure special aids and appliances.

Financial Assistance

Disabled Indian students, on production of certificate of disability (as defined in PWD Act, 1995), will be given assistance for pursuing a recognized course at the post matriculation/post-secondary level in recognized institutions.

Assistance will not be available for courses of less than one year in duration.

Assistance is available for purchase of a computer with editing software for graduate/post-graduate students pursuing professional courses and for purchase of support access software for cerebral palsied students.

Continuation/renewal of the awards will depend on successful completion of the course in the preceding year with minimum 50 percent marks.

A scholarship holder under this scheme will not hold any other scholarship/stipend simultaneously, the student having the option to make a choice.

For availing assistance under this scheme, the monthly family income inclusive of all sources (including parents/guardian) of the beneficiary, should not exceed Rs. 15,000.

In total, 500 awards will be available through institutions in which students will pursue higher and technical education.

A total of 58 awards for the visually impaired male and a similar number for female students will be given whereas 76 awards will be available for the male and female students with low vision, cerebral palsy and other disabilities.

The amount of award will vary among courses and will also depend on availability of hostel/residential facility with the institution.

Applications for the awards have to be made to the Secretary, National Fund in the Ministry of Social Justice & Empowerment through head of the institution in which the applicant is enrolled.

Scheme to Promote Voluntary Action for Persons with Disabilities

Projects funded for persons with visual impairment are:

1. Vocational Training Centers.
2. Sheltered Workshop.
3. Project relating to Survey, Identification, Awareness and Sensitisation.
4. Project for Manpower Development.
5. Project for Low Vision Centres.
6. Project for Legal Literacy and Counselling.
7. Environment Friendly and Eco-Promotive Projects for the Handicapped.
8. Project for Special Schools.

NHFDC Scheme for Setting Up Small Business in Service/Trading Sector

Loan up to Rs.1.0 lakh for sales/trading activity and Rs. 3.00 lakh for service sector activity for which financial assistance has been sought, will have to be operated by the disabled person himself and employing at least 15% disabled persons in his venture.

Miscellaneous Programmes

Family Pension

Disabled children/handicapped children shall be eligible for family pension even if they are born post-retirement from a marriage solemnised after retirement of the goverment servant.

Ad-hoc Allotment of General Pool Residential Accommodation to the Physically Handicapped Employees

Handicapped government employees may get ad hoc allotment of general pool residential accommodation on request to the Special Recommendation Committee and on the approval of the Urban Development Ministry.

Chapter 8

Research and Development

Research & Development

Research has always been a part and parcel of an individual's endeavour to find plausible and practical answers and solutions to problems and questions faced by him from time immemorial. These endeavours have resulted in the development of newer ways, learning new things, working more efficiently and in improving the quality of life for himself and his fellow beings. The thirst of gaining new knowledge and skills makes him different from the lower species.

Research efforts in all disciplines have contributed significantly to the progress of mankind. The disability rehabilitation field is no exception to this, as many new inventions and developments have contributed to a large extent in minimizing the impact of disabling conditions. For example, blindness began to be considered a barrier in receiving education after the system of writing was invented.

The ever curious mind of man tried and developed many systems one after the other for enabling the visually impaired persons to read and write. The invention of Braille (a system of dot-based touch reading) by Louis Braille, himself blind, and writing devices opened the gateway of gaining knowledge all over the world for the visually impaired persons. Similarly, the recent advances in the technology have made it possible to teach maths, science and other curricular areas to blind children hitherto considered very difficult, if not impossible. These persons can today work on computers without significant difficulty, move about independently, perform the duties of a teacher, factory worker, lawyer, so and so forth.

Research on Blindness Related Issues in India

Ever since the first school for the blind in India was set up in 1887, the scholars and professionals working in the field began to pay attention to the problems – educational placement, vocational training and job placement, etc. But, most of the efforts were/are of developmental in nature. For instance, the development of Inter-point Braille Writing Frame, Adaptation of Nemeth Braille code for Maths and Science, development of Braille shorthand machine, Braille writers, etc.

Research undertaken in India till date can be categorized broadly into three groups

First, research at the Master's, M.Phil, doctoral and post-doctoral level which can be called academic research of which there is no compilation. The topics covered in the past two or three decades include: development and validation of programmed learning material for teaching maths to primary school blind children, using audio and tactile material sequentially to promote cognitive development amongst the visually impaired children, the relationship between the educational achievement and level of aspiration, self concept and self esteem of blind children enrolled in

special and integrated educational settings, the personality dimensions of blind students, personality traits of blind and sighted persons—a comparison, academic skills of blind children studying in the two prevalent settings, parental attitudes towards the pre-school blind children, etc. Many of these studies have been published by the researchers. But, few of them have been replicated and made use of in the day-to-day teaching.

Second category is research undertaken by way of certain projects by Governmental and Non-governmental organizations. For example, the NIVH, Dehradun has adapted the WISC-R Verbal for use with blind children. The Institute has also adapted EPQ and Corniel Medical Index. Another piece of good research work of the Institute was a comparative study of manneristic behaviour amongst the blind and the sighted children which brought out for the first time that manneristic behaviour does not exist amongst blind children only, but is also found in seeing children although some mannerisms are characteristic of blind children while some others are typical in seeing children. This study was well appreciated.

Third is the research and developmental activities in the Indian context of a few technological devices designed and manufactured. The code of Braille contraction and abbreviations in Hindi, Tamil, Telugu, Bangla, Marathi and Gujarati languages have been developed which are in use. The standardized shorthand Braille system in Hindi has benefited a number of blind stenographers in securing gainful employment post-training from AICB, New Delhi and NIVH, Dehradun.

The Educational Survey published by NCERT (2006) reported on nine studies related to visual impairment. However, Jangira, Mukhopadhyay and Rath (1988) reported that of the 45 studies on the visually impaired, 13 were conducted before 1980, remaining between 1981 and 1988. A large number of variables were covered, but not enough studies to warrant generalization. Psychological variables such as personality traits, attitudes and behavioural problems were the variables studied most. These studies include personality traits, cognitive development, adjustment, etc. Other studies were on educational aspects—teaching blind children in integrated educational setting, identifying factors responsible for facilitating education of these children in general schools. Most of these studies compared the performance of blind children with that of their seeing counterparts. One study compared the behavioural characteristics of blind, deaf and seeing children.

A regular collection, collation, compilation and dissemination of these and other research findings and activities will go a long way in encouraging research and in application of the research hitherto undertaken and in the development efforts made.

Chapter 9

Future Vision

Though the country can feel proud of having developed and initiated many programs aimed at helping them to lead complete and fully satisfying life, even after more than 100 years of organized efforts of work for the blind and the visually impaired, the number of these persons benefiting from the services being provided by both Governmental and non-Governmental organizations is very small. Many need-based educational and job oriented vocational training have been initiated with good intention. The number of special schools has increased substantially. The number of Braille presses has also increased from one in 1951 to 17 in 2006 with smaller Braille production units in 75 Governmental and non-Governmental organizations. More than 10 audio book production centers are producing audio books on cassettes and CDs in Digitalized Access Information System (DAISy) format.

Twenty three Special Employment Exchanges, 55 Special Cells in general employment exchanges have been set up to assist these persons to find suitable job placements. Many innovations in designing newer technologies to facilitate the lives of persons with blindness and visual impairment have been made. These persons are now being trained to make use of computers to access information. Schemes to provide required equipment free of cost to the economically weaker sections among blind persons have been formulated and initiated.

The country has a date, 2020 as the target year by which we plan to become not only an economic super power, but also desire to achieve total literacy. This cannot be done unless children and youth afflicted with blindness in particular and other disabilities in general are afforded quality education, vocational training and enough job opportunities commensurate with their abilities and qualifications leading to inculcation of a sense of responsibility and participation. They will become contributing members of society.

Based on the current scenario the following needs to be considered as genuine and desired targets which will have to be visualized, planned and implemented to achieve this goal:

Bringing desired changes in the societal attitudes towards persons with visual impairment

Visual impairment in itself is not a barrier to mainstreaming. It is the attitude that makes the difference. Experience shows that on being accepted as equal partners, capable of making significant contribution to their community, the visually impaired proved that blindness is merely a limitation which could be overcome.

A perceptible change can be found in the attitudes towards the visually impaired in our country though confined to larger cities amongst the educated community. Media, both print and electronic, has played a vital role in bringing about desired global changes It is the need of the hour to make the best use of available media network in

reaching the unreached to demystify blindness and remove the prejudices. The media should be the means for more widespread awareness about the facilities currently available at Governmental and non-Governmental levels for the benefit of the visually impaired.

Promoting Voluntary Programs

The services for the blind and for other disabled groups initiated by voluntary organizations with financial support from philanthropists— individuals and groups, continue even today, with donor and State financial assistance. It is, therefore, necessary that these organizations in need of urgent support in capacity building to perform their tasks with greater success, greater efficiency, and earnestness are extended the much needed support.

Leadership training courses are to be organized for the manpower in these organizations to engage themselves in constructive activities rather than turn into pressure groups. Further, a scheme of social audit needs to be developed and implemented to scrutinize their programs in terms of achieving their goals— that of providing need-based training and rehabilitation services to visually impaired children and youth.

Initiating Early Intervention Services

If a disease is diagnosed early, it may not only be cured sooner, but can also be prevented from becoming chronic. This is very much true of providing rehabilitation services to persons with visual impairments. One of the action points of the Biwako Millennium Framework (2002) is "Infants and young children with disabilities require access to early intervention services, including early detection and identification (birth to 4 years age), with support and training to parents and families to facilitate the maximum development of the full potential of their disabled children." A few non-governmental organizations have taken a lead in initiating intervention services for visually-impaired children and youth aimed at meeting the pre-school educational needs of the visually impaired children. For this purpose, greater interaction and interface must be ensured between workers available in the villages, families of blind children and rehabilitation specialists/teachers available in the district.

The introduction of nurseries for pre-school children as a part of the ICDS programs will facilitate the young blind children as well. There have already been several attempts in this direction.

The required ICDS workers towards the special needs of blind infants and the components of parent-support and counseling could best be done through the joint efforts of available special school teachers and training institutions for professional social workers. Based on the outcome of such reviews, a standardized capsule could be worked out for more intensive orientation of ICDS workers and those working in emerging nursery schools. Health workers available in villages could also similarly be involved in early detection and identification of visual impairment among infants.

Complementary Roles of Special Schools and Inclusive Education Programs

Salamanca Declaration and Framework for Action (2002) on the education of children with special needs has very rightly said "Regular schools with inclusive orientation are the most effective means of combating discriminatory attitudes creating welcoming communities, building an inclusive society and achieving education for all. Moreover, they provide an effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system".

Different models of inclusive education for children with blindness have been initiated in line with this thinking. But, the results have not been encouraging. The reason perhaps is the lack of required preparation before the launch of this much needed programs in terms of needed trained human resource, need-based learning material, necessary infrastructural facilities, etc.

It is, therefore, essential that urgent measures are initiated to augment the training facilities on a large scale encompassing the skills of preparing the teaching-learning material, etc., so that inclusion of children with visual impairment in mainstream education could become a reality. It is further required that the special schools, which are available in a large number of districts are converted into resource centers to provide necessary support services for preparing blind children for main-streaming whenever necessary. These resource centers can also provide support to regular school teachers whenever required.

Augmenting the production and distribution of equipment and material

The manufacture and production of Braille books and audio books, appliances and other devices have increased substantially in the last fifty years. But, a large number of visually impaired children go without the needed equipment and material. It is therefore, necessary that the production of books, in Braille and on cassettes, is augmented by installing fast speed Braille Embossers and by establishing more talking book studios.

Promoting Research

Promoting research aimed at qualitative improvement and quantitative increase of rehabilitation services is the need of the hour to attain the goal of education for all visually impaired children and youth. Some of the key research areas in which attention needs to be focused may include:

Prevention of blindness.

Early Identification and Intervention services.

Design and development of assistive devices.

Psycho-educational assessment.

Rehabilitation, including CBR.

Job identification.

Another activity that needs urgent attention is the collection, compilation and publication of research abstracts to disseminate information on various findings for application.

Upgrading and modernizing vocational training for the visually impaired

One of the principal aims of education is to prepare a child to engage himself in gainful employment when he grows up. Vocational training of the visually impaired is provided by the special schools and organizations of and /or for the blind. The training imparted is largely traditional which has poor earning potential due to the availability of newer technologies. Research shows that with the adaptation of certain machines and tools, the visually impaired youth can learn to work as machinists, computer operators, plastic molders, etc. They can also be self-employed in managing cyber cafes, E-commerce, etc. Jobs have been identified which computer literate blind person can perform successfully. But, these efforts have not helped to enrich vocational skills of the blind because the curriculum in vocational training has not been updated keeping with the requirement of jobs identified. It is, therefore, imperative that the identified jobs are studied in terms of the skills and competencies that one needs to be able to work effectively and prepare the curriculum and manuals

for training. Only if the curriculums are transacted the educated blind youth can get gainful employment which is the ultimate aim of all efforts of the Government and the non-Governmental organizations.

To conclude, it would suffice to say that the foregoing need urgent and serious attention of policy planners, managers of various rehabilitation services and also the Government agencies to examine and implement these ideas to achieve the cherished goal of bringing all blind persons within the ambit of rehabilitation services so as to make them contributory citizens of this country.

Experts who contributed to the section on Visual Impairment

Prof. S.R. Mittal (Editor)
Shri A.K. Mittal
Dr. Bhushan Punani
Shri K. Kempaiah
Shri Dipendra Manocha
Shri Vijay Shankar Sharma
Shri Yogender Pandey
Smt. Preeti Khanna

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